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for Higher Education

Perspectives,
stakeholders, and
competences

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Tuning Journal for Higher Education (TJHE)

Perspectives, stakeholders, and competences

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Editorial

Mary Gobbi

Editor

> "*It is a narrow mind which cannot look at a subject from various points of view.*"
>
> *George Eliot,* Middlemarch (1871)

George Eliot, the pen name of Mary Anne Evans, a British Victorian author, aptly reminds us- as individuals- to look at the world around us from different points of view. Eliot implies that we should intentionally seek, and be open to, these different points of view, perspectives, or experiences. Like the witnesses to a crime, or the participants at a football match, where we stood, what we perceived, as well as our sensory/intellectual capacities, allegiances, and prior experiences shape our 'world view' and recall of the same event and set of circumstances. Whether as educators, researchers, leaders, practitioners of our field of study, or university administrators, we endeavour to be 'open minded'. Indeed, it is a characteristic we strive to enable and promote within our student populations and research endeavours. We find the ingredients to 'open mindedness' in the current Tuning generic competences, that include the capacities to be critical and self-critical, to appreciate diversity and multiculturalism; to learn; adapt to new situations and be creative. History shows us those moments in 'natural' philosophy when paradigms shifted- whether it was Archimedes, Newton, Galileo, Descartes, or Einstein. Some new ideas are so different and challenging that they threaten the status quo and establishment, generating resistance and persecution. Some innovators, like DaVinci, find ways to be covert about their ideas as their contemporaries do not have the capacity to 'think the unthinkable' and as J. William Fulbright wrote,

> We must care to think about the unthinkable things, because when things become unthinkable, thinking stops and action becomes mindless.

Paradoxically, while 'thinking the unthinkable' is associated with moments of inspiration, creativity, critical reflection, problem solving, quality improvement and genius, it is also initiated through times of crisis, disaster, or desperation. Within the last few decades, what previously might have seemed 'unthinkable', namely outcome and competence-based education, stakeholder engagement in course design and evaluation, student-centred, personalized approaches to education, new technologies, and experiential and work-based learning, they are now on the agenda. We need to question why it is taking some parts of the Academy so long to make these shifts. Is it a power dynamic, or is it because they are challenged by the perspectives that may emerge? Is it economic drivers and costs that may disturb the reimbursement models of professors? Sometimes the academics are not provided with the tools necessary for their professional competence, so they can effectively deal with the new perspectives, their implementation, and impact. Perhaps it is because engagement with stakeholders generates new relationships and forms of knowing. Furthermore, in the presence of many 'voices' and 'views', that can be disparate, and sometimes produce a cacophony of sound, how can, or does, the academy judge their salience, determine their worth and authenticity to evaluate these inputs and make decisions?

The papers in this edition offer some suggestions to address these queries when they deal with many stakeholders and a multiplicity of voices. Struck by the shifting sands and tensions of many case studies reported here, is it timely to ask whether our models of competence are still relevant and fit for purpose? Different definitions are found in the papers; so perhaps it is time to review our constructs of competence, informed by the evidence of the last twenty to thirty years and the impact of the pandemic. Let us perceive competence with an open mind, wisdom, and pragmatism.

This edition of the Journal contains the last 'formal' special section on COVID-19. There are other papers in the pipeline, but they will be integrated within the usual edition format from May 2023. I am sure that like us, you would like to express sincere thanks and appreciation to Professor habil. Anca Greere for her detailed, scholarly, and precise editorship of the special section. You will see in Professor Greere's editorial a resume of the key themes that have emerged from the papers in both this edition and the previous two editions. It has been a pleasure and honour to collaborate with Professor Greere, whose humour, sense of realism and aspiration have been truly appreciated by the editorial team. We wish her well with her future endeavours. We are fortunate that she will continue to be a reviewer in her specialist subject area. Anca is Professor of English Linguistics and

Translation Studies, Director of the European Master's in Translation Studies and Terminology, at the Department of Applied Modern Languages, Faculty of Letters, Babeș-Bolyai University, Romania. Our thanks are also offered to Babeș-Bolyai University for their support during the period of Professor Greere's Section Editorship.

Readers, this tenth edition (Volume 1) of the Journal starts the count down towards the tenth anniversary of the first edition, published in November 2023, under the pioneering influence of the then editor Paul Ryan. The first edition was entitled *New Profiles for New Societies* and focused on:

> the impact of new, quality educational programmes on societal developments, discussing whether building new profiles and new generations of graduates is the road to build new societies.

It is sometimes timely to reflect on the past to inform our future, and so next year we shall highlight issues raised during the last decade with their moments of success, trials, and tribulations. Let us look forward to the second decade of the Journal and 2033 with a sense of hope and optimism.

One success is the significant rise in papers submitted to the Journal, this has led to some unfortunate delays in our turnaround times. If any readers would like to consider being reviewers, please send a mini curriculum vitae to the editor. Thank you. Keep well and safe, especially to our friends in conflict zones and those experiencing natural disasters.

Editorial Team
November 2022

Introduction

Perspectives, stakeholders, and competences

Introduction

Mary Gobbi

Editor

Abstract: The papers in this Edition of the Journal comprise six 'general papers' and six in the COVID-19 section. Together, the papers clearly illustrate our theme *Perspectives, stakeholders, and competences*. While the papers comprising the general part of this Edition represent a diverse range of countries (Brazil, Iran, Spain, Turkey), there are some common themes. One cluster of papers is concerned with student outcomes or the professional competence of teacher trainees. The other cluster is interested in aspects of university strategy, whether financial or related to the university mission. The papers challenge us to consider the benefits of stakeholder engagement and multiple perspectives on policies, strategies, student or professional outcomes with their respective definitions, and specific educational interventions. Consequently, the methodologies and methods are appropriately diverse, involving bibliometric analysis, qualitative analysis (grounded theory, content, and textual analysis) the use of digital tools and statistics. From a theoretical lens, we encounter concepts such as parallax, historical and contemporary worldviews on education and the various philosophies on the nature of the university. Within a socio-political framework, we are introduced to the nuances of national government policies and their country-based impact that is shaped by local cultural traditions in education and attitude. Despite the range of topic, context and methods, each paper demonstrates a commitment to improving educational practice, research and student or staff experience.

Keywords: professional competences; COVID-19; teacher education; budgeting; strategy; bibliometric review.

Our first paper '*A bibliometric review of research on student outcomes in higher education*' by Ahmet Aypay and Hasan Yücel Ertem analysed 2,375 journal papers that met the initial screening criteria and were found in 52

Scopus- indexed higher education Journals during the period 1960-2020. Student outcomes, as defined in this paper, comprise competences that broadly include cognitive, affective, conscious, and social dispositions that create the basis for performance. Drawing on content analysis techniques, the study focussed on the distribution of the articles, their impact, authors and foci and knowledge base in the sector. 83.5% of the articles in the Scopus Data base were from the United States (1370), United Kingdom (330), Australia (2156), and Canada (66) demonstrating a 'Western' dominance in the literature. The most popular Journal was Studies in Higher Education (200 articles). Clustering the articles by theme, perhaps unsurprisingly, were outcomes concerned with learning and teaching, the retention of minorities, socio-economic status as a student, demography and diversity.

As the authors discussed, the quantity of papers from the United States and United Kingdom, with their respective contextual and cultural features, raises questions concerning the generalizability of the findings to other countries and settings where different trends, topics or influences upon Higher Education and student outcomes may exist. The bibliometric analysis enables the reader to discover how a field of study is influenced over time by authors (the most prolific), settings, data sources/populations and topics. Limitations of the study are that the criteria of analysis did not include author gender, ethnicity, or age and was restricted to the content analysis strategies outlined in the paper.

Perspectives on competences and outcomes from an International Business perspective are discussed by Marcelo Almeida de Camargo Pereira and Vera Lucia Felicetti, *'Competences in parallax in higher education from multiple standpoints in a Brazilian undergraduate program in International Business'*. In this small case study, the authors sought the views of several stakeholders (students, professors, programme lead, Dean, and employers) regarding their views of the educational process and professional competences required for a programme in International Business. Here, a different perspective on competences is offered, namely the authors relate competence to the labour market and the cognitive skills used by individuals to problem solve. Almeida de Camargo Pereira and Felicetti's introduction covers two other perspectives. The first is the development of education associated with international business from the industrial periods to current times. The second is the concept of *parallax*, that has its origins in astronomy namely the 'stellar parallax' that considers how shifts in objects occur according to the point of observation.

The sample was 7 graduates in one focus group, 4 interviews with employers of the graduates and 9 one to one interviews with academic staff.

Following transcription, the data were analysed by participant group using Textual Discourse Analysis generating units of meaning. Although the study sample was small, it is fascinating that the connections between culture and technology emerge so clearly in this study. Different cultures (professors, stakeholders, and graduates) exhibit different preferences for modes of learning and teaching particularly between students and their teachers. Surprisingly as a reader, it seems that students preferred more traditional modes of learning and teaching. In contrast, the academic teachers were trying to use modern pedagogies. This was attributed in part to the students' cultural experiences of school prior to university (i.e. traditional). Another difference was that graduates perceived that the real learning for professional competence came from the workplace. Aspects of this study echo the Tuning methodology that may have been a useful reference for the authors. Most helpful are the schematic diagrams or concept maps that present the data and were gleaned from the units of meaning. These show clearly the relationships between technology and culture on the perceptions and experience of stake holding groups in relation to work-based learning. The paper concludes by discussing recommendations for others engaged in the promotion of professional competence in their field.

Continuing this theme of professional skill development is the work of Daniel David Martinez and Sara Cortés Dumont *'ICT and 360º evaluation: Improving professional skills in higher education in Spain'*. The authors studied the extent to which 360-degree evaluation techniques could improve the impartiality of student assessment or judgment skills. 360-degree evaluation of a person's performance or character relies upon the triangulation of three points of reference, in this instance self-assessment, peer assessment and teacher assessment. The method generates large volumes of data. The research investigated whether this form of evaluation could enable students to learn to make impartial judgements on performance content, enabled by a previously designed digital web-based tool. In this case study, fifty-six bilingual (Spanish/English) primary school teacher students volunteered to undertake the study during their final class presentation. All the participants engaged in the peer evaluation, but only forty-five completed the self-evaluation. The teacher's scores were used as the reference point. Seventy criteria that included both quantitative and qualitative components formed the assessment tool, with qualitative responses being quantified. The data included comments that justified the scoring outcomes. The student participants were predominantly female (44/56), and some gender differences were noticed in the responses. The detailed methodology gives helpful background knowledge on 360-degree evaluation and the ICT tools employed.

The authors found that the various modes of assessment revealed different behaviours and the identification of students who were more able to assess objectively. The authors reported on the use, weaknesses, and strengths of the digital tool, explained how the characteristics of the task, academic course and instances of subjective bias influenced the responses. Debate concerning the extent to which (1) the criteria used were objective and not subject to interpretation by the assessor; and (2) that all the qualitative data were amenable to quantification for the purposes of analysis remains. Broader literature relating to self and peer/group assessment and their relationships to gender and cultural influences were not explored in detail. Having shown that the 360-degree evaluation and ICT had identified student abilities to assess and instances of under and over scoring, the authors then debated associated challenges within the social sciences and the Spanish education system. The study supported the notion that techniques like this could enhance reflective and critical thinking skills in the students.

Teacher trainees are the focus of the next paper *'Views of pre-service teachers on the research-based teacher education approach'* (Emel Bayrak Özmutlu). Here the author analyses the views of the trainees concerning their research-based course that had been integrated within their programme following a policy directive from the government in 2007. The aim was to increase the research skills of teachers and to promote critical thinking and reflective practice. The course itself is spread over fourteen weeks, with predominantly female trainees preparing to teach 'basic education' (primary school ages).

Using a qualitative interview methodology, one hundred and ten trainee teachers were interviewed to elicit their views concerning research competence for teachers; the growth/promotion of research-based teacher education; and the outcomes of the methods course itself. The methodology section in this paper is detailed, demonstrating a robust approach to validating instruments, pilot testing, interview question design and ethical considerations. The presentation of the qualitative data clearly demonstrated how the themes were generated. Content analysis was validated by an external person and thematic analysis conducted according to the aims of the study. Özmutlu's findings were that trainees considered that the programme and research-based education enabled personal development, improved professional competence and that they were better able to handle complexity. The author noted the cultural tendency towards teachers holding a 'passive technician role', arguing that the research based education could foster teachers who were more critical and able to be active implementers.

The final two papers in this section address university operations and strategy from a financial perspective (Zargham Faramarzi Nia, Hamid

Farhadi Rad, Yadollah Mehralizadeh, and Rahmatullah Gholipour Soteh: ' *Beyond performance-based budgeting policy in Iran's public universities: Causes, outcomes, and strategies'*) and that of mission (Nazife Karadağ and Betül Balkar: *'Comparison of strategic objectives of universities subject to mission differentiation with strategic objectives of well-established universities in Turkey'*).

First, we have Nia et al., who explored performance-based budgeting (PBB) in the context of an Iranian government policy initiative whose aim was to increase the transparency and accountability of the university system. Following a detailed account of the history and application of performance-based budgeting in the university sector, the authors investigated the reasons for the introduction of PBB in Iran, any consequences of its use and the identification of strategies that enabled effective implementation. The method adopted was grounded theory with in -depth semi-structured interviews with experts acquired through purposive sampling. There were two groups of participants, one from the government to give a macro perspective and the other from the university sector to explore the micro perspective and practical implementation issues. This fascinating paper provided detailed accounts of the research methods and rationale for their adoption. There were extensive findings and recommendations for local policy makers and points of interest for international colleagues.

The authors were able to elicit several factors that had influenced the adoption of EBB in Iran, and positive outcomes that included improved accountability and transparency. The authors reported factors that had led to the successful implementation of the model in the public universities. Their analysis of the factors that had been problematic led the authors to argue that performance-based budgeting alone cannot address the problems experienced by Iran's public universities and higher education. Their contextual analysis and research data led the authors to make recommendations and to propose that 'policy makers should caution in using this strategy and prioritize preserving the independence, nature and mission of the university'.

Consideration of the nature and mission of the university leads us to the final paper in this section by Nazife Karadağ and Betül Balkar ('Comparison *of strategic objectives of universities subject to mission differentiation with strategic objectives of well-established universities in Turkey'*). Mission differentiation has been a recent feature of the Turkish system (2006). These 'newer' type of universities has been shown to have a lower academic performance. This comparative study analysed the features of ten public universities with specific mission identification associated with their region, as determined by Turkish government requirements and ten public universities

who do not hold such mission requirements. The study excluded private and foundation universities. Documentary analysis of the relevant documents from each university were subjected to content analysis that focussed upon the quality of education, conditions for research, communication and interaction with stakeholders, identity, and internationalization. In addition, the mission universities were reviewed for the extent they were leading local, regional development.

The authors found many factors that enabled or hindered the 'mission' universities in their ability to work effectively with the local region. For example, there were problems with structural arrangements, legal regulations, and effective engagement with stakeholders in the region. While there were many similarities in objectives between these two groups of public universities that were attributed to the nature of their being public universities, the authors argued that the mission differentiation universities should strengthen their objectives to include more reference and engagement with the local region. Further work with the private and foundation universities might show diversity. While the findings of their study are specific to one country, Turkey, they would be of interest to international colleagues who are considering the development of similar 'mission differentiation' universities.

In conclusion, these six papers illustrate the crucial importance of stakeholder engagement and stakeholder perspectives within the full range of Higher Education activity, from individual courses within programmes, to the programmes themselves and the wider institutions at local, regional, and national levels. We also see how different worldviews and perspectives shape the lens through which these various evaluation and research studies are conducted, expressed, and validated. The importance of culture, technology and gender are but three interactive influencers upon context, sample populations, data analysis, interpretation, and presentation. Each paper has, to a greater or lesser extent, commented upon their relevance to the study and the relevant stakeholder experiences and expectations.

General Section — Articles

A bibliometric review of research on student outcomes in higher education 1960-2020

Ahmet Aypay and Hasan Yücel Ertem*

Abstract: This study conducted a bibliometric analysis of studies on student outcomes in higher education from 1960 to 2020, providing a bibliometric content analysis of articles based on 52 Scopus-indexed higher education journals. Bibliometric analysis methodology was used, and Preferred Reporting Items for Systematic Reviews and Meta-analyses were employed to identify and select the 2,375 articles included in the sample. The trajectory of publications over time was also analyzed, and often-cited journals, authors, articles, and co-citations were identified. The topical foci of research on student outcomes were revealed, co-occurrence analysis was performed, and keyword co-occurrence maps are presented. Limitations, interpretation, implications, and recommendations were also made on the basis of the findings.

Keywords: student outcomes; bibliometric review; topics; methodologies; citations; co-citations.

I. Introduction

Research on students arguably constitutes the most comprehensive literature in higher education, and this presents a major challenge to researchers and institutions. Given the exponential growth of publications, "… research on college students is perhaps the single largest area of inquiry in the field of higher

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education …".[1] College outcome literature has expanded considerably and there have been excellent and extensive evaluations of research on college students since 1973, especially in a comprehensive three-volume work that spans over decades.[2] These comprehensive publications indicate the sheer size and scope of research trends in college outcomes for over half a century. Pascarella noted that the "huge and complex body of research on college students is expanding at an accelerated rate" and that it is "encyclopedic".[3] He further predicted there might be up to 10,000 studies produced in the past two decades.

It is also highlighted that although syntheses worked fairly well previously, conducting such syntheses by one or two individuals would be impossible because of the large rate of growth in the number of publications. Even conducting reviews takes one to two years, and a considerable literature emerges during the review periods. Moreover, Pascarella suggested that each of the professional organizations may undertake such reviews with 10–20 scholars, or smaller scale reviews may be conducted:[4]

> … to break the huge body of research on college impacts into more manageable segments and conduct literature reviews in a continuous and overlapping manner rather than in the periodic, serial pattern that has characterized past efforts.[5]

II. Literature review

Several systematic reviews have been conducted in higher education recently.[6] However, the majority have focused on student health, nutrition, and psychological health.[7] Other studies have focused on a specific group of

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[1] Ernest T Pascarella, "How College Affects Students: Ten Directions for Future Research," *Journal of College Student Development* 47, no. 5 (2006): 508-520.

[2] Matthew J. Mayhew, Alyssa N. Rockenbach, Nicholas A. Bowman, Tricia A. Seifert, Gregory C. Wolniak, Ernest T. Pascarella, and Patrick T. Terenzini, *How College Affects Students: 21st Century Evidence that Higher Education Works*, Volume 3, (Indianapolis, IN: Jossey-Bass, 2016).

[3] Ernest T. Pascarella, How College Affects Students: Ten Directions for Future Research," *Journal of College Student Development* 47, no. 5 (2006): 508-520, https://10.1353/csd.2006.0060.

[4] Pascarella, "How College Affects Students, 508-520.

[5] Pascarella, How College Affects Students, 508-520.

[6] Malcolm Tight, "Systematic Reviews and Meta-analyses of Higher Education Research," *European Journal of Higher Education* 9, no. 2 (2019): 133-152, https://doi.org/10.1080/21568235.2018.1541752.

[7] Michelle Richardson, Charles Abraham, and Rod Bond, "Psychological Correlates of University Students' Academic Performance: A Systematic Review and Meta-analysis," *Psychological Bulletin* 138, no. 2 (2012): 353-387, https//: doi.org/10.1037/a0026838.

students such as those at-risk,[8] stress management,[9] mental health and student well-being,[10] and creativity.[11] These reviews have added to our knowledge on specific issues, such as the intersectionality,[12] diversity,[13] special needs,[14] critical thinking,[15] student engagement,[16] social networks, and social capital[17] of college students. In addition, the reviews have focused on the findings of one-country studies, i.e., the US or developing countries.[18] Furthermore, the corpus of these studies on college experiences give valuable implications about higher education, but still lacks a synthesis of student outcomes in higher education.

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[8] Jeffrey C. Valentine, Amy S. Hirschy, Christine D. Bremer, Walter Novillo, Marisa Castellano, and Aaron Banister, "Keeping At-risk Students in School: A Systematic Review of College Retention Programs," *Educational Evaluation and Policy Analysis* 33, no. 2 (2011): 214-234, https://doi.org/10.3102/016237371139812.

[9] Yagmur Amanvermez, Metta Rahmadiana, Eirini Karyotaki, Lenore de Wit, David D. Ebert, Ronald C. Kessler, and Pim Cujipers, "Stress Management Interventions for College Students: A Systematic Review and Meta-analysis," *Clinical Psychology* (2020), https://doi.org/10.1111/cpsp.12342.

[10] Joanne Worsley, Andy Pennington, and Rhiannon Corcoran, "What Interventions Improve College and University Students' Mental Health and Wellbeing? A Review of Review-level Evidence," Accessed December 6, 2020. https://whatworkswellbeing.org/wp-content/uploads/2020/03/Student-mental-health-full-review.pdf.

[11] Hsing-Yuan, Liu, Chia-Chen Chang, and Chang Gung, "Effectiveness of 4Ps Creativity Teaching for College Students: A Systematic Review and Meta-analysis," *Creative Education,* 8, no. 6 (2017): 857-869. https://doi.org/10.4236/ce.2017.86062.

[12] Sue Nichols and Garth Stahl, "Intersectionality in Higher Education Research: A Systematic Literature Review," *Higher Education Research & Development* 38, no. 6 (2019): 1255-1268, https://doi.org/10.1080/07294360.2019.1638348.

[13] Antonio Duran, "Queer and of Color: A Systematic Literature Review on Queer Students of Color in Higher Education Scholarship," *Journal of Diversity in Higher Education* 12, no.4 (2019): 390-400, https://doi.org/10.1037/dhe0000084.

[14] Alison Nuske, Rilotta Fiona, Michelle Bellon, and Amanda Richdale, "Transition to Higher Education for Students with Autism," *Journal of Diversity in Higher Education* 12, no. 3 (2019): 280-295, https://doi.org/10.1037/dhe0000108.

[15] Angelito Calma and Martin Davies, "Critical Thinking in Business Education: Current Outlook and Future Prospects," *Studies in Higher Education* 46, no. 11 (2020):2279-2295, https://doi.org/10.1080/03075079.2020.1716324.

[16] Gloria Aparicio, Tximin Iturralde, and Amaia Maseda, "A Holistic Bibliometric Overview of the Student Engagement Research Field," *Journal of Further and Higher Education* 45, no. 4 (2021): 540-557. https://doi.org/10.1080/0309877X.2020.1795092.

[17] Shweta Mishra., "Social Networks, Social Capital, Social Support and Academic Success in Higher Education: A Systematic Review with a Special Focus on 'Underrepresented' Students," *Educational Research Review* 29, (2020): (100307), https://doi.org/10.1016/j.edurev.2019.100307.

[18] Elaine Unterhalter and Colleen Howell, "Unaligned Connections or Enlarging Engagements? Tertiary Education in Developing Countries and the Implementation of the SDGs," *Higher Education* 81, (2021): 9-29, https://doi.org/10.1186/s13643-016-0384-4.

"Student outcomes" are outputs of the process reflecting the procedural and structural dynamics of higher education from the student side. Student outcomes include not only the intended learning outcomes but also the competences or skills that college students receive. Student outcomes are defined here as competences which broadly include cognitive, affective, conscious, and social dispositions that create the basis for performance.

Despite the large size of the literature on college students, only a few studies have explored the structure and processes from the sociology of science perspective. The current study has neither the breadth and depth of the books that synthesize the research produced over decades,[19] nor does it claim that it may substitute the classical synthesis on research. Nonetheless, bibliometric reviews may be utilized as a holistic overview of the literature, are conducted rapidly, and may be used as a supplement to literature reviews. Bibliometric reviews provide a more objective approach, while "a systematic, transparent, and reproducible review process" may lead to better descriptions, evaluations, and monitoring.[20]

This study seeks to systematically review the research on college student outcomes, explore the distribution of the studies, and identify the conceptual trends of student outcomes. The research questions are as follows:

1. What is the volume, growth trajectory, and geographic distribution of the higher education literature based on student outcomes between 1960 (technical genesis of databases) and 2020?
2. What journals, authors, and articles on student outcomes have evidenced the greatest citation impact over the past six decades?
3. What is the intellectual structure of the higher education knowledge base on student outcomes?
4. What topical foci are pertinent to student outcomes that have attracted the attention of higher education scholars between 1960 and 2020?

III. Methodology

Content analysis was conducted as the research design in the current study to achieve the purpose of the study. Content analysis is employed to summarize data from many studies, and data conceptualized through content analysis help

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[19] Matthew J. Mayhew et al, *How College Affects Students: 21st Century Evidence that Higher Education Works*, Volume 3, (Indianapolis, IN: Jossey-Bass, 2016).

[20] Ivan Zupic and Tomaz Čater, "Bibliometric Methods in Management and Organization," *Organizational Research Methods* 18, no. 3 (2015): 429-472, https://doi.org/10.1177/1094428114562.

in seeing the relationships between terms.[21,22] Bibliometric analysis has become popular in search of topographical trends within a body of knowledge.[23] It is a way to support empirical investigations of the process and structure of fields or the knowledge base. In addition, bibliometric analyses offset some of the weaknesses of traditional literature reviews. Bibliometric methods provide diversity in conceptualizations and modeling to explore the foundations, intellectual core, and directions for future research of a typical research field, such that these methods offer complementary perspectives to traditional literature reviews that are limited to present holistic perspectives. Additionally, bibliometric methods may be used to generate new knowledge.[24,25] The current study combined bibliometric content analysis in order to document trends in the concepts and intellectual approaches of research on college students.

Our bibliometric content analysis was conducted through a systematic review including the stages of defining questions, determining study types, literature searching, screening of the results of the search, appraising studies, synthesizing studies, and disseminating the findings of the review.[26]

III.1. Selection of sources

The research questions focused on four main issues of students in the higher education literature. The review was delimited to articles published in higher education journals. Books, book chapters, proceedings, conference papers, dissertations, and reports were excluded. These documents were excluded because of the preferred science mapping parameters in the literature, and because the records of journal articles are kept comprehensively in the databases. Further, the journals were delimited to the Scopus index.

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[21] Louis Cohen, Lawrence Manion, and Keith Morrison, *Research Methods in Education* (New York, NY: Routledge, 2007).

[22] Ali Yildirim and Hasan Şimşek, *Sosyal Bilimlerde Nitel Araştırma Yöntemleri* (Ankara: Seçkin yayıncılık, 2016).

[23] Phillip Hallinger and Jesna Kovačević, "A Bibliometric Review of Research on Educational Administration: Science Mapping the Literature, 1960 to 2018," *Review of Educational Research* 89, no. 3 (2019): 335-369, https://doi.org/10.3102/003465431983038.

[24] Gloria Aparicio, Tximin Iturralde, and Amaia Maseda, "A Holistic Bibliometric Overview of the Student Engagement Research Field," *Journal of Further and Higher Education* 45, no. 4 (2021): 540-557, https://doi.org/10.1080/0309877X.2020.1795092.

[25] Alexander Serenko and Nick Bontis, "Global Ranking of Knowledge Management and Intellectual Capital Academic Journals: 2013 Update," *Journal of Knowledge Management* 17, no. 2 (2013): 307–326, https://doi.org/10.1108/13673271311315231.

[26] Mark Petticrew and Helen Roberts, *Systematic Reviews in the Social Sciences: A Practical Guide* (Malden, MA: Blackwell, 2006).

Scopus was selected in order to allow the opportunity to generate databases for systematic reviews. Among the Scopus-indexed higher education journals, 52 journals were identified. The search criteria excluded journals solely on education in general. Consequently, the 52 journals in Table 1 were included in the review.

Table 1

Journal List

Journal name	Cited score 2019
Active Learning in Higher Education	5.4
Alternative Higher Education	Inactive
Art, Design and Communication in Higher Education	0.9
Arts and Humanities in Higher Education	1.8
Assessment and Evaluation in Higher Education	4.8
Assessment in Higher Education	Inactive
Christian Higher Education	0.8
Community College Journal of Research and Practice	0.8
Chronicle of Higher Education	Inactive
European Journal of Higher Education	2.4
Higher Education	5.3
Higher Education for the Future	New
Higher Education Forum	0.7
Higher Education in Europe	Inactive
Higher Education Pedagogies	0.8
Higher Education Policy	2.3
Higher Education Quarterly	2.3
Higher Education Research and Development	3.7
Higher Education, Skills and Work-based Learning	1.5
Industry and Higher Education	1.4
Innovative Higher Education	2.0
International Journal of Educational Technology in Higher Education	5.6
International Journal of Higher Education	0.2

Journal name	Cited score 2019
International Journal of Learning in Higher Education	0.4
International Journal of Sustainability in Higher Education	3.2
International Journal on E-Learning: Corporate, Government, Healthcare, and Higher Education	0.5
Internet and Higher Education	17.1
Journal of Applied Research in Higher Education	1.2
Journal of College Student Development	2.3
Journal of College Student Retention: Research, Theory and Practice	2.3
Journal of Computing in Higher Education	4.0
Journal of Continuing Higher Education	0.8
Journal of Diversity in Higher Education	3.4
Journal of Further and Higher Education	2.2
Journal of Geography in Higher Education	3.0
Journal of Higher Education	4.1
Journal of Higher Education Outreach and Engagement	1.1
Journal of Higher Education Policy and Management	2.5
Journal of Hispanic Higher Education	1.5
Journal of Marketing for Higher Education	3.5
Journal of Women and Gender in Higher Education	0.1
Language Learning in Higher Education	0.5
Learning and Teaching in Higher Education: Gulf Perspectives	New
NASPA Journal About Women in Higher Education	Inactive
Perspectives: Policy and Practice in Higher Education	1.7
Quality in Higher Education	1.8
Research in Higher Education	3.7
Review of Higher Education	2.0
Studies in Higher Education	5.9
Teaching in Higher Education	3.7
Tertiary Education and Management	2.1
Tuning Journal for Higher Education	0.1

III.2. *Identification*

PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) was developed by Moher et al. and the PRISMA Group[27] was followed to identify the sources in the following four steps: identification, screening, eligibility, and inclusion for synthesis. For the identification stage, the following parameters were conducted: inclusion of time period (1960 to 2020); inclusion of selected journals; inclusion of articles as document types; and the exclusion of commentaries, books, chapters, proceedings, conference papers, dissertations, reports, and editorials. For the screening stage, the keywords, namely, "college students," "higher education," and "student outcomes," were searched. Thus, 2,396 studies were initially screened. The eligibility check was performed in the third stage, and 21 documents were excluded on the basis of their content. Finally, 2,375 articles were included for bibliometric synthesis in the final step. Figure 1 demonstrates the PRISMA flow diagram.
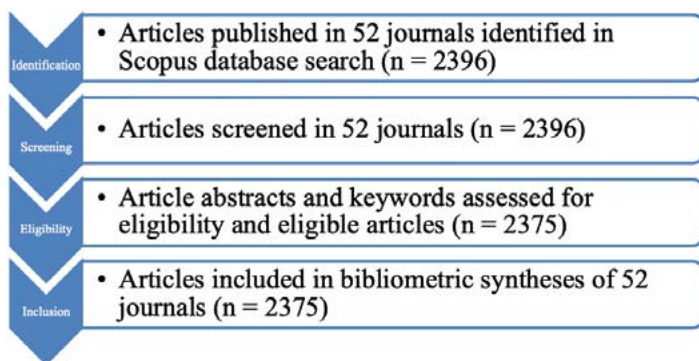
Figure 1
PRISMA Flow Diagram

III.3. *Data extraction and analysis*

A total of 2,375 articles was recorded to be synthesized and analyzed. The metadata of each article from the Scopus database were stored in an

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[27] David Moher, Alessandro Liberati, Jennifer Tetzlaff, Douglas G. Altman, Antes, G., ... and Jocalyn Clark, "Preferred Reporting Items for Systematic Reviews and Meta-analyses: The PRISMA Statement (Chinese edition)," *Journal of Chinese Integrative Medicine* 7, no. 9 (2009): 889-896, https://doi.org/10.3736/jcim20090918.

Excel file. The metadata included authors with their affiliations, sources, article title, abstract, keywords, references, and values related to citations. The current study used descriptive analysis, citation analysis, co-citation-analysis, and social network analysis. Scopus analytic tools, Excel functions, Tableau, and VOSviewer were used to conduct these analyses. Moreover, Scopus analytical tools together with Excel were used to present descriptive analysis results; such as the number of citations, author affiliations, and growth over time. Tableau was also employed to construct a heat map demonstrating the geographical distribution of articles. Finally, VOSviewer was applied to conduct citation analysis and co-citation and to represent the relationships among structures through social network maps.

IV. Results

This section presents the findings of the study. Each sub-section corresponds to the research questions.

IV.1. *What is the volume, growth trajectory, and geographic distribution of the higher education journal literature based on student outcomes between 1960 and 2020?*

A total of 2,375 HE journal articles were found, as noted above. Since there were no articles between 1960 and 1972, the first two articles were found in 1973. Seventy-six articles were detected in the 1970s and 1980s. The 1990s included 156 studies, while the first decade of the millennium had 479 articles. Between 2010 and August 2020, the researchers reached 1,591 journal articles. With 293 articles, the largest number of articles was published in 2019, while 209 articles were published in 2020, although the year 2020 had not yet been completed when the data were collected. This unprecedented increase in the number of articles may be an indication of the importance ascribed to students in a more global and competitive era. Globalization, competition, the covid-pandemic, and advances in computer technology introduce new challenges for higher education institutions to attract students. Hence, the number of studies over time tends to be upward regarding student outcomes.

The geographical distribution of articles on student outcomes is depicted via the heat map in Figure 2 indicating the intensity of countries in terms of number of articles published. The heat map was created with the version of Tableau 2020.3, which was used to specify the distribution of articles. The map shows the dominance of Anglo-American communities; such that the

United States, United Kingdom, Australia, and Canada brought in 1,373, 330, 216, and 66 articles, respectively. These countries account for 83.5% of the articles in the Scopus database. Conversely, most African countries, some Middle-East countries, and a few Western Asian countries had either few or no studies. Figure 2 demonstrates the geographical distribution of articles on student outcomes.
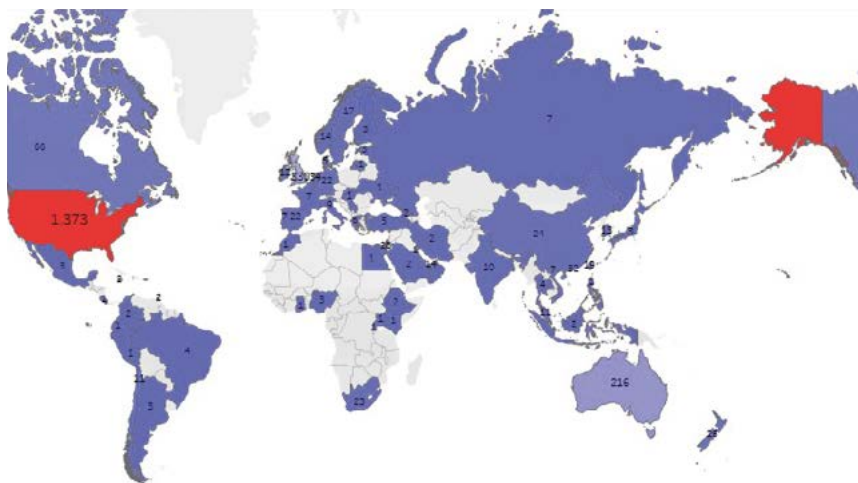
Figure 2

Geographical Distribution of Articles on Student Outcomes

The distribution of these articles is aligned with the development levels of the countries. Therefore, developed countries produce more than the developing ones. Table 2 shows this differentiation in terms of the publications in some countries.

Table 2

Countries in terms of Number of Publications

Developed countries		Developing countries	
Country	Number of studies	Country	Number of studies
United States	1,373	Kuwait	1
United Kingdom	330	Lithuania	1

Developed countries		Developing countries	
Country	Number of studies	Country	Number of studies
Australia	216	Morocco	1
Canada	66	Peru	1
Netherlands	34	Philippines	1
Hong Kong	32	Rwanda	1
Israel	28	Serbia	1
New Zealand	25	Slovakia	1
China	24	Uganda	1
South Africa	23	Ukraine	1
Germany	22	Kenya	1
Spain	22	Hungary	1
Taiwan	19	Ghana	1
Sweden	17	Egypt	1
Norway	14	Ecuador	1
United Arab Emirates	14	Costa Rica	1

IV.2. *What journals, authors, and articles on student outcomes have evidenced the greatest citation impact over the past six decades?*

Table 3 presents the top 20 journals in terms of the number of articles published, authors cited and co-cited, and articles cited and co-cited. The publications of articles on student outcomes according to the journals. For instance, "Studies in Higher Education (SiHE)" published the highest number of articles. The "Community College Journal of Research and Practice" and "Research in Higher Education" followed SiHE, respectively. Highly regarded journals and databases, such as Web of Science and Scopus, value and publish papers on students. This may be considered an indication of the paradigmatic development of research on students. As mentioned earlier, competitiveness in higher education has made journals more sensitive to articles focusing on students. This reality is evident by considering the ratio of number of documents to citations per document (CPD). Table 3 presents the journals that have published the largest number of articles.

Table 3

Number of Articles Published in HE Journals

Rank	Journal	Number of relevant articles (1960–2020)	Number of total documents (2016–2019)	Scopus citations (2016–2019)	CPD* (2016–2019)
1	Studies in Higher Education	217	591	3,485	5.90
2	Community College Journal of Research and Practice	197	325	264	0.81
3	Research in Higher Education	186	170	624	3.67
4	Journal of Diversity in Higher Education	174	103	349	3.39
5	Higher Education	164	436	2,293	5.26
6	Review of Higher Education	108	144	291	2.02
7	Journal of Further and Higher Education	103	288	645	2.24
8	Assessment and Evaluation in Higher Education	81	352	1,679	4.77
9	Journal of College Student Development	76	242	552	2.28
10	Journal of College Student Retention Research Theory and Practice	76	99	228	2.30
11	Higher Education Research and Development	74	392	1,453	3.71
12	Journal of Hispanic Higher Education	71	80	117	1.46
13	Christian Higher Education	70	84	66	0.79
14	Chronicle of Higher Education	64	N/A	N/A	N/A

Rank	Journal	Number of relevant articles (1960–2020)	Number of total documents (2016–2019)	Scopus citations (2016–2019)	CPD* (2016–2019)
15	Innovative Higher Education	57	125	245	1.96
16	Teaching in Higher Education	55	254	943	3.71
17	Journal of Marketing for Higher Education	54	57	201	3.53
18	Journal of Applied Research in Higher Education	52	201	232	1.15
19	Internet and Higher Education	48	111	1,896	17.08
20	Higher Education Skills and Work Based Learning	44	178	269	1.51

* CPD: Citations per document.

Additionally, the researchers investigated the authors of the articles. Nicholas. A. Bowman, Ernest. T. Pascarella, and Matthew J. Mayhew published more than 10 articles each. Specifically, these scholars are from the Anglo-American countries mentioned above; therefore these findings confirm one another. Further, it may be linked to the research culture of higher education institutions. For instance, institutional differentiation and the focus of scholars on student outcome research have made a difference.[28] Contrarily, the financial support and promotions of higher education institutions may also make a difference. Table 4 exhibits the most productive HE scholars who have published at least six or more articles.

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[28] "World University Rankings 2020," Times Higher Education (THE), accessed July 10, 2021, https://www.timeshighereducation.com/world-university-rankings/2020/world-ranking#!/page/0/length/25/sort_by/rank/sort_order/asc/cols/stats.

Table 4

Authors with a High Number of Articles

Rank	Author	Country	Institution	Number of relevant articles (1960–2020)	Number of total documents	Scopus citations	CPD
1	Bowman, N. A.	US	U. of Iowa	16	88	1,983	22.53
2	Pascarella, E. T.	US	U. of Iowa	15	155	5,820	37.55
3	Mayhew, M. J.	US	Ohio State U.	11	66	1,016	15.39
4	Museus, S. D.	US	U. of California	9	32	600	18.75
5	Denson, N.	Australia	Western Sydney U.	8	47	1,420	30.21
6	Park, J. J.	US	U. of Maryland	8	48	797	16.60
7	Crisp, G.	US	U. of Texas	7	22	980	44.55
8	Duran, A.	US	Auburn U.	7	24	46	1.92
9	Hu, S.	US	Florida State U.	7	51	1,431	28.06
10	Kuh, G. D.	US	Indiana U.	7	74	5,347	72.26
11	Burd, S.	US	U. of New Mexico	6	185	259	1.40
12	Dugan, J. P.	US	Arete Association	6	46	735	15.98
13	Hurtado, S.	US	U. of California	6	48	4,592	95.67
14	Latz, A. O.	US	Ball State U.	6	16	60	3.75
15	Liu, O. L.	US	Educational Testing Service	6	55	1,181	21.47
16	Miller M. T.	US	U. of Arkansas	6	53	165	3.11

Lastly, the articles that had the highest number of citations were examined. Scopus provides tools to sort studies in terms of citations. By sorting from the highest citation to the lowest citation, analyses affirmed that "A performance indicator of teaching quality in higher education: the course experience questionnaire," "Findings on Facebook in higher education: A comparison of college faculty and student uses and perceptions of social networking sites," and "The use of flipped classrooms in higher education: A scoping review" were among the frequently-cited articles. The most influential article was about teaching quality, while other highly influential articles were related to technology integration. Instructional technology, distance education, and online learning, which are also linked to student learning, were frequently studied topics, just to name a few. In sum, student outcomes in highly influential studies were commonly related to teaching, learning, and technology. Table 5 displays the 20 most influential articles.

Table 5

Highly-Cited Articles

Rank	Author	Article	Scopus citations	Topic
1	Ramsden, P.	A performance indicator of teaching quality in higher education: the course experience questionnaire	659	Teaching
2	Roblyer, M.D., McDaniel, M., Webb, M., Herman, J., Witty, J.V.	Findings on Facebook in higher education: a comparison of college faculty and student uses and perceptions of social networking sites	647	Instructional technologies
3	O'Flaherty, J., Phillips, C.	The use of flipped classrooms in higher education: A scoping review	612	Instructional technologies
4	Kahu, E.R.	Framing student engagement in higher education	390	Engagement
5	Kabilan, M.K., Ahmad, N., Abidin, M.J.Z.	Facebook: An online environment for learning of English in institutions of higher education?	328	Instructional technologies

Rank	Author	Article	Scopus citations	Topic
6	Song, L., Singleton, E.S., Hill, J.R., Koh, M.H.	Improving online learning: Student perceptions of useful and challenging characteristics	316	Online learning
7	Crisp, G., Cruz, I.	Mentoring college students: A critical review of the literature between 1990 and 2007	312	Mentoring
8	Shea, P., Sau Li, C., Pickett, A.	A study of teaching presence and student sense of learning community in fully online and web-enhanced college courses	254	Distance education
9	Zepke, N., Leach, L.	Improving student engagement: Ten proposals for action	253	Engagement
10	Broadbent, J., Poon, W.L.	Self-regulated learning strategies and academic achievement in online higher education learning environments: A systematic review	250	Online learning
11	Wals, A.E.J., Jickling, B.	"Sustainability" in higher education: From doublethink and newspeak to critical thinking and meaningful learning	244	Sustainable development
12	Rovai, A.P.	In search of higher persistence rates in distance education online programs	237	Attrition
13	Thomas, S.L., Heck, R.H.	Analysis of large-scale secondary data in higher education research: Potential perils associated with complex sampling designs	228	Complex sample

Rank	Author	Article	Scopus citations	Topic
14	Bliuc, A.-M., Goodyear, P., Ellis, R.A.	Research focus and methodological choices in studies into students' experiences of blended learning in higher education	226	Learning
15	MacNell, L., Driscoll, A., Hunt, A.N.	What's in a name: Exposing gender bias in student ratings of teaching	210	Gender inequality
16	Tymon, A.	The student perspective on employability	198	Employability
17	Kirkwood, A., Price, L.	Learners and learning in the twenty-first century: What do we know about students' attitudes toward and experiences of information and communication technologies that will help us design courses?	194	Information & communication techno.
18	Locks, A.M., Hurtado, S., Bowman, N.A., Oseguera, L.	Extending notions of campus climate and diversity to students' transition to college	185	Transition
19	Salisbury, M.H., Umbach, P.D., Paulsen, M.B., Pascarella, E.T.	Going global: Understanding the choice process of the intent to study abroad	166	Internationali-zation
20	Tomlinson, M.	Graduate employability: A review of conceptual and empirical themes	165	Employability

In addition to the citation analysis of authors and articles, co-citation analyses for authors and articles were performed via VOSviewer. An "author co-citation network" represents the frequency with which two authors are cited together. It was conducted by setting a threshold of at least 50 co-citations. Respectively, Ernest T. Pascarella, Sylvia Hurtado, and George D. Kuh, Patrick Terenzini, and Alexander Astin were the most influential

scholars, with more than 500 co-citations on student outcomes. This finding is similar to the citation analysis results. Table 6 exhibits the top 20 co-cited HE scholars for the period of 1960–2020.

Table 6

Twenty Highly Co-Cited Scholars in Higher Education

Rank	Author	Co-citation	Link strength
1	Pascarella, E.T.	687	20,598
2	Hurtado, S.	573	17,914
3	Kuh, G.D.	568	15,383
4	Terenzini, P.T.	511	14,079
5	Astin, A.W.	513	12,941
6	Nora, A.	398	12,657
7	Tinto, V.	559	10,538
8	Bowman, N.A.	208	8,381
9	Chang, M.J.	210	7,489
10	Cabrera, A.F.	234	7,390
11	Milem, J.F.	161	5,043
12	Pike, G.R.	137	4,927
13	Kinzie, J.	179	4,834
14	Braxton, J. M.	173	4,459
15	Denson, N.	115	4,449
16	Gurin, P.	139	4,369
17	Pascarella, E.	140	4,264
18	Mueus, S.D.	163	4,113
19	St. John, E.P.	140	4,062
20	Perna, L.W.	191	4,018

Finally, a "document co-citation network" was created in which the frequency of two authors was cited together. The network set a threshold of at least 10 co-citations, and 26 articles were found. The studies by Gurin et

al., Denson, and Hurtado emerged from the document co-citation analysis. The first three of the most co-cited documents were about diversity. Other influential documents were focused on topics related to student retention, such as persistence, attrition, and degree completion. Table 7 demonstrates the top 20 co-cited HE articles for the period 1960–2020.

Table 7

Twenty Most Co-Cited Documents in the Field of Higher Education*

Rank	Document	Co-citation	Link strength
1	Gurin, P., Dey, E. L., Hurtado, S., Gurin, G. (2002). Diversity and higher education: Theory and impact on educational outcomes	22	29
2	Denson, N. (2009). Do curricular and co-curricular diversity activities influence racial bias? A meta-analysis	11	28
3	Hurtado, S. (2005). The next generation of diversity and intergroup relations research	13	25
4	Antonio, A. L. (2001). The role of interracial interaction in the development of leadership skills and cultural knowledge and understanding	10	24
5	Chang, M. J. (1999). Does racial diversity matter? The educational impact of a racially diverse undergraduate population	13	13
6	Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research	36	19
7	Astin, A. W. (1993). What matters in college: Four critical years revisited	17	16
8	Bean, J. P., (1980). Dropouts and turnover: The synthesis and test of a causal model of student attrition	11	14
9	Pascarella, E. T., Terenzini, P. T. (1991). How college affects students	12	9
10	Umbach, P. D., Wawrzynski, M. R. (2005). Faculty do matter: The role of college faculty in student learning and engagement	13	10
11	Tinto, V. (1987). Leaving college: Rethinking the causes and cures of student attrition	12	9

Rank	Document	Co-citation	Link strength
12	Astin, A. W., Student involvement: A developmental theory for higher education (1984)	12	7
13	Tinto, V. (1997). Classrooms as communities: Exploring the educational character of student persistence	10	8
14	Bean, J. P., Metzner, B. S. (1985). A conceptual model of nontraditional undergraduate student attrition	12	5
15	Pascarella, E. T., Terenzini, P. T. (2005). How college affects students: A third decade of research	13	5
16	Adelman, C. (2006). The toolbox revisited: Paths to degree completion from high school through college	10	3
17	Lave, J., Wenger, E. (1991). Situated learning: Legitimate peripheral participation	12	2
18	Braun, V., Clarke, V. (2006). Using thematic analysis in psychology	15	1
19	Moustakas, C. (1994.) Phenomenological research methods	10	1
20	Arum, R., Roksa, J. (2011). Academically adrift: Limited learning on college campuses	11	0

* Some studies were available two or three times due to different coding or classifications. Documents with the total link strength were considered.

IV.3. *What is the intellectual structure of the knowledge base on student outcomes?*

The intellectual structure of a knowledge base is the representation of complex relationships between concepts in a specific field. In the current study, the intellectual structure of the higher education knowledge base on student outcomes depicts the interrelations of concepts related to student outcomes in higher education. The intellectual structure of the knowledge base of student outcomes was examined within "author co-citation analysis." The logic behind author co-citation analysis is to detect author similarity in a cited document. In other words, author co-citation is the frequency with which two authors are cited by at least two other authors. Accordingly, VOSviewer was employed to generate the co-citation map visualizing the similarities of research by HE scholars. A threshold of at least 50 citations

with a display of 167 authors was selected. Figure 3 shows that the maps classified authors into five clusters and that the researchers assigned labels to those groups on the basis of the content of the studies. The density of links connecting scholars was proportional to the number of times a scholar was co-cited with another scholar. Further, the density of links connecting the clusters referred to the interconnectedness nature of the knowledge base on student outcomes. Pascarella, E. T., Hurtado, S., Terenzini, P. T., and Tinto, V. received the greatest attention as the largest nodes such that this form was consistent with the results presented in Table 6. Moreover, Pascarella, E. T., Terenzini, P. T., and Kuh, G.D. played a boundary spanning role for integrating the concepts of every five clusters. These clusters imply the communities of scholars in the same topic, building upon the works of one another as it was underlined in the Invisible Colleges.[29] The content and development of the publications are influenced by a social structure within disciplines, and they create norms in specialized fields. Individuals adhere to this scheme, and thus the literature expands and develops.
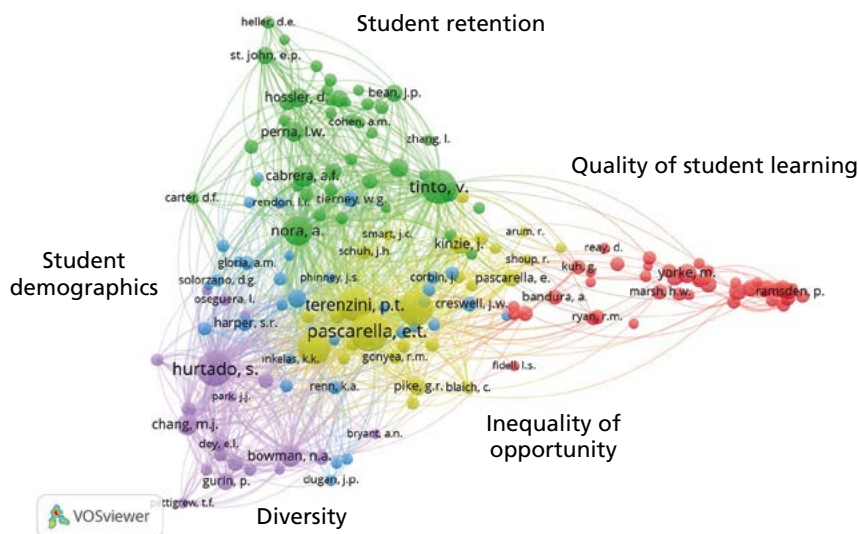
Figure 3

Author Co-Citation Network

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[29] Diana Crane, *Invisible Colleges: Diffusion of Knowledge in Scientific Communities* (Chicago: University of Chicago Press, 1972).

The coding and categorization procedure in the content analysis and common perspectives in the literature were followed in order to label the clusters. By considering the positions of clusters provided by VOSviewer in terms of the interconnectedness of the knowledge base, the labels of clusters were placed in the author co-citation network map. Further, the density of the links indicates the interconnectedness of the knowledge base. The first cluster included 44 articles and was labeled as the quality of student learning. This cluster in the middle-right region of the map, represented by the scholars such as Kember, D., Yorke, M., and Ramsden, P., was associated with student learning. The second cluster consisted of 43 articles and was named as student retention. This cluster, placed on the upper side of the map and signified by Tinto, V., Nora, A., and Cabrera, A. F., was on student persistence and attrition. The third cluster had 33 articles and was termed as student demographics, and this cluster appeared dispersed at the center of the map. In this cluster, Harper, S., Museus, S. D., and Gloria A. M. studied the students from different demographics, especially minority students. The fourth cluster had 26 articles and was called the inequality of opportunity. This cluster was located in the center of the map, and Pascarella, E. T., Terenzini, P. T., and Kuh, G.D focused more on inequalities in transition to college, persistence in higher education, student success, and degree completion. The final cluster included 21 articles and was named as diversity. This cluster was placed at the bottom of the map, and Hurtado, S. Cheng, M. J., and Bowman, N. A. were among the scholars who studied student diversity.

Interestingly, the fourth cluster was placed in the center or the hearth of all other clusters. It may be an indicator of the interrelatedness of all clusters, and it is closely related to all knowledge bases on students. To name a few, quality problems in student learning from the first cluster, student attrition topics from the second cluster, diversity issues and minority students from the third cluster, and homogeneous structures in higher education from the final cluster were all related to the fourth cluster, namely, the inequality of opportunity. This highlights the general importance of social structure in higher education and inequalities based on the differentiated educational opportunities of student background variables.

IV.4. *What topical foci are pertinent to student outcomes that have attracted the attention of scholars between 1960 and 2020?*

Co-occurrence analysis in VOSviewer was performed to ascertain the topical foci on college students. The co-occurrence analysis or co-word analysis is a technique to identify trends in topical foci studied by HE scholars. The co-

word analysis indicates the close relations between concepts behind words that frequently co-occurred in the documents (Zupic & Cater, 2015).[30] The co-word analysis is based on keywords coming from documents, and it also presents a comprehensive picture of the knowledge base. The map emerged from the co-word analysis that depicted the network of themes and their relationships.

The co-word analysis was adjusted to concepts in titles, keywords described by authors, and index keywords. In the analysis, a threshold of at least 10 co-occurring cases of a keyword was set, and the 63 most frequently co-occurring keywords were displayed. The most commonly co-occurring five keywords were higher education (n = 389), retention (n = 54), assessment (n = 53), diversity (n = 51), and college students (n = 50). Naturally, higher education had the highest total link strength between the keywords, and all other keywords were almost equally important.
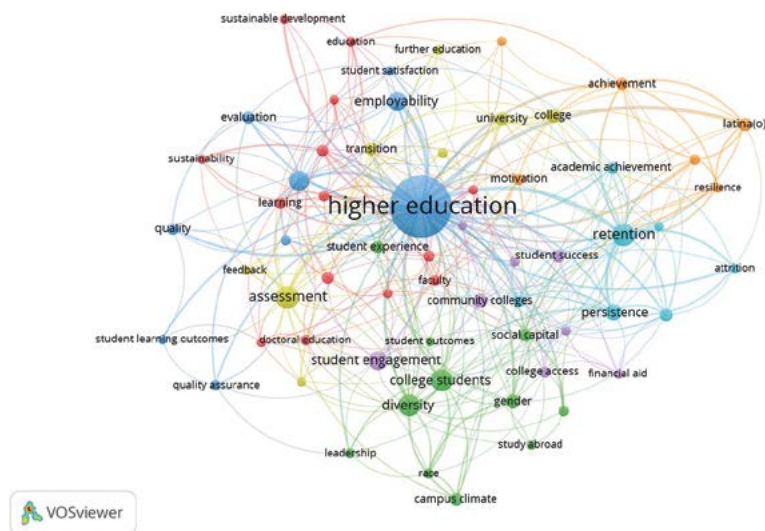
Figure 4

Keyword Co-Occurrence Map

Author citation analysis and document co-citation analysis gave similar patterns so findings in these two analyses are complementary. Thus, the

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[30] Ivan Zupic and Tomaz Čater, "Bibliometric Methods in Management and Organization," *Organizational Research Methods* 18, no. 3 (2015): 429-472, https://doi.org/10.1177/1094428114562629.

topical foci of the studies were found to be compatible with the intellectual structure highlighted earlier. The most commonly co-occurring keywords, namely, retention, diversity, and college students, correspond to the intellectual structure based on student retention, diversity, and the quality of student learning. Figure 4 depicts the keyword co-occurrence map based on 2,375 articles focused on student outcomes.

The co-word analysis map exhibits clusters, namely, student development, diversity, process and structure in higher education, assessment and evaluation, higher education economics, student retention, and student behaviors. Regions from the central left to the upper side of the map (red) include keywords on student development, such as learning, doctoral education, and sustainability. The bottom of the map (green) contain keywords on diversity, i.e., gender, social capital, and study abroad. A more dispersed region beginning from the center (dark blue) consists of keywords related to process and structure in higher education, such as employability, quality, and learning outcomes. A region from the bottom left to the upper right (yellow) comprised of keywords on assessment and evaluation, including feedback, assessment, and further education. Additionally, a region from the bottom right to the center (purple) is composed of keywords of higher education finance, financial aid, higher education finance, and college access. The region at the center-right (light blue) presents keywords related to student retention, for example, retention, persistence, and attrition. Finally, the region from the upper right side (orange) encompasses keywords on student behaviors, such as motivation, self-efficacy, and resilience.

A topical analysis is performed using articles published in Scopus-indexed journals between 2011 and 2017 to discover recent trends. Klavans and Boyack proposed this procedure as an indicator of trends that have emerged in recent documents.[31] Temporal or topical analysis confirms that research in HE research focused more on "student learning outcomes," "international students," "sustainability," "student experience," "faculty," "equity," "stem," and "student success." As "student learning outcomes" is among the trend-topics, it may be accepted as an indication of the importance of the current study. Figure 3 highlights the relative emphasis of recent topics. Topics like employability, student achievement, student experience, and faculty have increased recently.

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[31] Richard Klavans and Kevin W. Boyack, "Which Type of Citation Analysis Generates the Most Accurate Taxonomy of Scientific and Technical Knowledge?," *Journal of the Association for Information Science and Technology* 68, no. 4 (2017): 984-998, https://doi.org/10.1002/asi.23734.

Figure 5

Temporal Overlay for the Keyword Co-Occurrence Map
on Articles from 2011 to 2017

V. Conclusions and discussion

This bibliometric systematic review aimed to examine the knowledge base of student outcomes in higher education. A bibliometric analysis was performed by conducting the mapping of the HE literature on student outcomes to realize such a goal. The researchers analyzed 2,375 articles published in 52 Scopus-indexed HE journals between 1960 and 2020. The review's limitations, interpretation of findings, and the implications and recommendations of the study are highlighted in this section.

V.1. Interpretation of results

This paper provides an overview of journals, articles, citations and co-citations, and the intellectual structure of research on student outcomes over time. The corpus of studies focusing on student outcomes revealed an upward trend. Sixty-seven percent has been the highest number of articles published in the most recent decade (2011–2020) (n = 1591) since 1960. The reason for this unprecedented increase in the number of studies in the preceding decade may be attributed to the greater emphasis on higher education as a result of the unprecedented expansion. Increases in the number of programs, number of journals, and professional associations may provide an explanation.

The higher education literature encompasses various studies from student learning[32,33,34] to academic motivation.[35,36,37] The volume and growth trajectory of the literature on student outcomes offered evidence for the importance of the topic in higher education.

Topographical analysis on the literature indicated a skewed geographical distribution in that the majority of HE studies came from the US, the UK, Australia, and Canada. The field emerged in the US and expanded to other countries. Despite this dominance, a positive and remarkable note is that there were many studies from divergent regions or communities of the world. For instance, African, Latin American, and few Middle Eastern countries have published articles on the topic. Nonetheless, the differences between the countries concerning the knowledge base were large. The differences may stem from the amount of investment, expansion, and access because investment in HE in developing countries tended to be lower. Similar conclusions were reached in other studies.[38,39,40]

[32] Libba McMillan, Tanya Johnson, Francine M. Parker, Caralise W. Hunt, and Diane E. Boyd, "Improving Student Learning Outcomes Through a Collaborative Higher Education Partnership," *International Journal of Teaching and Learning in Higher Education* 32, no. 1 (2020): 117-124.

[33] Tatiana Melguizo and Jacques Wainer, "Toward a Set of Measures of Student Learning Outcomes in Higher Education: Evidence from Brazil," *Higher Education* 72, no. 3 (2016): 381-401, https://doi.org/10.1007/s10734-015-9963-x.

[34] O Zlatkin-Troitschanskaia, Hans A. Pant, and Hamish Coates, "Assessing Student Learning Outcomes in Higher Education: Challenges and International Perspectives," *Assessment and Evaluation in Higher Education* 41, no. 5 (2016): 655-661, https://doi.org/10.1080/02602938.2016.1169501.

[35] Anushree Chauhan, Manisha Goel, and Ritu G. Arora, "Motivation Among Higher Education Academicians: A Factor Analytical Approach," *ANVESHAK-International Journal of Management* 7, no. 1 (2018): 172-189, https://doi.org/10.15410/aijm/2018/v7i1/119884.

[36] Ching Y. Huang, "How Background, Motivation, and the Cooperation Tie of Faculty Members Affect their University–Industry Collaboration Outputs: An Empirical Study Based on Taiwan Higher Education Environment," *Asia Pacific Education Review* 19, no. 3 (2018): 413-431, https:/doi.org/ 10.1007/s12564-018-9546-5.

[37] Gordana Stankovska, Slagana Angelkoska, Fadbi Osmani, and Svetlana P. Grncarovska, "Job Motivation and Job Satisfaction among Academic Staff in Higher Education," *Bulgarian Comparative Education Society* 15, (2017): 159-166.

[38] Taherah Dehdarirad, Anne Villarroya, and Maite Barrios, "Research on Women in Science and Higher Education: A Bibliometric Analysis," *Scientometrics* 103, no. 3 (2015): 795-812, https://doi.org/ 10.1007/s11192-015-1574-x

[39] Phillip Hallinger et al., "A Bibliometric Review of Research on Educational Administration: Science Mapping the Literature, 1960 to 2018," *Review of Higher Education* 89, no. 3 (2019): 335-369, https://doi.org/10.3102/00346543198303380.

[40] Ömer F. Sönmez, "Bibliometric Analysis of Educational Research Articles Published in the Field of Social Study Education based on Web of Science Database," *Participatory Educational Research* 7, no. 2 (2020): 216-229, https://doi.org/10.17275/per.20.30.7.2.

"Studies in Higher Education" published more than 200 articles, and this journal is highly reputable and included in the Web of Science. Kwiek[41] reached similar conclusions by elucidating that "Studies in Higher Education" was one of the two most elite global journals in HE. The interest of high-ranking journals on student outcomes may indicate the importance and attraction of the topic for international scholars. In addition, the current study put forward evidence for the contributions of pioneer HE scholars, such as Astin, Pascarella, Hurtado, and Tinto, based on citation impacts. Other bibliometric reviews reported similar results on influential authors.[42,43,44] Finally, some highly-cited documents were on instructional technology, while highly co-cited documents were about diversity. Documenting these studies in terms of citation impacts may be valuable. First, these documents highlighted the prominent role of research in the evolution of the HE knowledge base. According to Hallinger and Kovacevic,[45] readers or other scholars may synthesize current and future ideas so that knowledge accumulation and fresh insights may resolve challenges in the studying practice of HE. By contrast, this review identified "canonical texts"[46] that made paradigmatic contributions to interdisciplinary approaches by documenting studies on HE[47] and other related fields,[48] which may underpin

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[41] Marek Kwiek, "The Prestige Economy of Higher Education Journals: A Quantitative Approach," *Higher Education* 81 (2021): 493-519 https://doi.org/10.1007/s10734-020-00553-y.

[42] Gloria Aparicio et al., "A Holistic Bibliometric Overview of the Student Engagement Research Field." *Journal of Further and Higher Education* 45, no.4 (2021): 540-557, https://doi.org/10.1080/0309877X.2020.1795092.

[43] Ali Özkaya, "Bibliometric Analysis of the Publications Made in STEM Education Area," *Bartin Üniversitesi Egitim Fakültesi Dergisi* 8, no. 2 (2019): 590-628, https://doi.org/10.14686/buefad.450825.

[44] Kim H. Yeoh and Kiran Kaur, "Subject Support in Collection Development: Using the Bibliometric Tool," *Collection Building* 27, no. 4 (2008): 157-166, https://doi.org/10.1108/01604950810913724.

[45] Phillip Hallinger et al., "A bibliometric review of research on educational administration: science mapping the literature, 1960 to 2018," *Review of Higher Education* 89, no. 3 (2019): 335-369, https://doi.org/10.3102/0034654319830380.

[46] Howard D. White and Katherine W. McCain, "Visualizing a Discipline: An Author Co-Citation Analysis of Information Science, 1972–1995," *Journal of the American Society for Information Science* 49, no. 4 (1998): 327-355.

[47] Patricia Gurin, Eric Dey, Sylvia Hurtado, and Gerald Gurin, "Diversity and Higher Education: Theory and Impact on Educational Outcomes," *Harvard Educational Review* 72, no. 3 (2002): 330-367, https://doi.org/10.17763/haer.72.3.01151786u134n051.

[48] Anthony L. Antonio, "The Role of Interracial Interaction in the Development of Leadership Skills and Cultural Knowledge and Understanding," *Research in Higher Education* 42, no. 5 (2001): 593-617.

the intellectual structure of the HE knowledge base. In conclusion, the identification of highly cited and co-cited documents provides evidence for the evolution of the HE field.

The intellectual structure of the higher education knowledge base was examined within the author co-citation analysis. Pascarella, E. T., Hurtado, S., Terenzini, P. T., and Tinto, V. appeared as the most frequently co-cited authors. These scholars also appeared in citation impacts, and the results were consistent. Moreover, five clusters emerged, namely, student retention, quality of student learning, inequality of opportunity, diversity, and student demographics. These clusters offered a useful base to represent the constructs in the cognitive structure of HE. Learning and teaching,[49] the retention of minorities,[50] socio-economic status as a student demographic,[51] and diversity[52] are frequently studied constructs in HE, just to name a few. Even though variations in the disciplines, geographical areas, and cultural traditions make a more complex intellectual structure of the higher education knowledge base, the current study presents an opportunity to interrogate the inter-relations between the constructs. One of the most essential findings concerning the intellectual structure was the inequality of opportunity. As Figure 1 demonstrates, the central location of the cluster of the inequality of opportunity is also at the center of all other HE student outcomes, such as retention and learning. From past to present, scholars[53,54,55,56] have placed a

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[49] Elisabeth J. Spelt, Harm J. Biemans, Hilde Tobi, Pieternel A. Luning, and Martin Mulder, "Teaching and Learning in Interdisciplinary Higher Education: A Systematic Review," *Educational Psychology Review* 21, no. 4 (2009): 365-378, https://doi.org/10.1007/s10648-009-9113-z

[50] Gurnam Singh, "Black and Minority Ethnic (BME) Students' Participation in Higher Education: Improving Retention and Success: A Synthesis of Research Evidence," https://s3.eu-west-2.amazonaws.com/assets.creode.advancehe-document-manager/documents/hea/private/bme_synthesis_final_1568036653.pdf.

[51] Marybeth Walpole, "Socioeconomic Status and College: How SES Affects College Experiences and Outcomes," *The Review of Higher Education* 27, no. 1 (2003): 45-73, https://doi.org/10.1353/rhe.2003.0044.

[52] Sylvia Hurtado, "The Next Generation of Diversity and Intergroup Relations Research," *Journal of Social Issues* 61, no. 3 (2005): 595-610, https://doi.org/10.1111/j.1540-4560.2005.00422.x.

[53] Gary A. Berg, *Low-income Students and the Perpetuation of Inequality: Higher Education in America* (New York, NY: Routledge, 2016).

[54] Neil Guppy, Paulina D. Mikicich, and Ravi Pendakur "Changing Patterns of Educational Inequality in Canada," *Canadian Journal of Sociology* 9, no.3 (1984): 319-331, https://doi.org/10.2307/3340158.

[55] William H. Sewell, "Inequality of Opportunity for Higher Education," *American Sociological Review* 36, no. 5 (1971): 793-809, https://doi.org/10.2307/2093667.

[56] Yossi Shavit (Ed.), *Stratification in Higher Education: A Comparative Study* (Stanford, CA: Stanford University Press, 2007).

special emphasis on inequality in higher education through different lenses. In sum, the in/equality of opportunity has always been a problem and is likely to continue to complicate other issues.

Similar patterns observed in the intellectual structure of HE also appeared in the topical foci of the studies. Co-word analysis based on author keywords offered clusters on student development, diversity, process, and structure in higher education, assessment and evaluation, higher education finance, student retention, and student behaviors. Higher education finance was discerned from the intellectual structure, and globalization may be the reason for this differentiation. As a typical result, competitiveness makes a difference for the economic power of countries. The close associations between globalization and higher education were also emphasized by scholars.[57,58,59,60]

Student learning outcomes, international students, sustainability, student experience, faculty, equity, STEM, and student success were common, and these topics were more closely aligned with student needs and expectations. Recent studies[61] have highlighted student-focused approaches. This bibliometric review was made conceivable by organizing and systematizing the corpus of research. This review provided a perspective on the evolution and the recurrent themes of research on student outcomes. Researchers may develop more innovative approaches to the study of student outcomes.

V.2. *Implications and recommendations*

Several implications may be offered for the current study. Scopus provides scholars with an opportunity to perform bibliometric reviews on various topics concerning students. Scopus may also contribute by enhancing

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[57] Ludmila Aleksejeva, "Country's Competitiveness and Sustainability: Higher Education Impact," *Journal of Security & Sustainability Issues* 5, no.3 (2016): 355-363, http://dx.doi.org/10.9770/jssi.2016.5.3(4).

[58] Philip. G. Altbach and Jane Knight, J, "The Internationalization of Higher Education: Motivations and Realities," *Journal of Studies in International Education* 11, no. 3/4 (2007): 290-305, https://doi.org/10.1177/1028315307303542.

[59] Christopher D. Hammond, "Internationalization, Nationalism, and Global Competitiveness: A Comparison of Approaches to Higher Education in China and Japan," *Asia Pacific Education Review* 17, no. 4 (2016): 555-566, https://doi.org/10.1007/s12564-016-9459-0.

[60] Santos Lopez-Leyva and Gary Rhoades, "Country Competitiveness Relationship with Higher Education Indicators," *Journal of Technology Management & Innovation* 11, no. 4 (2016): 47-55, https://doi.org/10.4067/S0718-27242016000400007.

[61] Gloria Aparicio et al., "A Holistic Bibliometric Overview of the Student Engagement Research Field," *Journal of Further and Higher Education* 45, no.4 (2021): 540-557, https://doi.org/10.1080/0309877X.2020.1795092.

literature reviews and partly validating the results. A second implication is that studies on students are limited in their geographical distribution vis-à-vis the development of HE. Further, bibliometric reviews may help in literature reviews, and scholars may identify gaps or build on trends on topical foci in the literature. The scholars reading bibliometric reviews are more aware of where and how they begin the literature review than other scholars, since bibliometric reviews presented are both the most frequently and least frequently studied topics. Bibliometric reviews are conceived more as objective evaluation of research impact, since they are quantified. They are easily reproducible using similar steps, and they take less time and cost less. Individuals can easily scale the literature based on the unit of analysis: individual, institutional, national, and international levels. These advantages also create disadvantages if they are used to increase personal gain.

Researchers and practitioners may use bibliometric reviews for cross-cultural comparisons and draw a more global picture of HE. Practitioners may become accustomed to multi-dimensional perspectives by identifying the links between perspectives. The Web of Science (WoS) database may be utilized to perform similar or more creative bibliometric reviews. Finally, policy-makers may identify the (complexity of policies) to improve student outcomes. Scholars and administrators may also synthesize research on the basis of several studies and may construct more effective policies.

V.3. Limitations

This study does not claim that the results cover all the knowledge base and intellectual structure of HE on student outcomes. The reality is much more complex and the sheer size of the studies in the literature attest this. The bibliometric reviews provide a general representation of the published work within a narrowly defined topic. The current study is limited by the information provided by the Scopes database. Moreover, it does not have the breadth and depth of research synthesis and meta-analysis studies, although it offers a general overview and useful complementary information for those studies. Another limitation was related to the inclusion and exclusion criteria because publications such as books, chapters, and dissertations were excluded from the study. Thus, this review did not include the entire HE literature around the world. However, Scopus is the largest medium to compile the reviews of research, and "co-citation analysis" provides an opportunity to overcome this limitation to a certain extent. Nonetheless, the findings cannot be generalized to cover the whole knowledge base. Another limitation arose from cultural and contextual issues because we only included studies

published in English. The study was limited to the context of more dominant communities, such as the US and the UK, such that contextual or cultural biases may prevent the broader applicability of findings to other societies. Accordingly, there may be unobserved trends, topics, or hidden trends. Finally, the current study was limited to choices on the method of analysis. The gender, ethnicity, or age of the authors were not considered.

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Competences in parallax in higher education from multiple standpoints in a Brazilian undergraduate program in International Business

Marcelo Almeida de Camargo Pereira and Vera Lucia Felicetti**

Abstract: This article, a summary of a broader doctoral research study by the author,[1] has different research participants, namely: graduates, their employers, professors, the College Dean and the Program Chair. The goal is to identify how these subjects comprehend the teaching and learning processes of professional competences, in the context of a Brazilian higher education program in International Business. For the theoretical reference, we discuss the concept of competence with different theoretical foundations. We present educational tools that promote teaching and learning competences, in addition to addressing competences for the 21st century. Using Textual Discourse Analysis, we deconstruct and categorize the transcribed discussions by the participants. We arrive at units of meaning, which are related to cognition, behavior, management, pedagogy, and technology, among others. Graduates understand competences are developed through work experience. Professors incorporate life and professional problems into their pedagogical practice, in line with the Dean and Program Chair,

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[1] Marcelo Almeida de Camargo Pereira, "Competências em Paralaxe na Educação Superior: múltiplos atores em um curso tecnológico" (PhD diss., La Salle University, 2020), 01–276.

who claim the use of market values to structure the program curriculum. As for the employers, they conceive of college as background for the development of professional competences, which in their opinion, occurs via work experience. The process of analyzing and connecting the units of meaning led to the development of two emerging categories: culture and technology. They are in constant action and reaction, moving the dimensions necessary for competent action, under the aegis of the technological paradigm.

Keywords: higher education; competences; professors; graduates; employers; business studies.

I. Introduction

Our society is constantly evolving and rapidly transforming. There is even a term VUCA, an acronym for Volatility, Uncertainty, Complexity and Ambiguity, to describe the current time. This concept, developed in the 1990s in a North American military high school, helps explain disruptions in society, which leads to major challenges and breaks with patterns accepted up to that point.[2]

In the complexity of this society, there are social, environmental, economic and professional issues. We must discuss the role of individuals regarding work in the 21st century, in which robots have already taken positions from humans, whose work is guided or mediated by cellphone applications, and nations compete for markets.

All of this influences work relations, which have become more intensely flexible/unstable, economically considered a means for reducing unemployment and informality and, on the other hand, a process of removing worker's rights and changes in work favoring market competition.[3]

In this debate on changes in the labor market and technological evolution, workers find that their trade is displaced from their identity. On the one hand, if technologies can provide more security, on the other, there are greater challenges for the professional placement of certain groups. This challenge comes with the urgent need for professional retraining and seems to have gained ground in the economic domain. During a meeting held at the World Economic Forum in 2020, specialists

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[2] Nathan Bennett and G. James Lemoine, "What a Difference a Word Makes: Understanding Threats to Performance in a VUCA World," *Business Horizons* 57, no. 3 (2014): 311-317.
[3] Pierre Bourdieu, *Os Usos Sociais da Ciência: Por uma Sociologia Clínica do Campo Científico* [Social Uses of Science: Towards a Clinical Sociology of the Scientific Field, my translation] (São Paulo: Editora UNESP, 2004): 17-65.

indicated the need to retrain the workforce in the face of technological advances. Some estimates indicate that in a two-year period, from 2020 to 2022, 44% of professional knowledge will change, with emphases on the following aspects: reasoning, decision-making, teamwork and knowledge management, in which cognitive skills, such as thinking and learning, gain prominence.[4]

Given this complex context of constant, profound and disruptive changes, we see fertile ground for discussing an educational model that can prepare professionals and citizens to face this complexity. Many traditional models, which were focused on teachers as transmitters of content and students as receptors, have given way to students as active leaders and learning as an educational objective. Therefore, the concept of competence aligns with workers taking their jobs back and becoming active leaders of their labor. It is summarized here as a set of cognitive skills mobilized by individuals for solving problems.

As such, a proposal for teaching competences in Higher Education, in which content can be experienced and applied by students, can better prepare future professionals. Based on the above, the goal of this paper is to explain how different players in a Brazilian higher education context in the city of Porto Alegre, RS, in the area of International Business, comprehend the teaching and learning process of professional competences.

This paper is divided as follows: the introduction, in which we present the research problem; the methodology, which presents methodological aspects regarding data collection and analysis; the theoretical framework; emerging categories; final considerations, and the references.

II. Theoretical framework

In pursuit of the origins and changes in work relations and their demands, one can see through history the evolution of the idea of work and workers, which includes the logic of competence. This process can be explained starting from the industrial revolution in the 18th century, with the emergence of industrial capitalism, which takes on new forms today due to the Information Age with new technologies.[5]

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[4] "We Need a Global Reskilling Revolution – Here's Why," World Economic Forum, posted on January 22, 2020, https://www.weforum.org/agenda/2020/01/reskilling-revolution-jobs-future-skills/.

[5] Philippe Zarifian, *Objetivo Competência: Por uma Nova Lógica* [Objective Competence: For a New Logic, my translation] (São Paulo: Atlas, 2001), 57.

II.1. *Competences: what are they? How do we promote them?*

Competences appear amid problems that life presents. They manifest in professional, real and contextualized situations.[6,7,8]

Another common aspect found in the literature was the connection between the complexity of situations, a component necessary for competent performance. In order for competence to manifest, situations should present problems in which individuals use cognitive resources. They are: skills of comprehension, mobilization, analysis and intervention. We highlight the use of mental schemas in mobilizations, observed by some authors.[9,10]

We emphasize the importance of individuals as competent beings. As leaders responsible for their actions, they have knowledge, analyze situations, mobilize resources and adapt solutions via schemas, then they act and face the complexity. It seems elementary, but these skills together highlight a worker's leadership.[11]

Therefore, we conjecture that competence confirms the result of an action, in which a person acts appropriately and effectively given a complex problem, using an unprecedented response, based on their knowledge and experience, with a holistic analysis of the problem, in a responsible way and with excellence. This person stands out as someone who is reliable for responsibilities in work and life.

The concept of competence is still under construction. However, we see some common ground among the authors, which makes it possible to establish a theory appropriate for this study. One commonality is the existence of dimensions that are synergistically related, some subjective in nature, such as knowledge acquired, mental schemas, learning skills and adapting solutions, as well as other exogenous factors, such as tools, singular and increasingly complex problem situations, as well as the time necessary

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[6] Zarifian, *Objetivo Competência: Por uma Nova Lógica* [Objective competence: towards a new logic], 73-74.

[7] Guy Le Boterf, *Desenvolvendo a competência dos profissionais* [Developing professional competences, my translation], (Porto Alegre: Artmed, 2003), 37-131.

[8] Antoni Zabala and Laia Arnau, *Como aprender e ensinar competências* [How to Learn and Teach Competences, my translation] (Porto Alegre: Artmed, 2010), 37.

[9] Zabala and Arnau, *Como aprender e ensinar competências* [How To Learn and Teach Competences], 39.

[10] Philippe Perrenoud, *Desenvolver competências ou ensinar saberes? A escola que prepara para a vida* [Developing competences or teaching knowledge? A school that prepares you for Life, my translation] (Porto Alegre: Penso, 2013), 45.

[11] Zarifian, *Objetivo competência: por uma nova lógica* [Objective competence: for a new logic], 42.

for competent action to manifest. Figure 1 represents a summary of authors presented here.
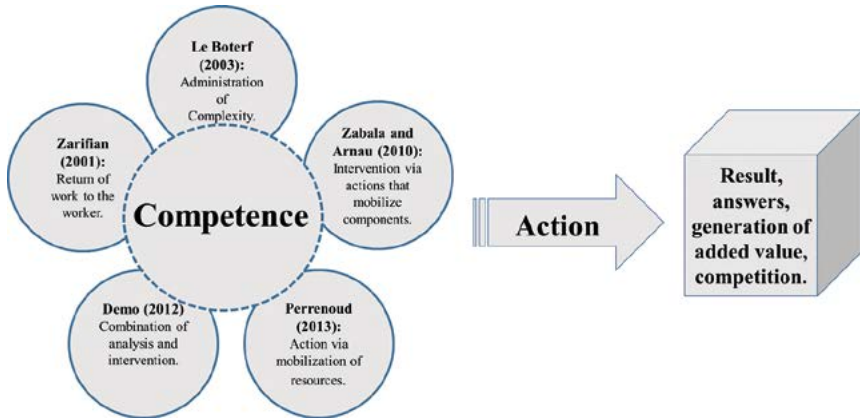
Figure 1

The definition of competence[12,13,14,15,16]

In Figure 1, the concept of competence is in dotted lines, representing the lack of fixed contextual boundaries outlining this construct. Revolving around the term, conceptual circles are connected to competence, representing the worker's return to work, administrating a complexity of situations in our time through mobilized and coordinated actions. The concentric movement of these circles makes the set appear to be a single object, which materializes through individual actions, generating a new object, which is the palpable and objectified result of competence. In other words, it is the response or solution to a complex question or situation, which generates subjective value for individuals, their work and capital.

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[12] Pedro Demo, *Habilidades e competências no século XXI* [Abilities and competences in the 21st century, my translation] (Porto Alegre: Editora Mediação, 2012), 11.

[13] Le Boterf, *Desenvolvendo a competência dos profissionais* [Developing professional competences], 37.

[14] Perrenoud, *Desenvolver competências ou ensinar saberes?* A escola que prepara para a vida [Developing competences or teaching knowledge? A school that prepares you for life], 45.

[15] Zabala and Arnau, *Como aprender e ensinar competências* [How to learn and teach competences], 37.

[16] Zarifian, *Objetivo competência: por uma nova lógica* [Objective competence: for a new logic], 56.

The relation between the concepts defended by these authors converge on the meaning of belonging in competence. This belongs to the individual, worker or student, who, given complex situations, in which resources are scarce, mobilize resources for an intervention.

How does one promote teaching and learning competences? The literature indicates that there is no single way, but an interrelation of techniques to promote teaching. Therefore, we developed Figure 2, which helps present these tools.
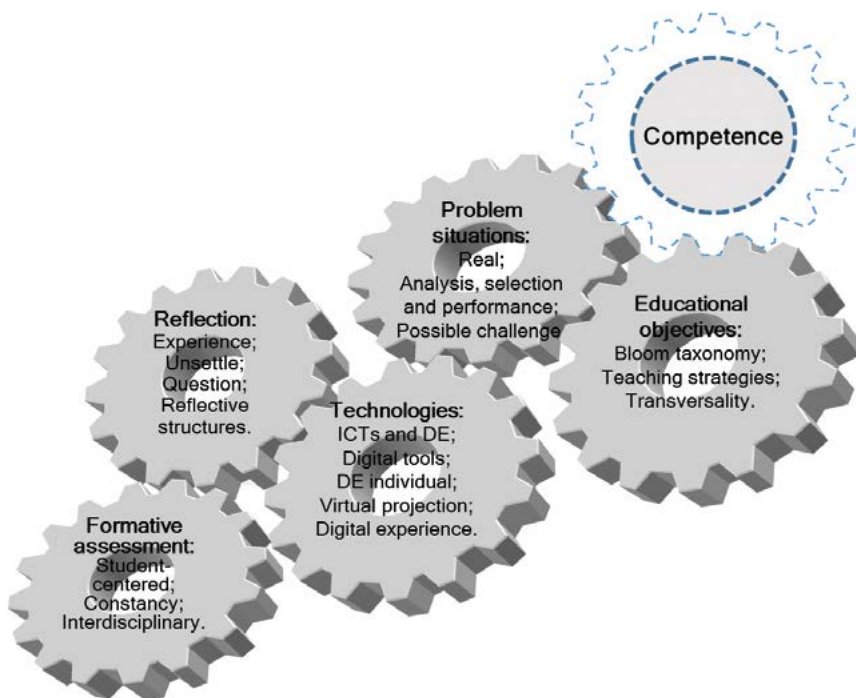
Figure 2

Tools for Teaching and Learning Competences

Figure 2 presents tools in the form of gears that help develop competences: formative assessment, in which the focus of the educational process shifts to students; assessments are constant and require professor-student dialogue and exchanges, preferably working on interdisciplinarity. Reflections, fundamental for assessments, are the means as well as the end to the educational process,

since they promote an unsettling of cognitive structures and questions actions. Another important aspect is the inclusion of new technologies, which transform education and the roles traditionally attributed to professors and students, as well as Distance Education, or remote learning, as we are experiencing in this pandemic. This is also technology-mediated learning, using digital tools that require students to be up-to-date and adapt to technology. Another verified component is the use of problem situations, which require the professor to be sensitive to planning potential challenges within their students' reality, so they can put into practice resources for solving this situation, in a process of analysis, selecting schemas and action. Finally, all the gears move (or are moved by) educational objectives, aligned with the new terminology of competences, related to a level of thinking expressed by the Bloom Taxonomy, in which teaching and learning strategies should be planned transversally and flexibly.[17,18,19,20,21,22,23,24,25]

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[17] Benjamin Samuel Bloom, David R. Krathwohl and Bertram B. Masia, *Taxonomia de objetivos educacionais: domínio cognitivo* [Taxonomy of educational objectives: the classification of educational goals] (Porto Alegre: Globo, 1972), 31-195.

[18] Philippe Meirieu, *Aprender... Sim, mas como?* [Learn... Yes, but how?, my translation] (São Paulo, SP: Martins Fontes, 1998), 47-84.

[19] Donald Alan Schön, *Educando o Profissional Reflexivo: Um Novo Design para o Ensino e a Aprendizagem* [Educating the Reflective Practioner: Toward a New Design for Teaching and Learning in the Professions] (Porto Alegre: Artmed, 2000), 47-136.

[20] Selma Garrido Pimenta, "Professor reflexivo: construindo uma crítica" [Reflective practitioner: building a critique, my translation], in *Professor reflexivo no Brasil. Gênese e crítica de um conceito,* ed. Selma Garrido Pimenta and Evandro Ghedin (São Paulo: Cortez Editora, 2008), 17-52.

[21] Zabala and Arnau, *Como Aprender e Ensinar Competências* [How to Learn and Teach Competences], 39.

[22] Juan Manuel Álvarez Méndez, "Avaliar a Aprendizagem em um Ensino Centrado nas Competências," [Evaluating Learning in a Competence-Centered Teaching Model, my translation] in *Educar por Competências. O que Há de Novo?*, ed. José Gimeno Sacristán, Angel I. Pérez Gómez, Juan Bautista Martínez Rodríguez, Jurjo Torres Santomé, and Félix Angulo Rasco (Porto Alegre, RS: Artmed, 2011), 233-264.

[23] Neil Currant, Becka Currant, and Peter Hartley, "Defining and supporting the new digital students," in *Universities into the 21st century. Learning development in higher education*, ed. Peter Hartley, John Hilsdon, Christine Keenan, Sandra Sinfield, and Michelle Verity (United Kingdom: Palgrave Macmillan, 2011), 221-224.

[24] Patrícia Alejandra Behar, *et al.*, "Educação a distância e competências: uma articulação necessária" [Distance learning and competences: a necessary articulation, my translation], in *Competências em Educação a Distância,* ed. Patrícia Alejandra Behar (Porto Alegre: Penso, 2013), 42-55.

[25] Linley Cornish, "The Challenge of Developing Reflective Practitioners," in *Higher Education and Learning,* eds. Maria Emilia Amaral Engers, Marília Costa Morosini, and Vera Felicetti (Porto Alegre: EDIPUCRS, 2015), 51-64.

II.2. *Competences for the 21st century*

The Information Age, also referred to as Industry 4.0 or Knowledge Society, has presented several points of reflection and inflection on economic, productive and social relations, especially influencing work relations. In this period, there was a shift in productive forces from the manufacturing industry to that of services, altering job offers, demanding professionals with new competences.[26,27,28,29]

As such, the new competent professional is local and global. By proposing a competent professional for working in a broad context, Global Citizenship Education is a relevant proposal, since it outlines global competences based on local concerns, towards a collective international stance, via collaboration, innovation and knowledge management.[30] This flexible professional mobilizes different soft skills, based on personal relations, such as negotiation, leadership and communication.

The competences to work in this new age should be renewed by *transforming* old competences. Thus, transformative competences come into play, consisting of cycles of action, reflection and anticipation, in which value is created between different players, in a culturally and socially diverse environment, which is self-regulated and relaxed, with these different players assuming responsibilities and reflecting on their actions.[31]

Finally, the five competences for the 21st century, according to the Public Service of Ontario,[32] are: critical thinking, communication, collaboration,

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[26] Manuel Castells, *The rise of the network society* (São Paulo: Paz e Terra, 2007), 67-112.

[27] "Informe Empleadores: Titulados Universitarios y Mercado Laboral" [Employers's Report: University Graduates and the Labor Market, my translation], Agencia Nacional de Evaluación de la Calidad y Acreditacion, Aneca, Proyecto Reflex, Madri, Espanha, published in 2008, http://www.aneca.es.

[28] Glauco Arbix, *et al*., "O Brasil e a nova onda de manufatura avançada: o que aprender com Alemanha, China e Estados Unidos" [Advanced manufacturing: what is to be learnt from Germany, the U. S., and China], *Novos Estudos Cebrap* 36, no. 3 (November 2017): 29-49, https://doi.org/10.25091/S0101-3300201700030003.

[29] Priscilla Kohls dos Santos and Marília Costa Morosini, "Education for Global Citizenship and internationalization of Higher Education: the vision of the academic staff," *Revista Internacional de Educação Superior* 5, (2019): 1-17, https://doi.org/10.20396/riesup.v5i0.8653913.

[30] "Global Citizenship Education: Preparing Learners for the Challenges of the 21st Century," United Nations Educational, Scientific and Cultural Organization - Unesco, published in 2015, https://unesdoc.unesco.org/ark:/48223/pf0000227729.

[31] "The Future of Education and Skills. Education 2030," OECD, published in 2018, https://www.oecd.org/education/2030/E2030%20Position%20Paper%20(05.04.2018).pdf.

[32] "21st Century Competences Foundation Document for Discussion," Ontario Public Service, Ontario, published in 2016, http://www.edugains.ca/resources21CL/About21stCentury/21CL_21stCenturyCompetences.pdf.

creativity and innovation. These competences appear to be sufficient for facing the challenges of this century, such as poverty, deindustrialization, intolerance - to which technology itself has given a voice, inequality and unemployment.

Considering the concepts presented in this section, the New Competent Professional is one who mobilizes interpersonal elements, communicates with different people, respects a diversity of opinions, works collaboratively towards results that do not conflict with their ethical values and who considers the world their home. This professional is innovative and manages information and knowledge. They are flexible in relation to new challenges and are leaders, mobilizing people through relationships. They do not allow themselves to be subjugated by technology but master it for professional practice. They are global.

III. Methodology

This study uses a qualitative approach with characteristics of a case study, as it investigates an abstract and contemporary phenomenon: teaching and learning professional competences in a specific context, a higher education program.[33,34]

The concept of stellar parallax is linked to astronomy and refers to a shift in objects according to their point of observation, or the angular shift of a celestial body from the Earth's surface and not from the center of the Earth. Through this research, we aimed to explain how different players in a higher education context, in the area of international business, conceive of teaching and learning professional competences, having different points of observation, which can be interpreted as points of view, angles and experiences.[35,36]

We provide an analogy of the definition of parallax in order to establish relations between multiple players and their different positions, as points of observation. Therefore, the theme of competences can be the "star" observed from different positions: graduates of the technology program in International

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[33] Robert K. Yin, *Case study research: design and methods* (Porto Alegre: Bookman, 2005), 32.

[34] Marina de Andrade Marconi, Eva Maria Lakatos, *Metodologia Científica* [Scientific Methodology, my translation] (São Paulo: Editora Atlas S.A. 2010), 264.

[35] Denise Najmanovich, "O Feitiço do Método," [The Spell of the Method, my translation], in *Método; Métodos; Contramétodo*, ed. Regina Leite Garcia (São Paulo: Cortez, 2003), 25-62.

[36] Kepler de Souza Oliveira Filho and Maria de Fátima Oliveira Saraiva, *Astronomia e Astrofísica* [Astronomy and Astrophysics, my translation] (São Paulo: Editora Livraria da Física, 2004), 135.

Business, professors, the program chair, the academic dean and employers of these graduates. The different shifts, or perspectives of each one, enabled the movement in parallax.

For the data collection, we conducted a focus group with 7 graduates and individual interviews with 6 professors, 1 Program Chair and 1 Academic Dean from a Higher Education Institution (HEI), as well as 4 employers of the graduates, all related to the area of International Business.

The focus group had a duration of two hours, and no previous preparation was required to the participants. The researcher conducted the focus group as a non-directive mediator, conducting discussions with open-ended semi structured questions without interfering with his judgments or his personal opinions.[37],[38]

The interviews were done individually. Each interview lasted for approximately 30 minutes, and no previous preparation was required of the participants. The discussion questions were related to aspects of teaching and learning competences and relations between the job market and Higher Education, which intertwine the consequent analyses.

The focus group and interviews were recorded with a mobile, and for the transcription of the audio files, we have used the computer program Voicemeter[39] to transmit the audio from the microphone to the computer, and the website <dictation.io> to help us with the transcriptions.

This transcribed text became our research *corpus*. This *corpus* had been previously categorized, i.e., the texts were divided according to the groups of participant subjects (graduates, employers, professors, dean and program chair). Regarding the data analysis, in order for the parallax to be determined, we used Textual Discourse Analysis with the transcribed discussions from the focus groups and interviews. Consequently, it was possible to deconstruct and unitize them, establishing new relations, in the form of new units of meaning and emerging categories of analysis.[40]

The process of analyzing the aforementioned research *corpus* included different perspectives, perceptions and ideas by the participants researched. This led to new perspectives on the texts, such that new interpretations

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[37] Bernadete Angelina Gatti, *Grupo focal na pesquisa em ciências sociais e humanas* [Focus group in social and human sciences research, my translation] (Brasília: Liber Livro, 2005), 9.

[38] Antônio Carlos Gil, *Como elaborar projetos de pesquisa* [How to prepare research projects, my translation] (São Paulo: Editora Atlas S.A, 2010), 109-119.

[39] Available at: https://www.vb-audio.com/Voicemeter/.

[40] Roque Moraes and Maria do Carmo Galiazzi, *Análise Textual Discursiva* [Textual Discourse Analysis, my translation] (Ijuí: UNIJUÍ, 2007), 85.

emerged from the chaos, in the form of emerging categories. This characterizes the depth attained by the researcher after months analyzing the *corpus*, in spiral and dialectical interactions with the theoretical reference, in which the discussions were deconstructed and related to the theoretical reference according to the different groups of players.[41]

Based on this process, the participants' statements were connected between the different groups of players and grouped into units of meaning. The connection of these units provided the emerging categories, which helped us understand and explain the phenomenon being studied.

This research was approved by La Salle University ethical committee, under the Certificate of Presentation of Ethical Appreciation process 12019219.4.0000.5307.[42] All participants of the research signed an Informed Consent Form, in which the anonymity and confidentiality of the data were assured.

IV. Emerging categories

The connection between Graduates and their Employers resulted in the following units of meaning: learning through practice, culture, commitment, technology, ethics, transformation, generations, relationships and instability. Based on these units, from the standpoint of graduates and employers, we can deduce that learning happens through work experience, which is unstable and stems directly or indirectly from existing technologies, which change the way we work and live. As a way to launch into the job market, one must be committed to his own learning. Knowledge acquisition, which broadens culture, transforms people for their professional and social performance. This process, however, varies according to different generations and individual maturity. Younger generations tend to want to accelerate this process, skipping over important steps in learning, a reflex of the immediacy provoked by new technologies.

The connection between Professors, the Program Chair and College Dean led to the following units of meaning: prior student education, practice-based pedagogy, technology, entrepreneurial project, problem situations, systemic view, educational objectives, professor mediator, reflection, relationship, student-centered approach, and formative assessment. Based on these results, we can envision profound changes in the role of Higher

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[41] Moraes and Galiazzi, *Análise Textual Discursiva* [Textual Discourse Analysis], 83-88.

[42] Further information available at: https://www.unilasalle.edu.br/canoas/mais/comite-de-etica-em-pesquisa (in Portuguese).

Education. The heart of the educational process is aimed at student empowerment, while professors take on an important role of knowledge mediator. Lifestyles and productive needs interfere directly with education, in which work transforms pedagogy, changing the way to teach, with new technologies included in the teaching and learning processes. This entire reformulation has clear principles, systematized through educational objectives, which emulate work situations in a constant assessment process, and promote reflections on performance, as a continuous cycle within a system. On this path, obstacles for teaching are in students' precarious prior education, which needs to be salvaged by the professor mediator.

The following units of meaning emerged from Graduates and Professors: traditional teaching; tables; entrepreneurial project; prior student education; student commitment; educational objectives; and personnel management. We can see some (dis)connections in the "head to head" between these important players. If professors have a new role of mediator for teaching competences, students also need to change their paradigm beyond traditional teaching, understood here as predominantly expository classes, and be committed to their learning. This may be explained by students' prior education, still tied to this kind of teaching, in which teachers and memorizing content play a central role. In this respect, when they face a truly challenging activity, in which they must pursue knowledge from different areas and people, combining multiple skills, they demonstrate the need to develop management and self-management skills.

Regarding the connection between the Employers of Graduates, the Program Chair and College Dean, who represent a conceptual dialogue between the job market and Education, the following units of meaning emerged: practice-based pedagogy; Pedagogical Program Project (PPP);[43] entrepreneurial project; technology; behavior; frustration; critical thinking; structuring core faculty (SCF);[44] educational objectives; generations; reflection; ethics; theory and practice; and collaboration. We see a feedback cycle in the connection between the job market and Higher Education. The market receives professionals from this level of education, who are educated with knowledge that it defines. The program is designed according to practices, trainings and experiences by professors from the job market, who know the area and adapt their classes to situations in the market. In this design, there must be a balance between theory, seen in college, and practice, in the

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[43] In the Brazilian context, it is a document that helps systematize and organize the curriculum, by selecting the content necessary for student education.

[44] This is a group of professors responsible for updating the PPP.

job market. In this discussion, different generations, driven by technology, can learn ethical values for their professional work, with the nascent trend towards collaboration instead of pure competition with one another.

Finally, when all participants are analyzed together, which we call a parallax movement, the following units of meaning emerged: culture; dialogue; practice; ethics; competition; behavior; communication; knowledge; relationship (experience); resilience; technical competences; systemic vision; proactivity; technology; innovation; and critical thinking. The characteristics necessary for International Business professionals to work in society, from the perspective of multiple groups of players, can be attributed to individuals who, with critical thinking, act ethically in society, interact with various players, considering their culture and their larger context, that is, thinking globally. They understand that the world today is competitive, but start to realize that collaboration can provide a collective well-being. This individual is connected through technologies and learns every day through relationships with different people. They actively face reality, resisting obstacles that life and work present.

In order to understand which units of meaning emerged from each player, and to help us determine the points in common that each individual have, we present Figure 3, which shows an adapted four set Radial Venn with the units of meaning grouped by groups of players.
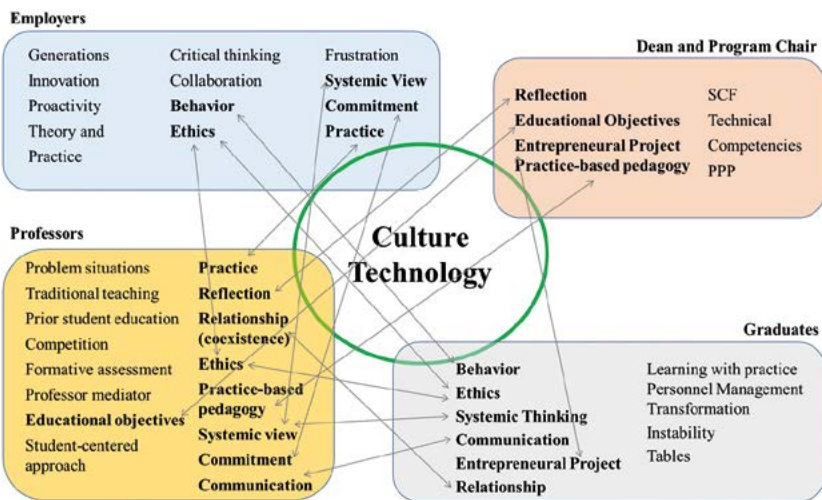
Figure 3

Units of meaning by groups of research participants

Figure 3 organizes the units of meaning from the corpus in each box, which represents the group of participants interviewed. Inside the boxes, the words, which represent the units common to other groups of participants, are in bold. Moreover, they are connected by gray arrows, in which gray arrows represent the connections from one to three groups of participants, and the green circle reveals emerging connections common to all of them. Finally, the green circle presents vital information for this analysis, since there are two units of meaning in common with all participants: technology and culture, which will be addressed below.

Aside from these general aspects, provided in Figure 3, we were able to establish views on each different place researched, following the deconstruction of the corpus towards Parallax, which is the connection of all units of meaning as a single, multifaceted and multidimensional understanding. Based on the aforementioned figure, the following views were determined:

- Graduates: are in an unstable, transforming context that they still cannot understand. They see themselves in a competitive market and are constantly pressured to get training. They understand that technical competences are important, but behavioral ones are more highly demanded in the market, precisely because dealing with different people and cultures is one of our major challenges today. College takes on a meaning of transformation, since it emulates the corporate environment in the classroom. In Higher Education, graduates learn to communicate better, form connections with new colleagues and professors, in addition to broadening their views on performing in society as well as in work, and being more critical individuals, with ethical premises. Graduates understand that learning competences happens through work experience, even if college simulates situations with complex activities, which encourage students to apply (and demonstrate) their competences. College takes on the meaning of a preparatory ritual, since it provides a foundation for where learning is believed to take place: at work.

- Professors: are tuned into a period of changes and training (in the sense of teacher training) during this change. They see technologies change their performance in the classroom, with positive and negative aspects resulting from students' prior education and their lack of active commitment to their own learning. They aim to apply educational and technological techniques in the classroom, in order to capture the attention and motivate students. They feel like salespeople, who need to constantly demonstrate the relevance of the product they are selling: knowledge, which the

'client' or student who becomes this character in the teaching and learning process, agrees "to buy". Professors are increasingly more distant from traditional teaching, that is, all classes are developed in the same way, seen here as expository in nature, without the balance and diversity that the daily class routine requires, turning students into active participants committed to their learning. Therefore, professors aim to understand the students' world, in order to promote activities in class that are connected to their reality, at the same time in which they lead to relevant learning. These professionals promote practical activities, based on real situations, which spark meaning for students. Consequently, student assessments occur constantly, in which the activities, whose goals are pedagogically clear, promote reflection on performance, so that they can learn or change. Professors understand their role at a time in which information is at the disposal of students. They are the lighthouse that signals the path to learning competences, showing the way, though students are the ones who decide whether to take it.

- The Dean and the Program Chair: the Dean is involved in macro aspects of the HEI, while the Program Chair is concerned with curricular aspects, the faculty and the students. Both understand that professors need experience in the job market in their respective area of expertise, to then be prepared as teachers. Job market experience is essential for the classroom, since it turns professors into the means of access to the job market. The curriculum is structured to teach competences and skills. Professors end up becoming the main ally of chairs in achieving the vision of the HEI, which is to prepare people for the work world. The final program activity, the Entrepreneurial Project, interconnects all the disciplines, becoming the pinnacle of the program. The chairs are clear about the competences to be developed in the program, given that they fuel the job market, preparing their teachers, in this sense, to prepare students to work. These individuals understand that teaching competences takes place by applying connected techniques within the curriculum established by the HEI, in which contents are developed in a practical way, with guided activities that demonstrate what students can do with this content.

- Employers: can better understand the changes that have occurred in the job market due to seeing technologies change the way they work. Young employees are revealed to be willing and capable individuals, though without the patience necessary for the work, which requires persistence, resilience and critical thinking. Employers understand the

important value of ethics, together with a broad view of systems, in which actions of one employee can impact the entire organization. Moreover, they incorporate values of the market that they also demand of employees: proactivity and innovation. Employers understand that learning competences occurs with work and experience. College is an environment and a backdrop, because it promotes conceptual learning, while in the day to day of work, real practical learning occurs, in a context with pressure and communication with many people. This learning is always reactive, since work, practices and techniques change with greater speed. Situations become different and more complex, because technology is always ahead, and people keep updating to try to catch up to it, despite nobody realizing that this situation is similar to that of a laboratory guinea pig, running after food on a conveyor belt that never comes to an end. In order for everyone not to be laboratory guinea pigs, collaboration seems to be a solution, even if palliative, in this constant race against technology.

Finally, still in the scope of Figure 3, we observe two units of meaning common to all participant groups: culture and technology. These units are essential for the analysis. Therefore, we proceed with a new categorization, in which we determined that Culture and Technology encompass the units of meaning presented by the participants, in addition to constituting points in common according to the position of each participant researched, demonstrated in Table 1 below.

Table 1

Emerging categories and regrouping units of meaning

Emerging Category	Units of Meaning
Culture	Behavior, Collaboration, Commitment, Communication, Competition, Critical thinking, Culture, Ethics, Formative assessment, Knowledge, Learning with practice, Personnel management, Practice-based pedagogy, Prior student education, Reflection, Relationship (coexistence), Relationship, Resilience, Structuring Core Faculty (SCF), Student-centered approach, Traditional teaching, and Transformation.
Technology	Educational objectives, Entrepreneurial Projects, Frustration, Generations, Innovation, Instability, Pedagogical Program Project (PPP), Practice, Proactivity, Problem situations, Professor mediator, Systemic thinking, Systemic vision, Tables, Technical competences, Technology, and Theory and practice.

We are currently in a technological paradigm that transforms culture through information technology and its entire apparatus, such as computers, telecommunications, electronics, applications, etc. Technology promotes constant discontinuities in the foundations of the economy, society and culture. This entire pattern of discontinuity occurs in different stages, involving the automation of activities, experiences obtained with this information and reconfiguration within the technological paradigm, in an accelerated technology-based cycle. The clearest influences of technology on culture are in the knowledge generation process, in all spheres, given information processing and use. This has also changed economic activity in the sense of migrating from industrial economic activity to the service sector, which is the heart of the new social structure.[45]

As a result, some relations are established. Regarding culture, all units of meaning that are directly or indirectly related to it are grouped in this emerging category for the following reasons: learning through practice presumes knowledge (another unit of meaning), in addition to the emerging category of culture. Communication, seen in participants as a skill for exchanging information and knowledge between people, is a way to disseminate this emerging category. This approach is centered on students, individuals of culture, who learn and also produce knowledge. Formative assessment is a kind of assessment that assumes a constant professor-student relation, which highlights culture. Competition, seen in the sense of a competition culture, that is, a set of habits related to competition. Commitment, a quality unique to individuals, to being active leaders in their cultural development. Collaboration, an attitude of human beings who develop a support network, in the sense of promoting culture and sharing knowledge and skills. Ethics, a set of social rules for individual performance in society, embrace culture in the sense of being incorporated into the set of individual habits. Personnel Management, which despite its corporate meaning, conveys relationships with different individuals with different cultures. The SCF, in turn, is a kind of collegiate of professors for structuring a curriculum, in which culture is a key factor. Traditional teaching and prior student education walk hand in hand, since student education occurs in a context of knowledge and cultural transmission. Practice-based pedagogy has an important aspect: despite being an a priori practice category in the new technology category, pedagogy changes the science whose object of analysis is education, a disseminator of culture. Critical thinking follows this last category, being a quality of individuals in a cognitive process of analysis, reflection (another

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[45] Manuel Castells, *The Rise of the Network Society* (São Paulo: Paz e Terra, 2007), 269.

emerging category) and change. Transformation is in the last category because college changes individuals with respect to culture, transforming them. Relationships, also in the sense of coexistence, practice culture as a connection between human beings for disseminating culture and affection. Finally, resilience is included because it is also a cognitive ability to resist adverse situations, not related to technology.

In relation to the technology category, the units of meaning that are directly or indirectly related are grouped according to technical competences, in an operational sense. In order to exercise technical or technological activities, they use technology, since the very notion of competence, resulting from the evolution of work, is also connected to this emerging category. The units frustration and generations go hand in hand, since the virtuality provided by technology produces expectations that reality also occurs at the same speed, generating frustration in those who compare themselves with images of successful people and believe that the path is fast, as seen on social networks. Innovation, an idea constantly linked to technology (as an emerging category), also comes from the speed at which technology evolves. Instability, in turn, is directly related to new technologies and innovation, because the constant technological changes, which change the way people relate and work, in a context of interconnections and immediacy, provokes feelings of instability. Proactivity is another related unit of meaning, since, in constantly changing contexts, those who actively anticipate problems may stand out. Systemic thinking and systemic views are linked mainly through the notion that we are in a system in which one action is reflected throughout the entire chain.

Despite apparently being related to culture, Educational objectives involve processes for classifying categories of thought, transforming how culture is transmitted. Problem situations are class tools for transmitting culture, emulating real situations, in which culture can be applied. Practice goes into this new category due to the new technological paradigm changing the focus of educational development and knowledge accumulation to practical applications of this knowledge in real contexts. The entrepreneurial project adopts the technology category, since it is an integration of various tools for applying knowledge. Professor mediators are in this category because their role has been modified by technology. Considering how knowledge is available on the internet on a range of technological devices, professors have become a reference in applying knowledge. The PPP embodies the program in the technological paradigm, with emphasis on the practical application of knowledge. Finally, the tables are located along these lines as an instrument in technological environments for work, and theory and practice together demonstrate the applicability of culture for working professionals.

The two emerging categories, Technology and Culture, are directly connected to the theoretical reference. The former is based on the perspective of Zarifian,[46] who claims that competence is composed of dimensions, such as practical understanding, knowledge, transformation and situations. Assuming real contexts for these dimensions, it is connected to culture through knowledge and technology, especially in that it addresses transformation and situations that professionals face. Transformation, using an analogy, can be seen as a dialectical relation between two final emerging categories, which are related in a complex way, provoking (or modifying) competent actions.

Being complex categories, which are intertwined and add emerging units of meaning from various individuals on different paths, they are relevant to the indication from Le Boterf[47] that competence involves the administration of complexity, in which professionals confront problems using the resources available to them. The emerging categories are directly compatible with the knowledge that is part of the administration of complexity, namely: the knowledge to act relevantly, adhering to technology because of the ability to anticipate situations, which are connected to the proactivity unit of meaning; the knowledge to mobilize knowledge in a professional context is directly connected to technology, by means of the entrepreneurial project, the educational objectives and practice; the knowledge to transpose is also linked to technology, due to the need to adapt knowledge, following a standpoint within the educational objectives; the knowledge to learn and to learn how to learn, in turn, are linked to culture through reflection and knowledge; finally, the knowledge to get involved is connected to the emerging category culture, one of the components of commitment.

The idea that the relationship between the two emerging categories - technology and culture - influence reality, with meanings that denote subjective and environmental aspects, also corroborate claims by Zabala and Arnau.[48] As categories, technology and culture are also supported by the postulates of Perrenoud,[49] who claims that competence is a lattice that underlies and accelerates resources synergistically, constituting a type of intelligence memory for confronting situations. In this sense, the links

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[46] Zarifian, *Objetivo competência: por uma nova lógica* [Objective competence: for a new logic], 68-74.

[47] Le Boterf, *Desenvolvendo a competência dos profissionais* [Developing professional competences], 40-80.

[48] Zabala and Arnau, *Como aprender e ensinar competências* [How to teach and learn competences], 11.

[49] Perrenoud, *Desenvolver competências ou ensinar saberes? A escola que prepara para a vida* [Developing competences or teaching knowledge? A school that prepares you for Life], 45.

between emerging categories form this lattice, which seems to accelerate learning, the changes resulting from the technological evolution, and knowledge generation.

Based on the data analyzed from different points of view, which we call parallax, we can explain how different individuals involved in a Brazilian higher education context demonstrate teaching and learning professional competences. They result from the relations between culture and technology, which develop constantly and independently in a continuous dialectical movement, in which technologies drive culture, so that, through human knowledge, attitudes, experiences and other cognitive-behavioral resources, professional skills are updated in an environment of changes in the work world.

V. Final considerations

The goal of this article was to explain how different players in a higher education context, involved in the area of International Business, comprehend the teaching and learning of professional competences. To this end, a case study was carried out, a qualitative approach, with data collected via a focus group with graduates and interviews with professors, the dean of an HEI, a program chair and some employers of these graduates, all in the scope of a higher education program offered by a private HEI in the city of Porto Alegre, RS.

This study was based on an analogy with a term used in physics and astronomy, called (stellar) Parallax, which provides that, in order to determine the position of a celestial object, one must see it from different locations, which, in this study, were the various players researched. The research *corpus*, which was categorized, unitarized and deconstructed following Textual Discourse Analysis, led to the development of units of meaning. From these units, the potential for a final process of categorization emerged, leading to two final categories: culture and technology.

Graduates are in an unstable context in transformation that demands continuous learning in the face of challenges from the job market. They consider college to be a preparatory ritual and that learning in fact occurs in professional work. Professors are tuned into the changes that technology presents, aiming to take situations to the classroom in which the content can be applied and have difficulties sparking student commitment to their learning. Both the Dean of the HEI and the Program Chair are involved in broader aspects of the educational spectrum and understand that the orientation of the job market requires market professionals "transformed"

into professors. They work towards a structure that can converge on a curriculum appropriate for teaching competences, so that students can apply the content in the classroom. Finally, the employers of the graduates are tuned into the changes in the job world and may have difficulty with more recent generations, which aspire to learn more quickly and believe that the pace of professional development follows the same as that of technology, in addition to the contribution of work to society.

Competence undergoes direct transformations based on the interaction between culture and technology, which are the converging points among all subjects researched. Technology, in the broad sense, related to information technology and its interrelations with education and work, generates information and knowledge exponentially, transforming relations and the way people work, with structural changes comparable to those of the Industrial Revolution. It forces culture, which bears human qualities, such as behavior, knowledge, attitudes, emotions and cognition, to also move. It is a constant helicoidal movement, an almost endless action and reaction.

Therefore, we believe that this research can be applied to readjusting curricula for modern times, which demand behavioral competences that dialogue with the needs of the market and society, keeping in mind that Higher Education needs dialogue from these different players to be effective. The strength of one's competence is difficult to measure, given that it is implemented outside of the academic environment. However, a theoretically-backed, systematic study with defined objectives helps build paths that individuals can take in pursuit of competences.

Competences are an inseparable part within the capitalist system and need to be critiqued, embraced and more well-developed, so that the best of them can supervene to improve living conditions, being preferable that we all win. Human competences are the future, together with technology, towards an uncertain future, which can change. Perhaps there will be a time of singularity, in which humans will no longer be the only fuel for technology, but that it will feed itself. This context would open - some say it will open - a completely new path, which will provoke profound changes in production and in society, which will demand competent individuals for challenges that are yet to come.

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ICT and 360º evaluation: Improving professional skills in higher education in Spain

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Abstract: The current dynamics of knowledge and innovation generation are faced with, sometimes, incompatible social and cultural trends. Something to which the University is not oblivious. Based on contemporary studies and our own experience, one of the clearest tensions has to do with the ability to judging based on reasons and not emotions. To help with this, in the educational context, the 360-degree evaluation can be a useful instrument in terms of the strengthening of their objective judgment. It is a technique that was conceived to exercise objective evaluation, in several and concurrent ways, which also allows to know their degree of objectivity. To demonstrate its potential, a sample of 56 students was used, taking the teacher's grading as a reference. The task involved self, peer and inter-group assessment. The methodology was mixed, with support in descriptive statistics for quantitative grades and natural language processing for comments and clarifications. It was possible to detect differences in behavior depending on the type of analysis (self-assessment, peers, and groups), as well as determining which students were most qualified to assess objectively. Another issue was the general reluctance to explain numerical grades through notes. Here we consider several factors to explore, among which we highlight: the digital tool used and the time available; the phase of the academic course and the characteristics of the task; and subjective bias, especially in cases of low score. About the experience, it has also been possible to detect some difficulties derived from the application of a methodology, as complex and demanding as the one

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used, which generated more than 3000 evaluations. In any case, and in view of the data obtained, we consider that the results corroborate the practical utility of this approach and invite to explore additional aspects within this area.

Keywords: educational technology; formative evaluation; educational research; statistical analysis; comparative analysis.

I. Introduction

The main raison d'être of university educational innovation is to improve the training of new generations of professionals. This can be approached by many different angles. One of them is the ability to improve and reflect the development level of the professional skills that are to be acquired, such as the ability to deliver a fair judgment.

For this to happen, people must first of all become aware of the subjective pressure their decisions are subject to on a daily basis. This is a relevant issue in terms of assessment (Arreola Rico 2019; Curcu 2008; Galaz and Toro Arévalo 2019; Jornet Meliá et al. 2020; Oliveras Boté 2019), which goes beyond this field, extends into society (González-Such et al. 2021; Jornet Meliá et al. 2011; López Aguilar et al. 2020) and is even addressed in educational policies (Álvarez-López and Matarranz 2020; Elías 2017; Perales-Montolío et. al. 2014).

The normative solution reached by the Spanish educational system has been clear and widely agreed upon. The training of new generations of professional is not conceivable without first specifying what is expected of them in terms of the competence, skills, and capabilities they need to have, as well as the plans and programs that make this possible (Ortiz-Revilla et al. 2021; Rodríguez-Gómez et al. 2017; Sarceda-Gorgoso and Rodicio-García 2018). The ability to evaluate impartially, formulated in different ways, either on an individual or on an integrated basis and often associated with critical thinking, is always present (Vendrell i Morancho and Rodríguez Mantilla 2020).

Even taking into account the exceptional situation caused by COVID-19, it is clear that the role of educational technologies has become more and more relevant in all aspects of the training process. Both in university and pre-university environments, especially in the faculty of Education and in relation to specific didactic methods (Arancibia Herrera 2016; Martínez Romera 2019; Martínez Romera et al. 2020; Urquidi Martín et al. 2019).

Teaching social contents is, in this case, unavoidable, both for their formative relevance and because of the central position occupied by their objectivity-subjectivity pressure, due to the presence of the ideological and

emotional dimensions (in a broad sense), even in the university (Furedi 2018). This could affect the evaluation on both the form but also on the subject matter: the former being the preparation and exposition of a topic and the latter the interpretations and approaches on the mention topic.

People are more likely to accept a natural or mathematical fact -even when demonstrated by someone with whom there is an ideological disagreement- than a social or cultural fact, assuming that both facts are rigorously true. Thus, the subjective bias is not limited to the fact that there is a preference on how a topic has been presented, but there is also a judgment of the (or from the) ideology of the actors involved, while the evidence, the facts, and their methodological structure are left in the background. Thus, learning how to professionally manage form vs. matter, necessarily requires taking those relationships established between evidence, preconceptions, and subjectivity into consideration.

The role of information technology (ICT) can be critical in this regard, insofar as it can facilitate issues that otherwise could not have been addressed due to physical (availability of adequate space) or demographic (overcrowded classrooms) constraints. Digital rubrics (Cebrián-de-la-Serna and Bergman 2014; Fernández-Quero 2021; Ferreiro Concepción and Fernández Medina 2020; Grande de Prado et al. 2021), have proven very useful to solve problems such as attendance and participations. Thanks to them, it is possible to establish an evaluation tool that can be applied in multiple ways to establish objective judgments about curricular work.

One of the most interesting, but also the most complex to implement, is the 360-degree assessment (US Office of Personnel Management 1997). It has its origin in Germany in the early 1930s, as an instrument to improve the selection of military officers. After World War II, its use became widespread in the business world, as a tool for improving the selection of candidates. Despite the good results it offers, its use has not been too abundant in the analog era due to the complexity of its procedure (a lot of evaluation forms are involved). It has been with the arrival of the computer revolution, especially Internet, that its use has been increasing in number and scopes.

This technique is characterized by the use of three points of view that converge on the same issue, fact or activity. In general terms, a previously designed questionnaire is fulfilled recursively for comparative purposes: the vision of the person who makes or performs the object of evaluation; the vision of the peers; and the vision of the professional evaluator. This is done for each of the participants, hence the circular procedure that gives it its name. Upon completion, a significant volume of information has been generated, that can be analyzed from various angles. This is intended to

obtain a more contrasted and detailed judgement, which can overcome the subjective biases inherent to the human being.

Adapting this to the educational context, we have that the introduction of both self-assessment and peer evaluation, in addition to the teacher's, means involving students in decision-making about content and/or the performance of third parties. This practice is very interesting for the educational field (Báez-Rojas et al. 2021; Barba Aragón 2020; Dagal and Zembat 2017; Liu et al. 2021; Martínez Romera 2017; Meghdad et al. 2020), especially for social sciences and how they are taught.

In line with all the above, the following research question will be addressed: Is it possible to use the 360-degree technique in digital contexts to strengthen student impartial judgement? Two subquestions derive from it: Is it possible to identify and improve the skills of individuals? What role does the working group, and the class-group, play in the individual bias?

To carry out the experience and collect the necessary data, the CoRubric web application was used to design the questionnaire. A free tool for the design, application and analysis of evaluation rubrics in digital contexts, developed by Daniel Cebrián Robles (2019) and GTEA, a research group in educational technology from the University of Málaga (Spain).

II. Methodology

A case study was presented based on 56 bilingual (Spanish-English) primary school teacher training. The project used a digital assessment rubric based on the 360-degree model built using CoRubric. The presentations of the final classwork carried out in small groups (15) were evaluated in groups of 4 to 6 students. They consisted of the complete development of an educational activity (didactic unit) on the curricular contents of Social Sciences in Primary Education.

The instrument was developed and validated according to the standards in use (Cubillos-Veja and Ferrán-Aranaz 2018; García-Valcárcel Muñoz-Repiso et al. 2020; López-de-Arana Prado et al, 2019; Ortega-Quevedo et al. 2020; Tejada-Fernández et al. 2015; Usart Rodríguez et al. 2020). Both the form and the subject matter of the object to be evaluated were considered, a set of dimensions and criteria were established halfway between generalization and detail, and measurement scales were created according to each case, duly provided with semantic content. Before putting it into practice, this first draft was submitted and adjusted according to the opinion of experts; after this, a first pilot adaptation test was carried out, which also served to establish the mechanics of use, and no changes were needed.

Following the nomenclature (Gatica-Lara and Uribarren-Berrueta 2013; Pozuelos Estrada et al. 2020) for analytical rubrics, the tool covered 4 concepts and 9 unweighted aspects to be evaluated. The measurement scale, a closed Likert-type scale, presented four levels in 8 cases and three in 1. Each and every one of these levels has evidence descriptors (graded semantic content) to determine the level of compliance. The result of the rubric generates a final numerical score ranging from 0 to 100. Table 1 shows the final structure of the implemented tool.

Table 1

General layout of the assessment rubric

1. Content structure
1.1. Information quantity and relevance*
1. It has conceptual errors and focuses on ancillary issues
2. It has conceptual gaps and tends to focus on ancillary issues
3. It has some inaccuracies and focuses on the main topic of the work
4. It addresses all the theoretical aspects satisfactorily and is well focused on the subject
1.2. Degree of structuring
2. Communication with the audience
2.1. Oral communication
2.2. Body language
2.3. Management of the resources used
3. Interaction with the audience
3.1. Ability to motivate and create interest
3.2. Control of interactions
4. Use of technological resources
4.1. Quality of the resources used
4.2. Formal aspects of the presentation

* Evidence for each of the levels, it is presented as a sample in order to keep a compact view of the tool.

Source: compiled by author.

The digitalization and student use of the rubric was carried out using CoRubric. Fifteen additional assessment objects, the workgroups, were created, so that 56 evaluators had to assess 70 evaluation points using the 360-degree logic: self-assessment, peer evaluation (and workgroup evaluation) and teacher evaluation. The process generated 3042 assessments, 77.60% of the planned number of assessments (3920).

The analysis used mixed methods, consisting of the conversion of the qualitative assessments into discrete quantitative categories and the consideration of the (optional) observations that each aspect allows to be made in addition to its assessment. This latter aspect proved to be testimonial, with 34 annotations. Personal data anonymity was guaranteed by assigning a numerical identifier (IDx) to each participant.

The results were analyzed with SPSS v.26, and Pandas and scikit-learn (Pedregosa et al. 2011) were used for the advanced matrix manipulation with automata. For qualitative analysis, annotations comments, natural language processing (Hussen et al. 2021) was used, through NLTK (*Natural Language Toolkit*) library in Python.

II.1. *Data control*

The last methodological issue will be the first to be addressed in the analysis. Since its robustness depends on whether it can be continued. Two aspects must be checked here: that the data obtained is valid and reliable.

The question of validity has to do with the correct use of the evaluation scale assigned to each item. Since a digital application is used, this aspect is well controlled and it is not possible to get answers out of range. An advantage derived from the use of ICT support over the free manipulation of physical questionnaires by the participants. Therefore, this aspect will have no impact in our case, but it was necessary to point it out.

Regarding the reliability of data, we must rely on descriptive statistics. This type of control allows us to rule out that they are meaningless. In terms applied to our experience, for example, this would happen if everyone responded with a constant score to all items. Or if they do it through clear patterns, like: minimum/maximum grades, in an alternate way; or counter loop, meaning increase gradually the response value for each successive item until max-range is reached, and start over (or vice versa).

We find here Cronbach's Alpha coefficient as a consolidated reference (Barbera et al. 2021; Bujang et al. 2018; Emerson 2019). From its application a quotient is obtained that allows us to have greater certainty of the reliability of the dataset. Then a second analysis, called item-total correlation, must be

performed to ensure that each item is also consistent. If not, two types of action are derived: modify or delete it. The first leads to reformulating it and answering it again. If not possible, then it should be removed and the data reliability recalculated for the remaining set. This aspect is central to our analysis, so it will be the first stop of it.

III. Analysis

III.1. Tool validation

The scale reliability analysis applied to the aspects yielded a Cronbach's Alpha of 0.791, 0.795 with standardized items, above the 0.7 value considered the minimum necessary for tools designed for individual analysis in education (Taber 2018). The item-total correlation was above 0.3 in all cases, which meant an individual Cronbach's Alpha always higher than 0.75, thus reformulating or discarding any aspect was not necessary. (Frías-Navarro and Pascual-Soler 2021). In view of the above, the instrument exceeded the reliability requirements necessary to develop the data analysis.

III.2. Self-evaluation

Forty-five of the fifty-six participants completed the self-evaluation (80.4%). The average grade was 92.12 out of 100, with a standard deviation of 15.54 points. The extreme situations ranged from 0, reported by one individual (ID40), to 100, reported by 5 people (ID4, 5, 10, 22 and 24). Taking the teacher's grading as a reference, this had an average value of 84.57, 7.55 points lower than the student grade, and showed a similar standard deviation (14.0 points). ID40 and ID5 had a double self-evaluation, with average grades of 97.33 and 94.0. This meant that ID9 and 47 had the lowest self-evaluations (71.78 points). Figure 1 shows the comparative behavior.

Almost all of the grades were above the 50-point range in both cases. The student perception of their own performance was systematically higher and more concentrated than that observed by the teacher. The compared analysis made it possible to establish some behavioural patterns:

i. No significant discrepancies could be observed in the first section, up to approximately 40 points.
ii. between 40 and 60 points, there were specific situations with a higher grade from the self-evaluation than from the teacher.

iii. Most students were assigned between 60 and 90 points by the teacher, a discrepancy that peaked at 85 points, where the density of students quadruples that found in the self-assessments.
iv. At 90 points and above, the scenario was reversed, with the teacher finding fewer cases than those reported by the self-assessments, a situation that reached its turning point at 93 points, where the rate given by the teacher is one third of the self-assessed.

Therefore, the demographic grading patterns show significant discrepancies in favour of self-perception as compared to the teacher's evaluation. Only 5 people were stricter with themselves than the teacher, with ID47 being the strictest with a difference of 9.32 points (71.78 vs 81.1, respectively). While 40 students graded their work higher, to varying degrees: 23 by up to 10 points in their favour, 14 by up to 20 and 3 by more than 20; with ID42 reaching a record of 24.13 points (97.33 vs. 73.2).
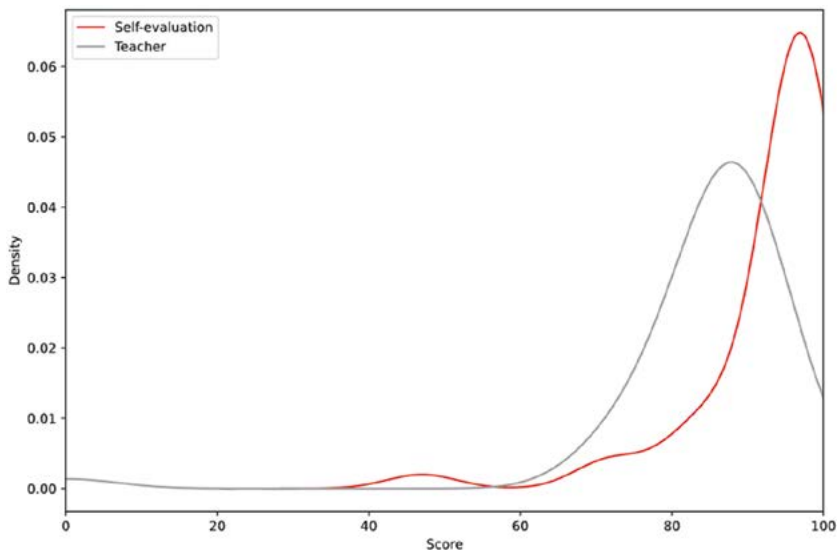
Figure 1

Comparative distribution of self-evaluation and teacher grades

III.3. Hetero-assessments

Fifty-six students participated in the peer evaluation, generating a total of 2,384 records, excluding the workgroup evaluations. The minimum grade is

5, given by ID27, and the maximum is 61, by ID18 and ID50. All cases above 55 are the result of the re-assessment by one or more peers. To analyze the behavior of the evaluators, a comparison was made with the teacher in terms of the average grade given in each case, as shown in Figure 2.
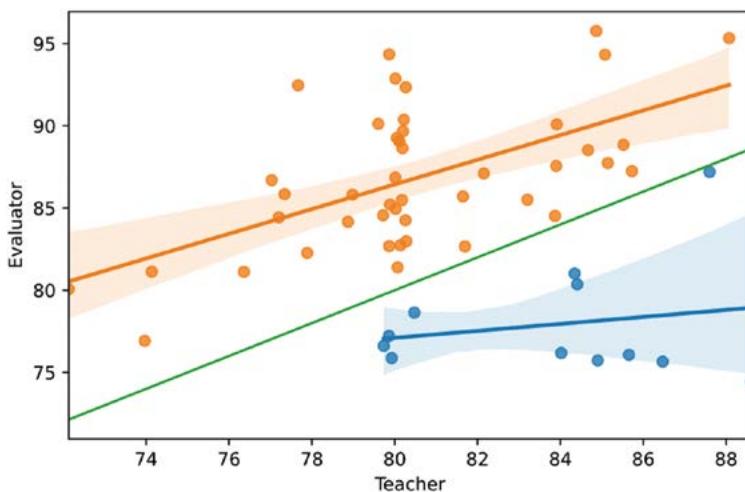
Figure 2

Comparison of the evaluations made, in average value

The diagonal dividing the graph into two areas represents the ideal line of perfect correspondence between the teacher's grade and the grade given by the students. Thus, the light dots at the top represent evaluators who gave higher grades than the teacher, and the dark dots at the bottom represent evaluators who were harsher than the teacher. The first group comprised of 44 students (78.57%) and the second of 12 (21.43%).

In the group of overgrades, in absolute terms ID30 stands out as the most extravagant value, with an average score of 95.77 points compared to 84.86 given by the teacher; the lowest case is represented by ID21 with a value of 76.92 points compared to 73.97 by the teacher. In relative terms, the highest discrepancy range belonged to ID10, who gave an average grade of 92.46 compared to 77.67 by the teacher, which implies a discrepancy of 14.79 points; while the most similar is ID26 with a grade of 84.52 compared to 83.87 by the teacher, which represents a deviation of 0.65 points.

In the group of undergrades, in absolute terms ID52 stands out as the most extravagant value, with an average score of 87.19 points compared to

87.6 given by the teacher; the strictest student was ID27 with 74.44 points compared to 88.61 by the teacher. In relative terms, the largest discrepancy was found in ID27, with 14.17 points of difference, thus coinciding with the lowest absolute extreme of the subgroup and of the whole class; and the most convergent coincides, similarly with ID52, with a discrepancy of 0.41 points. The standard deviation of the grades is 5.52 points for the students and 3.51 for the teacher; by subgroups, the overgraded subgroup yields a value of 4.31 and 3.28 and the undergraded subgroup a value of 3.53 and 3.14, respectively.

In addition, the regression curves and the estimated confidence interval range are also shown. There is a clear discrepancy in the slope between the two, so that the slope of the undergrades is almost horizontal, which describes a much more constant behavior of the criteria issued, with a marked widening of the confidence intervals towards the maximum values. The overgrade curve is slightly less steep than the ideal diagonal, indicating that the convergence of values occurs towards the upper end, the opposite of what happens in the undergrades. The confidence interval is more homogeneous, with a tendency to widen at the outer edges.

III.4. *Group assessment*

A second approach to hetero-assessment was taken into consideration, focusing the analysis on the evaluations issued on each work group as a singular entity, and it was also compared with the teacher's criteria based on the 613 grades given. The average number of grading per group was 40.87, with a minimum of 31 (J), a maximum of 49 (H), and a standard deviation of 6.83. Figure 3 shows the results of this comparison, arranged in descending order according to the teacher's grading.

There are no analogies between student and teacher behaviour. In contrast, there are some marked discrepancies, especially those affecting Ñ, J and I, in the group of those undergraded by the teacher, coinciding with relative minimums, and absolute in the case of J, which is also the group that has received the fewest evaluations; M, G, B and A show the highest overgrades, coinciding with relative maximums, and absolute in the case of M. The group with the most evaluations issued, H, is in a context of inflection in the relative maximum in a section of clear overgrade. The highest student/teacher convergence was observed in N, D and K, with no additional evidence to establish further relationships.

The groups' internal behaviour was highly heterogeneous, especially at the lower end. Within the 51 student grades with a fail grade(<50), 9 out of the 15 groups are identified: A (6), C(1), D(7), E(7), G(4), H(7), I(2), J(17) y
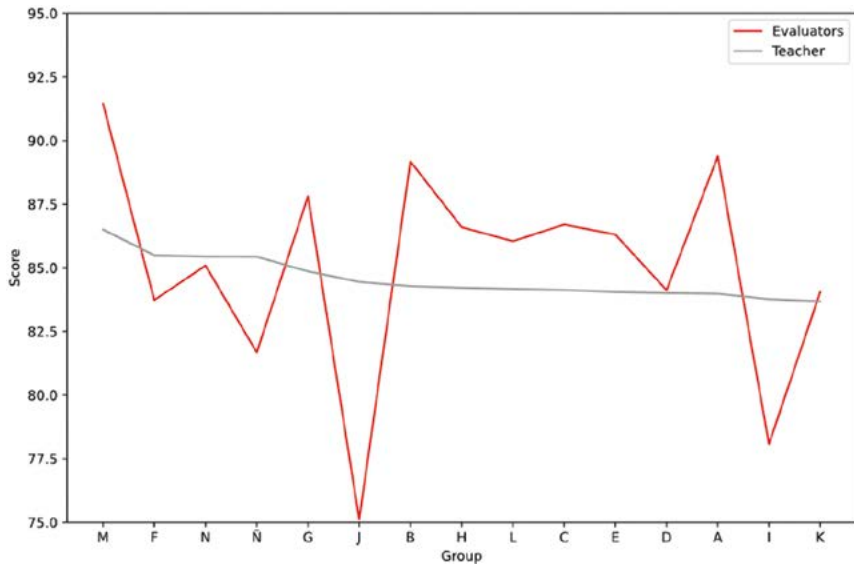
Figure 3

Comparative grading of workgroups, sorted by teacher's grading

N(2). One third of all the lowest grades fall on J. In addition, group grades compared to the average of its members are also lower. In statistical terms, there is a discrepancy in the criteria for grading the group as a unit rather than as a group of individuals.

III.5. Notes

Comments regarding the grades were testimonial and when they had a useful semantic value it was to indicate a low grade. Thus, ID11 justified his/ her zero for evidence 2.1 to ID31 on the fact that she did not actively participate ("*she didn't speak*"), and the same happened to ID22. An exception to this pattern is ID8, who justified a high grade in this same item for ID0 by giving her added merit due to her circumstance ("*She has presented her part without having the best tone of voice, so her effort must be congratulated*").

The above comments were always about people from different groups. But there are also redundant situations, as in the case of evidence 3.1. ID45 commented on ID47 -belonging to the same group (M)- to whom he/she awarded 80.67 points, arguing that "*she made the presentation of the project as if the participation of the audience was not necessary*."

A third situation was detected whereby every member of a group had the same traits as those of the group itself. ID21, in relation to evidence 3.2, assigned to all members and to the group itself, a score below 30 in all cases, arguing that "*they did not provide any time for questions or doubts about their project*", a comment that is noted for ID35, 37, 42 and the group itself (F), apart from ID36, also a member of this group.

Apart from the above, no elements were qualitative interesting as they did not significantly effect the assessment: ID22 pointed out that on evidence 4.2, group B exceeded the established time ("*They finished late*"), a comment which resulted in a grade of 90.67 points; several cases are also identified in which the comment reflects the chosen grade (1, 2, 3, 4).

III.6. *The influence of gender*

Although the sample had a clear female majority, 44 of the 56 participants were females, the high number of evaluations generated by each student allowed to consider the average grades given as an exercise in behavioral exploration in terms of peer judgment. The main results are laid out in Table 2.

Table 2

Mean ratings between sexes and corresponding teacher ratings

Gender of evaluator	Gender rated		Teacher	
	M	F	M	F
M	88.39	85.24	79.72	82.81
F	87.03	84.86	79.95	83.01
Mean	87.36	84.95	79.89	82.96

Source: compiled by the author.

Apart from the considerations on the grades in absolute terms which are similar to the student/teacher discrepancies identified above, it is possible to point out an additional new aspect associated with the discriminatory analysis by gender. On average, the grades given between males were more than 4 points higher than the average grade between females, a situation that was almost the opposite when viewing the grades given by the teachers. In the case of female-to-male and male-to-female grades, the difference is less than 2 points, and less than 3 in the case of the teacher.

IV. Discussion and conclusions

Before delving into the comment on the ins and outs of the research, we consider it necessary to contrast the results with the sources presented in the introduction from a global perspective. In order to establish the possibilities of use in other areas and places, as well as to determine to what extent the experience is generalizable. To do this, we will confront the topics addressed in the introduction that have served as theoretical support: the subjectivity of judgment in the university context; the identification of formal constraints for its reduction; the uniqueness of the social sciences as an obstacle; and the general difficulties of technological implementation. After this, the discussion of results will be developed and, finally, as a closing syllogism, the considerations related to the research question, and the derived sub-questions, will be addressed in the final paragraphs.

The presence of subjectivity in the evaluation has been verified, something that must be assumed as part of it and the free will of the students as a social subject (Curcu 2008, 212-213). Our position here is to agree on the diagnosis but disagree on the consequence, since today it is the subjective component that has been oversized and that needs to be reweighted, in our geographical context, as will be discussed later. Arreola Rico (2019), considers that this must be extended not only to teachers in training, but also to teachers in practice, because emotional competence must be present in the evaluation process. We understand that this could not be otherwise but, as in the previous case, we offer a different angle: today, the ability to discern and assume facts from personal interest is under question. This is an inalienable teaching skill in our opinion.

It still remains to be addressed, at this point, that bias may be present even in the teacher. As Galaz and Toro Arévalo (2019, 374) point out, evaluation expresses a set of relationships and spaces loaded with meaning for those involved. What is extended not only to his teaching, but also to his research, as demonstrated by Oliveras Boté thesis (2018). In both cases, the confrontation observed here between objectivity and subjectivity is reflected on the general theoretical plane, as a reality on which to act.

We opted on this occasion for the wake-up call of the later, since problems such as confirmation bias find in subjectivity fertilizer for its growth. This is not posed as an exclusionary dichotomy, but as a complex dialectic. Emotion is a source of implication and motivation of first order, as González-Such et al. (2021, 292) recalls from the perspective of social cohesion. With López Aguilar et al. (2020, 99), all the above makes it crucial to apply these findings in the evaluation processes and establish greater

communication between the educational research carried out and teaching practice, something about which there is still much to do.

A legal framework, the Spanish one, has been assumed for the development of the experience, this introduces conditioning factors. Broadly speaking, we can establish the existence of two educational models in the world: those based on competences and those based on content. Historically, all countries were in the second model, but since the last third of the twentieth century a change towards the first, consolidated at the beginning of the twentieth century, developed in some countries. Spain is immersed in a process of European convergence (European Higher Education Space), which is trying to generalize beyond its borders with the inclusion of countries such as Russia and Turkey. This is a competency-based proposal.

It is clear that the experiences indicated here, such as that of Sarceda-Gorgoso and Rodicio-García (2018), only have applicability under this paradigm. In our opinion, oriental models, such as Chinese, Korean or Japanese, clearly oriented towards content, present different problems. In this case, their concern is to promote the emotional involvement of university students to improve their involvement and performance (Shafait et al. 2021; Zhoc et al. 2020), as they belong to a sociocultural context where emotions tend to be more restrained.

The characteristics of the social sciences, as a subject of work, must be considered with respect to the natural or experimental sciences. Clearly, objectivity is much more assumed in the latter as an intrinsic characteristic. But it comes into conflict with ideology and emotionality, understood here in a broad sense, when we address the former. This fact is generalizable beyond this experience, because it connects with intrinsic characteristics of the different knowledges.

Thus, from the calm reading of the arguments of Furedi (2018), a clear conclusion is obtained: the vast majority of the academic scandals pointed out that lead to the dismissal of professors, to the censorship of research, activities and arguments, and even to the promotion of self-censorship as a survival strategy, occur in the field of social sciences. We consider the above as further evidence of the need to work, precisely, on the strengthening of rational thought in the branches of knowledge that in the university are being more gripped by subjectivism and postmodernism (Andrade 2019; Kestel and Korkmaz 2019; Milliken 2007; Searle 1995).

Undoubtedly, the technological perspective is the most positive when assessing the possibilities of implementation and generalization of this type of strategies, for several reasons. First, because the computer support required is minimal; any computer equipment capable of surfing the Internet

is sufficient, including mobile devices, which relaxes the pressure on available resources in contexts and countries with limited resources (Das 2019; Jogezai et al. 2020). Second, the virtualization of experience opens new windows of flexibility on synchronous and diachronic evaluation processes, as pointed out by the aforementioned Grande Prado team (2021, 53-54). And third, we must not forget that this type of technology, of which the new generations are native, is associated with an increase in participation inside (Zweekhorst and Maas 2015) and outside the classroom (Mano 2021).

About results discussion, the analysis of self-assessments is particularly interesting in the field of acquisition of professional competencies. This is because making an impartial judgment on one's own abilities, skills and performance is subject to the greatest possible pressure considering one's own interests. This ability to assess based on and adjusted to reality requires a habit that needs to be developed and strengthened. However, even in the field of education degrees, as is the case here, this type of assessment is often displaced by the more usual peer evaluation.

It is worth asking about the causes that lead to giving these clearly discrepant evaluations. Based on the authors' experience and the experiences analyzed in the initial sections, the authors believe that three of them ought to be considered:

i. During their training time, future teachers are not accustomed to using these skills.
ii. There are concerns about the impact that these grades may have on the students' record.
iii. The whole experience is considered trivial.

Relying on all available analysis is necessary to identify each case. This allows to observe certain clues: there are students who always overgrade in the same absolute order of magnitude, regardless of the object and the context of the evaluation, as explained in the third case. There are also cases in which the grade is very different from the teacher's, therefore the object and the context of the evaluation seem to play a role in the evaluation, as per the second case. Therefore, the relative difference of this last assumption remains as an indication to be considered on the ability to use impartial judgment, as per the first case. It goes without saying that all of the above is based on considering the teacher's opinion sufficiently objective which could, by any means, be improved.

Peer-to-peer assessment is essential to support the above-mentioned findings. The general behavior was different from that of the self-assessment. The group of evaluators who over-graded, as compared to the teacher's, was

also the largest. Nonetheless, they seemed to fall more clearly within the second than the third category, given the similar slope of the regression curve and the diagonal of ideal correspondence with the teacher, although what gives its robustness is a smaller percentage that falls within the confidence interval. On the other hand, the undergrading shows a more constant horizontal distribution, which can be associated with the third case, mirroring it in terms of self-evaluation.

One striking aspect in the group assessment is that it does not correspond to that of its members. Thus, in most cases the grades received by the members were not usually similar to the individual group grade; this leads us to think that the students' attitude towards this type of assessment was more oriented towards the third type of those described in the self-evaluation. The typical example here was group J, which received one-third of the lowest scores and held the worst absolute score with just 76 points. However, the average of its members is 88.42, with ID53 as the worst graded (87.26) and ID6 as the best (91.18). Clearly, there is a significant change in attitude when it comes to valuing a group rather than the individuals that make it up as the group tends to receive less favorable grades.

The idea of clarifying or qualitatively explaining the grades did not find much support. And even though the analysis of the few available rated grades made it possible to identify some relatively interesting behaviors, ultimately, this was not a relevant aspect of the 360-degree assessment under study. Therefore, what is relevant in our opinion is to consider why this happened. The most plausible explanation found lies in the complexity of the tool itself, as it had to be evaluated on dozens of occasions and by considering different assessment parameters. Undoubtedly, this requires more time than that what is available during the presentations.

There is therefore a difficult dilemma: this issue could have been given additional time, which would have meant stopping the rhythm of the presentations of final works in the final phase of the course; or it could have been done on a less important assignment, for instance in the middle of the course. Regarding the first possibility, there are solid counterarguments about the strain that this would place on the curricular development of the school subject, with the risk of trivializing the contents necessary to make a sound intellectual judgment about the subject itself. And as for the second, the very nature of the 360-degree assessment would not have been easier to carry out, only the amount of group work prior to it; with the added fact that, focusing the interest on an issue that is perceived as minor, compromises the students' interest and motivation.

As for the last aspect under consideration, i.e., performance by gender, although statistically it offers clearly different behaviors, it must be relativized

for two reasons. The first is the sample bias in the gender ratio, which is clearly more female dominated; the second is magnitude of these discrepancies, which are statistically negligible and move in the range of 2 to 3 points, or 2 to 3 tenths on a traditional decimal scale. However, both this aspect and the previous ones, ought to be repeated several times to determine more reliably whether we are dealing with generalizable patterns, and in what context and to what extent, if any.

Finally, we consider that the research question has been affirmatively answered, as long as the two sub-questions have been satisfied. First, the 360-degree assessment made it possible to identify student behaviors according to the scale of analysis, that could be related to their performance in terms of the acquisition of competencies; in this case the focus was on the development and strengthening of the ability to issue reflective and objective critical judgment among peers. And second, group behavior has been observed for both under and overestimated situations, which gives us clear indications of gregarious bias of judgment regarding. As observed with widespread reluctance to explain the scores in detail.

Undoubtedly, the complexity of the tool resulted in some difficulties, such as the teacher's control over its full application. However, it has also made it possible to create a controlled scenario for a professional valuation that would be difficult to carry out in its full scope by using other methodologies. This is of unquestionable added value in curricular areas such as Social Sciences and their didactics, in which the subjective component is more recurrent and evident than in other fields (Natural Sciences, Mathematics), even projecting itself into the political sphere. Therefore, not only does it help to train teachers who will be fairer in their professional opinion, but also to create freer citizens, as it helps them acquire intellectual tools, they can resort to in order to make the decisions they will have to face in their life.

As previously pointed out, new questions are also arising which call for this experience to be improved and repeated in this and other contexts, in order to find patterns that will ultimately help improve the teaching and learning of curricular contents, something essential in the educational process. This is because -according to Aristoteles and Professor Gustavo Bueno- the same as philosophizing means philosophizing against someone, teaching means teaching against ignorance, superstition, and obscurantism.

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Views of pre-service teachers on the research-based teacher education approach

Emel Bayrak Özmutlu*

Abstract: In this study, the aim was to complete an investigation based on the views of pre-service teachers taking a scientific research methods course grounded on the critical features of the research-based teacher education approach. Within this scope, answers to the questions of "what are the views of pre-service teachers about (a) the outcomes provided by the research methods course, (b) the reasons for teachers to have research competencies, and (c) the professional function of scientific studies?" were sought. This research was designed with the basic qualitative research pattern. The researcher developed an interview form comprising open-ended questions to specify the views of pre-service teachers, which were the research target. To create the study group for the research, criterion sampling was chosen from the targeted sampling methods. The study was completed with 110 pre-service teachers attending the educational faculty of a state university in Turkey. A detailed analysis process was completed in four stages for the research data. Analyses were performed on statements reporting a total of 684 views. Pre-service teachers showed development in 25 subcategories classified into research competence, professional competence, and personal growth. Teachers' need for research competency was justified based on the needs of contemporary teachers, the requirements due to the nature of the class, and ensuring the optimal conditions for effective teaching. Pre-service teachers' views on the professional function of scientific studies were examined under five categories. These are reliable knowledge, real context, ideal practice, beyond experience, and distance from being guides. The research findings can be interpreted as the fact that teacher education practices which take the principles of the research-based teacher education approach into account have the potential to achieve the teacher qualifications targeted by this approach. Considering the potential of these qualifications to fulfill the

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complex and high-level expectations demanded from the teacher, it is recommended that studies be conducted on how the principles of research-based teacher education can be integrated into existing teacher education programs.

Keywords: Pre-service teachers; research-based teacher education; scientific research methods course; teacher education; teacher education curriculum.

I. Introduction

When the learning approaches accepted by the educational understanding in our age and the qualities expected in an educated person are investigated, it appears that individuals must have research competency both to accurately direct learning processes and to be able to use what they learn in real-life contexts. Both in curricula[1] and in the literature related to 21st-century skills,[2,3,4] developing higher-order thinking skills, obtaining accurate information, and using what is known based on the needs of everyday contexts require individuals to have research competencies to a large extent. Within this framework, there is a long history of students making efforts to develop research skills, especially in the name of research-based, problem-based, and case-based learning studies. To raise researchers responding to the multidimensional and complicated expectations demanded in the 21st century, and individuals with scientific attitudes and behavior, it is vital to cultivate qualified teachers who are able to foster a scientific understanding and culture in schools.

Education to raise individuals with scientific thinking power is mentioned in political texts (National Education Basic Law number 1739), in curricula,[5] and in guidelines for teacher competencies.[6] Teacher education curricula fulfil a critical function to raise individuals with scientific thinking skill, which is included among the primary targets of our educational system, and to adhere to the basic principle in education of being scientific. Teacher

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[1] Ministry of National Education, *Turkish Course Curriculum* (Ankara: Ministry of National Education Publishing, 2019), 3.

[2] Ching-Sing Chai, and Siu Cheung-Kong, "Professional Learning for 21st Century Education," *Journal of Computer in Education* 4, no.1 (July 2017): 1-4, https://doi.org/10.1007/s40692-016-0069-y.

[3] Linda Darling-Hammond, "Constructing 21st-Century Teacher Education," *Journal of Teacher Education* 57, no.3 (May/June 2006): 300-314, https://doi.org/10.1177/0022487105285962.

[4] Rosefsky A. Saavedra and Darleen V. Opfer, *Teaching and Learning 21st Century Skills: Lessons from the Learning Sciences. A Global Cities Education Network Report* (New York: Asia Society, 2012), 3-24.

[5] Ministry of National Education, *Turkish Course Curriculum*, 3.

[6] General Directorate of Teacher Education and Development, *General Competencies of Teaching Profession* (Ankara: Ministry of National Education Publishing, 2017), 5.

education is accepted as an essential factor in coping with the difficulties of the 21st century and increasing the quality of education.[7] For this reason, teacher education is included among topics attracting significant interest from both political decision-makers and ordinary members of the public.[8]

Teaching is becoming a profession that demands the use of increasingly complex knowledge and skills.[9,10] The complexity of the modern world, characterized by unprecedented technological (r)evolution, increased mobility, migration, and rapid and profound social change, poses new challenges to teaching and teacher education.[11] Teachers have to use the opportunities offered by technologies[12] and respond to the demand for individualized learning.[13] Moreover, classes now contain a heterogeneous mix of students with different backgrounds, abilities and disability levels.[14,15] The Lisbon Strategy,[16] the EU 2020 strategy,[17] the MEB 2019-2023 Strategy Paper,[18] the

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[7] Päivi Hökkä, and Anneli Eteläpelto, "Seeking New Perspectives on the Development of Teacher Education: A Study of the Finnish Context," *Journal of Teacher Education* 65, no. 1 (January/February 2014): 39-52, https://doi.org/10.1177/0022487113504220.

[8] Organisation for Economic Co-Operation and Development, *A Flying Start: Improving Initial Teacher Preparation Systems* (Paris: OECD Publishing, 2019), https://doi.org/10.1787/cf74e549-en.

[9] Darling-Hammond, "Constructing," 300-314.

[10] European Commission, *Supporting the Teaching Professions for Better Learning Outcomes* (Strasbourg: European Commission, 2012), 22-42.

[11] Ana Raquel Simões, Monica Lourenço, and Nilza Costa, *Teacher Education Policy and Practice in Europe* (New York: Routledge, 2018), 3-5.

[12] Laura Menabò, Alessandra Sansavini, Antonella Brighi, Grace Skrzypiec, and Annalisa Guarini, "Promoting the Integration of Technology in Teaching: An Analysis of The Factors That Increase The Intention To Use Technologies Among Italian Teachers," *Journal of Computer Assisted Learning* 37, no.6 (February 2021), 1566-1577, https://doi.org/10.1111/jcal.12554.

[13] Robert M. Bernard, Eugene Borokhovski, Richard F. Schmid, David I. Waddington, and David I. Pickup, "Twenty-First Century Adaptive Teaching and Individualized Learning Operationalized as Specific Blends of Student-Centered Instructional Events: A Systematic Review and Meta-Analysis," *Campbell Systematic Reviews* 15, no. 1-2 (June 2019): 1, https://doi.org/10.1002/cl2.1017.

[14] Elaine Munthe, and Magne M. Rogne, "Research-based Teacher Education," *Teaching and Teacher Education* 46, (February 2015): 17-24, https://doi.org/10.1016/j.tate.2014.10.006.

[15] European Commission, *Improving the Quality of Teacher Education* (Brussels: European Commission, 2007), 2-16.

[16] "The Lisbon Strategy," The Lisbon Strategy, Google, accessed April 17, 2022, https://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/00100-r1.en0.htm.

[17] European Commission, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on achieving the European Education Area by 2025* (Brussels: European Commission, 2020), 1-29.

[18] Ministry of National Education, *2019-2023 Strategy Paper* (Ankara: Ministry of National Education Publishing, 2019), 37-88.

U.S. Government Strategy on International Basic Education for Fiscal Years 2019-2023,[19] and the targets set in the Reinforcing Education Accountability in Development[20] (READ) Act also point to the necessity of high-level teacher qualifications. On the other hand, teacher education systems are not equipped with the highest quality in every aspect to meet these new demands. In a study carried out by the OECD,[21] it was reported that there were deficiencies in teaching skills in almost all countries and that teachers had difficulties in terms of updating their skills. It is thought that the development goals targeted by the research-based teacher education approach[22,23,24,25,26,27] have the potential to overcome the deficiencies examined in the report.

The Common European Principles for Teacher Competences and Qualifications were adopted in the report on improving the quality of teacher education prepared by the Commission of the European Communities,[28] and in line with these principles, the Commission proposed a number of policy steps for improving the quality of teacher education in the European Union. Among these steps, the competencies that all teachers should possess at every point in their careers are described. Among these competencies, teachers' possession of research competencies comes to the fore. In the same report, under the heading of reflective practice and research, which is one of

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[19] "The U.S. Government Strategy on International Basic Education for Fiscal Years 2019-2023," The U.S. Government Strategy on Education, Google, accessed March 10, 2022, https://www.usaid.gov/sites/default/files/documents/1865/USG-Education-Strategy_FY2019-2023_Final_Web.pdf.

[20] "Reinforcing Education Accountability in Development (READ) Act (Division A, Public Law, 115-56)," Reinforcing Education Accountability in Development, Google, accessed March 10, 2022, https://www.congress.gov/115/plaws/publ56/PLAW-115publ56.pdf.

[21] Organisation for Economic Co-Operation and Development, *Attracting. Developing and Retaining Effective Teachers* (Paris: OECD Publishing, 2005), 1-12.

[22] Kirsi Tirri, "The last 40 Years in Finnish Teacher Education," *Journal of Education for Teaching* 40, no. 5 (September 2014): 600-609, https://doi.org/10.1080/02607476.2014.956545.

[23] Jessica Aspfors, Gunilla Eklund, and Sven-Erik Hansén, "Early Career Teachers' Experiences of Developing Professional Knowledge-from Research-Based Teacher Education through Five Years in The Profession," *Nordisk Tidskrift för Allmän Didaktik* 5, no. 1 (December 2019): 2-18.

[24] Hannele Niemi, "Educating Student Teachers to Become High Quality Professionals a Finnish Case," *Center for Educational Policy Studies Journal* 1, no. 1 (January 2011): 43-66, https://doi.org/10.26529/cepsj.440.

[25] Hannele Niemi, and Ritva Jakku-Sihvonen, "In the Front of the Bologna Process Thirty Years of Research-based Teacher Education in Finland," *Education Science*, (2006): 50-69.

[26] Sven-Erik Hansén, Liselott Forsman, Jessica Aspfors, and Marina Bendtsen, "Visions for Teacher Education Experiences from Finland," *Acta Didactica Norge* 6, no.1 (2012): 1-17.

[27] Hökkä and Eteläpelto, "Seeking," 39-52.

[28] European Commission, "Improving the Quality," 2-16.

the policy steps developed for increasing teacher qualifications, it is clearly stated that teachers should conduct classroom-based research, include classroom and academic research results in their teaching, and evaluate their effectiveness. In summary, the principles and steps written on the basis of the experiences of teachers and teacher educators across Europe, and endorsed by stakeholders, reveal the importance of having research competencies for improving the quality of teacher education in the European Union. This requirement can be fulfilled by a teacher education that helps teachers to be innovative and enquiring and that makes continuous learning and change possible.[29,30] It is accepted that the research-based teacher education approach has great potential for fulfilling the abovementioned requirements.[31]

When teachers are educated to be autonomous actors with rational theoretical-based decision-making and skills in producing and using research, they may overcome the difficulties of the future.[32] Undoubtedly, it is possible to see very different models in teacher education.[33] In this context, the classification[34] of teacher education based on behavioral, personal, traditional craft, and research-oriented paradigms can be examined. Research-based teacher education is equivalent to the research-oriented paradigm preparing teachers to analyze their actions and the resulting consequences. Additionally, this model abides by the technology-oriented teacher education derived from Feiman-Nemser's scientific study of knowledge teaching[35] and Moore's[36] definition of a teacher being a reflective practitioner. In this approach, prospective teachers are not passive recipients of professional knowledge

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[29] Niels Brouwer and Fred Korthagen, "Can Teacher Education Make a Difference?" *American Educational Research Journal* 42, no. 1 (January 2005): 153-224, https://doi.org/10.3102/00028312042001153.

[30] Linda Darling-Hammond and John Bransford, *Preparing Teacher for Changing World. What Teachers Should Learn and Be Able to Do* (San Francisco: Jossey Bass, 2005), 1-39.

[31] Auli Toom, Heikki Kynäslahti, Leena Krokfors, Riitta Jyrhämä, Reijo Byman, Katariina Stenberg, Katriina Maaranen, and Pertti Kansanen, "Experiences of a Research-based Approach to Teacher Education: Suggestions for Future Policies," *European Journal of Education* 45, no. 2 (May 2010): 331-344, https://doi.org/10.1111/j.1465-3435.2010.01432.x.

[32] Toom at al., "Experiences," 331-344.

[33] Yasemin T. Cakcak, "A Critical Review of Teacher Education Models," *International Journal of Educational Policies* 10, no. 2 (Winter 2016): 121- 137.

[34] Kenneth M. Zeichner, "Alternative Paradigms of Teacher Education," *Journal of Teacher Education* 34, no. 3 (May 1983): 3-9, https://doi.org/10.1177/002248718303400302.

[35] "Teacher Presentation: Structural and Conceptual Alternatives," Teacher Presentation: Structural and Conceptual Alternatives, Google, accessed March 17, 2021, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.463.5326&rep=rep1&type=pdf.

[36] Alex Moore, *The Good Teacher: Dominant Discourses in Teaching and Teacher Education* (London: Routledge Falmer, 2004), 3-26.

produced by educational scientists; they are seen as autonomous actors actively participating in knowledge production.[37]

There is a growing interest in research-based education in teacher education policy and practice in Europe and internationally.[38,39] Here, the aim is not to cultivate researchers or even teacher-researchers. The purpose is that pre-service teachers mainly acquire a questioning attitude to teaching.[40] Thus, teachers will be able to observe, analyze and develop studies. Pedagogical thinking of teachers means they can conceptualize daily phenomena, see them as part of an overall teaching process, and have the ability to rationalize decisions and actions taken during this process. Pre-service teachers receiving this education may display argumentation, decision-making, and analytical skills[41] during studies and acquire research skills.[42] These skills have great importance for teachers who need to act in the context of continuously changing education.

Research-based teacher education aims to cultivate autonomous, responsible, and reflective professional teachers who can base their teaching on research principles and can successfully use these principles to deal with the practical difficulties of the profession.[43,44] Research-based teacher education supports both individual and collective development. At a personal level, this means developing skills for analysis, in other words, problem solving and restructuring of solutions, and development of critical awareness and skills encouraging intellectual and personal growth. At the collective level, this

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[37] Mikko Puustinen, Janni Säntti, Anna Koski, and Tuure Tammi, "Teaching: A Practical or Research-based Profession? Teacher Candidates' Approaches to Research-Based Teacher Education," *Teaching and Teacher Education* 74, (August 2018): 170-179, https://doi.org/10.1016/j.tate.2018.05.004.

[38] Ulrika Bergmark, "Teachers' Professional Learning when Building a Research-based Education: Context-specific, Collaborative and Teacher-driven Professional Development," *Professional Development in Education* (Latest Article), https://doi.org/10.1080/19415257.2020.1827011.

[39] Ulrika Bergmark, and Kristina Hansson, "How Teachers and Principals Enact the Policy of Building Education in Sweden on a Scientific Foundation and Proven Experience: Challenges and Opportunities," *Scandinavian Journal of Educational Research* 65, no.3 (April 2021): 448, https://doi.org/10.1080/00313831.2020.1713883.

[40] Mireia Giralt-Romeu, Eva Liesa, and Montserrat Castelló, "Teacher Identity as Inquirer: Voices of Teacher Educators," *European Journal of Teacher Education* (Latest Article), https://doi.org/10.1080/02619768.2021.2015319.

[41] Kirsti M. Jegstad, Tove A. Fiskum, Jessica Aspfors, and Gunilla Eklund, "Dichotomous and Multifaceted: Teacher Educators' Understanding of Professional Knowledge in Research-based Teacher Education," *Scandinavian Journal of Educational Research* 66, no.6 (October 2022): 1010, https://doi.org/10.1080/00313831.2021.1958255.

[42] Toom, "Experiences," 331-344.

[43] Krokfors vd., "Investigating," 1-13.

[44] Tirri, "The Last," 600-609.

target means the activation of systematic thinking skills, using a professional language, and revealing the transformative potential of collaborative thinking.[45] Another target of research-based teacher education is to support teachers in professional development throughout their careers.[46,47,48]

Research-based teacher education encourages the development of the critical thinking skills of candidates and systematic investigation of daily professional work.[49,50,51] Thesis preparation activities, which are part of research-based teacher education, help students become familiar with scientific thinking processes.[52,53] For this reason, this approach focuses on alternative ways of carrying out advanced research-oriented activities that include both research-based concepts and teachers' professional practice. Suppose it is necessary to summarize the targets of research-based teacher education. In that case, firstly, the aim is to train reflective and autonomous teachers qualified to act like practicing researchers and think pedagogically. However, the purpose of research-based teacher education is not only to facilitate searchers but also to enable the knowledge and skills to be able to apply what they have learned to students, to observe students, to analyze their thoughts, and hence to become 're'searchers.[54,55]

With the Decree on the Organization of Higher Education Institutions number 41, dated 20 July 1982 in Turkey, all higher education institutions

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[45] Sven-Erik Hansén, Gunilla Eklund, and Jan Sjöberg, "General Didactics in Finish Teacher Education-the Case of Class Teacher Education at Åbo Akademi University," *Nordisk Tidskrift för Allmän Didaktik* 1, no. 1 (October 2015): 7-20.

[46] Jessica, Aspfors, Sven-Erik Hansen, and Johanne Ray, "Stability, Structure and Development. Features Constituting Finnish Teacher Education," *Scuola Democratica* 4, no. 3 (September/December 2013): 1-11. https://doi.org/10.12828/75800.

[47] Niemi, "Educating," 43-66.

[48] Niemi, and Jakku-Sihvonen, "In the Front of the Bologna," 50-69.

[49] Hilde W. Afdal, "Knowledge in Teacher Education Curricula Examining Differences Between a Research-Based Program and a General Professional Program," *Nordic Studies in Education* 32, no. 03-04 (Autumn 2012): 245-261.

[50] Hansén, "General," 7-20.

[51] Pertti Kansanen, "Teaching," in *Workplace Learning in Teacher Education. Professional Learning and Development in Schools, and Higher Education,* eds. Olwen McNamara, Jean Murray, and Marion Jones (New York: Springer, 2014), 279-292, https://doi.org/10.1007/978-94-007-7826-9_16.

[52] Hansén, "General," 7-20.

[53] Hansén, Eklund, and Sjöberg, "General Didactics, "7-20.

[54] Toom et al., "Experiences," 331-344.

[55] Ian Westbury, Sven-Erik Hansén, Pertti Kansanen, and Ole Björkvist, "Teacher Education for Research-based Practice in Expanded Roles: Finland's Experience," *Scandinavian Journal of Educational Research* 49, no. 5 (November 2005): 475-485. https://doi.org/10.1080/00313830500267937.

training teachers were handed over to universities.[56] The task of educating teachers gained a new structure and status. This date is accepted as the first step toward a research-based teacher education approach in Turkey. From 2007 to the present day (April 2022), scientific research methods courses have been compulsory in education faculties. In the preschool teaching program, the scientific research methods and research project courses are included in two semesters. Undoubtedly, as much as the structural organization of teacher education programs, a determining element for the success of the programs is how the implementation process is performed. This research aims to present an investigation of views expressed by pre-service teachers based on their experiences, about the potential of the scientific research methods course in the framework of research-based teacher education.

Pre-service teachers participating in this research took a scientific research methods course structured by noting the critical principles of the research-based teacher education approach, which are explained below. The aims of this course in research-based teacher education were designed based on the following features: the activities are organized in such a way that students can practice discussion, decision making and making justifications while researching and solving pedagogical problems; students learn search skills during studies; the program knowledge base is dynamic; and pre-service teachers are active processors of this knowledge.[57,58] During the lesson, pre-service teachers are requested to perform decision making, rationalizing, and argumentation while searching and resolving problems with cases and articles.[59] The program investigated in detail within the research context cannot include all dimensions of the research-based teacher education program within a two-hour theoretical lesson. However, it is vital as it has the feature of being a teaching implementation developed by noting the principles with critical importance for research-based teacher education within the scope of a theoretical lesson.

In this study, it is intended to investigate in depth how pre-service teachers who have experienced a scientific research methods course, designed by considering the critical principles of research-based teacher education, made sense of this experience. In this way, it will be possible to investigate the potential of this research methods course for the development of pre-service teachers. The research also investigates pre-service teachers' interpretations about the reasons for teachers to have research competency and the professional

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[56] "Official Gazette," Higher Education Institutions Training Teachers Were Handed Over to Universities, Google, accessed March 1, 2022, https://www.resmigazete.gov.tr/arsiv/17760.pdf.

[57] Krokfors, "Investigating," 1-13.

[58] Zeichner, "Alternative," 3-9.

[59] Toom, "Experiences," 331-344.

function of scientific studies from various angles. Undoubtedly, these views provide the opportunity to make inferences about the proximity of the pre-service teachers to being teachers who think pedagogically, and who are reflective and research oriented. This description is valuable in reflecting the views of a group experiencing a scientific research methods course developed on the basis of the critical principles of the research-based teacher education approach. In this context, answers to the following questions were sought: What are the views of pre-service teachers about:

- the outcomes provided by the research methods course.
- the reasons for teachers to have research competency?
- the professional function of scientific studies?

When the relevant literature is examined based on the research context, design-based longitudinal studies on research-based teacher education[60] are seen. In addition, studies examining the research-based teacher education approach from the perspectives of teacher candidates, teachers, mentor teachers, and teacher educators[61,62,63,64,65,66,67,68,69] are available. No research

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[60] Hilde W. Afdal, and Kari Spernes, "Designing and Redesigning Research-based Teacher Education," *Teaching and Teacher Education* 74, no. 1, (August 2018): 215-228, https://doi.org/10.1016/j.tate.2018.05.011.

[61] Daniel Alvunger, and Ninni Wahlström, "Research-based Teacher Education? Exploring the Meaning Potentials of Swedish Teacher Education," *Teachers and Teaching* 24, no. 4 (May 2018): 332-349, https://doi.org/10.1080/13540602.2017.1403315.

[62] Aspfors, Eklund, and Hansén, "Early Career," 1-18.

[63] Jessica Aspfors, and Gunilla Eklund, "Explicit and Implicit Perspectives on Research-based Teacher Education: Newly Qualified Teachers' Experiences in Finland," *Journal of Education for Teaching* 43, no. 4 (March 2017): 400-413, https://doi.org/10.1080/02607476.2017.1297042.

[64] Angela Brew, and Constanze Saunders, "Making Sense of Research-based Learning in Teacher Education," *Teaching and Teacher Education* 87, no: 2020 (January 2020): 1-11, https://doi.org/10.1016/j.tate.2019.102935.

[65] Gunilla Eklund, "Student Teachers' Experiences of Research-based Teacher Education and Its Relationship to Their Future Profession A Finnish Case," *Nordisk Tidskrift för Allmän Didaktik* 4, no. 1 (April 2018): 3-17.

[66] Rachel Jakhelln, Gunilla Eklund, Jessica Aspfors, Kristin Bjørndal, and Gerd Stølen, "Newly Qualified Teachers' Understandings of Research-based Teacher Education Practices-Two Cases from Finland and Norway," *Scandinavian Journal of Educational Research* 65, no. 1 (February 2021): 123-139, https://doi.org/10.1080/00313831.2019.1659402.

[67] Katarina Pajchel, Marie K. Jegstad, Gunilla Eklund, Siv G. Aalbergsjø, and PerØyvind Sollid, "The Role of School Placement Within Research-based Teacher Education through The Eyes of Science Mentors," *Teachers and Teaching* 27, no.1-4 (May 2021): 193-205, https://doi.org/10.1080/13540602.2021.1933416.

[68] Puustinen, Säntti, Koski, and Tammi, "Teaching," 170-179.

[69] Jegstad, Fiskum, Aspfors, and Eklund, "Dichotomous," 1-15.

has been found on research-based teacher education in Turkey, while it is seen that some research has been carried out on the scientific research methods course. In this scope, it appears that the views of pre-service teachers about scientific research processes,[70,71] attitudes to scientific research[72,73,74,75] and the correlation of attitudes to a variety of variables[76] were investigated, and that some experimental research[77] was performed. In the relevant literature, no other study has been found in which a scientific research course applied on the basis of a research-based understanding is discussed in terms of teacher qualifications. From this aspect, it is thought this study will contribute to the literature.

II. Methodology

II.1. Research design

The basic research method, which is included in the qualitative research models, was used in the study. The basic research method seeks to answer

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[70] Adnan Küçükoğlu, Adnan Taşgın, and Nilay Çelik, "An Investigation of Prospective Teachers' Perceptions toward Scientific Research Process," *Turkish Journal of Social Research* 17, no. 3 (March 2013): 11-24.

[71] Sümeyra Z. Et, and Mehmet N. Gömleksiz, "Graduate Students' Opinions on the Scientific Research," *Gaziantep University Journal of Educational Sciences* 6 (April 2022), 59-82.

[72] Zafer Çakmak, Cengiz Taşkıran, and Birol Bulut, "Examining Attitudes of Social Studies Pre-Service Teachers towards Scientific Research," *Adiyaman University Journal of Educational Sciences* 5, no. 2 (December 2015): 266-287, http://dx.doi.org/10.17984/adyuebd.02575.

[73] Aziz İlhan, Halil Çelik, and Alper Aslan, "Evaluating the Attitudes of University Students About Scientific Research," *Journal of Inonu University Faculty of Education* 17, no.2 (May 2016): 141-156, https://doi.org/10.17679/iuefd.17218132.

[74] Murat Polat, "Students' Attitudes towards Scientific Research in the Faculty of Education," *Pamukkale University Journal of Social Sciences Institute* 18, (May 2014): 77-90.

[75] Sevilay Karamustafaoğlu, and Bahri Meşeci, "Investigation of Attitude of Education Faculty Students Towards the Scientific Research Methods Course," *Anatolian Journal of Teacher* 5, no.1 (June 2021), 19-38, https://doi.org/10.35346/aod.917301.

[76] Mehmet A. Dombaycı, and Orhan Ercan, "Examining the Scientific Literacy Levels and Attitudes Towards Scientific Research of the Teacher Candidates' In Terms of Various Variables," *Abant İzzet Baysal University Journal of the Faculty of Education* 17, no. 3, (September 2017): 1265-1284, https://doi.org/10.17240/aibuefd.2017.17.31178-338822.

[77] Nazım Çoğaltay, "The Effect of the Methods of Scientific Research Course on Preservice Teachers' Scientific Epistemological Beliefs and Attitudes towards Scientific Researchers," *Journal of Social Sciences of Muş Alparslan University* 4, no. 2 (December 2016): 125-139, https://doi.org/10.18506/anemon.258557.

'what' and 'how' questions. The purpose of basic research is to understand, explain and search for basic patterns related to the research phenomenon.[78] Researchers applying the basic research method are interested in how people interpret their lives, how they build their worlds, and what meaning they give to their experiences. It seeks to understand how people grasp their lives and experiences. The main aim of basic research is to ascertain and interpret these meanings.[79] In this study, it is emphasized how pre-service teachers interpret the outcomes provided by the scientific research methods course, how they perceive the reasons for teachers to have research competency, and how they comprehend the professional functions of scientific studies. To that end, in order to understand and explain the views of teacher candidates in general within the scope of research competencies, the basic research method was adopted in this study. The views of the pre-service teachers focusing on the three themes reflected by the research problems were analyzed according to the principles of qualitative data analysis, and the analysis findings were summarized using descriptive statistics.

II.2. *Sample and data collection*

To determine the views of pre-service teachers, which were targeted for investigation within the scope of the research, an interview form comprising open-ended questions was developed by the researcher. This document included sections equivalent to the three problems in the study. For each research problem, two different questions were designed. In the process of developing the data collection tool, the opinions of three expert academicians in the fields of curriculum development, classroom teaching and preschool teaching were sought. The interviews with the specialists were made face-to-face. Based on the opinions of the experts, revisions were made on the basis of language and intelligibility requirements so that the expressions in the data collection tool could be understood by everyone in the same way. Moreover, expressions in the questions that were determined to be repetitive and to possibly cause overlap were removed. Finally, the compatibility of the questions in the data collection tool with the research problems was examined. In this context, the questions were examined one by one. After obtaining the endorsement of the experts, the draft form was finalized prior to the trial

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[78] Michael Quinn Patton, *Qualitative Research and Evaluation Methods,* trans. Mesut Bütün, and Selçuk B. Demir (Ankara: Pegem, 2018), 215.

[79] Sharan B. Merriam, and Elizabeth J. Tisdell, *Qualitative Research: A Guide to Design and Implementation* (San Francisco: Jossey Bass, 2015), 23-25.

implementation. Then the form was trialed with seven pre-service teachers. Data obtained from the trial implementation were analyzed and investigated to determine whether the targeted information was procured or not. As a result of the investigations, revisions were made where necessary, and the tool was given its final form.

The research was completed with pre-service teachers attending a state university in Turkey. The university where the research was carried out is not a research university. However, bachelor's, postgraduate, doctorate and non-thesis master's programs are active in the primary education department where the research was conducted. Faculty members in the department work collaboratively on innovative practices in teacher education and conduct joint academic research and projects within this scope. Criterion sampling was chosen from the targeted sampling methods when creating the study group. The first criterion in this research was attending the basic education department. In this way, the target was to investigate possibilities in a broad framework without creating a discipline-based advantage or disadvantage for research teaching. The second criterion was taking the scientific research methods course. Pre-service teachers who attended the research education course designed on the basis of the research-based teacher education approach for 14 weeks participated in the research. The study group of the research comprised 110 pre-service teachers attending the basic education department in the education faculty of a state university. Information related to the characteristics of the study group is shown in Table 1.

Table 1

Characteristics of the study group

	Elementary Education Department	Preschool Education Department
Women	46	34
Men	25	5
Total	71	39

II.3. Analysis of data

Bernard[80] (2006) briefly defines analysis as examination of the patterns in the data and the ideas that will help to investigate the reasons why these

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[80] Bernard H. Russel, *Research Methods in Anthropology. Qualitative and Quantitative Approaches* (Oxford: Altamira Press, 2006), 452-453.

patterns exist in the data. Creswell[81] (2013) defined the steps of this process as collection, breakdown, and coding of the data, and finding subcategories, categories and themes from the codes. In this research, qualitative content analysis was used as the data analysis method,[82] and an intensive analysis process consisting of four stages was followed. After the analysis process, which is explained in detail below, was completed by the researcher, the data and findings for the analysis were shared with a domain expert. The expert was asked to examine and evaluate all codes, subcategories, categories and themes related to the analysis. In addition, the expert was requested to correct the erroneous parts by providing explanations and to carry out the analysis process that was deemed appropriate. The items of feedback received from the expert were examined one-by-one, and the corrections made were accepted. Based on the feedback from the expert, the names of four subcategories were changed, and two subcategories were combined with other related subcategories in the same category. The inter-coder agreement was calculated as .91 according to the Miles and Huberman formula.

II.3.1. First stage: Open coding

In this process, coding is performed on the data set. The coding process is generally expressed as the process of separating the text into meaningful parts and labeling it[83]. When codes are repeatedly applied to qualitative data, coding is made. Coding enables the researcher to organize similarly coded data and group them around certain categories due to some common characteristics. In the open coding stage, the entire data set was read line by line. In this process, the data were divided into single or multiple sentences that reflected the views of the pre-service teachers. Following this process, 684 expressions reflecting opinions were determined from the data set. In the coding process, each expression was coded using in vivo coding. In vivo codes are codes created using actual words expressed by the interviewees[84]. Choosing the code names from among the pre-service teachers' expressions prevented possible errors that may originate from the researcher in the coding process. In this way, the influence of the researcher was reduced to a

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[81] John W. Creswell, *Qualitative Inquiry Research Design Choosing Among Five Approaches* (Thousand Oaks, CA: Sage Publications, 2013), 179-188.

[82] Margrit Schreier, "Qualitative Content Analysis," in *The SAGE Handbook of Qualitative Data Analysis*, ed. Uwe Flick (London: SAGE, 2014), 171–183.

[83] Creswell, *Qualitative Inquiry,* 179-188.

[84] Anselm Strauss, *Qualitative Analysis for Social Scientists* (Cambridge: Cambridge University Press, 1987), 87.

minimum[85]. All analysis in the research was carried out on these codes. Following this process, a total of 684 statements expressing views, of which 310 were those of preschool teachers and 374 belonged to classroom teachers, were labeled using in vivo coding.

II.3.2. Second stage: Classification of the dataset based on categories

The process performed at this stage is axial coding. The purpose of this coding is to strategically reassemble data that were split or fragmented during the open coding process[86]. The axis of axial coding is the categories recognized in the first-cycle coding. These categories are linked with subcategories in the next-stage analyses[87]. Compared to open coding, axial coding involves a higher degree of theoretical inference and analytic induction[88]. At this stage, the question "What subject is this statement related to?" was posed about the statements expressing opinions that were coded in the first stage. In this process, the statements were read again and again and classified on the basis of the issues that were considered to be relevant. Expressions coded in this way were classified on the category axis. Furthermore, the features of the three categories found were clearly separated, so that the axes, to which the subcategories found in the next stages would be connected, were clarified.

Table 2

The appearance of codes after the second stage of the analysis

	Views about the outcomes provided by research education	Views about the reasons for teachers to have research competencies	Views about the professional function of scientific studies
Preschool Education Dept.	135	130	45
Elementary Education Dept.	165	168	41
Total	300	298	86

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[85] Jimmie Manning, "In Vivo Coding," in *The International Encyclopedia of Communication Research Methods*, ed. Jörg Matthes (New York: Wiley-Blackwell, 2017), 1-2.

[86] Anselm Strauss and Juliet Corbin, *Basics of Qualitative Research Techniques and Procedures for Developing Grounded Theory* (Thousand Oaks, CA: Sage Publications, 1998), 124.

[87] Kathy Charmaz, *Constructing Grounded Theory* (London: Sage Publications, 2014), 148.

[88] Scott Cliff and Melissa Medaugh, "Axial Coding," in *The International Encyclopedia of Communication Research Methods*, ed. Jörg Matthes (New York: Wiley-Blackwell, 2017), 10.

II.3.3. Third stage: Classification of subcategories within categories

In this stage, opinion statements classified on the basis of topics were categorized based on the reflected perspective. In this stage, using the continuous comparative analysis method,[89] data coded in the same category were defined compared to other data. Saldana[90] considers this stage to be a synthesis and states that it is a process of discovery that will lead to unified meaning in the data. Analysis in this stage continued until there was no change in the subcategories. Opinion statements were classified in clusters named using letters without giving any names based on the candidates' perspectives in this analysis stage. Groups were continuously compared with each other, maintaining the necessary combination and separation processes. After repeated reading, naming processes were not completed until a class was proven to be complete. After completing the classification process, the classification clusters were named using the word or group of words thought to include the scope in the best way. After this analysis, the first category had 25 subcategories, while the second and third categories had five each.

II.3.4. Fourth stage: Accessing themes from categories

In the fourth stage of the analysis, categories representing pre-service teacher candidates' views were combined in themes. This process involved accessing themes in order to explain the data more clearly and in a more integrated way, and thereby, to make the analyses more meaningful. As the themes of the first sub-problem of the research, the themes used by Aspfors and Eklund[91] (2017) to categorize the views on research-based teacher education expressed by pre-service teachers in Finland who had just completed their postgraduate education were used. The reasons for this were that both studies mainly examine which outcomes are provided to pre-service teachers by the research-based teacher education approach on the basis of their views. Furthermore, the parallels in the method adopted in the research, the study group, the characteristics of the research data and the data analysis processes had an effect on this decision. The thematic research system with common aims was appropriate for the thematic classification of subcategories and categories accessed in the study. The researcher created the themes for the other two categories.

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[89] Berney G. Glaser, "The Constant Comparative Method of Qualitative Analysis," *Oxford Journals* 12, no. 4 (Spring 1965): 436-445, https://doi.org/10.2307/798843.

[90] Johny Saldana, *The Coding Manual for Qualitative Researchers* (Thousand Oaks, California: Sage Publications, 2019), 10.

[91] Aspfors, and Eklund, "Explicit," 400-413.

Table 3

The appearance of codes after the fourth stage of the analysis

Views about the outcomes provided by research education			Views about the for teachers to have research competencies			Views about the professional function of scientific studies		
	PS*	C**		PS	C		PS	C
Research competence	64	92	Requirement for contemporary teaching	54	75	They have a function	39	37
Professional Competence	57	64				They do not have a function	6	4
Personal Competence	14	9	Requirement for the nature of the class	71	85			
			Requirement for qualified teaching	5	8			
Total	135	165		130	168		45	41

* PS. Preschool teacher candidates.
** C. Classroom teacher candidates.

II.4. *Research context*

The pre-service teachers included in the study group of this research fulfilled the requirements of a 14-week teaching program in the scientific research methods course. Within the scope of the curriculum, the pre-service teachers saw all the theoretical content of scientific research methods. In addition to this, they examined seven cases specialized on the basis of classroom teaching and preschool teaching throughout the course. Each of the cases seen in Table 4 consists of problem areas that fall within the scope of their own fields and are specialized in educational research. Case studies consist of a case sample and open-ended questions directed to analyze the case. Each examined case was arranged in a way that would allow the pre-service teachers to practice discussion, decision making and justification while researching and solving pedagogical problems on the basis of questions.[92] The questions included in each case were designed in such a way as to lead the pre-service teachers to design a research proposal. The pre-service teachers analyzed the cases every two weeks, and by putting their analyses into report form, sent them by e-mail to the lecturer who conducted

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[92] Toom et al., "Experiences," 331-344.

the course. Another study carried out by the pre-service teachers within the scope of the curriculum was to analyze at least three articles each week.

In this way, the pre-service teachers examined at least 6 articles based on the analysis form given to them within the scope of the subject of the case they examined. The inquiry-based approach is based on the idea that the knowledge base of the study program is dynamic and that the prospective teacher is an active processor of this knowledge.[93] Based on this, the pre-service teachers experienced an active operational process with the dynamic content of the cases and articles they examined. The articles that the pre-service teachers were to read were sent to the candidates by e-mail each week by the faculty member. The case, case questions and article review questions used within the scope of the program were developed by two experts in program development in education, one of whom was the researcher herself. In addition to the theoretical courses, group discussions on the cases and the reviewed articles were held every two weeks. During the semester, the pre-service teachers developed 7 case-based research proposals and analyzed 42 articles. In this respect, it can be said that the pre-service teachers who participated in the study had a common experience guided by the expert regarding the cases examined within the scope of the study. The faculty member responsible for the course is a specialist in program development in education and has taken courses on teacher education programs during doctoral education and has teaching experience in scientific research methods and research project courses at undergraduate and postgraduate levels.

Table 4

Case topics investigated within the scope of the teaching program

Case topics for elementary education	Case topics for preschool education
Reading comprehension	Class management
Misconceptions	Special teaching methods
Emotional factors in learning	Individual differences
Professional development	Family participation
Class management	Adjustment to school
Learning responsibility	Problematic behavior
Peer bullying	Peer bullying

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[93] Zeichner, "Alternative,"3-9.

II.5. *Compliance with ethical conventions*

Ethics committee approval was obtained for this research from the Social and Human Sciences Research Ethics Committee of Ordu University, where the research was conducted (dated 15.09.2021 and numbered 2021-125). The British Educational Research Association Ethical Guidelines for Educational Research (2018) principles were taken into account in the study. In the research, the principles of consent and information, review of possible harm, protection of confidentiality, and the impact of the results on society were taken into consideration. During the data collection process, the participants were informed about the purpose of the study, why their participation was necessary, what they were asked to do, what would happen to the information they provided, how this information would be used, how and to whom it would be reported, and how they could access the research results. The participants were encouraged to express their reservations on these issues clearly, and their questions were answered. Data were collected on the day and time that each participant stated was appropriate. It was stated that participation in the study was voluntary and that participants had the right to withdraw from the study at any time. It was also stated that the identity information of the participants would be kept completely confidential, and that the data obtained would be kept in the encrypted computer of the researcher. All kinds of information that could lead to the identification of the participants were removed, and code names were used instead of their real names. While quoting the interview recordings, information that could reveal the identities of the participants was avoided. All the possible effects of the research results, and how the research results should be handled in order to be beneficial were mentioned, and suggestions were made for researchers and relevant stakeholders.

II.6. *Validity and reliability of the study*

Establishing validity and reliability of a qualitative research study requires the fulfilment of credibility, transferability, consistency, and verifiability thresholds.[94] To ensure credibility in qualitative research, the number and characteristics of the participants, how they were selected, the data collection tools, and analysis techniques used in the study should be explained in detail.[95] This information is described in detail under the method heading of the research. It is recommended to use detailed description and sample selection

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[94] Merriam and Tisdell, *Qualitative Research,* 238-266.

[95] John W. Creswell, and Miller L. Dana, "Determining Validity in Qualitative Inquiry," *Theory into Practice* 39, no:3 (June 2000): 124-130, https://doi.org/10.1207/s15430421tip3903_2.

strategies to fulfil the transferability requirement of the study.[96] The criterion sampling method was used in the study. In this way, a group was selected from which the richest data could be obtained to answer the research questions. Regarding detailed description, direct quotations in each subcategory are presented in the findings section. All research analyses were performed on in vivo codes. In this way, the statements of the participants directly constitute the most basic unit of the analysis. Long-term interaction, expert review, and participant validation strategies are recommended to increase credibility in qualitative research.[97] In the study, the opinions of three experts were obtained during the development of the data collection tool. After the analysis was completed, for inter-coder reliability, the data and findings of the analysis were shared with a domain expert. The expert was asked to examine and evaluate all codes, subcategories, categories, and themes of the analysis. In addition, the expert was requested to correct the incorrect parts by providing explanations and to perform the analysis that was deemed appropriate. After the feedback from the expert, the inter-coder agreement was calculated as .91 according to Miles and Huberman's formula.[98] After the feedback received from the expert, the names of four subcategories were changed, and two subcategories were combined with other relevant subcategories in the same category.

This research has a range of limitations. The first limitation is that the data in the study only refer to the views of pre-service teachers. Within the scope of the study, pre-service teachers were not observed in real class practice or in environments where research competency could be applied. Another limitation of the research is that the two hours of theoretical lessons in the scientific research methods course completed by pre-service teachers were based on the principles explaining research-based teacher education. A further limitation of the research is that the findings were limited to the views of pre-service teachers in a state university.

III. Findings

III.1. *Findings related to the first problem of the research*

The first problem of the research sought answers to the question about the views of pre-service teachers related to the outcomes provided by the

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[96] Merriam and Tisdell, *Qualitative Research*, 238-266.
[97] Merriam and Tisdell, *Qualitative Research*, 238-266.
[98] Mathew B. Miles and Michael A. Huberman, *Qualitative Data Analysis* (Thousand Oaks, California: Sage Publications), 64.

scientific research methods course. The findings regarding this problem can be seen in Table 5.

Table 5
Views about the outcomes provided by the scientific research methods course

	f	%
Research Competence		
Scientific thinking and understanding	59	37.8
Research competence	97	62.2
Professional Competence		
Professional thinking and understanding	90	74.4
Research-related teaching	5	4.1
Pedagogical theories and knowledge	26	21.5
Personal Development		
Maturity and self-knowledge	8	34.8
Self-discipline and confidence	11	47.8
Interpersonal ability	4	17.4

The views of the pre-service teachers about the outcomes provided by the scientific research methods course were classified into three themes and eight categories. The ideas of the pre-service teachers about the outcomes from the scientific research methods course were organized as research competence, professional competence, and personal development.

The research competence theme was classified in the categories of scientific thinking and understanding, and research competence. The research competence theme was examined, as seen in Table 6.

Table 6
Views about the research competence outcomes
of the scientific research methods course

Scientific thinking and understanding	f	%
STU.1. A multidimensional approach to problems	20	33.9
STU.2. An investigative approach to professional problems	16	27.1
STU.3. Awareness of scientific steps required for the solution of problems	15	25.5
STU.4. Understanding of the guiding power of scientific resources when faced with problems	8	13.5

Research competence		
RC.1. Development of scientific thinking processes	19	19.6
RC.2. Ability to access scientific resources	17	17.6
RC.3. Ability to analyze articles	10	10.3
RC.4. Structuring of the scientific research process	43	44.3
RC.5. Following scientific procedures in theoretical knowledge	8	8.2

The category of scientific thinking and understanding refers to the improving effect of the research methods course in the approach to professional problems, events and knowledge. The research competence category represents the development of skills used directly in scientific thinking and research processes. Direct quotations of pre-service teachers about the subcategories investigated within the scope of research competence are shown in Table 7.

Table 7

Direct quotations about the research competence outcomes
of the research methods course

STU	Scientific thinking and understanding
STU.1.	*Due to the cases we investigated and articles we read in the scientific research lessons, I developed the ability to look at events from multiple dimensions. I noticed that there might be not just one but several solution routes when faced with a problem.*
STU.2.	*I began to look at the behavior of children and teachers in depth. I began to ask investigative questions, such as "What are the effects of a child's behavior on the class when faced with situations?"; "What are the results of the teacher's behavior on students?"*
STU.3.	*I learned coping methods for problems I will face in my professional life. Rather than hearsay or preaching, I will consult science as a teacher suitable for the characteristics of the age. I will investigate articles. I will try to solve problems I encounter using scientific solution methods.*
STU.4.	*I realized the importance for my profession of using scientific resources as guides when faced with problems in my domain.*
RC	Research competence
RC.1.	*I can think analytically when faced with problems, and I feel I have an integrated approach to events.*
RC.2.	*As I read so many articles, it became easier to understand them. When I need it, I know where I can access that information.*

RC	Research competence
RC.3.	*Firstly, I learned to read and analyze the articles. In this way, I know how to benefit from information and articles in the field when I need them.*
RC.4.	*I learned which routes I will use when I need to perform any research when I begin my profession; I know what processes I need to perform with scientific tools for problems I face.*
RC.5.	*Now, I can understand that the theoretical knowledge we see in education science is a product of scientific research and what process produced it.*

Another theme about the outcomes from the research methods course was professional development. When the professional development theme is examined, this competence was classified into the categories of professional thinking and understanding, research-related teaching, and pedagogical knowledge and teaching, as seen in Table 8. The professional thinking and understanding category included views on the teaching profession identity, general practice and management, problem fields, and professional development. In the research-related teaching category, students' views about the development of research competence outcomes were included. Finally, the pedagogical knowledge and teaching category included views about learning and development during the teaching process

Table 8

Views about the professional competence outcomes
of the research methods course

	f	%
Professional thinking and understanding		
PTU.1. I gained a professional identity	6	6.6
PTU.2. I conceptualized problem areas in teaching	38	42.2
PTU.3. I understood that being a teacher is not just about teaching	21	23.2
PTU.4. I noticed that science is the backbone of professional development	13	14.4
PTU.5. I see the intertwining of teaching with science	12	13.6
Research-Related Teaching		
RT.1. Performing interrogation-based teaching	2	40
RT.2. Being a role model	3	60

	f	%
Pedagogical Knowledge and Teaching		
PKT.1. I can notice individual differences in teaching	3	11.5
PKT.2. I can access teaching methods with proven efficacy	19	73.1
PKT.3. I clarified the topic of class needs	4	15.4

Citations from pre-service teachers related to the subcategories investigated within the scope of professional competence can be seen in Table 9.

Table 9

Direct quotations about the professional competence outcomes
of the research methods course

	Professional thinking and understanding
PTU.1.	*This course provided a more professional identity.*
PTU.2.	*The articles I read within the scope of this course ensured that I had more information about problems in class. It provided information about what problems I will encounter in my professional life and their solutions.*
PTU.3.	*I saw that teaching is not just about teaching things but is also about producing new information by observation. Instead of ignoring a problem, I learned the need to investigate the causes and find solutions. At the same time, I understood that this information should be shared and that these resources should be used.*
PTU.4.	*There are many lessons to be inferred from the cases we investigated in class and the articles we read. The most significant contribution is that I understood how necessary scientific processes and publications are for professional development. I look to the future with hope.*
PTU.5.	*The guiding statements of our teachers and the findings in the articles we read expanded my perspective about teaching. I believed that the teaching profession could only achieve success with love. However, now I think the first and most vital step is to develop continuously, and I learned the scientific basis of being open to learning.*
	Research-related teaching
RT.1.	*Researcher teachers will ensure learning by interrogating and questioning students. Teachers without this type of equipment will provide rote-based education.*
RT.2.	*Teachers are responsible for young generations' acquisition of research, investigation, problem-solving, and critical thinking skills, but we need to have these skills ourselves first. These teachers are teachers with scientific attitudes and behavior.*

	Pedagogical knowledge and teaching
PKT.1.	*Due to the experience I obtained through the articles and case investigations, I can develop appropriate solutions and methods for individual differences in class.*
PKT.2.	*I learned new strategies and practices. At the same time, I know what results are provided when these strategies and procedures are applied. I learned how to access these resources.*
PKT.3.	*I think scientific research will guide me in finding what can be good or bad for students, what can be done for their development, and how to teach effectively.*

The personal development theme was investigated in the categories of maturity and self-knowledge, self-discipline and confidence, and interpersonal ability, as seen in Table 10. The maturity and self-knowledge category includes views about the lessons of pre-service teachers reflecting themselves, awareness of their strong and weak aspects, and the outcomes of work regarding maturity. In the self-discipline and confidence category, they expressed views about acquiring self-discipline and confidence, as the requirements of the research process took them out of their comfort zone. The interpersonal ability category included views involving the development of social communication and interaction in lessons.

Table 10

Views about the personal development outcomes
of the research methods course

Personal Development Outcomes	f	%
MS.1. Maturity and Self-knowledge	8	34.8
SDC.1.Self-discipline and Confidence	11	47.8
IA.1. Interpersonal Ability	4	17.4

Quotations related to the subcategories investigated within the scope of personal development of pre-service teachers can be seen in Table 11.

Table 11

Direct quotations about the personal development outcomes
of the research methods course

		Personal Development
MS.1.	*When I came across topics I wasn't interested in, I thought, "If you only learn topics you love, you can never develop yourself. It would be best if you forced yourself for the topics you don't like so that you can develop…" That thought motivated me.*
SDC.1.	*The most outstanding contribution in terms of my development is to the thought of pushing and expanding the boundaries of the brain by researching, questioning, thinking, and continuously learning in a comfortable environment.*
IA.1.	*It ensured that I could more easily express myself academically.*

III.2. Findings related to the second problem of the research

The second problem of the research sought answers to the question about pre-service teachers' views regarding the reasons for teachers to have research competency. The findings related to this problem can be seen in Table 12.

Table 12

Views about the reasons for teachers to have research competencies

	f	%
Requirement for contemporary teaching		
NMT.1.Contemporary teaching requires scientific knowledge and pathways	109	84.5
NMT.2.Current teachers must think at higher levels	20	15.5
Requirement for the nature of the class		
RNC.1.The scientific method shows the class discovery paths	25	16
RNC.2.A class can only solve complicated problems via scientific routes	131	84
Requirement for qualified teaching		
NQT.1 Qualified teaching needs methods proven to be effective	13	100

The pre-service teachers explained that teachers' possession of research competency was a requirement for contemporary teaching, requirement for the

nature of the class, and requirement for qualified teaching. The first category included views about the necessity of being a researcher to be a qualified teacher in the present day. Another point emphasized was that the higher-order thinking skills of researcher teachers are a requirement for teaching today. In the second category, the pre-service teachers explained the need for teachers to have research competency to explore the class and the nature of cases and problems requiring solutions. In the last category, the pre-service teachers stated that they saw teachers' possession of research competence as a necessity for qualified teaching. The pre-service teachers emphasized that methods with proven effectiveness should be researched and applied in order to increase the success level of students. Direct quotations related to these categories investigated within the scope of this problem are given in Table 13.

Table 13

Direct quotations about the reasons for teachers to have research competencies

	Requirement for contemporary teaching
NMT.1.	*Researcher teachers work in a more planned and careful way. They don't act based on guesses. They use science for their decisions. They are open to innovation and change. They read continuously. They solve problems they encounter through the scientific process. They use articles and include methods with positive outcomes in class. All of these are expected from teachers with the constructivist approach.*
NMT.2.	*Researcher teachers use their minds more effectively. While they can develop solutions more rapidly, analytically, and accurately when faced with problems, other teachers may produce solutions that cause chaos. For this reason, instead of a learning-centred approach, they use routes, and so they don't lose authority.*
	Requirement for the nature of the class
RNC.1.	*Researcher teachers actually explore the class using scientific processes. They observe student behavior and ask themselves questions. Why is it this way? What is the effect and they search for answers to these questions that will benefit students.*
RNC.2.	*In scientific research processes, answers are found by working from a problem. When I'm a teacher, I may encounter many problem situations in class. I will only be able to solve all these problems through scientific process skills.*
	Requirement for qualified teaching
RQT.1.	*Teachers equipped with knowledge of the scientific research process will apply positive outcomes and create a more qualified teaching process. They will be able to achieve their aims.*

III.3. *Findings related to the third problem of the research*

The third problem of the research sought answers to the question about the views of pre-service teachers related to the professional function of scientific studies. The results related to this problem can be seen in Table 14.

Table 14
Views about the professional function of scientific studies

They have a function	f	%	They do not have a function	f	%
HF.1.Real context	30	39.7	HNF.1.Distance from being guides	10	100
HF.2.Reliable knowledge	25	32.8			
HF.3.Beyond experience	14	18.3			
HF.4.Ideal practice	7	9.2			
Total	76	100		10	100

The views of pre-service teachers about the professional function of scientific studies were classified into five categories. The views expressed by the pre-service teachers were investigated in the categories of real context, reliable knowledge, beyond experience, ideal practice, and distance from being guides. The real context category dealt with the need for data from scientific studies in the actual class and school contexts in teachers' professional lives, and they explained topics in terms of situations and events encountered every day in teaching. The reliable knowledge category included validity and reliability information about scientific studies and views about the functional role for teachers in terms of being obtained from experts. The ideal practice category included views of pre-service teachers about the efficacy of articles as guides for teachers, including proven exemplary implementations. The category of beyond experience included views about teachers being informed by scientific studies about realities that they would not be aware of in real life and the fact that teachers required them for this reason. Views in the final category were about how scientific studies were far from being guides for teachers as they were very general and did not openly state what should be done in class. Direct quotations about these categories investigated within the scope of this subproblem can be seen in Table 15.

Table 15

Direct quotations about the professional function of scientific studies

They have a function	
HF.1.	*Every topic dealt with in the articles considered behavior as it is seen in class. For this reason, when I'm a teacher, I will know a little about what the results of the style of behavior I display will be and about the internal mood of students and parents. As a result, I can say these articles put me in the field for my professional life.*
HF.2.	*The articles we read in class were prepared based on scientific data by experts. All of this knowledge is free from errors as much as possible, and is obtained by fulfilling scientific requirements.*
HF.3.	*I think I will be able to apply what I read in the articles in my class. They reflect what has been researched and actually should happen. They reflect the ideal practices in similar situations.*
HF.4.	*The articles informed me about topics that I would not have noticed if we were in class. They told us about issues that would not have come to mind.*
They do not have a function	
HNF.1.	*All of the articles we investigated were based on broad topics. Explanations were all based on scientific findings. They did not include information based on practice. As they included obscure work, I didn't understand what I need to do, or when and how to do it.*

IV. Conclusion and discussion

The research findings showed that the pre-service teachers did not consider the outcomes of research-based teacher education only within the framework of research competence. The opinions of the teacher candidates showed that they also evaluated the outcomes of this teaching process within the scope of professional competence and personal development. Studies with teacher educators, teacher candidates and mentor teachers for research-based teacher education have similarly expressed the contribution of research-based teacher education to multi-faceted development.[99,100,101]

A close examination of the research competence category reveals that this competence was not only considered within the scope of the skills used

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[99] Jegstad, Fiskum, Aspfors, and Eklund, "Dichotomous," 1-15.
[100] Aspfors, and Eklund, "Explicit," 400-413.
[101] Pajchel, Jegstad, Eklund, Aalbergsjø, and Sollid, "The Role of School," 193-205.

between the planning stage of a research process up to the reporting stage. They also discussed research competence in terms of the improvement enabled by the instruction in their approaches to professional problems, events, and knowledge accumulation. While fulfilling the requirements of the profession, a multidimensional approach to problems, an exploratory approach to professional events, the realization that the solution of professional problems requires scientific steps, and the realization of the guiding power of scientific resources in the face of problems, are among the subcategories that emerged here.

Some of the pre-service teachers' views examined under the category of professional development focused on the development of professional thinking and understanding. It can be understood from the teacher candidates' explanations that they developed an understanding of the complex nature of the teaching profession and its close connection with science. Again, in the same category, the teacher candidates stated that they were able to overcome the challenging problems of the teaching and learning process through scientific research and the skills they developed in this process. It is seen that important requirements, such as taking individual differences into account, access to teaching methods whose effectiveness has not been tested, and clarification about classroom needs were mentioned here. Finally, they expressed the outcomes that they thought they had achieved in terms of developing their students' research and inquiry skills.

The research shows that this process also made important contributions to the pre-service teachers' personal development. One of the most striking features in this category is that the instruction process enabled them to develop their maturity and self-knowledge skills. It can be seen that the reflective texts they wrote and the evaluations they made during the process were effective in enabling them to recognize their own strengths and weaknesses. Moreover, they stated that during the research-based teaching process, they gained self-discipline and confidence through planned studies requiring discipline that took them out of their comfort zone. Finally, they reported that they showed improvement in their communication skills with the studies carried out in this category. It is thought that the effective use of both written and oral communication methods contributed to this development.

The second sub-problem of the study examined the reasons why teachers should have research competencies. The review showed that the teacher candidates discussed having research competence as a requirement of contemporary teaching. Here, the candidates evaluated their research competence within the scope of a high-level thinking skill. The explanations in the second subcategory indicate that the candidates regarded the classroom

as a place that can only be discovered and solved by means of the scientific process and knowledge. In the last category, they justified having research competence as a requirement of the quality of teaching as a process.

The pre-service teachers' views on scientific studies were examined under two categories as having a function and not having a function. It can be understood that the teacher candidates who stated that scientific studies do not fulfill any function wanted to see clear instructions from scientific studies about what should be done in the classroom. The candidates who stated that scientific studies are functional gave explanations to the effect that science is based on observation, interview and experimentation in real life contexts, is valid and reliable, and heightens teachers' awareness of realities that cannot be discerned in real life. In a study[102] in which the relationship between theory and practice is neglected in teacher education programs, it is stated that developmental research-based teacher education ensures that the individual theories of the candidates are rooted in the context of real problems.

According to teacher educators, one of the essential axes of research-based teacher education is to enable candidates to become teachers who can think pedagogically.[103] The results of the research indicate that the teacher candidates achieved a large number of gains related to pedagogical thinking. Such a development was also seen in the results of Afdal and Spernes.[104] The research showed that the majority of pre-service teacher gained skills and knowledge to reflect on and approach educational research systematically. Van Ingen and Ariew,[105] moreover, found that the systematic approach to academic reading, which was also attempted to be achieved in this research, allowed students to integrate research-based knowledge with professional reasoning and practice in a variety of ways. In the study, it was seen that many teacher candidates reflected similar views.

The research also shows that the pre-service teachers expressed their views on the multifaceted benefits of a scientific research methods course prepared on the basis of the research-based teacher education approach.

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[102] Guillaume Escalié, Sébastien Chaliès, Pascal Legrain, and Sylvie Moussay, "A Developmental Research-based Teacher Education: Designing and Implementing a New Program for Preservice Teachers in France," *Teaching Education* (Latest Article). https://doi.org/10.1080/10476210.2022.2066076.

[103] Krokfors, "Investigating," 1-13.

[104] Afdal, and Spernes, "Designing," 215-228.

[105] Sarah van Ingen, and Susan Ariew. "Making the Invisible Visible: Preparing Preservice Teachers for First Steps in Linking Research to Practice," *Teaching and Teacher Education* 51, (October 2015): 182-190, https://doi.org/10.1016/j.tate.2015.07.001.

Similarly, Aspfors and Eklund[106] examined multidimensional development areas under the themes of research, professional and personal competencies in their research. In a design-based longitudinal study by Afdal and Spernes,[107] it was seen that pre-service teachers progressively valued the ability to think and work with others during studies based on the research-based teacher education approach. In this study, similar outcomes were observed in the personal development category. In addition, it has been seen that the outcomes examined within the scope of the research competence theme are largely compatible with those of Afdal and Spernes'[108] research. Research has shown that most students learn to identify professional problems and explore analytically using literature and research-based methods. Qualification research-based skills are considered essential for candidates to make informed decisions.[109] In the study, it was seen that the teacher candidates gained new perspectives about their professional practices during their education process based on this approach, in line with the research results of Afdal and Spernes[110] Dobber et al.,[111] and Aspfors and Eklund.[112]

At this point, it may be interpreted that research teaching is an essential part of the course in terms of providing development from multiple aspects for pre-service teachers. From this perspective, the compulsory inclusion of a scientific research methods course in teacher education curricula may be considered as the right decision. It appears that research competency is included among teacher competencies.[113] Additionally, research project courses, included in preschool teaching curricula and allowing pre-service teachers the opportunity to acquire research experience directly, may be recommended as a compulsory course in other departments. However, it is essential to underline the critical need to consider courses within a model reflecting the research-based teacher education approach when adding

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[106] Aspfors, and Eklund, "Explicit," 400-413.

[107] Afdal, and Spernes, "Designing," 215-228.

[108] Afdal, and Spernes, "Designing," 215-228.

[109] Marilyn Cochran-Smith, Mikael Alexandersson, Viv Ellis, Lexie Grudnoff, Karen Hammerness, Alis Oancea, and Auli Toom, *Transforming Norwegian Teacher Education: The Final Report of The International Advisory Panel for Primary and Lower Secondary Teacher Education* (Lysaker: Norwegian Agency for Quality Assurance in Education NOKUT, 2020), 109.

[110] Afdal, and Spernes, "Designing," 215-228.

[111] Marjolein Dobber, Sanne F. Akkerman, Nico Verloop, and Jan D. Vermunt, "Student Teachers' Collaborative Research: Small-Scale Research Projects during Teacher Education," *Teaching and Teacher Education* 28, no. 4 (May 2012): 609-617, https://doi.org/10.1016/j.tate.2012.01.009.

[112] Aspfors, and Eklund, "Explicit," 400-413.

[113] General Directorate of Teacher Education and Development, "*General,*" 5.

courses to teacher education curricula. It is known that there are essential deficiencies in ensuring that prospective teachers are actively involved in the research and implementation process.[114] Krokfors et al.[115] stated that the importance of all faculties in higher education is linked to the same organizational theme and that each should understand this subject in a similar way. It is also essential to consider the research findings of Brew and Saunders,[116] because the research shows that the views of teacher educators on the issues related to the research-based teacher education approach are not in agreement. Pajchel et al.,[117] on the other hand, stated in their research that a more advanced collective knowledge base covering content and methodological approaches within research-based teacher education should be established. Afdal and Spernes[118] stated that there is still a prevalent conflict about what research-based education infers and how it should be organized. It is important to pay regard to these findings in the process of disseminating the research-based teacher education approach in Turkey.

Another problem in the research is related to the views of pre-service teachers about the requirements for teachers to have research competency. The majority of pre-service teachers' views related to the reasons for a teacher to have research competency appear to be expressed based on the need for contemporary teaching understanding. Considering the requirements for teaching based on the constructivist learning concept, teachers are expected to fulfill requirements like being guides, acting at the level of the student, being aware of individual differences, applying up-to-date teaching methods, and paying attention to affective factors that have an effect on the learning process and outcomes.[119] Fulfilment of these requirements is possible if teachers actively use their research competence in the classroom. In the study, it was revealed that teacher candidates established a relationship between contemporary teaching conditions and research competencies. It is noteworthy that all teacher candidates participating in the study had completed their primary education after the program reform in 2005. The fact that they had graduated from a constructivist learning-based curriculum may have

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[114]   Munthe, and Rogne, "Research," 17-24.

[115]   Leena Krokfors, Heikki Kynäslahti, Katariina Stenberg, Auli Toom, Katriina Maaranen, Riitta Jyrhämä, Reijo Byman, and Pertti Kansanen. "Investigating Finnish Teacher Educators' Views on Research-based Teacher Education," *Teaching Education* 22, no. 1, (March 2011): 1-13, https://doi.org/10.1080/10476210.2010.542559.

[116]   Brew, and Constanze, "Making," 1-11.

[117]   Pajchel, Jegstad, Eklund, Aalbergsjø, and Sollid, "The Role of School," 193-205.

[118]   Afdal, and Spernes, "Designing," 215-228.

[119]   Dale H. Schunk, *Learning Theories*, trans. Muzaffer Şahin (Ankara: Nobel Publishing, 2014).

been effective in the establishing of this relationship by pre-service teachers. Eklund's[120] research findings also support this finding. In these studies, students regarded research-based education as part of the professional requirements of the future teaching profession and stated that research is the basis and rationale of the domain.

Another important point here is the statements of pre-service teachers to the effect that their research competencies had a function in using higher-order thinking skills effectively. The research process served to enhance the higher-order thinking skills of teacher candidates, led by analytical thinking.[121,122,123,124,125] It is expected that pre-service teachers following active reading and analysis processes within a research-based implementation will acquire competence in using their thinking capacity at a higher level. It is crucial to provide teachers and teacher candidates with the chance to enhance their thinking capacity at higher levels through active use during scientific thinking processes.

Another reason for teachers to have research proficiency is explained on the basis of the nature of the classroom. Classroom life is complex and multidimensional for the teacher. The myriad daily tasks and responsibilities of teaching simultaneously compete for attention. Class experiences are complicated and multidimensional from the perspective of the teacher.[126] The categorization by[127] Shulman assists us in seeing the complex nature of teaching. Teaching actions are shaped by many cognitive decisions that teachers make before, during, and after teaching.[128] A teacher needs to interpret the culture in the class and community contexts to know how students learn and the most effective way to teach them. Additionally, teachers should find a way to understand and nourish the soul and personality of each child in class. It is necessary to effectively use reflection skills to efficiently construct and manage class activities, create good communication,

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[120] Eklund, "Student Teachers' Experiences," 3-17.
[121] Hansén, Eklund, and Sjöberg, "General," 7-20.
[122] Kansanen, "Research-based," 131-146.
[123] Krokfors, "Two-fold," 147-159.
[124] Toom, "Experiences," 331-344.
[125] Westbury, "Teacher," 1-13.
[126] Aspfors, Eklund, and Hansén, "Early," 2-18.
[127] Lee Shulman, "Knowledge and Teaching: Foundations of the New Reform," *Harvard Educational Review* 57, no. 1 (February 1987): 1-23, https://doi.org/10.17763/haer.57.1.j463w79r56455411.
[128] Kendra M. Hall-Kenyon, and Smith K. Leigh, "Negotiating a Shared Definition of Curriculum Integration: A Self-Study of Two Teacher Educators from Different Disciplines," *Teacher Education Quarterly* 40, no. 2 (Spring 2013): 89-108.

use technology, and continuously improve these skills.[129] These explanations reveal the complicated nature of the class, awaiting discovery by the teacher. In the research, the pre-service teachers explained the need for research competency due to the class requiring exploration and being full of problems waiting to be solved. It is thought that the in-depth discussions and analyses about classes based on the cases and articles investigated within the scope of the course were influential on the accurate comprehension of this reality by teacher candidates.

Finally, the research investigated the views of pre-service teachers about the professional function of scientific studies. Some pre-service teachers stated that they became aware of topics and concepts unrecognizable in real life due to the articles. However, some pre-service teachers noted that the papers were far from being guides. Similarly, the study by Puustinen et al.[130] shows that some teacher candidates do not accept or understand the impact of research in teacher education or teacher studies. It is considered that views about this topic reflected pre-service teachers' perspectives about the roles of teachers. It is assumed that teacher candidates' views may be interrogated in the context of whether they see teaching as work for a passive technician or as having an implementer role. The current educational system in Turkey is criticized for cultivating pre-service teachers as passive technicians.[131] Schön[132] criticized the assumption that all professional problems can be solved based on research outcomes in traditional teacher education, qualified as technical rationality. Current professional knowledge draws attention to the idea that not every problem encountered in the teaching profession may have a solution. In this approach that reduces teachers to passive implementers, teachers are not expected to perform research, yet they are expected to implement the research in practice. In this model's role, there is no place for the development of teachers' creativity and critical thinking powers. In the study, some pre-service teachers did not expect the articles they read to support their independent intellectual, professional practice but expected them to explain what they should do in a class entirely. This approach observed among the views of the pre-service teachers is thought to reflect the passive technician teacher role. It is believed that research-based teacher

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[129] Darling-Hammond, "Constructing," 300-314.

[130] Puustinen, "Teaching," 170-179.

[131] Yasemin S. Tezgiden-Cakcak, "*Preparing Teacher Candidates as Passive Technicians, Reflective Practitioners or Transformative Intellectuals?*" (PhD diss., Middle East Technical University, 2015).

[132] Donald A. Schön, *Educating the Reflective Practitioner: Toward a New Design for Teaching and Learning in the Professions* (USA: Jossey-Bass, 1987).

education, with teachers producing knowledge and solving problems, will play an essential part in their adopting the position of thinking implementers.

V. Recommendations

In the future, it is recommended that researchers carry out the following studies. The effects of research-based teacher education practices on pre-service teachers can be investigated based on observations in real classroom environments. Longitudinal studies can be designed to observe the practices of pre-service teachers who have been educated with a research-based teacher education approach after starting the profession. Research studies examining the effectiveness of enriched teaching practices designed on the basis of the research-based teacher education approach can be designed. In the future, studies can be designed to include pre-service teachers attending various universities. In addition to the above suggestions, it is recommended that experts and policy makers conduct collaborative studies on how to implement the principles of research-based teacher education in teacher education curricula. Finally, teacher educators need to focus on ways to implement the principles of the research-based teacher education approach in their practices for teacher education curricula. In this context, faculties can cooperate in developing a joint strategy on integrating this approach with the courses in the current curriculum.

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Beyond performance-based budgeting policy in Iran's public universities: Causes, outcomes, and strategies

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Abstract: The main aim of the present study was to analyze the causes, outcomes, and strategies of performance-based budgeting in the Iranian higher education system. To this end, a qualitative approach based on the grounded theory was used. In order to collect reliable data, in-depth semi-structured interviews were conducted with two groups of experts who were selected by purposive sampling method based on the selection of desirable cases. After qualitative content analysis of the collected information via encoding, the detailed report preparation method and comparison with expert opinions were taken into account to validate the findings. At a significance level of 0.0001, the kappa measure of agreement was 0.786. The results showed that finding a suitable mechanism to ensure accountability and transparency in universities was the main focus of performance-based budgeting approach, and its implementation was affected by various factors at the macro level (government) and micro level (university). Positive outcomes of this budgeting model include improved accountability and transparency, project-

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oriented nature of the model, and improved efficiency and effectiveness. Besides, threat to the nature and independence of the university was possibly a negative consequence of this plan. To use the benefits simultaneously and avoid the negative consequences, various strategies were proposed, including the expansion of the authority, independence, and freedom of the university and the involvement of the university's senior managers.

Keywords: university; higher education; performance-based budgeting; performance indexes; performance management.

I. Introduction

The university, as a dynamic social institution, has always witnessed a change in its function and redefinition of its identity, given the scientific nature of academia and the expectations of governments and society. Throughout history, many academic and managerial models have been used to improve academic performance. Because public universities are typically dependent on public funding, in recent decades, policymakers and academics have implemented performance-based budgeting policies in many universities around the world to improve accountability, transparency, and performance.[1,2,3,4] Performance-based budgeting includes methods and mechanisms that strengthen the relationship between appropriations allocated to executive agencies and their outputs and consequences through the use of performance information.[5] Many world-renowned universities, including the Universities of Tennessee, Ohio, and Indiana, are currently implementing different models of performance-based budgeting based on their local

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[1] Kevin J. Dougherty and Rebecca S. Natow, "The demise of higher education performance funding systems in three states," *CCRC Working paper, no. 17* (May 2009): 50-55. https://ccrc.tc.columbia.edu/publications/performance-funding-demise-three-states.html.

[2] Thomas Sanford and James Hunter, "Impact of performance funding on retention and graduation rates" *Educational Policy Analysis Archives* 19, no.33 (2011): 1-27. https://doi.org/10.14507/epaa.v19n33.2011.

[3] David Alstadt, Eric Fingerhut and Richard Kazis, " Tying founding to community college outcomes," *Jobs for the Future, Boston and Washington Dc* (April 2012): 1-40. https://files.eric.ed.gov/fulltext/ED537261.pdf.

[4] Kevin J. Dougherty et al., "The Political Origins of Performance Funding 2.0 in Indiana, Ohio, and Tennessee: Theoretical Perspectives and Comparisons with Performance Funding 1.0," *CCRC working paper no. 68* (February 2014): 1-55. https://ccrc.tc.columbia.edu/publications/political-origins-performance-funding-2.html.

[5] Keysie Miao, "Performance-Based Funding for higher education: A Detailed Look at Best Practices in 6 States," *Center for American Progress*, (August 2012): 1-12. https://www.americanprogress.org/article/performance-based-funding-of-higher-education/.

conditions and characteristics.[6,7] In Iran, performance orientation and performance-based budgeting have been on the agenda of policy makers in the Fourth Development Plan (Articles 138 and 144), the Fifth Development Plan (Article 219) and the Sixth Development Plan (Article 7), and its implementation and experimental stages have already begun in the courts of the country. In this view, the present study has sought to explain and analyze the causes consequences, and strategies of this type of budgeting model.

Resource allocation strategies in any country depend on many factors including history, culture, political discourse, economic size and capacity, population, role of universities and their degree of independence, and number of universities and institutions of higher education.[8,9] Research by the Organization for Economic Cooperation and Development (OECD) on a set of member countries has shown that the higher education financing system has important effects on the development of the higher education system and consequently the economic and social development of countries,[10] there were two general waves in the formation and spread of performance-based budgeting as follows:

1) The First Wave (performance funding 1.0): performance-based budgeting as an incentive to universities:

   The first model or first wave of performance-based funding allocation was implemented in 1979 at the University of Tennessee.[11] The first wave lasted until the first decade of 2000. Between 1979 and 2009, 26

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[6] Thomas Harnisch, "Performance-based Funding: A Re-Emerging Strategy in Public Higher Education Financing, *American Association of State Colleges and Universities," A Higher Education Policy Brief*, (June 2011): 44-65. http://www.aascu.org/uploadedFiles/ AASCU/Content/Root/PolicyAndAdvocacy/Policy Publications /Performance_Funding_ AASCU_June2011.pdf.

[7] Mary McKeown-Moak, "The New Performance Funding in Higher Education," *Educational Considerations* 40, no.2 (2013): 1-11. https://doi.org/10.4148/0146-9282.1082.

[8] Yahya Mohammad Alshehri, "Performance-Based Funding: History, Origins, Outcomes, and Obstacles," Journal of Higher Education Theory and Practice 16 no. 4 (2016): 45-56. http://www.digitalcommons.www.na- businesspress.com/JHETP/AlshehriYM_ Web16_4_.pdf.

[9] Kevin J. Dougherty et al., "*The Policies of Performance Funding for Higher Education, Origins, Discontinuations and Transformation*," (Johns Hopkins University Press; 1st edition (May 15, 2015): 17-291

[10] Justin C. Ortagus et al., "Performance-Based Funding in American Higher Education: A Systematic Synthesis of the Intended and Unintended Consequences," *Educational Evaluation and Policy Analysis*, 42 no.4, (2020): 520–550. https://doi. org/10.3102/0162373720953128.

[11] Harnisch, 46-56.

US states implemented a performance-based budgeting model.[12] In the first type model, performance-based public funding resource allocation was in the form of gifts and rewards to the performance indexes and outcomes. On average, between 1 and 6 percent of additional government funding was allocated to the universities during the first wave of implementation of this model.[13]

2) The Second Wave: performance-based budgeting as a budgeting system: In the second type model (performance funding 2.0), the main budget of institutions and universities was paid through this new system. The amount of university funding varied according to state policy; In addition, in the second type of model, financial resources were paid to institutions with deprived students and poor backgrounds. By the end of 2015, 32 states in the United States had implemented this model, and 5 more states were working to implement it.[14,15]

Many factors have played a role in driving universities towards performance and implementation of this funding model. Dougherty, Natow, Sosanya, Hana, Lara and Vikash[16] identified three origins and supporting theories for the performance-based budgeting model:[17] 1) advocacy coalition framework,[18] 2) policy entrepreneurship theory,[19] and 3) Policy diffusion theory.

According to the advocacy coalition framework, policy change is the product of a coalition of actors inside and outside the government that

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[12] Harnisch, 46-56.

[13] Kevin J. Dougherty, and Vikash Reddy, "Performance funding for higher education: What are the mechanisms? What are the impacts?," *ASHE Higher Education report*, 39 no. 2 (June 2013): 1-134, https://onlinelibrary.wiley.com/toc/15546306/2013/39/2

[14] Renata Opoczynski, "the creation of performance funding in Michigan: Partnership," *Education Policy Analysis Archives*, 24 no 122, (2016): 45-49. http://dx.doi.org/10.14507/epaa.24.2488.

[15] Amy Y. Li and Alice I. Kennedy, "Performance Funding Policy Effects on Community College Outcomes: Are Short-Term Certificates on the Rise?," *Community College Review* 46 no. 1 (2018): 3-39. https://doi.org/10.1177/0091552117743790.

[16] Kevin J. Dougherty et al., "The Political Origins of Performance Funding 2.0 in Indiana, Ohio, and Tennessee: Theoretical Perspectives and Comparisons with Performance Funding 1.0, " *CCRC working paper no. 68* (February 2014): 1-55. https://ccrc.tc.columbia.edu/publications/political-origins-performance-funding-2.html.

[17] Dougherty et al., "The Political Origins," 11.

[18] Paul A. Sabatier and Christopher M. Weible, "The advocacy coalition framework: Innovations and clarifications," in *Theories of the Policy Process* (London: Routledge, 2007):189–222.

[19] Michael Mintrom and Phillipa Norman, "Policy Entrepreneurship and Policy Change," *Policy Studies Journal* 37 no.4 (2009):649-667,https://doi.org/10.1111/j.1541-0072.2009.00329.x.

show deep common beliefs about social values, proper role of government, and social groups and have common political views on social problems, causes, and best-possible solutions.[20] Besides, according to the policy entrepreneurship theory, political change in the country and states created a new window of implementation of this model.[21] In five of the six states, surveyed, political change in government – the Republican victory in parliamentary elections – paved the way for the growth and implementation of the type-1 model of performance-based resource allocation. Moreover, increasing the cost of higher education introduced the concept of responsibility, which was one of the components and objectives of performance-based financial resources allocation.[22] Based on the policy diffusion theory, Dougherty, Natow, Sosanya, Hana, Lara and Vikash[23] suggested that advocators of performance-based budgeting model could be persuaded to implement this model by referring to the implementation of similar policies in other states, national policymaking organizations interviews, and external consultants' recommendations. For example, policymakers in different states, by looking at and imitating successful behavior and policies implemented in another state, set the stage for the implementation of that policy in their state.[24] In addition to the aforementioned three theories that had a major role in the development of the first type of performance-based budgeting model in universities, in the second wave of acceptance and implementation of financial resources allocation based on performance, there were factors such as the role of government, the influence of external actors, the motivation and perspective of the university board, and the economic recession.[25]

II. Research questions

1. What factors led the government to use performance-based budgeting? How?

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[20] Dougherty et al., "The Political Origins," 12.

[21] Mintrom and Norman, 649-667.

[22] Kevin Dougherty, Rebecca Natow, Rachel Hare Bork and Blanca Vega, "The Political Origins of State-Level Performance Funding for Higher Education: The Cases of Florida, Illinois, Missouri, South Carolina, Tennessee, and Washington," *CCRC working paper, no. 22* (October 2010):1-101. https://ccrc.tc.columbia.edu/media/k2/attachments/state-level-performance-funding-cases.pdf.

[23] Dougherty et al., "The Political Origins," 16.

[24] Dougherty et al., "The Political Origins," 24.

[25] Dougherty and Natow, 50-55

2. What will be the consequences and outcomes of implementing performance-based budgeting in Iranian public universities?
3. What are the strategies for effective implementation of performance-based budgeting in Iranian public universities?

III. Research methodology

III.1. Research method

The research paradigm is interpretive and research methodology is qualitative grounded theory (GT). Since the qualitative method and interview tool can give us a better understanding of the deep and complex views and attitudes of the designers and implementers of the university-based model, the qualitative method based on the systematic approach of the grounded theory (GT) Corbin and Strauss, 1998 was applied.[26] In this method, the researcher, by being directly involved in the field of action, continuously comparing real data and consciously and purposefully selecting the most appropriate participants, examines the hidden angles of a phenomenon and formulates the theory himself/herself without relying on existing theories.

III.2. Research participants

According to the research topic, participants were classified into two levels: macro (government) and micro (university). It seems that many decisions at the macro level are made without the participation of the executors and with a centralization approach, and there may be disagreement about the methods of implementing the plans and programs at both the macro and micro levels. It is also possible that the views and attitudes of people working at the macro or micro level of an organization are different from each other and each sees the plan from different angles. In order to collect original data, two groups of informants were selected by purposive sampling method based on the selection of desirable cases using the semi-structured interview method. The first group involved macro policymakers composing of 10 managers and experts from the Plan and Budget Office of the Ministry of Science, Research and Technology, Ministry of Economic Affairs and Finance, and Plan and Budget Organization, whereas the second group

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[26] Juliet Corbin and Anselm Strauss, "*Basics of qualitative research: Techniques and procedures for developing grounded theory,*" (2nd Ed.), (London: Sage Publication, 1998).

involved micro-level executives and operational specialists of universities (9 administrators, faculty members, and budget experts of public universities). The researchers' reasons for selecting individuals and organizations were due to the fact that the PBO is responsible for using the new method of performance-based budgeting. The Ministry of Economic Affairs and Finance is also in charge of auditing and supervising how the public budget is spent, and the Ministry of Higher Education is in charge of receiving information from public universities, concluding memoranda of understanding with the government and Plan and Budget Organization, and monitoring university budgets. In the operational and micro sector, the directors and faculty members of public universities and the managers and experts of the university budget department interact directly with the implementation of the plan and find the results of the plan sooner than others. The continuity of the interviews and the constant presence of the researcher in the field of action continued until the theoretical saturation. The qualitative content analysis was conducted on the collected information via encoding method. To validate the findings, they were compared with the opinions of the experts and a detailed report was prepared. Table (1) shows the appearance of the participants in the research (M: means that the interviewee has been from the government (macro level); I: interview; M^I: means that interviewee has been selected from university (micro level))

Table 1

The appearance of the participants in the research

Row	Interview code	
		Participants qualifications at the macro level (government)
1	MI 1	PhD, responsible for reviewing the budgets of universities and higher education institutions. Secretary of Performance-Based Budgeting Working Group
2	MI 2	Responsible for reviewing the budgets of universities and higher education institutions
3	MI 3	Credits and Commitments of the Ministry of Science, Research and Technology of Higher Education, Expert under the Deputy Director General of Finance
4	MI 4	Higher education property, holding conferences and seminars on budgeting, accrual accounting and finance of higher education

Row	Interview code	
5	MI 5	Member of the Faculty of Economics, Director of the University Plan and Budget, Secretary of Region 3 and Member of the Policy Council of the Plan and Budget Office of the Ministry of Science, Designer of Higher Education Performance Oriented Budget, Member of the University Strategic Council, Research related to Research Topic
6	MI 6	PhD, University Accountant, Expert Associate of Deputy General Director of Finance, Ministry of Science, Research and Technology
7	MI 7	PhD, Integration of Accounts and Accounting Methods of Ministry of Economic Affairs and Finance, Supervisor of Performance-Based Budget Execution of other organizations, Cooperation with Plan and Budget Organization of Iran
8	MI 8	PhD, Treasury of the Ministry of Economic Affairs and Finance, Research related to performance-based budgeting
9	MI 9	PhD, Accounting Office of the Ministry of Economic Affairs and Finance, holding conferences and workshops related to performance-based budgeting, cooperation with Plan and Budget Organization of Iran
10	MI 10	Associate Professor, Member of the Committee for the Preparation and Development of Accrual Accounting, Department Manager, Member of the Working Group on Higher Education Resources and Economics of the Sixth Development Plan
Participants Qualifications at the Micro Level (University)		
11	MⁱI 1	Faculty Member - Head of the Performance Evaluation Department of Shiraz University - Higher Education Management, research related to the research topic
12	MⁱI 2	Faculty Member, Associate Member in Higher Education Budget Projects, Research and Scientific Projects in the Field of Higher Education Financial Resources
13	MⁱI 3	Professor, Faculty Member, PhD in general policy, research related to the research topic
14	MⁱI 4	PhD in Higher Education Management, Faculty Member, Member of the Restructuring Council of the Ministry of Science, Research and Technology, Research Related to Research Topic and Higher Education
15	MⁱI 5	Director General of University Budget and Financial Credits

Row	Interview code	
16	MᴵI 6	Faculty Member, Associate Professor of Economics, Head of Faculty, Related Research in Performance Management
17	MᴵI 7	Faculty Member, Associate Professor of Economics, Former Dean of the Faculty, Research Related to Higher Education Economics, Former Director General of Planning and Coordination of Economic Affairs of Khuzestan Province
18	MᴵI 8	Professor, Faculty Member, Expert in the Economics of Higher Education, Research and Projects Related to Research Topic, Executive Positions Related to Budget and Finance, Coauthor of the Present study
19	MᴵI 9	Faculty Member, Director of Supervision and Quality Assurance of University, Expert in the field of Performance Orientation of University, Related Research, Coauthor of the Present Study

III.3. *Data collection method (interview protocol)*

Based on the research objective, semi-structured interviews were used to collect data. The purpose of the interview was to obtain real data on the identification of requirements and barriers to the performance orientation of public universities.

III.4. *Data analysis*

Strauss and Corbin,[27] open, axial, and selective coding methods were used to analyze the data. The analysis was performed in three stages and the findings were reported in Table (2). These three stages were:

Table 2

Examples of open coding (taken from an interview)

Row	Sentences (extracted semantic units)	Open codes (labels)
1	The previous and even the current budgeting of the Ministry of Science was incremental, which was based on the input index of the axis. This type of budgeting is very fragile and weak.	Inadequacy of the previous budgeting model

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[27] Corbin and Strauss, Basics of Qualitative Research, 37.

Row	Sentences (extracted semantic units)	Open codes (labels)
2	This plan will prevent the waste of resources, both in the conditions of economic prosperity and in the conditions of budget deficit.	Improvement of cost management
3	By implementing this model, our universities will become strategy-oriented, the lack of which is now strongly felt.	Program oriented
....		

Open Coding: To start the analysis, first the final files prepared in the previous step were open-coded. In open coding, each semantic unit of the interview was selected and labeled. Frequent review of the interview text provided relative confidence in extracting all semantic units and labeling.

Axial Coding: In order to achieve more abstract concepts that had better explain the phenomenon of performance-oriented requirements and barriers, open codes that are semantically more similar were organized into axial codes.

Table 3

How to make a connection between open codes and axial codes
(extracted from an interview)

Axial codes	Open codes	Number of open codes
Increasing the authority and independence of university	State domination of the university / University dependence / Increase of legal authority / Freedom of action of executive directors / Non-interference of the government in the selection and appointment of senior managers	6
Design of agreed performance indicators	Involvement of university participation / University-government agreement / Government-university alignment / Development of performance indicators based on the nature of the university /	4
...		

Selective Coding: Selective coding is a general category that covers all axial codes. In this study, the selected code is to improve the accountability and transparency of the university through the implementation of performance-based budgeting system.

III.5. *Validation of the findings*

In order to evaluate the availability and reliability of the research findings, in addition to preparing a detailed report, the concepts extracted by the researchers were compared with an expert's opinions. The Kappa Cohen index was used to make this comparison. The closer this index is to the number 1, the more agreement there is between the researcher and the expert. The implementation steps were such that after analysis and coding by the researchers, another researcher as an expert in the field of research, without knowing the initial coding, also coded and extracted the concepts. Using SPSS software and at a significance level of 0.0001, the value of the Kappa of agreement was 0.786. Since this value is greater than 0.6, the availability and reliability of the data were estimated to be appropriate and desirable.

IV. Findings

After performing the three steps of open coding, axial coding, and selective coding, the axial codes were presented in the paradigm model of the grounded theory (Fig. 1).
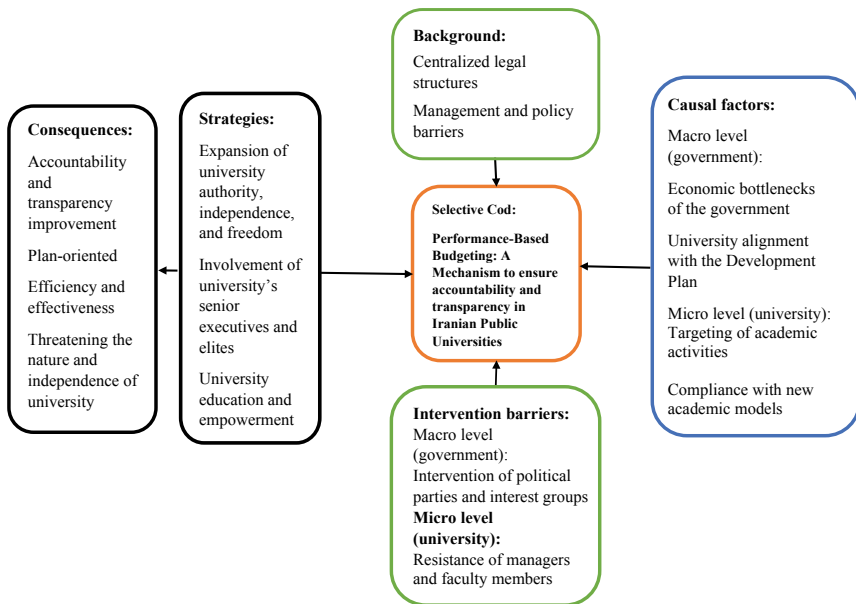
Figure 1

A model of performance-based budgeting University in Iran

V. Discussion

The overall objective of this study was to describe and analyze the causes, outcomes, and strategies of performance-based budgeting model in Iranian public universities. In what follows, the most important codes selected based on the paradigm model of Figure 1 are presented.

V.1. *Factors and drivers influencing the tendency to implement performance-based funding*

These factors are the drivers towards performance and implementation of performance-based funding. Two general categories of factors at the macro level (government) and at the micro level (university) are influential in this regard. The macro-level factors are factors outside university and include policymakers and influential groups. Besides, there are indications in the university itself of the desire of university administrators to implement performance-based budgeting policies that can be proposed as micro-level and intra-university factors.

V.1.1. Macro-level factors (outside university)

V.1.1.1. Government economic bottlenecks

In the Fourth Development Plan (Articles 138 and 144) and the Fifth Development Plan (Articles 219), policies were made in the field of performance and the use of performance-based budgeting, but the implementation of programs related to these policies was delayed for many reasons such as the existence of financial resources from the sale of oil and the existence of sufficient government funds.

- MI2: "When it comes to oil money, it does not matter how and how much you spend! However, when you have a crisis and you have no money, you become careful and then you spend. Both the government and the people are like that. Restrictions have increased today. The government spends and expects to see effective results. There is no extra money like before."

Public universities are financially dependent on the government, and no specific action has been taken in recent decades to break the dependency. In recent years, due to the economic difficulties of the government and the reduction of government financial resources, increase of public demands concerning civil construction and social costs, budget deficit, intensity of international sanctions, etc., the use of performance-based budgeting system has been on the agenda of government officials.

- MI1: "You know, with the budget we have now, we cannot achieve the functions of universities and we have to implement this policy. In this situation, we either have to reduce our workload, in which case we distance ourselves from the institution of the university and its nature, or have to do cost management and use financial resources available in the best possible condition."

V.1.1.2. Alignment of the university with development programs

One of the important criticisms about the relationship between the university and the government is the inconsistency of the two in order to achieve the five-year development plans and objectives of the country. The development of higher education in Iran led to the entry of many people with different motivations into universities. The high number of graduates in various academic disciplines did not correspond to the reality of the labor market and employment in the country. Universities focused mainly on education and were not responsible for employment, calling it outside their remit. On the other hand, graduates, organizations, society, administrators, and faculty members expected the university to be more involved in the economic and social development of the country and to have a better result than the current situation. Therefore, in recent years, the concept of university accountability has become a public demand by the government and society. Governments believe that universities should be accountable for the use of the country's public resources and that their performance should be tangible in the short term.[28] Proponents of the performance-based university model argue that with the implementation of the performance-based budgeting plan, the government and the university will agree on output-oriented performance indicators and the strategic plans of the universities will be accomplished in accordance with the government's objectives in five-year development plans and social and academic requirements. As such, academic involvement in the community will increase.

- M[I]I3: "Implementation of the new plan will lead to meaningful research and improve the university's relationship with society and industry."

V.1.2. Micro-level factors (within the university)

V.1.2.1. Targeting of university activities

University as a social institution has various functions and objectives. The nature and mission of the university makes sense in relation to the three

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[28] Dougherty, Jones, Lahr, Natow, Pheatt, and Reddy, 17-29.

functions of education, research, and community service. One of the important expectations of the university is to participate in the activities of the government and society by prioritizing and targeting its activities. Accordingly, universities have sought to program and target their activities in the community. The use of leverage of financial resources to direct and target academic activities has become common in the last decade.[29]

- M^{I}I3: "I am holding my courses and writing my articles. Who comes to read my articles? Where does it help? But if this plan is implemented, all this will become purposeful. Academics resist this plan at first, but when it fits in, everything becomes purposeful. Then, I enjoy writing articles. Article is not for article' sake. It is to solve a problem, indeed."

In the new budgeting model, government and university agree on performance indicators. These indicators reflect the mission and nature of the university as well as the priorities, objectives and expectations of the government and society. In other words, based on a strategic plan, the university bases its activities such as research, education, and skills training on the expectations of the government and society, and takes on a new and effective role in regional and national development.

- MI7: "The fact is that we did not have a targeted budget. People's expectations are very high. When the budget is published, people want to know why the government spends the budget like this. They ask if we have achieved our goals or not!"

V.1.2.2. University compliance with new academic models

The nature of science is change and adaptation to modern knowledge, and universities, as a separate microcosm of society, are pioneers in this field. There are many academic and managerial models of universities in the world, and in a competitive and global environment, universities are trying to use the latest methods to improve their effectiveness and efficiency. The transformation of Iranian public universities with the academic, research, and entrepreneurial generations has shown that there is a desire, among Iranians, to conform and use the higher education experiences of other leading countries in the world. The performance-based budgeting model is no exception. In prestigious American and European universities, different models have been developed according to the type and conditions of universities, and university administrators are willing to use these models in

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[29] Harnisch, 44-65.

order to prove their performance and convince the government to assign them more financial resources.

- MI3: "It was a plan that was being used all over the world, but we did not use it and we are still using the traditional and old system. We have exchanges with the world and we have economic relations. We need to update our information globally."

V.2. *Influential factors: Preconditions*

In order to implement large and effective plans in higher education and universities, it is necessary to study the background and initial and indigenous conditions. Some underlying factors can cause a plan to achieve its objectives, and yet some might hinder or block the plan's implementation. Two general categories of factors that prepare the ground for performance-based budgeting are:

V.2.1. Centralized legal structures

By implementing a performance-based budgeting plan, the government expects universities to improve their performance in the defined indicators; however, there exists a contradiction between the performance expectations of the university and the degree of authority and power of the university to change them according to the existing legal structures of the country.

For example, the government expects students to study in a field during the standard period of study, while a university might be weak in attracting talented and capable students due to the weather conditions and the distance from the country's communication channels, and students do not show interest in choosing this university. In addition, the university has limited authority over the system for hiring and promoting faculty members and staff, selecting senior university administrators, and changing curricula and course contents. Furthermore, the lack of infrastructure for the implementation of the plan, such as the implementation of accrual accounting, the cost of completed academic activities, information and supervisory systems, and the lack of binding rules of the plan are among the preconditions for the implementation of the plan.

- MI5: "The legal and customary structures and stuff like that do not allow the university to easily flex its performance and make changes. All courses are free. Because the course is free, the student comes. In this situation, all disciplines are considered required though the

market does not need them. University funding should be free. 35% of the total university budget should be at its disposal, not 10%! How to move when the university has no resources? The university must have flexibility and freedom and even be able to lay off or recruit its own staff independently. The university in its current form is suspended."

V.2.2. Structural problems of management and policy-making

Policy-making, planning and budgeting are related concepts that are discussed in a continuum. The lack of an executive link between these three concepts is evident in developing countries. We examined this issue under the heading of structural problems of management and policy-making. For example, many successful projects based on research that have had good results in other countries are mentioned in planning and policy-making, and for some time there are advertisements and follow-ups; however, they eventually fail in the absence of proper implementation conditions due to structural and managerial problems in the country such as the lack of planning, the lack of managerial stability, and the reduction of attention to decentralization and the transfer of authority to comprehensive public universities in the provincial capitals.

- M^{I}I6: "I do not think the government can do this in this time. The infrastructure is not ready at all. Reform of the budgeting structure has been formulated and written, but there is a long way to go to implement it. It takes a long time! Much longer than just 2 or 5 years. No field is yet provided. The forms are completed and submitted every year, but the executive branch has not yet been involved in the plan, and the budget is still increasing. Activity-based costing has not yet been implemented in organizations. There are more and more tables and forms that are now being filled out, but the system and plan have not yet been implemented."

V.3. Influencing factors: Interfering factors

Interfering factors indicate a situation that is not predictable and has not been considered in the plans of policy makers. The most important intervening factors are the resistance based on the distrust of managers and faculty members towards the government and the influence of powerful political actors due to political changes in the country.

V.3.1. Resistance based on the distrust of managers and faculty members

There are different views on the implementation of this plan in universities and among managers and faculty members. There are pros, cons and neutrals or indifferent views on the implementation of the plan. Pheatt et al. argued that faculty members' concerns are primarily about academic standards. They believed that the government and university officials only expect high passing rates and that they are supposed to pass all students under the new system.[30]

- M^I I4: "Basically, this approach has nothing to do with the academic literature. This is a matter of controlling the university, indeed. The control is from above and non-expert.

One of the important principles in the field of resistance of faculty members and executives is how to implement the plan in universities. Senior managers can create satisfaction and improve performance by supporting the plan and tying the indicators to the goals and mission of the university, or rather they can create serious barriers to the goals and mission of the university by imperfectly implementing the plan.

- M^I I2: "There may be resistance; but it is the art of university management to tie the quantitative functional goals of the university to the themes and disciplines of the individuals' activities. The operating budget says, for example, how many books and articles must be published this year; however, it does not say on what subject? "The director of a university department should have the art of tying the interests of his faculty members to functional goals."

One of the most important concepts in this field is the problem of trust. The mental perception of faculty members and executives of the hidden intentions and objectives of the government officials and senior university administrators in conducting the plan is of great importance. If academics see the plan as a factor in undermining the university's independence, restricting academic freedoms and standards, controlling universities, etc., and if they distrust the government officials or senior managers of the university, then there will be serious obstacles to the effective implementation of the plan.

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[30] Lara Pheatt, Hana Lahr, Kevin J. Dougherty, Sosanya M. Jones, Rebecca S. Natow, and Vikash Reddy. "Obstacles to the Effective Implementation of Performance Funding: A Multi-State Cross-Case Analysis." New York: Columbia University, *CCRC Working Paper no. 77,* (November 2014): 1-68. https://core.ac.uk/download/pdf/158157273.pdf.

V.3.2. Influence of powerful political actors

Dougherty et al.[31] considered the will of influential political groups and parties as one of the most important factors in the development of performance-based budgeting in some US states. They believed that governmental authorities diligently represented the implementation of this policy and called on the University Board of Trustees to implement new methods for allocating state budgets to universities so that universities can be more accountable to government budget receipts; however, this type of budgeting system stopped after a while in some universities (Dougherty et al.). Dougherty and colleagues considered the reduction of strong political supporters as an important factor in stopping this system and academic model. The legislators who led and represented this policy lost their policy-making position and influence at the end of their term. Besides, the newly appointed statesmen generally had other views and priorities.[32]

- MI1: "Consider universities abroad. Can we say that they have implemented this plan because they also have budget constraints? This is a successful experience that the country wants to have. Look at private companies. Municipalities, health insurance, etc. are the places where this model has been implemented."

V.4. Implications of the performance-based model of university

V.4.1. Accountability and transparency

Budgeting is the response to citizens who want to know how and where their money is spent.[33] The performance-based budget allocation model was part of the paradigm of trying to improve accountability in higher education. Resource dependency theory also supports the consequence of improving accountability and transparency through the use of this type of budgeting model. According to resource dependency theory, higher education institutions depend on government funding for their survival. If the government links incentives and financial resources to the performance of universities and these financial resources are attractive and sufficient enough, higher education institutions will have internal changes to obtain them in

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[31] Dougherty et al., "The Political Origins," 14.
[32] Dougherty, Natow, Bork and Vega, CCRC working paper no. 22.
[33] Christopher Neary "*U.S. Higher education performance-based funding policy diffusion and its association with state political ideologies and state budgeting taxonomies*" (PhD diss., Iowa State University, 2019). https://lib.dr.iastate.edu/etd/17065.

order to better respond to new changes. This theory suggests that universities should ensure their competitiveness and viability by realizing agreed output-oriented performance goals. Governments seek to motivate higher education institutions to change the university's strategies, activities, programs, and culture through a performance-based budgeting model.

- MI1: "If the university does not welcome this plan and does not adapt and synchronize, the university will be out of competition. If the performance-based budgeting system is not implemented in the universities, they will face financial problems and crises. Indifference is useless because other universities are implementing the plan."

- MI8: Any executive body that uses government funding should be financially transparent. This is what strengthens the financial system and the resistance economy. Transparency - Accountability is at stake.

The implementation of this budgeting model can create transparency. The fact is that at present public universities do not make much effort to obtain funding, and public resources are paid solely on the basis of the number of students and faculty members or equipment, development, or running costs such as salaries. Implementing this plan will make the university more accountable for receiving funding, at least compared to the traditional input-based budgeting. In other words, universities should report their reasons for spending more effectively and meet the agreed criteria. Besides, due to the launch of information systems related to this budgeting system, transparency in university expenses and revenues will be strengthened. Accountability and transparency are the most important goals seen for the implementation of this type of budgeting model.

- MI1: "Operational budgeting encompasses all systems and activities. All activities will be systematized and structured. Suppose a teacher requests a pen. The teacher registers his request sitting at his desk. The application will be referred to the Deputy of Education and then to the Deputy of Finance. Next, the procurement and administrative affairs will be done. The procurement officer checks the warehouse. If they have a pen, they give it to the teacher, and if not, they have to buy. They need to document the costs. See how much transparency is here."

V.4.2. Plan-oriented

Another consequence of implementing performance-based budgeting is planning at both the government and community and the university levels.

As suggested before, the link between policy-making, planning, and budgeting in developing countries is weak. The implementation of this plan will cause the university to be involved in the indicators and goals agreed upon with the government and the local community. On the other hand, based on the nature of this budgeting model, it is essential to provide a comprehensive plan by determining university objectives priorities so that an exact and clear use of financial resources in accordance with the objectives can be realized and checked.

- MI1: "This system can be very helpful in strategic planning. Something that our universities are very weak in now. Universities either do not have a strategic plan or if they do, they do not adhere to it. Operational budgeting steps try to assist universities in strategic planning. Through this system, the university knows what its resources are and how much it is, and it can carry out its activities based on its strengths and weaknesses and the plan features."

V.4.3. Efficiency and effectiveness

Dougherty et al,[34] Posited that the most important government criticism of universities, which was a precondition for the effective implementation of performance-based budgeting policy, is the reduction of the efficiency and effectiveness of universities in society and in relation to government needs. Therefore, emphasizing the realization of the expected results with the highest degree of economic efficiency, improving efficiency and effectiveness, and facilitating the monitoring of budget implementation are among the most important goals of the performance-based financial resource allocation plan. It seems that by implementing this model and due to the targeted spending of limited financial credits, many unproductive and unnecessary activities in universities are eliminated. Furthermore, information and monitoring systems may eliminate activities or jobs that are less efficient for the functioning of universities.

- MI9: "Universities must be useful. We were caught up in the routine of paying the budget. We are not plan-oriented and mission-oriented. We did not prioritize. Wherever we saw the need, we came and spent the resources aimlessly. Management must have three main goals: operational efficiency, effectiveness, and economic well-being. The goal is to enhance productivity."

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[34] Dougherty and Reddy, ASHE Higher Education report, 39 no. 2.

Moreover, since the main financial resources are focused on performing a function or an indicator based on the priorities and needs of a university, it is likely to achieve effectiveness and obtain desirable results. Extensive needs or goals prevent high quality goals from being achieved, and hence effectiveness might not be attained.

V.4.4. Threat to the nature and independence of the university

In addition to the positive consequences seen for this budgeting model, undesired consequences have also been reported. The nature of the university is such that it has many positive effects in the cultural, economic, political, and social fields. These effects are long-term and in many cases cannot be measured. Therefore, trying to quantify all the goals, activities, and functions of the university in the form of the number of articles, the number of graduates and other quantitative indicators is not acceptable to academics. The dependence of public universities on government budgets has led to violations of university independence, not only in terms of financial resources but also in other areas related to the functioning of universities. Emphasis on increasing the number of graduates in a field will lead to leniency and impose pressure on faculty members to pass all students whether they have acquired the required qualifications or not. Threats to academic freedom, delays in funding, and pressure on faculty members can be interpreted as unprofessional interference at the university.[35]

- M[I]5: "Performance-based budgeting was the PBO's revenge on the universities for their financial independence. Though we do not have any financial controllers, different budget systems monitor us closely. Controllers went out and budget systems came in through the window. The Ministry of Higher Education should have reacted to this monitoring and control."

V.5. *Effective performance strategies in university's performance-based model*

V.5.1. Expansion of university authority and independence

Policymakers seek to change and improve university performance by implementing a performance-based budgeting plan, but this will not be

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[35] Dougherty, Jones, Lahr, Natow, Pheatt, and Reddy, 17-29.

achieved largely without expanding the scope of university authority. For example, a university is expected to increase the number of graduates in a field, but because the university is in an unsuitable geographical location and is not a brand university, it may have students with a weaker background and may not be able to achieve the stated goal scientifically.[36] Therefore, expanding the university's authority and independence in terms of the method of admission of students, hiring faculty members and staff, selection of university administrators, university cost structure, re-engineering of organizational positions, etc. leads to the flexibility of the university in meeting new expectations. However, academic values may be threatened if this strategy is not used properly and the differences between universities are not taken into account. Data faking, providing unrealistic information and statistics, pressure to accept students who have not yet acquired sufficient skills and experience are among the consequences of the mismatch between the university's authority and new expectations in this area.

- M^{I}I5: "University has no authority to determine its cost structures. The university cannot easily change a centralized issue. For example, it cannot dismiss or recruit faculty members. As such, universities cannot be performance-oriented unless we give them the necessary authority and they become freer. This authority does not exist in our current systems."

In addition to the expansion of authority, the different nature of the university requires that the university should be independent. The university is a scientific environment and is the center of wisdom of society and the place of specialized and critical discussions.

Having independence does not mean denying accountability, monitoring and auditing the university's financial processes. It seems that the supervision of the university board of trustees over the university is a solution to the problem of threats to the independence of the university by implementing this budgeting model.

V.5.2. Involvement of the university

An important criticism against macro-level policies is that they are often done without consulting and taking into account the conditions of the target

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[36] Kevin J. Dougherty and Rebecca S. Natow, "Analyzing Neoliberalism in Theory and Practice: The Case of Performance-Based Funding for Higher Education" *Centre for Global Higher Education, Working paper*, no. 44(March 2019): 1-56. https://doi.org/10.7916/d8-a1kt-7p96.

organization. Centralized decision-making will make universities resist the implementation of the plan. Furthermore, the lack of support of senior managers from the implementation of the plan will to a large extent cause disruption in the implementation process. Bargaining, negotiation, participatory decision-making, and the presence of senior university administrators in the initial specialized working groups can encourage the participation of universities in the implementation of the plan.

- M^II3: "The implementation trends are top-down, bottom-up, and hybrid. They are doing something here. If the trend is not combined and if there is no support from the bottom and if they do not consult on how to do the procedure, my guess is that they will not succeed. Participation provides success. The terms and conditions are also very important. Environmental factors are influential. The ground must also be prepared."

V.5.3. Education and empowerment

One way to effectively implement the performance-based budgeting model is empowering employees, managers and faculty members. Unfamiliarity of university administrators with the objectives, philosophy, and necessity of implementing this model, as well as unfamiliarity of staff with budgeting information systems and how to collect data and analyze them in the university will lead to the failure of objectives in the implementation phase. Furthermore, the university is a training ground for professionals and experts of other organizations, and the university is expected to train skilled and capable staff associated with this budgeting model and to help develop a culture of using this model in other organizations. Education also reduces the initial resistance of universities and accelerates awareness of the positive effects and consequences of the model in the university among academics.

- M^II5: "We do not have anything as human resource empowerment in the financial sector. In this plan, we are far behind the Ministry of Health. We are the best university, but we do not train financial specialists!"

VI. Conclusion

Nowadays, political and environmental pressures, finance and workplace factors, university accountability and responsibility, and the needs and expectations of the beneficiaries have resulted in the diversity of scientific

communities within universities. The root of these changes can be found in the evolutions and in the conditions and needs of society. The availability of financial resources for the implementation of plans, activities, and functions of the university is an absolute necessity. New generation universities in their approaches seek to develop and expand their financial and revenue resources to be able to have the necessary efficiency and effectiveness in the competitive organizational and inter-organizational environment. Despite the efforts of universities to develop sources of income and emphasis on the concepts such as financial independence and freedom from the government, the universities still receive most financial resources from the government. Financing and accurate performance appraisal are among the most important government-university agreements in the development era. Under the agreement, government officials have expected universities to be accountable for the resources they received and to demonstrate, with accurate performance metrics, that they had spent the resources on activities with the highest social achievement. Due to this global trend, in recent years, Iran's higher education has also moved towards performance-based budgeting. Proponents of the performance-based approach to financial resource allocation argue that if funding is allocated based on educational and research outputs and their implications, the plan executors and decision makers within education systems will always be diligent in optimizing resource allocation and will be motivated to meet the real needs of applicants and funders. This mechanism can be presented via objectives such as improving accountability, transparency, and responsibility of managers and increasing efficiency and effectiveness in higher education, as a driving and policy-making force in directing and influencing higher education. This grounded theory research has investigated the performance-based budgeting model at both macro and operational levels. The findings showed that the government economic bottlenecks, inefficiency of input-oriented budgeting system, improving efficiency and effectiveness, targeting budget, improving accountability and transparency, inclination to observe immediate and functional results in the university, targeting academic activities, and modeling successful global projects are effective factors in shaping the tendency of the government and the universities towards this model. Besides, any budgeting model has its own objectives and consequences. However, undesirable consequences are not aimed by policymakers. Among the outcomes identified in this study are: improving accountability and transparency, being plan-oriented, improving university financial discipline, enhancing productivity, improving government and university

supervision of financial, organizational, educational and research processes, targeting research projects, adjusting disciplines and universities according to the needs of society, encouraging the universities to increase their financial incomes, reducing government attention to long-term considerations and objectives of the university, and inadequate understanding of the identity and mission of the university in financial institutions. It seems that the reason for the success of this model in some universities is due to how it is implemented. After providing the basic requirements and laying the groundwork for the implementation of this model, the effective implementation strategies identified in Iranian public universities are: implementation of the legal requirements and technical prerequisites of the plan, increasing the authority, independence and freedom of action of the university, comprehensive and agreed-upon design and development of performance indicators, education and empowerment of the university through training courses, attracting the participation of academics in the plan implementation, etc.

VI.1. *Implementation steps of performance-based budgeting*

One of the important and determining issues in the efficiency and effectiveness of performance-based budgeting is how to implement it. According to the identification of the causes, methods and consequences of performance-based budgeting, researchers believe that the implementation steps of performance-based budgeting are:

VI.1.1. Review of executive programs and activities of public universities

The most important factor in the budgeting system and performance-oriented university model is the executive plan. The executive program of the universities should be developed based on the economic, social, political, and cultural needs of the society and its approach should be to help the government and develop the country. Some of Iran's public universities have strategic plans and the purpose of determining what programs and activities to carry out in each year of the implementation of this program has also been determined. However, what is important is that the Ministry of Science, Research, and Technology as the representative of the university reach an agreement with the Program and Budget Organization as the representative of the government on an annual plan. In this annual program, the government and the university must agree on important matters such as strategies, policies, executive measures and plans, activities and performance measures and quantitative goals.

VI.1.2. Determining the performance indicators

Based on the quantitative goals related to each activity that were calculated from the executive plan, indicators and performance metrics are determined and the government and the university agree on the goal of each indicator. For example, if the index is the publication of research articles, the university and the government agree on a number and a reasonable amount.

VI.1.3. Costing of programs and activities

This step is at the university level, and its meaning is that the university is responsible for costing its activities. At this stage, the establishment of the cost accounting system is necessary. After that, the cost of each academic activity is calculated and determined.

VI.1.4. Performance management

Performance management is a process that by converting the strategic goals of universities into measurable criteria, collecting and analyzing data, reporting performance and reviewing performance information reports and applying its results in different fields, leads to the improvement of the organization's performance. Performance management includes measuring and evaluating performance as well as improving and monitoring the implementation of the performance agreement.

VI.2. *Advantages and opportunities of implementation of performance-based budgeting in Iran's public universities*

With considering the current conditions of Iran's public universities, it seems that the implementation of performance-based budgeting has the following advantages and opportunities:

VI.2.1. Executive guarantee

The fact is that, especially in third world and developing countries, many plans and goals do not come true. In other words, there is no strong executive guarantee for their realization. Performance-based budgeting uses the budget as an agent and a guaranteeing lever to improve performance, accountability and transparency, and by changing the way of allocating and distributing the public budget of public universities, it makes the university more responsive to its outputs and the needs of the surrounding environment.

VI.2.2. Interaction between the university and the government

Another advantage of implementing performance-based budgeting is providing a context for the university and the government in which it is possible to discuss and bargain on goals and indicators according to the needs of society. In this type of budgeting, the university and the government as agents and executives must agree on the indicators and goals, and this will not be possible unless the university and the government interact and get closer.

VI.2.3. The participation of the university in the development of the country

In the five-year development plans of Iran, the role of organizations, including the university, has been defined, and the university must fulfill the goals seen in order to develop the country. However, there was no agreement and legal requirement with a high executive guarantee in this field, and the university could perform its traditional duties and roles in the field of action and not participate. It seems that by implementing performance-based budgeting, faculty members will act purposefully and based on the needs of the society in carrying out scientific and student projects, especially in the selection of theses and dissertation topics at the graduate level.

VI.2.4. Innovation and adaptability to the environment

The government pays the budget of universities annually. In Iran, government and university agreements on some short-term goals and indicators can be concluded for one year or based on a five-year development plan. This means that according to the new expectations of the activity environment of the government and the university in the society and the changes in various scientific fields, some indicators agreed by the government and the university can be added or reduced.

VI.2.5. Development of financial and income resources of the university

As mentioned in the section on the reasons for implementation of performance-based budgeting and based on the theory of resource dependence, the financial constraints of the government and the dependence of public universities on the public budget are among the reasons for the implementation of this type of budgeting. It is predicted that the implementation of the performance-oriented university model can double the incentive to develop revenue sources for public universities. Also, if one of the performance

indicators agreed between the government and the university is to earn new income through projects with society and industry, it can be predicted that the faculty members of public universities will be driven to implement financial projects with industry and society in order to achieve this indicator.

VI.2.6. Motivating senior and operational managers of the university

Based on performance-based budgeting, if the senior and operational managers of the university help to improve the university's performance indicators, the government and the university will encourage them.

VI.2.7. Improving the university performance evaluation system

Currently, and with the current management models, there are various qualitative and quantitative indicators for the internal and external evaluation of public universities, and this evaluation is reviewed and given feedback on a continuous and annual basis. But the reality is that due to the lack of accountability culture, the results of the performance evaluation are not taken seriously and are less considered in the policy making process or the reform of university processes.

VI.2.8. Improving the information mastery of managers

Through setting up information systems and collecting operational data from various university indicators, managers' information about the state of universities increases.

VI.2.9. Improvement of student services

Among the performance indicators implemented in world-renowned universities based on the performance-oriented approach, is the number of graduates or their employment rate. According to this index, the survival and permanence of the student becomes important and as a result, continuous monitoring of his performance in different courses and providing counseling and welfare services are among the priorities of the university.

VI.2.10. Facilitating knowledge management and organizational learning

Obtaining funding of a faculty depends on the interaction, cooperation and coordination of its employees, faculty members and administrators. It is

predicted that the free dissemination of information based on knowledge management theory, organizational learning theory, and also the learning organization will be strengthened due to the efforts of the staff to improve performance and take the maximum budget.

The final point is that the researchers believe that the implementation of performance-based budgeting will not solve all the problems of Iran's public universities and higher education, and perhaps the incomplete and unfavorable implementation of this model will cause public universities to face new problems. The fact is that the inconclusive and constant conflict between the government and the university over the past few decades has caused the trust in the government as a policy maker and representative of society to decrease due to the non-fulfillment of the government's development and implementation plans and the loss of public resources. On the other hand, the not so favorable performance of the university has diminished the role of this social institution in the development of the society. The important mission of performance-based budgeting is to end this long-term conflict and solve society's problems with an interaction-oriented approach. A place where the university, as a symbol of civil society, by maintaining its independence for the use of public funds, institutionalizes accountability, transparency, and responsibility in the society. Iran's policy makers should caution in using this strategy and prioritize preserving the independence, nature and mission of the university. In addition they should pay attention to the long-term goals of the university, immeasurable educational indicate, university's diverse, and service of university in society.

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An investigation of mission differentiation and specialization in Turkish universities in the context of strategic objectives

Nazife Karadağ and Betül Balkar*

Abstract: This study examines and compares the strategic objectives of the universities included in the "mission differentiation and specialization on the basis of regional development" project carried out in the Turkish higher education system and well-established universities in Turkiye. Therefore, the aim of this study is to determine how the goal of "mission differentiation and specialization on the basis of regional development" is tried to be realized in the higher education system and whether this goal really brings a difference to the activities of universities. The study was conducted through document review. The universities included in the study were determined by criterion sampling and two different study groups were formed for comparison. The first study group consisted of the universities involved in the mission differentiation project. The second study group consisted of the well-established universities located in various geographical regions of Turkiye. Data were analyzed through the content analysis. The strategic objectives of the universities were examined under the themes of increasing quality in education, increasing the quantity and quality of scientific research, improvement of communication and interaction with stakeholders, strengthening of corporate identity/structure/ensuring institutionalization and internationalization. The strategic objectives of the universities with mission differentiation are also analyzed in terms of leading local and regional development. The results of the research show that universities subject to mission differentiation and well-established universities have different qualifications only in terms of "leading local and regional development" and "strengthening community service studies."

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However, there are also points where goals and performance indicators depending on these strategic objectives are resembled. The similarities in the strategic objectives of the universities show that the missions of the universities with mission differentiation and specialization should first be clarified based on a general framework provided by the Council of Higher Education. In line with the guiding framework, universities should establish their unique strategic objectives in the strategic planning process in order to contribute to regional development.

Keywords: regional development; mission differentiation; strategic objectives of universities; strategic plans of universities; higher education.

I. Introduction

In the historical process, universities have passed through three stages in line with their missions. The change in universities is explained by classifying the universities as a science-oriented medieval university (First-generation), a Humboldt-type university focused on education and research (Second-generation), and an entrepreneurial and socially integrated university (Third-generation).[1] First generation universities were established with the aim of "creating critical professions."[2] The first-generation universities, which played almost no role during the Enlightenment and were in stagnation, exhibited a structure far from the scientific and political developments of the age, as "ivory towers" designed separately from the society and unwilling to open their doors to the emerging middle class. Second Generation universities, also known as research universities, were founded in 1810 by Wilhelm von Humboldt's reform of the University of Berlin.[3] The third-generation universities, which have created an innovative, creative university model that contributes to the development of their regions, draw attention with their entrepreneurial structure.[4]

In the 21st century, "academic institutions and systems have faced pressures of increasing numbers of students and demographic changes,

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[1] Johan G. Wissema, *Towards the Third Generation University: Managing the University in Transition* (Cheltenham: Edward Elgar Publishing, 2009), 3-43.

[2] Ali Rıza Erdem, "Üniversite Anlayışındaki Değişim: Birinci Nesil Üniversiteden Dördüncü Nesil Üniversiteye [Change in Mental of University: From the First-Generation University to the Fourth Generation]," *TYB Akademi Dil Edebiyat ve Sosyal Bilimler Dergisi* 16, no. 16 (2016): 21-52.

[3] Philip G. Altbach, "The Complex Role of Universities in the Period of Globalization," accessed August 9, 2021, https://upcommons.upc.edu/bitstream/handle/2099/8111/altbach.pdf.

[4] Münevver Çiftçi, "Girişimci Üniversite ve Üçüncü Kuşak Üniversiteler [The Entrepreneur University and Third Generation Universities]," *Dumlupınar Üniversitesi Sosyal Bilimler Dergisi* 27 (2010): 1.

demands for accountability, reconsideration of the social and economic role of higher education, and the impact of new technologies."[5] Additionally, "higher education is facing unprecedented challenges in the definition of its purpose, role, organization and scope in society and the economy. The information and communication technology revolution, the emergence of the knowledge economy, the turbulence of the economy and consequent funding conditions have all thrown new light and new demands on higher education systems across the world."[6]

"Increased global competition has placed higher education at the center of government policies. Governments are reviewing higher education systems since academic research functions are seen as a catalyst for innovation and economic growth."[7] The increasing importance of information production and innovation for economic development necessitated universities to have new roles. In many higher education studies, it is stated that the missions of universities should be reconsidered depending on the rise of the knowledge-based economy together with globalization and global crises.[8]

With the higher education policies adopted after 2004 in Turkiye, access to higher education has increased significantly and there has been an increase in the massification of the higher education system. However, the increase in access to higher education has caused many problems as well, the problem of localization in particular. In many studies, it is emphasized that planning problems depending on the distribution of the number of students and instructors,[9,10] problems related to graduation-employment,[11] problems due to

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[5] Philip G. Altbach and Todd M. Davis, "Global Challenge and National Response: Note for an International Dialogue on Higher Education," *International Higher Education* 14 (Winter 1999): 2.

[6] European Commission and OECD, "A Guiding Framework for Entrepreneurial Universities," (2012), accessed July 27, 2022, https://www.oecd.org/site/cfecpr/EC-OECD%20 Entrepreneurial%20Universities%20Framework.pdf.

[7] Ellen Hazelkorn and Jeroen Huisman, "Higher Education in the 21st Century–Diversity of Missions," *Higher Education Policy* 21, no. 2 (2008): 147.

[8] Chiara Rinaldi et al., "Universities and Smart Specialisation Strategy: From Third Mission to Sustainable Development Co-creation," *International Journal of Sustainability in Higher Education* 19, no. 1 (2018).

[9] Didem Doğan, "Yeni Kurulan Üniversitelerin Sorunları ve Çözüm Önerileri [Problems of Newly-Founded Universities and Solution Offers]," *Yükseköğretim ve Bilim Dergisi* 3, no. 2 (2013): 112.

[10] Fatma Mızıkacı, *Higher Education in Turkey* (Bucharest: UNESCO/CEPES, 2006), 81.

[11] Üstün Ergüder, Mehmet Şahin, Tosun Terzioğlu, and Öktem Vardar, *Neden Yeni Bir Yükseköğretim Vizyonu* [*Why A New Higher Education Vision],* (İstanbul: İstanbul Politikalar Merkezi, 2009), 20.

the insufficient number of lecturers,[12] problems due to insufficient physical infrastructure,[13,14] are experienced in Turkiye. Since 2006, the rapid expansion of universities and the policy of establishing a university in every province adopted in those years caused the Turkish higher education system to face some problems in practice. In addition, there are problems such as the low academic performance for universities established after 2006 and the fact that universities adopt a mission based on progress in every field instead of specializing in certain fields.[15] These problems negatively affect the fulfillment of university missions for education, scientific research, and community service, and prevent universities from being the locomotive of development in a knowledge-based economic system.

It seems possible for universities to develop economic, social, and human capital through the integration with the city and region they are located in. Therefore, the missions of universities in Turkiye have been reconsidered based on their strengths in order to enable them to tend towards differentiation and diversity. The "Mission Differentiation and Specialization on the Basis of Regional Development" project was initiated by the Council of Higher Education in cooperation with the Ministry of Development, especially for higher education institutions established after 2006 in order to increase the contribution of universities to the region they are located in and to encourage specialization in certain fields.[16] Accordingly, some of the universities were selected as Regional Development Oriented University and their fields of focus are as follows: Bingöl University, *agriculture and basin-oriented development*; Burdur Mehmet Akif Ersoy University, *animal husbandry*; Düzce University, *health and environment*; Kırşehir Ahi Evran University, *agriculture and geothermal energy*; Uşak University, *textile, leather and ceramics*; Aksaray University, *sports and health*; Kastamonu University, *forestry and nature tourism*; Muş Alpaslan University, *animal*

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[12] Mızıkacı, *Higher Education in Turkey*, 80.

[13] Doğan, "Yeni Kurulan Üniversitelerin Sorunları ve Çözüm Önerileri [Problems of Newly-Founded Universities and Solution Offers]," 112.

[14] Murat Özoğlu, Bekir Gür, and Sedat Gümüş, "Rapid Expansion of Higher Education in Turkey: The Challenges of Recently Established Public Universities (2006–2013)," *Higher Education Policy* 29, no.1 (2016): 31.

[15] Ebru Karataş Acer and Nezahat Güçlü, "Türkiye'de Yükseköğretimin Genişlemesi: Gerekçeler ve Ortaya Çıkan Sorunlar [The expansion of higher education in Turkey: The rationales behind this expansion and its challenges]," *Yükseköğretim Dergisi* 7, no. 1 (2017): 32.

[16] Council of Higher Education of Turkey (YÖK), "Bölgesel Kalkınma Odaklı Misyon Farklılaşması ve İhtisaslaşma Programı: Proje Hakkında [The Program of Mission Differentiation and Specialization on the Basis of Regional Development: About the Project]," accessed August 12, 2021, https://bolgeselkalkinma.yok.gov.tr/hakkinda/proje-hakkinda.

husbandry; Recep Tayyip Erdoğan University, *tea cultivation*; Siirt University, *agriculture and animal husbandry*.

The specialization of the universities involved in the project and their contribution to the region, in other words, the achievement of the objectives of the project is only possible with the effectiveness of the universities in line with the differentiation of their missions. Therefore, these universities with mission differentiation are expected to have a different operating structure than other universities in Turkiye. In addition, the fact that universities have too many missions to contribute to science and society may cause the overlapping of the missions of universities with and without mission differentiation. Therefore, it is important to compare these universities with other universities that are not subject to mission differentiation in order to determine their effectiveness in specialization and contribution to the region. Considering that well-established universities, which are among the first universities established in Turkiye, have a diversity of missions and the high potential of fulfilling their missions, it is of more critical importance to compare the strategic goals of well-established universities and universities with mission differentiation. In particular, determining whether these universities have a different function from the well-established universities in Turkiye will be able to show to what extent the new structure that is being tried to be established in higher education brings difference and diversity for higher education. In this study, the strategic objectives of the universities included in the "Mission Differentiation and Specialization on the Basis of Regional Development" project carried out in the Turkish higher education system and other well-established universities in Turkiye are examined and compared. Therefore, the aim of this study is to determine how the goal of "mission differentiation and specialization on the basis of regional development" is tried to be realized in the higher education system and whether this goal really brings a difference to the activities of universities. Thus, the present study will contribute to the higher education literature by defining the features that universities should have and the activities they should carry out in order to differentiate and specialize their missions on the basis of regional development. In line with this aim, the sub-problems of the research are as follows:

1. What are the issues of focus for the strategic objectives of the universities involved in the "Mission Differentiation and Specialization on the Basis of Regional Development" project in the Turkish higher education system?

2. What are the issues of focus for the strategic objectives of the well-established universities in Turkiye?

II. Theoretical framework

Universities, which are among the main institutions that lead the development of the city and region in which they are located, are institutions where the wisdom reached through systematic research method is transferred through teaching.[17] Altbach and Berdahl think that universities were developed as an institutional response to the pressure of meeting the professional, religious, and administrative needs of society through education.[18] As universities acknowledge and respond to social transformations and global trends, their missions have also undergone a transition process.[19] The mission of universities, which began with transfer of knowledge and education in the Middle Ages, has evolved and expanded over time to include searching for, producing, and applying knowledge. The first universities were learning centers for professions in the fields of law, clergy, medicine, and academia, which were known as the main professions of the period. Although the medieval universities mainly focused on vocational training, they were also engaged in intellectual, religious, and political life.[20] However, medieval universities emerged as a powerful modernization element for medieval culture.[21]

Until the 19th century, universities focused largely on teaching activities and training specialists in fields such as medicine, law, and theology, but in the early 19th century, the research, as a mission, became prominent for the universities. Research universities have their origins in Wilhelm von Humboldt's reform of the University of Berlin in 1810.[22] Humboldt adopted the research function as a main function of the university and argued that the university should be a place where scientific knowledge is produced rather than a vocational training service is provided. The rise of the German Humboldt University in the 19th century enabled universities to undertake the function of producing knowledge for the realization of teaching and vocational training. As a result of this development, the teaching and research

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[17] Karl Jaspers, *The Idea of the University* (London: Peter Owen Ltd, 1965).

[18] Philip G. Altbach and Robert O. Berdahl, *Higher Education in American Society*, rev. ed. (Buffalo, NY: Prometheus Books, 1981), quoted in Thomas J. Denham, "*A Brief History* of The Major Components of the Medievel Settings" (PhD diss., Nova Southeastern University, 2002), 2.

[19] Jonathan R. Alger, "The Educational Value of Diversity," *Academe* 83, no.1 (1997).

[20] Altbach, "The Complex Role of Universities."

[21] Rocco Frondizi et al., "The Evaluation of Universities' Third Mission and Intellectual Capital: Theoretical Analysis and Application to Italy," *Sustainability* 11, no. 12 (2019): 1.

[22] Philip G. Altbach "The Past, Present, and Future of the Research University," in *The Rood to Academic Excellence: The Making of World-Class Research Universities*, ed. Philip G. Altbach and Jamil Salmi (Washington, DC: The World Bank, 2011), 11-32.

functions of the university were linked to each other.[23] With the emergence of research universities, "research" has not only become an academic initiative but has also been associated with applied sciences and national development.[24] After these developments regarding the research-oriented mission of universities, universities associated their functions with social interests and developed a wider sense of responsibility towards society.[25] The new and universal university model, based on the principles of Newman and Humboldt, has been the main source of social progress. Therefore, such universities focused on research on national and global problems.[26]

After the Second World War, the need for highly educated human resources and the changing socio-economic environment increased the need for higher education. This demand paved the way for massification of the higher education. In this process, as a result of the advances in science and technology and the democratic pressure to improve living conditions; universities had to adopt the mission of contributing to socio-economic development as well as their research and development mission.[27,28] Massification, which became dominant with the increase in the number of students and lecturers, the increase in the number of institutions, the improvement of the infrastructure and the increase in the number of departments, created the third mission of the university, the mission of serving the public.[29]

In recent years, there have been significant changes in the ways of acquiring, disseminating, and transforming knowledge depending on the structural changes that have become prominent terms such as globalization, the information age, and the rise of the knowledge-based economy.[30] With the transition from the industrial society to the information society, the concept of knowledge has begun to take place on the basis of socio-economic reality. The concept of knowledge is at the heart of the knowledge-based

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[23] Roger King, "The Contemporary University," in *The University in the Global Age*, ed. Roger King (Basingstoke: Palgrave MacMillan, 2004), 1-27.

[24] Altbach, "The Complex Role of Universities."

[25] Sintayehu Kassaye Alemu, "The Meaning, Idea and History of University/ Higher Education in Africa: A Brief Literature Review," *Forum for International Research in Education* 4, no.3 (2018).

[26] Geoffrey Boulton and Colin Lucas, "What are Universities For?" *Chinese Science Bulletin* 56, no. 23 (2011).

[27] Frondizi et al., "The Evaluation of Universities' Third Mission."

[28] King, "The Contemporary University."

[29] King "The Contemporary University."

[30] Bo Göransson and Claes Brundenius, eds., *Universities in Transition: The Changing Role and Challenges for Academic Institutions* (New York: Springer, 2011), 3-10.

economy. Therefore, universities, one of the knowledge-intensive institutions, have become centers of economic development.[31] The evolution of the global, digital, and knowledge-based economies of the 21st century has also affected higher education institutions.[32] In the 21st century, higher education institutions and systems have to face issues such as increasing student numbers, demographic change, accountability requirements, reconsidering the social and economic roles played by higher education, and the effect of new technologies.[33] As a result of all these changes faced by higher education institutions, higher education institutions need to focus on the mission of creating different learning environments that will meet the different needs of students to ensure inclusiveness. In addition, it has become a necessity to strengthen e-learning and technology-based learning opportunities in facilitating the access of individuals with exceptional characteristics to educational resources in order to prevent disadvantages in accessing higher education and to ensure equality in education.[34]

According to Wissema, the aforementioned new situations cause new and urgent demands from higher education institutions in order to ensure adaptation to the changing needs of the society and the economy. As a result of the radical changes of the learning-teaching process by digital technologies and the internet, it has become mandatory for universities to develop new models and strategies in order to survive in the 21st century. The search for alternative financing, which is due to the fact that the costs of scientific research using advanced technology exceed the budgets that governments can provide, is one of the primary causes that lead universities to adopt new models and strategies. For that, the universities seek cooperation with technology-oriented enterprises. In addition, the globalization created many opportunities, and the increasing opportunity for students to study abroad pushes universities to compete to attract the best students.[35]

Many internal and external factors such as the adoption of universities as an incubation center for science or technology-based commercial activities

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[31] Organization for Economic Co-operation and Development, *Transition to Learning Economies and Societies* (Paris: OECD, 1996).

[32] Agyei Fosu, "Readiness of Universities for the 21st Century digital economies: A look at selected lecturers from Universities in Buffalo City Metropolitan in Eastern Cape Province South Africa," *International Journal of Community Development and Management Studies* 3 (2019).

[33] Altbach and Davis, "Global Challenge and National Response."

[34] Asu Altunoğlu, "Yükseköğretimde Kapsayıcılığın Uygulanabilirliği Üzerine Bir Tartışma [Applicability of Inclusiveness in Higher Education]," *OPUS Uluslararası Toplum Araştırmaları Dergisi* 16, no: 27, (2020): 679.

[35] Wissema, *Towards the Third Generation University*.

and the boom of interdisciplinary research have necessitated changes as well.[36] One of the new structures emerging in this process is the third-generation universities. The character of third-generation university is different from first- and second-generation universities. Unlike the medieval university and Humboldt University, there is a network structure dominated by perfection instead of hierarchical structure in the third-generation university.[37] According to Lukovics and Zuti, experts are trained in first-generation universities, specialists and scientists in second-generation universities, and specialists, scientists, and entrepreneurs in third-generation universities.[38]

In regions with different competitive potential, it is inevitable for universities to have different roles in order to increase their competitiveness.[39] Accordingly, it is possible to see the structuring of fourth-generation universities that have prioritized regional involvement in recent years. Fourth-generation universities are generally accepted as universities that emphasize local/regional involvement. According to Lukovics and Zuti, fourth-generation universities aim at competitiveness and try to ensure broad participation through local communities. In order to achieve this, it creates and implements an innovation ecosystem. Fourth-generation universities, which are based on third-generation universities and the concepts of university-based development and local development through universities, are considered to be the pioneers of the realization of regional development.[40] Erdem emphasized that the main characteristics of fourth-generation universities are their "thematic" and "transformative" nature. According to Erdem, fourth-generation universities have specific focuses, and therefore, exhibit thematic features, and they use their functions to transform society as a result of transferring the knowledge they have obtained in their fields of activity into practice.[41] Finally, fifth-generation universities, where knowledge-based innovative systems have become dominant due to the

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[36] Wissema, *Towards the Third Generation University*.

[37] Rudy Rabbinge and Maja Slingerland, "Change in Knowledge Infrastructure: The Third Generation University," in *Transitions Towards Sustainable Agriculture and Food Chains in Peri-Urban Areas*, eds. Krijin J. Poppe, Catherine Termeer, and Maja Slingerland (Netherlands: Wageningen Academic Publishers, 2009).

[38] Miklós Lukovics and Bence Zuti, "Successful Universities Towards the Improvement of Regional Competitiveness: 'Fourth Generation' Universities," (presentation, European Regional Science Association (ERSA) 53th Congress, Regional Integration: Europe, the Mediterranean and the World Economy, Palermo, Italy, August 2013).

[39] Lukovics and Zuti, "Successful Universities."

[40] Lukovics and Zuti, "Successful Universities."

[41] Erdem, "Üniversite Anlayışındaki Değişim."

interaction with environment,[42] are creating a new wind of change in higher education systems. "The fourth and the fifth trends concern the need for changes in university management, as multidisciplinary research teams and faculties increase the overall complexity and a huge increase in the number of students has led to bureaucracy."[43]

The fact that universities with mission differentiation have a teaching-oriented mission causes them to be considered in the category of first-generation universities. And also, they can be included in the second-generation university category in terms of serving the generation of scientific knowledge, and in the third-generation university category in terms of their potential to transform the knowledge into commercial products by considering institutional and social benefits. They are similar to fourth-generation universities in terms of providing service to the community and emphasizing regional involvement. However, the fact that they do not have a thematic structure suitable for their field of expertise, have similar education programs with universities without mission differentiation, and do not have a dominant knowledge economy-based innovation potential prevents them from being an absolute fifth- or even fourth- generation. Therefore, it can be understood that universities with mission differentiation necessitates a different university structure. Hence, they should be evaluated and defined in a separate category.

II.1. *The case of Turkiye*

Turkish higher education system has gained its current structure with the university reform in 1933. With the establishment of the Council of Higher Education (YÖK) in 1981, a restructuring process in academic, institutional and administrative aspects of higher education was started. Today, all the planning for higher education, especially strategic planning for higher education, coordination between universities and ensuring quality assurance are carried out by YÖK. The higher education system in Turkiye has a three-stage structure that provides education at associate, undergraduate and graduate levels based on secondary education. As of 2021-2022, there are

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[42] Joanna Morawska-Jancelewicz, "The Role of Universities in Social Innovation Within Quadruple/Quintuple Helix Model: Practical Implications from Polish Experience," *Journal of the Knowledge Economy* 13, (2022).

[43] Paula Kyrö and Johanna Mattila, "Towards Future University by Integrating Entrepreneurial and the 3rd Generation University Concept," (presentation, 17th Nordic Conference on Small Business Research, Helsinki, Finland, May 2012), 4, accessed July 27, 2022, http://pyk2.aalto.fi/ncsb2012/Kyro.pdf.

131 state universities and 78 foundation universities in Turkiye. In addition, there are 3,114,623 associate degree students, 4,676,657 undergraduate students and 449,717 postgraduate students registered in the higher education system. The total number of faculty members in higher education is 184,619.[44] Accountability, accreditation, internationalization, quality assurance, increasing quantity and quality come to the fore among the current trends and problems of the Turkish Higher Education system.[45]

III. Methodology

This study, adopted the qualitative research approach was carried out using the document analysis method. The main purposes of document analysis are the examination and interpretation of data in order to have a sense or understanding of an issue and develop empirical knowledge.[46] In this research, the strategic objectives and goals of the universities included in the scope of the research were analyzed and interpreted in detail through document analysis.

III.1. Study group

The criterion sampling method was adopted for determining the universities to be included in the scope of the research. In line with two different criteria adopted, two different study groups were formed in the research. In the first study group of the research, it was aimed to include universities with mission differentiation and specialization. Therefore, ten universities involved in the Mission Differentiation and Specialization on the Basis of Regional Development project were included in the first study group. Since ten universities were involved in the mission differentiation project at the time the research was conducted, the strategic plans of the mentioned ten universities were included in the scope of the research.

In the second study group, it was aimed to include the most well-established universities in different geographical regions of Turkiye. Since the aim of the research is to compare universities with mission differentiation

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[44] Higher Education Information Management System, "2020-2021 Higher Education Statistics," accessed July 24, 2022, https://istatistik.yok.gov.tr/.

[45] Gökhan Çetinsaya, "Büyüme, Kalite, Uluslararasılaşma: Türkiye Yükseköğretimi İçin bir Yol Haritası [Growth, Quality, Internationalization: A Roadmap for Higher Education in Turkey]," *Yükseköğretim Kurulu Raporu,* (2014).

[46] Juliet Corbin and Anselm Strauss, *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory,* 3rd ed. (Thousand Oaks, CA: Sage, 2008).

and well-established universities, the regional distribution of the universities examined should be similar. For the inclusion process of the second study group, the following criteria were taken into consideration: If there is more than one university with mission differentiation in a geographical region, the same number of well-established universities for that region will be included in the research. Thus, it was determined how many well-established universities from each region would be examined in the research. In addition, if there is more than one well-established university in a region, the university with more programs was preferred for the study. Thus, it was determined which universities to choose from a geographical region. Since there is no university with mission differentiation in the Marmara Region, the well-established universities in the Marmara Region were not included in the scope of the research. As a result, a total of 20 universities, 10 with mission differentiation and specialization, and 10 with well-established background, were included in the study group. Information about the universities in the study groups is presented in Table 1.

It was deemed appropriate to examine the same number of documents for the universities in both groups to ensure that the richness of the documents examined regarding the universities with mission differentiation and well-established universities is similar in terms of scope. Corbetta stated that the researcher can decide the sample size himself in the document analysis.[47] The number of documents examined during the comparison process in the analyzes allowed a comprehensive comparison.

Table 1

Information on study group universities

Region	University with Mission Differentiation		Well-established University
	University	Specialization	University
Central Anatolia	Ahi Evran University	Agriculture and Geothermal Energy	Ankara University (1946)
	Aksaray University	Sports and Health	Gazi University (1926)
Aegean Region	Uşak University	Textile, Leather and Ceramics	Ege University (1955)

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[47] Piergiorgio Corbetta, *Social Research: Theory, Methods and Techniques* (Thousand Oaks: Sage, 2003).

Region	University with Mission Differentiation		Well-established University
	University	Specialization	University
Mediterranean Region	Mehmet Akif University	Animal Husbandry	Çukurova University (1973)
Southeast Anatolia Region	Siirt University	Agriculture and Animal Husbandry	Dicle University (1973)
Blacksea Region	Düzce University	Health and Environment Technologies	Samsun 19 Mayıs University (1975)
	Kastamonu University	Forestry and Nature Tourism	Karadeniz Technical University (1955)
	Recep Tayyip Erdoğan University	Tea Cultivation	Abant İzzet Baysal University (1992)
Eastern Anatolia Region	Muş Alparslan University	Animal Husbandry	Erzurum Atatürk University (1957)
	Bingöl University	Agriculture and Basin-Oriented Development	İnönü University (1975)

III.2. *Data collection*

"Almost all possible sources of information, data and ideas in policy-oriented research are divided in two groups as the 'documents' and the 'people'."[48] Accordingly, the data of this research, which was structured within the scope of higher education policies, were collected via document analysis method. "Document analysis is a research method for rigorously and systematically analyzing the contents of written documents."[49] Corbetta evaluates documents in two groups as personal and institutional documents.[50] The documents analyzed in this study are included in the institutional

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[48] Eugene Bardach and Eric M. Patashnik. *A Practical Guide for Policy Analysis: The Eightfold Path to More Effective Problem Solving*, 3rd ed. (Washington, DC: CQ Press, 2009), 6.

[49] Elise Wach and Richard Ward, "Learning about Qualitative Document Analysis," *Institute of Development Studies, Practice Paper in Brief* 13, (2013): 1.

[50] Corbetta, *Social Research: Theory, Methods and Techniques*.

document category. In the research, the institutional strategic plans of 10 universities with mission differentiation and 10 well-established universities were analyzed in this regard. The strategic plans, which were examined through document analysis, were accessed through the official websites of the universities. Since the documents used in the research are available for public use and accountability in the official websites of the universities, there is no need for ethical approval regarding the conduct of the research.

III.3. *Data analysis*

The data obtained from the documents were analyzed through content analysis process. Content analysis is "the process of categorizing and organizing information about the research questions."[51] Bowen recommends first quickly eye-scanning the documents in order to get a general perspective, then reading the documents in detail to determine the relevant analysis categories and interpreting the whole at the last stage. Accordingly, it can be said that document analysis consists of scanning (superficial review), reading (comprehensive review) and interpretation stages.[52] In the research, first of all, the strategic plans of the universities included in the scope of the research were examined in this regard. Afterwards, through detailed readings (comprehensive analysis), content analysis was performed to determine the analysis categories and patterns in the data sets. Then, the interpretation stage was carried out in line with the patterns in the data sets.

In the content analysis, the themes were selected in line with the strategic objectives of the universities. In line with the strategic objectives of the universities of both study groups, the themes of "increasing quality in education", "increasing the quantity and quality of scientific research", "improvement of communication and interaction with stakeholders", "strengthening of corporate identity / structure / ensuring institutionalization" and "internationalization" were determined as the common themes. Besides these common themes, the strategic objectives of the universities subject to mission differentiation are analyzed in terms of leading local and regional development, while the strategic objectives of the well-established universities are analyzed in terms of strengthening community service efforts. After these themes were determined as the representing themes of the strategic objectives of the universities, the goals related to the strategic

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[51] Glenn A. Bowen, "Document Analysis As a Qualitative Research Method," *Qualitative Research Journal* 9, no. 2 (2009): 32.

[52] Bowen, "Document Analysis," 32.

objectives and the performance indicators demonstrating the achievement level of these goals were analyzed at the conceptual level.

For the determination of the themes, coding was performed at both the paragraph and sentence level. In the coding at the sentence level, the strategic objectives directly stated in the strategic plans were coded. In the coding at the paragraph level, the strategic objectives represented by the relevant paragraphs were revealed and coded. During the analysis of goals and performance indicators, coding was performed at the level of sentences and words. Therefore, comprehensive summarization and interpretation could not be carried out for the coding of goals and performance indicators, unlike strategic objectives.

The coding process was carried out in line with the approach, a shortened example of which is presented below:

The strategic plan of Gazi University includes the objective of "increasing the quality of education and training, and expanding internationalization and accreditation." This objective was evaluated at the sentence level in the analysis and coded under the themes of both "increasing the quality of education" and "ensuring internationalization." One of the goals related to this objective is "to increase the use of laboratories and social areas and the use of current technology by students by reducing the number of students per faculty member by at least 15%." This goal was coded as "improving education and training infrastructure" in the conceptual coding. While performance indicators related to goals were coded at the conceptual level, it was also coded as "the number of associate/undergraduate students per faculty member" and "the number of graduate students per faculty member."

III.4. Reliability

In order to demonstrate how reliability is achieved in qualitative research, Hickey and Kipping recommend providing an explanation of how concepts or categories are constructed.[53] Accordingly, in this research, the data analysis process is explained in detail in order to ensure reliability of the research. In order to ensure external reliability of the research, the research processes were reported transparently, and data sources were clearly stated as references.[54] In addition, in the methodology section, data collection tools, data collection process and how the data were analyzed were explained in detail. As

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[53] Gary Hickey and Cheryl Kipping, "A Multi-Stage Approach to the Coding of Data from Open-Ended Questions," *Nurse Researcher* 4 (1996).

[54] Lynne M. Connelly, "Trustworthiness in Qualitative Research," *Medsurg Nursing* 25, no. 6 (2016).

recommended by Guba and Lincoln, more than one examiner was involved in the efforts in data collection, analysis, and interpretation stages. The researchers' areas of expertise are educational administration/education policy and higher education. Thus, regular discussions were held about the consistency of the research processes, the process stages were compared, and the consistency of the approach and interpretations in the analysis process was ensured in this regard.[55]

IV. Results

The findings of the study are presented depending on the themes included in Table 2 for the universities in both groups.

Table 2

Summary table of research findings

Group	Themes
Strategic Objectives of Universities with Mission Differentiation	• Leading local and regional development • Increasing quality in education • Strengthening of corporate identity / structure • Increasing the quantity and quality of scientific research • Improvement of communication with stakeholders • Ensuring internationalization
Strategic Objectives of Well-Established Universities	• Increasing quality in education • Increasing the quantity and quality of scientific research • Strengthening community service efforts • Ensuring institutionalization • Improvement of communication with stakeholders • Ensuring internationalization

IV.1. *Strategic objectives of universities with mission differentiation on the basis of regional development*

IV.1.1. Leading local and regional development

The universities with mission differentiation on the basis of regional development focuses on the following goals in line with the strategic objective of leading local and regional development:

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[55] Egon G. Guba and Yvonna S. Lincoln, "Competing Paradigms in Qualitative Research," in *Handbook of Qualitative Research,* eds. Norman K. Denzin and Yvonna S. Lincoln (Thousand Oaks, CA: Sage, 1994).

- Developing projects
- Starting programs to train the qualified human resources required by the region
- Organizing activities to promote the natural, historical, and cultural values of the region
- Strengthening cooperation with local and regional institutions and organizations
- Organizing trainings and conducting R&D studies in line with the field of specialization
- Increasing scientific information generation capacity in line with the development-oriented mission
- Diversifying the number of undergraduate and graduate programs in line with the development-oriented mission

The performance indicators reflecting the achievement status of the university goals within the scope of the strategic objective of leading local and regional development are as follows: The number of projects in line with the development-oriented mission, the number of indexed articles published on the specialization field, the number of faculty members, the number of books published on the specialization field, the number of departments and programs opened/started, the sectoral satisfaction rates regarding the programs, the employment rate of new program graduates in organizations/enterprises in the region.

IV.1.2. Increasing quality in education

The universities with mission differentiation on the basis of regional development set goals for the following areas in line with the strategic objective of increasing the quality in education:

- Carrying out accreditation efforts
- Being a standing-out university for successful students and qualified lecturers
- By becoming a more desirable university, increasing the points required for students to apply the university
- Carrying out activities for the promotion of the university
- Improving education and training infrastructure
- Disseminating e-learning system
- Updating the curriculum
- Improving the effectiveness of undergraduate transfer process as well as minor and double major programs

- Improving the effectiveness of applied training programs
- Increasing the number of activities that will positively affect the interest and motivation of the students
- Increasing the number of lifelong learning opportunities

The performance indicators reflecting the achievement status of the goals of the universities in line with the strategic objective of increasing quality in education are as follows: The number of students benefiting from exchange programs, the number of faculty members benefiting from exchange programs, the number of administrative personnel benefiting from exchange programs, the number of associate/undergraduate students, the number of graduate students, the number of associate/undergraduate students per faculty member, the number of graduate students per faculty member, the number of congresses in which students participate with oral and/or poster presentations, the number of departments/programs included in the cooperative education project, the number of students benefiting from cooperative education, the increase in the number of students taking part in national and international projects, the number of accredited programs.

IV.1.3. Strengthening of corporate identity / structure

The universities with mission differentiation on the basis of regional development set goals for the following areas in line with the strategic objective of strengthening of corporate identity/structure:

- Strengthening the physical and administrative infrastructure
- Strengthening the IT infrastructure
- Strengthening library services infrastructure
- Strengthening the quality assurance system
- Strengthening the sense of corporate belonging
- Increasing the lodging/accommodation capacity
- Making environmental arrangements for the persons with disabilities
- Institutionalization

The performance indicators reflecting the achievement status of the goals of the universities in line with the strategic objective of strengthening of corporate identity/structure are as follows: The completion rate of documentation processes, the rate of adoption of the rules determined in the corporate identity guide, the rate of the number of operations that can be performed online, the number of managers trained, the establishment of the internal management system, creation of a corporate identity guide, increasing the number of automation, strengthening wireless access, increasing the

number of books per student, the number of units with at least one social media account.

IV.1.4. Increasing the quantity and quality of scientific research

The universities with mission differentiation on the basis of regional development set goals for the following areas in line with the strategic objective of increasing the quantity and quality of scientific research:

- Strengthening graduate education programs
- Encouraging participation in scientific activities
- Increasing university-industry cooperation
- Hosting scientific events
- Increasing the number of projects carried out with the support of institutions such as the EU (European Union), TÜBİTAK (Scientific and Technological Research Council of Turkiye), the organization that supports academic and industrial research and development studies and innovations, BAP (Scientific Research Projects), Development Agency, etc.
- Organizing project trainings for personnel
- Supporting academic staff for scientific research processes
- Providing translation and corrected reading support to faculty members
- Providing academic consultancy services for scientific publication
- Increasing the number of licensed software programs used in research activities
- Establishing a foreign language translation and revision office
- Encouraging graduate students to participate in scientific activities
- Ensuring that university journals are included in international indexes

The performance indicators reflecting the achievement status of the goals of the universities in line with the strategic objective of increasing the quantity and quality of scientific research are as follows: The number of students graduating from graduate education programs, the number of national articles, the number of international articles, the number of academic journals published in the university, the number of faculty members benefiting from academic incentives, the number of new laboratories and centers established.

IV.1.5. Improvement of communication with stakeholders

The universities with mission differentiation on the basis of regional development set goals for the following areas in line with the strategic objective of improvement of communication with stakeholders:

- Ensuring active operation of application and research centers
- Ensuring students benefit from internships in public institutions and organizations
- Providing additional resources by receiving grants within the scope of public projects
- Prioritizing artistic and cultural activities
- Organizing events for individuals with special needs
- Organizing social responsibility projects
- Developing cooperation with non-governmental organizations
- Encouraging student clubs/societies for social responsibility projects

The performance indicators reflecting the achievement status of the goals of the universities in line with the strategic objective of improvement of communication and interaction with the stakeholders are as follows: The number of cooperation areas and protocols, the number of activities aimed at increasing efficiency in energy use, the number of projects carried out on nature, environmental pollution and recycling, the number of books in the central library, the number of social, cultural and sports activities organized for the students.

IV.1.6. Ensuring internationalization

The universities with mission differentiation on the basis of regional development set goals for the following areas in line with the strategic objective of ensuring internationalization:

- Signing bilateral agreements with universities in the member countries of exchange programs
- Initiating joint international graduate education programs
- Increasing the number of international students and faculty members
- Organizing informative meetings on exchange programs for students and academic staff

The performance indicators reflecting the achievement status of the goals of the universities in line with the strategic objective of ensuring internationalization are as follows: The number of students coming from abroad within the scope of the exchange program, the number of students going abroad within the scope of the exchange program, the number of faculty members coming from abroad within the scope of the exchange program, the number of faculty members going abroad within the scope of the exchange program, the number of foreign graduate program students.

IV.2. *Strategic objectives of well-established universities*

IV.2.1. Increasing quality in education

The well-established universities set the following goals in line with the strategic objective of increasing quality in education:

- Ensuring accreditation for undergraduate and graduate programs
- Updating education programs
- Increasing the number of double major and minor programs
- Improving library facilities
- Reducing the number of students per faculty member
- Encouraging the initiation of interdisciplinary master's and doctoral programs
- Improving support for faculty members
- Improving the physical and technological infrastructure of academic units
- Improvement of education-teaching environment and working environment

The performance indicators reflecting the achievement status of the goals determined by the well-established universities within the scope of the strategic objective of increasing quality in education are as follows: The number of accredited education programs (national), the number of students benefiting from lifelong learning programs through e-learning, the number of interdisciplinary graduate programs initiated, the number of students who qualify to study at the university by being in the first 5% tranche in the Higher Education Exam (YKS).

IV.2.2. Increasing the quantity and quality of scientific research

The well-established universities set the following goals in line with the strategic objective of increasing the quantity and quality of scientific research:

- Increasing the number of publications and citations for journals scanned in international indexes
- Improving academic publication incentives
- Providing academic publication support to graduate students
- Hosting national and international scientific events
- Increasing the number of projects supported by external resources (TÜBİTAK, EU Programs, etc.)
- Increasing the number of BAP-Supported projects

The performance indicators reflecting the achievement status of the goals determined by the well-established universities within the scope of the strategic objective of increasing the quantity and quality of scientific research are as follows: the number of projects supported by domestic resources (BAP), the total annual expenditure amount of domestic resource supported BAP projects, the annual total expenditure amount of projects with external support (Ministry of Development, EU, SAN-TEZ, TÜBİTAK, etc.), the number of research laboratories with improved infrastructure, the number of projects per faculty member, the number of faculty members trained in scientific research methods, the rate of publication of doctoral and master's theses (%).

IV.2.3. Strengthening community service efforts

The well-established universities set the following goals in line with the strategic objective of strengthening community service efforts:

- Organizing conferences, workshops, and seminars
- Increasing cooperation with non-governmental organizations
- Conducting expertise and consultancy activities
- Increasing the quality of healthcare services
- Conducting awareness projects
- Organizing events for people with disabilities
- Strengthening social unity with cultural and sports activities
- Being sensitive to social demands
- Increasing the production capacity of the units engaged in production
- Increasing the number of sports events
- Increasing the number of artistic and cultural activities
- Increasing the capacity of the university in terms of access to sports facilities/events for the benefit of the people of the region

The performance indicators reflecting the achievement status of the goals determined by the well-established universities within the scope of the strategic objective of strengthening community service efforts are as follows: The number of training/certification programs initiated by various academic units, the number of national and international sports, cultural and artistic activities held at the university, the number of social responsibility projects.

IV.2.4. Ensuring institutionalization

The well-established universities set the following goals in line with the strategic objective of ensuring institutionalization:

- Ensuring satisfaction for the students and the personnel
- Communication with alumni
- Organizing in-service training for academic staff
- Establishing a university-owned media organ to increase the recognition of the university
- Creating corporate/official accounts in social media networks

The performance indicators reflecting the achievement status of the goals determined by the well-established universities within the scope of the strategic objective of ensuring institutionalization: The number of events held for alumni, the number of personnel participating in in-service training, the job satisfaction rate of the academic staff (%), the level of belonging for students (%).

IV.2.5. Improvement of communication with stakeholders

The well-established universities set the following goals in line with the strategic objective of improvement of communication with stakeholders:

- Strengthening communication with stakeholders that provide internship opportunities
- Improving the patent process
- Establishing a career development center
- Improving cooperation with national and international organizations to strengthen cooperation among university-public sector-private sector
- Increasing the effectiveness of the continuing education center in order to strengthen the cooperation with non-governmental organizations (NGOs) and to expand the phenomenon of serving the public

The performance indicators reflecting the achievement status of the goals determined by the well-established universities within the scope of the strategic objective of improvement of communication with stakeholders: The number of projects carried out in cooperation with universities, public sector, private sector, and international organizations, the number of meetings held for social information purposes, the number of social responsibility projects carried out.

IV.2.6. Ensuring internationalization

The well-established universities set the following goals in line with the strategic objective of ensuring internationalization:

- Increasing the number of foreign students and faculty members

- Initiating dual degree programs
- Initiating programs providing education in a foreign language
- Strengthening international exchange programs
- Increasing the number of students and faculty members benefiting from the exchange program
- Ensuring full participation in the programs initiated within the scope of ERASMUS programs

The performance indicators reflecting the achievement status of the goals determined by the well-established universities within the scope of the strategic objective of ensuring internationalization: The number of academic staff involved in externally funded projects, the number of academic staff with foreign master's and/or doctorate degrees, the number of international databases that can be accessed at the library.

V. Discussion and conclusion

This study has tried to explain how mission differentiation can be achieved by comparing the strategic objectives of universities with mission differentiation and well-established universities in the Turkish higher education system. Although this study was conducted in the context of the Turkish higher education system, the results of the study point out the factors and deficiencies required for mission differentiation and specialization in universities. Therefore, the results also offer practical implications for higher education systems aiming at mission differentiation for universities.

In this study, it is concluded that universities with mission differentiation and well-established universities in Turkiye fulfill similar functions in terms of strategic objectives, goals, and performance indicators. Both universities with mission differentiation and well-established universities have given importance to quality in education, scientific research, internationalization, institutionalization and cooperation with stakeholders within the scope of their strategic objectives. Apart from these common strategic objectives, universities with mission differentiation have the objective of "leading local and regional development" and well-established universities have the objective of "strengthening community service efforts." However, although it can be perceived as different areas due to their name, these two strategic objectives also have common features in terms of goals and performance indicators. As a result, although the universities with mission differentiation and well-established universities differ in terms of quality, they actually seem to have very similar objectives. Therefore, in structuring universities with a specific mission and expertise in a higher education system, it may be

useful to consider the objectives of well-established universities as a reference for comparison.

The new trends observed in higher education indicate that the economies of industrialized countries have become more knowledge-based, and universities have become the main driving force of regional economic development.[56] As stated by Gibbons, the central role attributed to Stanford University in the development of Silicon Valley has contributed to the widespread perception that universities can act as "innovation engines" generating new ideas to stimulate the creation of commercial products.[57] The main responsibility of universities in achieving this mission successfully is to train highly qualified human resources. Depending on the educational services of universities, highly qualified graduates are attending in the labor market and local workforce can easily engage in new initiatives with newly acquired skills and abilities. According to Lengyel, therefore, with the qualified workforce trained in higher education institutions, the interest of businesses from outside the region can increase and the attractiveness for entrepreneurship increases as well.[58] The universities need clearly defined strategies, international and local competitiveness, income generation opportunities, human resources, education quality and research infrastructure, and cooperation with other institutions and organizations in order to develop locally and create and maintain a global presence.[59] The strategic objectives of the universities with mission differentiation in Turkiye are generally focused on developing projects to contribute to local and regional development in line with the development mission, opening a program to train qualified human resources needed by the region, organizing activities to promote the natural, historical and cultural values of the region, and strengthening

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[56] Michaela Trippl, Tanja Sinozic, and Helen Lawton Smith, "The Role of Universities in Regional Development: Conceptual Models and Policy Institutions in the UK, Sweden and Austria," *European Planning Studies* 23, no. 9 (2015).

[57] James F. Gibbons, "The Role of Stanford University: A Dean's Reflections," in *The Silicon Valley Edge: A Habitat for Innovation and Entrepreneurship*, eds. Chong-Moon Lee, William F. Miller, Marguerite Gong Hancock, and Henry S. Rowen (Stanford, CA: Stanford University Press, 2000), 200-217, quoted in Wolfe David A., "The Role of Universities in Regional Development and Cluster Formation," in *Creating Knowledge, Strengthening Nations: The Changing Role of Higher Education*, eds. Glen A. Jones, Patricia McCarney, and Michael L. Skolnik (Toronto: University of Toronto Press, 2016), 167.

[58] Imre Lengyel, "Távolság versus közelség" dilemma az ipari-egyetemi kapcsolatokon alapuló tudásalapú helyi gazdaságfejlesztésben. In A gazdasági környezet és a vállalati stratégiák. A IX. Ipar- és vállalatgazdasági konferencia előadásai, Szeged, 2008, 551-562, quoted in Lukovics and Zuti, "Successful Universities."

[59] Lukovics and Zuti, "Successful Universities."

cooperation with local and regional institutions and organizations. In addition, the performance indicators related to the achievement status of the strategic objectives of the universities that are considered within the scope of mission differentiation are generally expressed in terms of quantitative and theoretical outputs. Practical goals, especially concrete goals for strengthening cooperation with local and regional institutions and organizations, are of secondary importance. However, in order for higher education systems to create a structure conducive to mission differentiation, universities need to determine qualitative criteria for their strategic objectives. In this respect, it is predicted that universities with mission differentiation in Turkiye can generally contribute to local and regional development in academic and political fields. However, universities should focus on cooperation with regional institutions and organizations in order to encourage innovation, entrepreneurship and competition based on qualitative performance indicators and thus to produce concrete economic and social outputs. In this way, the production of projects that will provide mission differentiation can be realized in higher education systems.

According to the results, strengthening community service efforts is among the strategic objectives of the well-established universities, but it is not included in the strategic objectives of the universities with mission differentiation. Since the objective of universities with mission differentiation to lead local and regional development includes community service efforts, there may not have been a separate and specific strategic objective in this regard. Concepts of globalization, networking, better relations with the society, the development of the service sector and the knowledge-based economic structure have been effective in this mission of universities to be included in their agenda.[60] Community service efforts will contribute to the development of the regional capacity and prestige of the university.[61,62] Therefore, goals such as increasing cooperation with non-governmental organizations, conducting expertise and consultancy activities, and increasing the quality of healthcare services determined by well-established universities in line with the strategic objective of strengthening community service efforts will also contribute to the development

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[60] John Goddard, *Higher Education and Regions: Globally Competitive, Locally Engaged* (Paris: Organisation for Economic Cooperation and Development (OECD), 2007).

[61] Paul Chatterton and John Goddard, "The Response of Higher Education Institutions to Regional Needs," *European Journal of Education* 35, no. 4 (2000): 475-497.

[62] Peter Vaessen and Martin Van Der Velde, "University Knowledge Transfer Through Social and Professional Embeddedness: A Case Study," in *Economic Geography of Higher Education: Knowledge Infrastructure and Learning Regions*, eds. Roel Rutten, Frans Boekema, and Elsa Kuijpers (London: Routledge, 2003), 87-109.

of the region. In addition, as in Turkiye, the establishment of children's universities affiliated to universities can be considered within the scope of community service activities in terms of ensuring equality in access to education and supporting children's participation in social life. As a result, there is a need to clearly define what universities with mission differentiation can do within the scope of community service activities. In general, for a more functional structuring of a higher education system, universities with mission differentiation should define in what ways they differ from universities without mission differentiation in terms of community service activities. Universities should be able to make definitions on these issues in line with a general framework prepared by the governmental bodies responsible for higher education.

Increasing the quality of education in general is among the strategic priorities of the universities in both groups included in the study. Universities have prioritized accreditation in order to increase the quality of their education and training programs. One of the main goals of the reforms that started with the Bologna Process is to increase the quality of education.[63] Accreditation processes have been initiated in order to increase the quality of education and research and to ensure quality accountability.[64] By the European Association for Quality Assurance in Higher Education (ENQA), increasing the quality of education has been associated with the competencies of the academic staff of the universities.[65] In this study, the goal of the universities of which the strategic objectives are examined is to increase the competencies of academic staff by increasing the support provided to the faculty members based on the objective of increasing the quality of education. In line with the Bologna Process, the quality of education is among the issues that universities with or without mission differentiation should primarily focus on. However, universities with mission differentiation are expected to set more specific objectives on how to increase the quality of education in the field they specialize in. In higher education systems aiming at mission differentiation, universities should determine more specific activities and

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[63] Barica Marentič Požarnik, "Improving the Quality of Teaching and Learning in Higher Education Through Supporting Professional Development of Teaching Staff," *Napredak* 150, no. 34 (2009): 341- 359.

[64] Council for Higher Education Accreditation (US), *Recognition of Accrediting Organizations: Policy and Procedures* (Washington: Council for Higher Education Accreditation, 2006), accessed August 12, 2021, https://www.chea.org/sites/default/files/other-content/Recognition-Policy-2006.pdf.

[65] Thune Christian, *Standards and Guidelines for Quality Assurance in the European Higher Education Area* (Helsinki: European Association for Quality Assurance in Higher Education, 2005).

performance indicators to ensure the development of academic staff, especially in the area of specialization they focus on.

The results of the study show that improving the quantity and quality of scientific research is another common strategic objective adopted by the universities in both groups. In the 11th Development Plan of Turkiye, policies and measures aimed at achieving this strategic objective have been adopted. Many policies included in the 11th Development Plan, prepared by the Presidency of Strategy and Budget,[66] such as "The budget resources allocated for strengthening the R&D infrastructures of universities and developing scientific research projects in terms of quantity and quality will be increased"; "a policy document regarding scientific research projects will be prepared, project monitoring mechanisms and new performance-based methods for resource allocation will be developed"; "qualified researchers carrying out high-level scientific and technological studies abroad will be supported to come to Turkiye and train researchers within the scope of the International Fellowship for Outstanding Researchers Program" support the improvement in both quantity and quality of scientific research. However, it should be noted that scientific research in different disciplines cannot be increased by employing the same methods. Universities specializing in a particular field need to determine more specific measures to increase scientific studies in their fields of expertise. Otherwise, it may not be possible to observe the difference in mission between universities in practice.

According to the results, another common strategic objective focused on by universities in both groups is to strengthen communication with stakeholders. Universities' communication with stakeholders affects many processes related to the strategic objectives of universities and the quality of education.[67] Therefore, it is important for universities to receive feedback from stakeholders in the goal setting process. Universities of which strategic plans were examined in this study set goals for internal and external stakeholders in order to strengthen institutional performance. Szwajkowski states that demands, needs and capacities of stakeholders should be taken into account in relations with stakeholders.[68] Burrows emphasizes the importance of stakeholder analysis for

[66] Presidency of the Republic of Turkey Strategy and Budget Presidency, *11. Kalkınma Planı [The 11th Development Plan] (2019-2023)* (Ankara: Strateji ve Bütçe Başkanlığı, 2019), 100-101, accessed July 27, 2022, https://www.sbb.gov.tr/wp-content/uploads/2022/07/On_Birinci_Kalkinma_Plani-2019-2023.pdf.
[67] Juha Kettunen, "Stakeholder Relationships in Higher Education," *Tertiary Education and Management* 21, no. 1 (2015): 56-65.
[68] Eugene Szwajkowski, "Simplifying the Principles or Stakeholder Management: The Three Most Important Principles," *Business & Society* 39, no. 4 (2000): 379–396.

higher education institutions as an institutional survival strategy.[69] Similarly, Harvey states that the demands of the labor market should be considered by higher education institutions.[70] On the other hand, Simmons states that the performance of higher education institutions is related to their capacity to respond to the needs of stakeholders associated with the institution.[71] Therefore, the universities examined in this study aim to increase their institutional performance by prioritizing the opinions of internal and external stakeholders. This aim, of course, has a rational basis for every university. However, in order for the differentiation of mission in the higher education system to serve regional development, universities should make a systematic planning especially for determining external stakeholders and conducting cooperation with them. Therefore, it is expected that the strategic objectives of universities with mission differentiation will be structured more strongly in this direction.

Strengthening the corporate identity or ensuring institutionalization are among the strategic objectives of the universities in both groups included in the study. For these objectives, universities focus on issues that will contribute to their brand values, such as establishing a university-owned media organ in order to increase the recognition of the university, creating corporate/official accounts in social media networks, and ensuring student and personnel satisfaction. In this respect, strengthening the corporate identity is evaluated by universities in the context of branding. Gray, Fam, and Llanes examine universities under the following themes based on their prominent features in the branding process: learning environment (faculty members, physical conditions, research resources), reputation/acknowledgment (brand name, achievements, and high educational standards), career opportunities for graduated students (employment status of graduates, expected income levels, perception of the markets/sectors towards graduated students), regional image (political stability, security, and hospitality of the country where the university is located), cultural tolerance (religious freedom and cultural diversity).[72] On the other hand, Bennett and Ali-Choudhury evaluate the

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[69] Joanne Burrows, "Going beyond labels: A Framework for Profiling Institutional Stakeholders," *Contemporary Education* 70, no. 4 (1999): 5–10.

[70] Lee Harvey, "Employability: Developing the Relationship Between Higher Education and Employment," (opening presentation, the Fifth Quality in Higher Education 24-Hour Seminar, Warwick University, October 1999), accessed August 12, 2021, http://qualityresearchinternational.com/esecttools/relatedpubs/Employability5thQHE.pdf.

[71] John Simmons, "Reconciling Effectiveness and Equity in Performance Management: A Stakeholder Synthesis Approach to Organizational Systems Design," *Systemic and Action Research* 16, no. 5 (2003): 355–365.

[72] Brendan J. Gray, Kim Shyan Fam, and Violeta A. Llanes, "Branding Universities in Asian Markets," *Journal of Product & Brand Management* 12, no.2 (2003): 115.

branding processes of universities within the scope of the aspects that make universities different from other universities, the opportunities provided to students, capacity building for student needs, and increasing the interest of successful students towards the university.[73] In addition, academic offers (qualified faculty members, physical equipment, etc.) and intangible assets constitute the brand promise of higher education institutions.[74] According to Valitov, the first of the brand components of higher education institutions is university qualifications (such as accreditation, applied education programs and international validity of programs, faculty members, social and financial characteristics of the institution); the second of the brand components is the student gains such as employment guarantee, values (history/background, alumni achievements), and image, which includes artistic and sports activities as well as personal development opportunities.[75] In this study, it is noteworthy that the objectives of the universities with mission differentiation towards establishing a corporate identity are more comprehensive than the objectives of the well-established universities. Universities with mission differentiation have more emphasis on strengthening their physical and administrative infrastructure, improving the quality assurance system, and institutionalization. Therefore, universities with mission differentiation have set their objective of increasing brand values in a way that covers many areas that the literature on creating brand value points out. As a result, in a higher education system where there is an understanding of specialization and mission differentiation for universities, it is necessary to ensure that the characteristics and promises of universities are recognized by the society.

One of the primary objectives of the universities in the 21st century is ensuring internationalization. Universities included in this study also prioritize goals such as conducting exchange programs, strengthening student and academic staff mobility, and encouraging joint graduate education in line with the objective of internationalization. One of the higher education objectives included in the 11th Development Plan of Turkiye covering the period of 2019-2023 is to ensure internationalization. However, universities need to determine the methods of how to achieve internationalization in a systematic way. Universities adopt academic strategies (university rankings,

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[73] Roger Bennett and Rehnuma Ali-Choudhury, "Components of the University Brand: An Empirical Study," (presentation, 3rd Annual Colloquium of the Academy of Marketing's Brand, Corporate Identity and Reputation SIG, Brunel University, September 2007).

[74] Robert C. Lockwood and Jerry Hadd, "Building A Brand in Higher Education," *Gallup Management Journal* 12 (2007): 1-6.

[75] Shamil M. Valitov, "University Brand as a Modern Way of Winning Competitive Advantage," *Procedia-Social and Behavioral Sciences* 152 (2014): 295-299.

accreditation, promotion, quality, and recognition) and institutional strategies (elements such as management, personnel, policy, and culture) in the internationalization process.[76] In order to ensure internationalization, it is recommended that governments develop national policies on internationalization, make higher education attractive with financial and non-financial incentives, and increase competitiveness; on the other hand, it is recommended that higher education institutions analyze the environment effective on internationalization, develop institutional strategies on internationalization, and strengthen the monitoring and assessment mechanisms of the internationalization process.[77] Therefore, the fact that the internationalization objectives of the universities examined in this study are limited to exchange programs may weaken their competitiveness. In addition, there is a need to know the points of internationalization strategies of universities with mission differentiation, which differ from the strategies of other universities. It should be clarified how a university serving regional development defines internationalization and what outputs it expects to produce from internationalization.

As the results of the study reveal, the strategic objectives of universities with and without mission differentiation may be similar. However, universities in a higher education system that will provide regional development through mission differentiation and specialization should define their strategic objectives by associating them with the characteristics of the area they specialize in and the dynamics of the region they are located in. Otherwise, the fact that universities with different qualifications carry out similar activities may significantly limit the structuring of the higher education system in a way that will contribute to development.

VI. Implications and limitations

The results of this study revealed that universities with mission differentiation and well-established universities have similar structures and

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[76] Abdullah Selvitopu and Ayhan Aydın "Türk Yükseköğretiminde Uluslararasılaşma Stratejileri: Süreç Yaklaşımı Çerçevesinde Nitel Bir İnceleme [Internationalization Strategies in Turkish Higher Education: A Qualitative Inquiry in the Process Approach Context]," *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi* 33, no.4 (2018): 803-823.

[77] Fabrice Hénard, Leslie Diamond, and Deborah Roseveare, *Approaches to Internationalisation and Their Implications for Strategic Management and Institutional Practice: A Guide for Higher Education Institutions* (Paris: OECD, 2012), accessed August 12, 2021, https://www.oecd.org/education/imhe/Approaches%20to%20internationalisation%20-%20final%20-%20web.pdf.

functions due to the similarity between their strategic objectives and goals. However, it is expected that the strategic goals and objectives of these universities, which have different theoretical functions, will also be different. Therefore, universities with mission differentiation should set strategic objectives by considering local and regional needs and conditions, and by including internal and external stakeholders in the planning processes in line with their own dynamics, instead of setting generalizable goals. It is recommended to make regulations that enable the participation of external stakeholders in the strategic planning process of universities with mission differentiation. Although standard procedures are applied in the strategic planning of all public institutions, an additional regulation can be made on the participation of external stakeholders in the strategic planning of such universities, unlike other public institutions.

The performance indicators of the universities in both groups are mostly based on quantitative measurements. It should be noted that performance indicators reflecting the achievement of strategic objectives should include qualitative indicators as well as the quantitative ones. The Council of Higher Education can use economic incentive mechanisms for universities that prove the quality of their activities in line with qualitative performance indicators. In the strategic planning process, studies on the defining of qualitative performance indicators may be made compulsory for universities with mission differentiation.

The goals and performance indicators of the universities in both groups are mostly limited to academic subjects. However, research and development units need to be made more active so that universities with mission differentiation can serve regional development. Universities subject to mission differentiation need to be integrated with the region and their potential to respond to regional needs should be increased. Therefore, there is a need for regulations that allow universities with mission differentiation to cooperate with institutions and organizations in their regions. Institutions and organizations that cooperate with the universities may be offered tax reductions or economic incentives by the government.

In the relevant literature, there is a research gap regarding the comparison of the objectives and activities of universities with and without mission differentiation and specialization. Therefore, it is a limitation that the results of this study cannot be compared with the results of the studies conducted in the context of other higher education systems. Future research exploring the mission differentiation and specialization of universities in the context of higher education systems of various countries may contribute to filling this research gap.

Private universities and foundation universities were not included in the study. Therefore, examining only state universities within the scope of the study can be considered as a limitation. Examination of only state universities may have played a part in determining the similarity of the strategic objectives of universities with mission differentiation and well-established universities. The strategic objectives of private universities and foundation universities may differ when compared to the objectives of state universities. For this reason, it is recommended to make a multidimensional comparison between public, private and foundation universities in future research on the missions of universities.

It is also important to mention the limitations regarding the generalizability of the study results. The adoption of the qualitative approach in the study allows the results to form an understanding of the research subject in line with naturalistic generalization. The results show the deficiencies and necessary factors that must be taken into account for the realization of mission differentiation and specialization in higher education. Therefore, the results offer important implications for higher education systems that aim to include a structure based on mission differentiation and specialization for universities. For this reason, the study provides an opportunity to gain an insight of higher education systems in which such a structuring is aimed.

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COVID-19 experiences, impact, and implications for higher education

COVID-19 Special Section: Introduction

Targeted reflection, mutual understanding, and collaborative working. Building blocks for post-pandemic models in higher education

Anca Greere

COVID-19 Special Section Editor

Abstract: This introduction to the COVID-19 Special Section highlights the importance for targeted reflection on pandemic experiences, mutual understanding of perspectives and best practice sharing by and across stakeholder groups. Higher education, similar to other global sectors, has been profoundly shaken by the realities brought about since March 2020, and different stakeholders have felt the impact and consequences of the pandemic on a daily basis. Reports of challenges go a long way towards enabling understanding; however, unless these are combined with demonstrations of responses in context and analyses of their effectiveness, they remain at the level of awareness and cannot move towards action. Sharing the lessons learned, alerting to specificities and gaining perspectives have never been more timely, as higher education shapes future models for enhanced stakeholder experiences within increased quality parameters.

Notwithstanding the disruptive effect on societies, COVID-19 must also be recognised as an accelerator for higher education, impacting digitalisation, accessibility and creating opportunities for new approaches to educational delivery and collaboration. The papers in this Special Section cover a variety of contexts, moving swiftly from Spain to Poland to the United States of America, India and Iran to return to Europe, i.e. Slovenia. Authors tackle specific challenges experienced by stakeholders, be they students, teaching and administrative staff, researchers or policy makers, and discuss lessons learned, highlight perceived benefits and recommend how these may be translated into policy and practice.

Keywords: higher education stakeholders; COVID-19 experiences in higher education; future prospects for higher education; COVID-19 responses in higher education; good practice in crisis management.

On 14 September 2022, the head of the World Health Organisation indicated,[1] in what appeared a judiciously articulated statement, that the end of the pandemic was in sight and we should seize the opportunity to "finish the race". Governments are, thus, urged to take the evidence and experience of the last 32 months, and retain, for the future, what was found to work best to save lives, protect health systems, and avoid social and economic disruption.

Although the reality on the ground may feel very different to individuals, communities and national contexts still confronting new waves and more variants, the cautiously optimistic news raises the bar for more strategic future thinking where robust contingency and increased agility could allow for the experiences of COVID-19 to not be repeated or, at least, not with the same degree of impact. This places responsibility on all actors, within all areas of existence, to reflect intensely on the lessons learned and design unassailable plans for the future.

Higher education, too, needs to rise to the challenge

In many contexts across the world, the academic year 2022/2023 gave opportunity to invite students back in the classrooms, back in the libraries, back in the residence halls, back on campus. Strangely enough it seemed to take some higher education institutions by surprise as they scrambled to update infrastructure, find sufficient physical space for larger numbers of students admitted during the pandemic or take a clear approach on how or if online components were to play a role in the "new normal". If the end of lockdowns could have been a clear sign to accelerate preparations for crafting viable arrangements, it seems that only some took this cue, while others made some adjustments, and others, still, aimed for a full return to pre-pandemic times. The degree of strategic clarity and operational preparedness (or lack thereof) was felt equally across a variety of groups of higher education stakeholders, with staff and students experiencing the highest exposure.

What is the "New Normal", then?

With many higher education institutions across the world exhibiting, pre-COVID, traditional education models, the rapid move to online education has created a steep learning curve, which saw staff and students

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[1] "The end of the COVID-19 pandemic is in sight: WHO," United Nations, UN News, accessed November 9, 2022, https:// news.un.org/en/story/2022/09/1126621.

gain resilience and become more proactive. Research,[2] as also evidenced in papers of the TJHE COVID-19 special sections,[3] shows that in the emergency response phase many actors on the ground felt challenged and displayed negative emotions which took a toll on performance. However, as higher education moved into the transition phase, confidence increased, digitalisation became routine and more positive feelings of achievement came to the fore.

Many stakeholders have articulated the need to seize the benefits and ensure that they feature in future strategic planning to safeguard that valuable lessons will not be lost[4] and that higher education is given opportunity to consolidate the paradigm shift which sees online, hybrid, blended models permeate mainstream education. If approached effectively, the "New Normal" can aid ambitions of widening access, generating flexibility, embedding ethical considerations, reinforcing sustainable actions through increased digitalisation, balanced resourcing and advanced infrastructures.

With the notion of traditional degree-type education already being under strong challenge for some years now, the onus is on institutional management structures and national policy initiatives to accommodate changing expectations of and motivations for higher education. With more diverse profiles of learners seeking to connect agilely to education to serve purposes of upskilling and reskilling, concepts like stackability and portability have never been more relevant.[5] In this changing world, where higher education is

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[2] Anca Greere and Fiona Crozier, "Quality assurance expectations for online higher education: stepping stones to support post-pandemic decisions in Georgia," *Quality in Higher Education* (Taylor and Francis 2022), https://doi.org/10.1080/13538322.2022.2123266.

[3] Seena Joseph, Robyn Thompson, Subashnie Soobramoney, and Jeanette Wendy Wing, "Emergency remote teaching and learning during COVID-19 pandemic: Efficacy of a four-stage model," *Tuning Journal for Higher Education* 9, no. 2 (2022): 245-278, https://doi.org/10.18543/tjhe.2134.

Emilia Mazurek, "Higher education during the COVID-19 pandemic in the opinions of students in Poland," *Tuning Journal for Higher Education* 10, no. 1 (2022): 263-284, https://doi.org/10.18543/tjhe.2172.

Esmaeil Ghaderi, Ali Khoshnood, and Neda Fekri, "Achievement emotions of university students in on-campus and online education during the COVID-19 pandemic," *Tuning Journal for Higher Education* 10, no. 1 (2022): 319-336, https://doi.org/10.18543/tjhe.2346.

[4] Anca Greere and Fiona Crozier, "Quality assurance expectations for online higher education: stepping stones to support post-pandemic decisions in Georgia," *Quality in Higher Education* (Taylor and Francis 2022), https://doi.org/10.1080/13538322.2022.2123266.

[5] "Recommendation on a European approach to micro-credentials for lifelong learning and employability," *Council of the European Union*, accessed November 9, 2022, https://data.consilium.europa.eu/doc/ document/ST-9237-2022-INIT/en/pdf.

often pushed to play a survival game, it seems legitimate to seize the opportunities presented by COVID-19 and allow them to guide education in response to societal dynamics, especially where the quality of the educational experience can be enhanced.

However, this is only possible if the higher education sector assumes the responsibility of transforming an experience littered with negativity, uncertainty and disruption into one which recognises the positives and seeks to give them strategic value. To achieve such transformational stance will be highly dependent on the interactions higher education promotes so as to understand the views of stakeholders, to account for their different perspectives, to support cross-stakeholder sharing and to stimulate the co-creating of desirable models. Higher education needs to bring with it all stakeholders towards a collectively endorsed blueprint for the future as students, teachers, administrators, researchers, employers etc. come aligned with policy makers to allow for constructive change.

All papers in this section highlight the importance for targeted reflection on pandemic experiences, mutual understanding of perspectives and best practice sharing by and across stakeholder groups. Higher education, similar to other global sectors, has been profoundly shaken by the realities brought about since March 2020, and different stakeholders have felt the impact and consequences of the pandemic on a daily basis. Reports of challenges go a long way towards enabling understanding; however, unless these are combined with demonstrations of responses in context and analyses of their effectiveness, they remain at the level of awareness and cannot move towards action. Sharing the lessons learned, alerting to specificities and gaining perspectives have never been more timely, as higher education shapes future models for enhanced stakeholder experiences within increased quality parameters.

Notwithstanding the disruptive effect on societies, COVID-19 must also be recognised as an accelerator for higher education, impacting digitalisation, accessibility and creating opportunities for new approaches to educational delivery and collaboration. The papers in this COVID-19 Special Section cover a variety of contexts, moving swiftly from Spain to Poland to the United States of America, India and Iran to return to Europe, i.e. Slovenia. Authors tackle specific challenges experienced by stakeholders, be they students, teaching and administrative staff, researchers or policy makers, and discuss lessons learned, highlight perceived benefits and recommend how these may be translated into policy and practice.

The first paper, authored by Anna Sala-Bubaré, Mariona Corcelles, Núria Suñé-Soler, and Montserrat Castelló Badia, puts the spotlight on

researchers and explores their perceptions of the unfolding pandemic and its impact on Responsible Research and Innovation practices. Entitled *"Researchers' perceptions of COVID-19 impact on Responsible Research and Innovation (RRI)-based practices and society's view of science in the first months of the pandemic",* the paper thoroughly investigates changes in research practices across different disciplines, while aiming to highlight societal shifts in perception in regards science and the potential for responsible and innovative scientific advancement. The study is based in Spain, more precisely its three Catalan-speaking regions, where a survey was administered online in the first months of the pandemic. Responses from 1499 researchers were analysed and conclusions drawn on the individual positioning of researchers in respect their own research environment, further extrapolated to society's views. Whereas predominantly the collective view is positive in regards items which explored how society views research and the role of the researcher, concerns are also expressed about fake news infiltrating global communication channels and taking a toll on societal perceptions. The analysis also reflects some interesting differences across disciplines, with Health Sciences and Social Sciences researchers perceiving higher impact than in other disciplines, and Humanities being more sceptical towards a positive outlook of society in respect research prospects. There is, however, firm consensus when it comes to a plea for working conditions and funding to improve so as to allow the research community to deploy all its capabilities in support of regional challenges and global crises, like the pandemic.

Responsible Research and Innovation, as a key action of the European Union's Science with and for Society programme,[6] promotes interdisciplinary research practices geared at societal needs and responsive to its expectations. As such, the engagement of a wide range of stakeholders must be secured to relevantly consider all perspectives which can support the design and implementation of well targeted research initiatives. Such engagement is advocated across all the phases of a research project and would see citizens, policymakers, professionals, and civil organisations come together alongside researchers to shape, in a co-creative environment, the outcomes which are deemed valuable for society. Setting the COVID-19 pandemic in context and acknowledging the added challenges which it has brought forward for research, the authors outline the gaps experienced and pinpoint lessons learned, grouped under four main headings: the relevance of science for

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[6] "Science with and for society", European Commission, Open Research Europe, accessed November 7, 2022, https://open-research-europe.ec.europa.eu/gateways/sciencewithandforsociety/about-this-gateway.

citizens and society, *fake news* and the role of media, the importance of improving the relationship between science and politics, and the need to improve research investment. Importantly, researchers perceived the COVID-19 pandemic as an opportunity to open science to society, highlighting how science has been more available and easily accessible, promoting a better and more rigorous understanding of experiences and realities.

With our second paper "*Higher education during the COVID-19 pandemic in the opinions of students in Poland*", we stay in the context of Europe but shift focus to a different group of stakeholders, namely students, whose opinions of the pandemic experience are analysed and put into perspective so that higher education may consider the valuable lessons learned and take them as guidance into the future. The study proposed by author Emilia Mazurek focussed on eliciting the views of 290 students from a variety of universities in Poland about the implementation of distance education arrangements, mindful also of the social implications and the adjustments necessary to cope with social life limitations as imposed during the pandemic. Organised as a two stage process, the research investigates perceptions during emergency remote teaching and learning, i.e. in the initial stages of the pandemic when distance education was forcefully imposed, with little if any preparation and, subsequently, moves to explore changing attitudes across the transitional stages of the pandemic, once students and teachers became more accustomed to distance delivery and more confident in the use of online educational technologies.

Consistent with other findings reported in previous COVID-19 special section papers of the Tuning Journal for Higher Education, the study found that in the initial stages of the pandemic students were trying to cope with challenges arising from an absence of personal interaction with teachers and other students, difficulty in organising online classes to stimulate practice-based interaction, lack of standardisation of platforms used for online education at the university, an increase in out-of-class independent learning workload and health risks related to prolonged exposure to the computer screen, few opportunities for exercise and fresh air, and feelings of isolation and social withdrawal. In the second semester of distance education, however, there was an increase in student satisfaction with online delivery as reports indicate an increase in synchronous classes. This satisfaction is seen by the author as consolidating the option for online education for the future, as an integral part of higher education in Poland, to sit effectively alongside more traditional type delivery. With most universities in Poland having exhibited more conventional modes of education before the pandemic it is clear that such direct and rapid exposure to the online environment has generated a steep learning curve, with

students rising to the challenge. This anticipates online and blended modes to become part of mainstream educational offers, thus generating what the author describes as the "educational revolution in Poland".

The third paper draws our attention to a different, less explored but equally relevant, area of challenge as it proposes ways of dealing with teaching staff turnover at moments in the academic year when this is likely to create the greatest impact. Coupled with the uncertainties generated by the COVID-19 pandemic, mid-semester changes in teaching staff opened up highly problematic management issues, which intensified the apprehension experienced by students and had to be resolved in a timely and effective manner. "*Preparing for the unexpected in a COVID-19 world: The teaching dilemmas of a mid-semester faculty change*", authored by Deborah M. Gray, Jeremy T. Bond, Jessica M. Wicks, and Nancy Hicks, demonstrates the dynamics of the COVID-19 fallout in the United States of America and shifts our attention, yet again, to a different group of stakeholders, those involved in management decisions and administrative interactions. Conscious of the shortage of research geared towards identifying best practices for handling the dilemmas associated with mid-semester teaching staff changes, the paper focusses on: (1) the impact on students of such changes and the most appropriate actions which can alleviate the tensions generated and (2) the support in place for incoming replacement teaching staff for a smooth transition and one which allows for minimum disruption to the educational process. A mixed methodology research combining student surveys and administrator interviews led to interesting conclusions about practical approaches which have the potential to make a positive difference in the opinion of students and administrative staff. It is demonstrated that expectations play a key role in the success of teaching staff transitioning, with students keen to observe levels of flexibility during the course take-over, i.e. expecting that the new teacher will first ascertain the level of knowledge gained before moving into the lessons as planned and, subsequently, be willing to fill any gaps that students may still be exhibiting from their previous teaching. Transitions that are student-focussed are recognised to require more support than would standard personnel turnover procedures, with mid-semester teaching staff changes requiring robust contingency planning based on functional and rapidly implementable solutions, if students are to be duly protected from such disruption.

Importantly, this paper raises awareness of an area least explored but with worrying consequences especially in COVID-19 times, when mental health issues have been on the rise within higher education with both students and staff requiring effective support to allow them to develop relevant coping

mechanism. The three reasons why teaching staff might be replaced mid-semester are noted as being related to voluntary departures, extenuating motivations and punitive catalysts for departure, with COVID-19 likely having accentuated all such areas, creating a stronger cocktail for disruption. Changes derived from COVID-19 restrictions will have seen working conditions become more stressful, family and health issues on the rise; this will have had a knock on effect on performance and commitment which in turn will have created the desire to voluntarily leave to avoid further mental health pressures. The authors conclude that it is incumbent on higher education institutions to recognise such chain of causality and have mechanisms in place for swift action. With teaching staff members playing a pinnacle role in student learning and their teaching practice having significant impact on student persistence and retention, mid-semester changes, if not administered effectively, may take a dramatic toll on students. This is because students who feel a sense of community in the classroom have a higher rate of attendance, participation, and persistence and COVID-19 is demonstrated to have profoundly disrupted this sense of community. Moreover, where COVID-19 was doubled by staff replacements, higher education institutions will have had a more difficult task on their hands.

Esmaeil Ghaderi, Ali Khoshnood, and Neda Fekri offer us the fourth paper in our COVID-19 Special Section entitled "*Achievement emotions of university students in on-campus and online education during the COVID-19 pandemic*", which also brings in focus the emotional impact generated by the COVID-19 pandemic on students through a comparison between face-to-face educational experiences and online delivery. The authors, too, emphasise the link established between feelings and emotions and the motivation and academic performance of students as they aim to better understand how students reacted, emotionally, in the physical classroom as opposed to the virtual classroom. 92 Iranian higher education students, studying Humanities and Social Sciences, were asked to evaluate their emotions by completing the Achievement Emotions Questionnaire developed by Bieleke et al. (2021) twice, once for the emotions related to on-campus experiences and a second time for those experienced in pandemic online delivery. At the time of the questionnaire, students had had a minimum of two semesters delivered traditionally, on campus, and two semesters delivered online as part of the university emergency response to the COVID-19 pandemic. Using Pekrun's (2006) control-value three-dimensional taxonomy of achievement emotions and applying it to educational settings, the authors distinguish emotions felt by students in various achievement situations, such as learning, doing homework, participating in class, or taking exams, and investigate the

consequences on a learner's ability to self-regulate, on their use of flexible strategies and on their academic performance.

Overarching findings indicate that classroom-based teaching and learning was associated with positive emotions such as enjoyment, hope and pride, while online classes triggered anger. Interestingly, anxiety, hopelessness, boredom and shame displayed no significant variations between the two educational formats. Still, one third of students indicated that continuing in online mode could be preferred and would allow optimum use of resources. The authors, thus, urge educational policymakers, curriculum planners, and teachers to consider how students feel comparatively about the two modes of higher education delivery in deciding the formats of the future and anticipate blended models and online collaborative learning, which have shown demonstrable benefits, to become integrated in educational portfolios of a wide range of higher education institutions.

The fifth paper "*Teaching-learning process through virtual mode during the pandemic time: Systematic literature review and gap analysis*" by Ajay Kumar Singh and Mukesh Kumar Meena, looks specifically at the benefits of the virtual classroom as used during the pandemic lockdown in India. 305 teachers and 588 students in higher education institutions were surveyed and expected versus actual benefits were concluded on. A significant difference is reported between expected benefits and actual benefits and this is attributed predominantly to technical barriers with students being unable to connect to virtual classroom due to availability, connectivity and accessibility issues. However, poor digital skills of both teachers and students were also reported and their consequences noted as frequently translating into disengagement, feelings of isolation, and reactive attitudes with effect on academic performance. Actual benefits were more difficult to articulate as the challenges seemed to overshadow the identification of actual benefits. This led the authors to formulate a number of concrete recommendations that would see educational authorities and higher education institutions working together to resolve problems of a technical or pedagogical nature. A plea for improved infrastructural investments and extended technical support is made to ensure that the Indian higher education context may also relate more strongly to actual benefits.

Our sixth and final paper in the COVID-19 Special Section investigates an area much discussed, namely the difficulties encountered in achieving learning outcomes related to components of practical training in a variety of programmes. Specifically, Irena Hergan and Mojca Pečar focus on "*Teaching practicum for primary teacher education students during the COVID-19 pandemic*" as they present the results of a research conducted with Faculty of

Education pre-service student teachers to assess the usefulness of their distance teaching practicum during COVID-19 for their professional development. This study brings us back to Europe, namely Slovenia, where the authors administered an online survey in spring 2020, with 238 student responses received. Whereas it was found that perceptions of usefulness were varied across the two groups surveyed, third year students versus fourth year students, it demonstrated that teaching practice can be delivered online, meaning that learning outcomes are not majorly affected, if there is a good balance between preparing materials, supporting pupils and delivering lessons via videoconferencing.

Reflective practices are highlighted as generating important layers of professional development, with students needing to acquire reflection skills which they can deploy habitually in a deliberate, purposeful and planned manner. The pre-pandemic set-up described by the authors sees third year students working in groups at primary schools with teaching and teaching observations conducted equally, whereas fourth year students spend their whole practicum teaching individually the same group of pupils – all under the supervision of a primary school teacher mentor. COVID-19 moved the practicum from an authentic school environment online and logistical adaptations were inevitable; however, the reflective features of the practicum work were still maintained, with students encouraged to keep records of the content and scope of their work and evaluate their pedagogical experience afterwards. Overall, the authors believe that students had less diverse experiences during the distance practicum because the teacher mentors were instructed to integrate students in the areas where they would be most helpful; thus, many students were asked to prepare various teaching materials, rather than engage in interactive delivery with pupils. As such, exposure to the various pedagogical realities of primary school teaching was more limited, although students reported being able to develop, to a satisfactory extent, their time management skills, plan and teach in different subjects, take into account pupil diversity, include diverse teaching materials, and reflect on their work and the work of pupils together with teacher mentors – which meant learning outcomes were not put at risk, allowing for the programme to demonstrate continuity and comparability.

Conclusively, all papers identify multiple challenges which have been experienced under the pandemic, but, importantly, move into reflection mode and analyse how or if the responses to challenges can be transformed into lessons for the future. The transferability of best practices is evident and the opportunity for future options is unquestionable. Continuing to share and

learn from our experiences will generate the building blocks to shape higher education.

With this edition of the Tuning Journal for Higher Education, we will have had three successful COVID-19 sections, all generously sharing experiences from across the globe for a better understanding, increased applicability and improved transferability of lessons learned which can pave the way for the future. This being the last iteration of the special section, I close my role as COVID-19 Special Section editor and offer my thanks to all authors, all contributors, all colleagues who have engaged with this section and made it a valuable resource. I urge you all to continue to nurture, collectively and individually, your commitment, your perseverance and your passion for higher education, and offer the guarantee that the Tuning Journal for Higher Education will be here to support you.

Good luck and stay safe!

Researchers' perceptions of COVID-19 impact on Responsible Research and Innovation (RRI)-based practices and society's view of science in the first months of the pandemic

Anna Sala-Bubaré, Mariona Corcelles, Núria Suñé-Soler, and Montserrat Castelló*

Abstract: Over the last decade, national and international agencies have repeatedly called for research practices aligned with the Responsible Research and Innovation (RRI), with varied effects on different disciplines and countries. The COVID-19 pandemic made this need even more critical. This study aimed to explore whether and how, from researchers' point of view, the COVID-19 pandemic has led to changes in RRI-based research practices in the different disciplines and, more generally, society's perception of science. 1499 researchers in the three Catalan-speaking regions of Spain responded to an online questionnaire in the first months of the pandemic. Results showed that while only half perceived an impact on RRI-based practices, this proportion was higher for Health Sciences and Social Sciences researchers in all the dimensions. Most researchers perceived a positive impact on societal actors' views of science, although researchers in the Humanities were more sceptical than those in other disciplines. The analysis of open-ended questions revealed researchers from all disciplines were also concerned about fake news and claimed that researchers' working conditions and research funding across all

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disciplines needed to be improved for future research to be capable of coping with current and future challenges.

I. Introduction

Over the last decade, the concept of Responsible Research and Innovation (RRI) has gained visibility and traction in Europe, specifically in the European Commission (EC) policy context. RRI is a key action of the European Union's Science with and for Society (SwafS). It asks for a shift in research practices towards a new interdisciplinary, sustainable, ethical, and society-oriented research approach. RRI claims that, for research and innovation processes and outcomes to be relevant, they must align with society's values, needs and expectations. To that end, not only researchers but all societal actors (e.g., citizens, policymakers, professionals, and civil organisations) must be involved in all the phases of the research process, which means that their views are taken into account when designing and conducting research and that they can easily access the results and outcomes of such research (European Commission, n.d.).

RRI advocates for the development of inter/transdisciplinary and intersectoral projects, knowledge transference and governance commitment to research to generate innovation and changes in and for society. However, the degree of implementation of these principles is very disparate within the European Arena. Differences among countries in their RRI implementation are in line with the financial investment of the countries in research and development (Mejlgaard et al. 2019; OECD 2021). Specifically, Spain, with a domestic public and private expenditure in Research & Development (R&D) below the OECD average (European Commission 2020), has deficits in some of the RRI principles, such as public engagement, the use of technologies, interdisciplinarity, and internationalisation of research, among others (European Commission 2021; Mejlgaard et al. 2019). These principles are especially relevant to facing the consequences posed by COVID-19 in a post-pandemic scenario.

The COVID-19 pandemic is one of the most unexpected and far-reaching challenges facing researchers worldwide, not only in terms of health but also of its psychological, social, and economic effects. Crucial and new ethical scientific challenges emerged due to the pandemic regarding research objectives, priorities, methodologies, resources, and processes (Kara and Khoo 2020). The R&D ecosystem was also under scrutiny during COVID-19, and several gaps emerged. Coordinated and sustained research funding, an

efficient end-to-end R&D ecosystem, and efficient research structures and policies are some of the most critical gaps faced by the R&D ecosystem, along with the need to ensure global equitable access to research-related outcomes and products (Lurie et al. 2021).

In this sense, the difficulties of communication between science and society, that is, effective communication of research results and research-based recommendations, have also been palpable during the COVID-19 pandemic. The 'infodemic' and rise of fake news have made it even more difficult for citizens to access, understand and use trustworthy research-based information (Hartley and Vu 2020; Lu et al. 2021; van Der Linden et al. 2020). Some studies found that citizens' views about science and researchers are significant predictors of the extent to which they engage and use scientific information and disease-preventing behaviours (Chu et al. 2021; Lu et al. 2021). The study of Post et al. (2021) suggested that citizens have different informational needs, which are related to their views of science, policymaking, and media. Their results also highlighted the importance of enhancing citizens' understanding of scientific knowledge as refutable and temporary and clarifying the connection and boundaries between scientific results and policymaking to avoid dogmatic views of science and the alienation of people seeking to construct their own opinions (Post et al. 2021).

The RRI principles of co-creation and responsible research constitute a unique opportunity to cope with all the challenges mentioned above (Kara and Khoo 2020). However, aside from the developments of the knowledge, treatment and prevention of the virus itself, the extent to which the COVID-19 pandemic has impacted research and, more specifically, the RRI processes globally and locally is unclear.

Researchers' perceptions of these changes are especially relevant, as they are both key informants of such impact and central actors in implementing the RRI principles. Studies exploring researchers' voices regarding the impact of the COVID-19 pandemic on their work are scarce. A notable exception is a study conducted by Frontiers (Rijs and Fenter 2020). A survey distributed among Frontiers editors, reviewers and authors in May and June 2020 obtained more than 25.000 responses from Health and Science researchers worldwide. Besides offering evidence of COVID-19 impact on participants' personal and institutional work, results show researchers' worries about the long-lasting effects of the pandemic on funding, the fake news and the need to promote research-based policies (Rijs and Fenter 2020). In line with the RRI principles, the study claims the need to improve society's science education -including political leaders- and to promote interdisciplinary research to enable research-based responses to current and future threats. The

authors also found that the pandemic resulted in an increased willingness to publish open-access articles, share data, and use preprint servers. Although not further explored, significant disciplinary and geographical differences appeared in almost all the variables (Rijs and Fenter 2020). These findings call for in-depth exploration of the differential impact of the COVID-19 pandemic among researchers of different backgrounds.

The present study aims at exploring researchers' perceptions about the impact of the COVID-19 pandemic on their disciplines, with an emphasis on RRI-based practices (i.e., interdisciplinary collaborations, knowledge transfer and dissemination, and engagement of non-academic actors) and on the perceptions of the main societal actors at the beginning of the COVID-19 pandemic. These were the aims of this study, guided by the following questions:

1. What are researchers' perceptions about the impact of the COVID-19 pandemic on RRI-based practices in their discipline?

2. What are the differences among disciplines in researchers' perceptions of the impact of the COVID-19 pandemic?

3. What are researchers' perceptions about the impact of the COVID-19 pandemic on citizens', politicians', media's, and professionals' perception of science?

4. What are the differences among disciplines in researchers' perceptions of the impact of the COVID-19 pandemic on citizens', politicians', media's, and professionals' perception of science?

5. What are the lessons learnt and future opportunities emerging from the COVID-19 pandemic from researchers' perspectives?

II. Method

II.1. Participants

1499 researchers from the three Catalan-speaking regions of Spain (Catalunya 57.4%; Valencia 36%, and the Balearic Islands 6.6%) participated in the study, 52.9% of which were female, 45.8% were male, and 1.3% identified with non-binary categories. The mean age of participants was 44.29 years old (age range = 23-79). Participants were distributed among disciplines: Sciences (27.4%), Social Sciences (25.6%), Humanities (17.3%), Health Sciences (16.4%) and Engineering and Architecture (13.3%). Most respondents were PhD holders (64.2%), 27.2% were pre-doctoral researchers, and 8.7% were other research staff (e.g., lab and research assistants).

II.2. Instrument

Data were collected through an online survey developed as part of a larger project on researcher development. This survey focused on the impact of the COVID-19 pandemic on different aspects of the lives and work of researchers. The survey was available in Spanish and Catalan[1] and took 10 to 15 min to complete. The present study focused on two scales of the survey, one related to the changes researchers perceived in their discipline due to the pandemic (5 items), and the other focused on the impact they thought the pandemic had had on the perceptions of science of different societal actors (4 items) (see Table 1 for more detail on the items of each scale). All items were Likert Scale questions with five answer options (1 -very negative impact- to 5 -very positive impact-). The survey also included one open-ended question where they could extend their responses and reflect on what changes they thought should be maintained and why.

Table 1

Survey Items

Dimension	Item		Answer options
Discipline	Do you think that the COVID-19 pandemic has had an impact on the research of your discipline in relation to the following aspects?	• The prioritisation of knowledge transfer and dissemination • Interdisciplinary collaborations • Collaborations outside the academic field • The emergence of new research topics • Funding opportunities	1 = Very negative impact 2 = Negative impact 3 = No impact 4 = Positive impact 5 = Very positive
Social Science perception	What impact do you think the COVID-19 pandemic has had on these groups' interest in science and research?	• Citizens • Politicians • Media • Professionals	1 = Very negative impact 2 = Negative impact 3 = No impact 4 = Positive impact 5 = Very positive

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[1] The full survey, as well as details on the aims and procedures of the project, can be accessed here: https://www.researcher-identity.com/impactocovid19.

Dimension	Item		Answer options
Changes to maintain	Which of these changes do you think will be relevant to maintain? Why?		Open-ended

II.3. Procedure

Responses were collected in May and June 2020. Institutional e-mail addresses of researchers from all the universities in the three regions were collected from universities' public websites. Potential participants were sent an e-mail with basic information about the project and a link to the project's website, where they could get further information about the aims and objectives, funding, risks, and advantages of participating, and they could download the complete questionnaire. Participants accessed the survey through this website. The link to the questionnaire was not included in the e-mail to ensure participants had full information about the project before answering. At the beginning of the questionnaire, participants gave their consent to participate according to the ethics clearance procedures. The study aims and procedures were approved by the ethics committee and the data protection delegate of our institution.

II.4. Data analysis

Descriptive analysis was conducted for all items of the two scales: changes in the discipline and changes in societal actors' perception of science. Rather than being interested in assessing the intensity of perceived impacts, we aimed at knowing and comparing the direction (or type) of impact researchers perceived: positive, negative or no impact. Therefore, answers were classified into three categories (1-negative impact-; 2-no impact-; 3- positive impact) by collapsing the two ends of the 5-point responses of the Likert scales ("very negative impact" and "negative impact" were merged into "negative impact" and "very positive impact" and "positive impact" were integrated into "positive impact"). With these categories, descriptive analysis was conducted for the two scales. Pearson's Chi-square test was used to analyse differences between disciplines for the two scales' questions. Corrected standardised residuals were calculated for all the cases to assess the strength and location of the association. Overall, this analysis allowed us to assess the frequency and distribution of the three types of

impact (negative, positive and no impact) and compare disciplines regarding each type instead of comparing the intensity of the impact (e.g., mean scores) perceived by each discipline.

Responses to the open-ended question (n = 494) were analysed using a consensual qualitative research approach (Hill 2012) by four researchers to ensure consistency around the overall themes. The aim was not to quantify participants' qualitative responses but to organise data to illustrate regularities in researchers' views. Thus, emerging themes were organised and grouped into categories related to the different dimensions of RRI, and representative examples of each category were selected to illustrate these categories.

III. Results and discussion

III.1. What are researchers' perceptions about the impact of the COVID-19 pandemic on the RRI- based practices of their discipline?

Regarding the first aim of the study, results across disciplines showed that, at the beginning of the pandemic, approximately half of the respondents perceived no impact of the COVID-19 pandemic on the RRI-based practices of their disciplines (see Figure 1), namely knowledge transfer and dissemination, interdisciplinary collaboration, and collaborations with non-
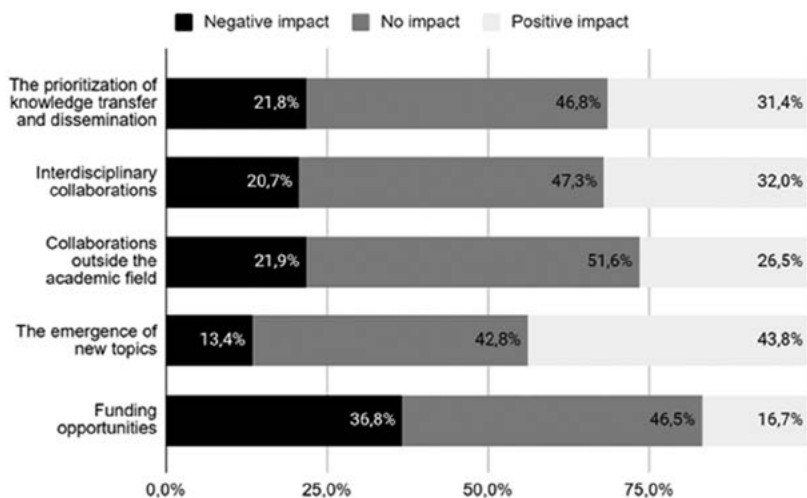

Figure 1

Impact of the COVID-19 pandemic on RRI-based practices

academic sectors. Researchers were slightly more positive about the impact of the pandemic on the emergence of new topics and more negative regarding the impact on funding, with more than one-third reporting negative effects. Given that the study was conducted during the first months of the COVID-19 pandemic, it is possible that non-traditional research collaborations were not yet put into place, although this aspect seems the best tool for fighting against COVID-19 (Lee and Haupt 2021). Future studies can analyse if this perception changed in the later stages of the pandemic, and researchers now perceive a higher impact of the RRI principles in their disciplines.

III.2. *What are the differences among disciplines in researchers' perceptions of the impact of the COVID-19 pandemic on RRI-based practices?*

Despite many researchers did not perceive any impact of the COVID-19 pandemic on the practices of their discipline, further results showed statistically significant differences among disciplines in all the items analysed (see Table 2): prioritization of knowledge transfer and dissemination (X^2 (8) = 35.910, p < 0.001); interdisciplinary collaborations (X^2 (8) = 38.807, p < 0.001); collaborations outside academia (X^2 (8) = 39.770 p < 0.001); emergence of new topics (X^2 (8) = 164.885, p < 0.00); and funding opportunities (X^2 (8) = 57.275, p < 0.001).

Table 2

Impact of the COVID-19 pandemic on the RRI-based practices of each discipline

	Science	Social Sciences	Humanities	Health Sciences	Engineering and Architecture
Knowledge transfer and dissemination					
Negative impact	89 (21.7%)	65 (16.9%) z = -2.7	63 (24.3%)	66 (26.8%) z = 2.1	44 (22.1%)
No impact	197 (47.9%)	165 (43%)	137 (52.9%) z = 2.2	96 (39%) z = -2.7	107 (53.8%) z = 2.1
Positive impact	125 (30.4%)	154 (40.1%) z = 4.3	59 (22.8%) z = -3.3	84 (34.1%)	48 (24.1%) z = -2.4
Interdisciplinary collaborations					
Negative impact	88 (21.4%)	61 (15.9%) z = -2.7	65 (25.1%)	54 (22%)	43 (21.6%)

	Science	Social Sciences	Humanities	Health Sciences	Engineering and Architecture
No impact	204 (49.6%)	163 (42.4%) z = -2.2	137 (52.9%) z = 2	101 (41.1%) z = -2.1	104 (52.3%)
Positive impact	119 (29%)	160 (41.7%) z = 4.7	57 (22%) z = -3.8	91 (37%)	52 (26.1%)
Collaborations outside academia					
Negative impact	84 (20.4%)	71 (18.5%)	73 (28.2%) z = 2.7	55 (22.4%)	45 (22.6%)
No impact	242 (58.9%) z = 3.5	180 (46.9%) z = -2.2	118 (45.6%) z = -2.2	116 (47.2%)	118 (59.3%) z = 2.3
Positive impact	85 (20.7%) z = -3.1	133 (34.6%) z = 4.2	68 (26.3%)	75 (30.5%)	36 (18.1%) z = -2.9
The emergence of new topics					
Negative impact	66 (16.1%)	32 (8.3%) z = -3.4	35 (13.5%)	40 (16.3%)	28 (14.1%)
No impact	221 (53.8%) z = 5.3	89 (23.2%) z = -9.0	142 (54.8%) z = 4.3	82 (33.3%) z = -3.3	107 (53.8%) z = 3.4
Positive impact	124 (30.2%) z = -6.6	263 (68.5%) z = 11.3	82 (31.7%) z = -4.3	124 (50.4%) z = 2.3	64 (32.2%) z = -3.6
Funding opportunities					
Negative impact	161 (39.2%)	116 (30.2%) z = -3.1	120 (46.3%) z = 3.5	79 (32.1%)	75 (37.7%)
No impact	172 (41.8%) z = -2.2	190 (49.5%)	126 (48.6%)	106 (43.1%)	103 (51.8%)
Positive impact	78 (19%)	78 (20.3%) z = 2.2	13 (5%) z = -5.6	61 (24.8%) z = 3.7	21 (10.6%) z = -2.5

z = Corrected adjusted residuals.

Results show that *Social Sciences researchers* were more likely to perceive a positive impact of the COVID-19 pandemic on the RRI-based practices of their discipline. Specifically, they were more likely to perceive a positive impact on the prioritisation of knowledge transfer and dissemination (40.1%) than their counterparts were in the Humanities (22.8%) and Engineering and Architecture (24.1%). Interestingly, Health Sciences

researchers were more likely to perceive a negative impact on this RRI-based practice than their counterparts were (26.8%). Differences between Social Scientists and Humanities researchers were also evident in regards to interdisciplinary collaborations (41.7% and 22%, respectively, perceived a positive impact) and in the collaborations outside academia, where social scientists tended to perceive a more positive impact (34.6%) and Humanities researchers were more likely to perceive a negative impact (28.2%). In this regard, Sciences and Engineering and Architecture researchers were more likely to perceive no impact than the other disciplines (58.9% and 59.3%, respectively).

The most significant differences among disciplines are observed in the emergence of new topics. Again, Social Scientists (68.5%), along with Health Scientists to a lesser extent (50.4%), were much more likely to report a positive impact on the emergence of new topics than their counterparts were (Science: 30.2%, Humanities: 31.7%, Engineering and Architecture: 32.2%). Finally, concerning funding opportunities, although, as explained above, most of the researchers perceived negative or no impact on their discipline, differences among disciplines follow a similar trend: researchers in Health (24.8%) and Social Sciences (20.3%) were more likely to report a positive impact than researchers in the Humanities (5%) and Engineering and Architecture (10.6%) were.

At the beginning of the COVID-19 outbreak, Health Sciences researchers, especially those in medical disciplines, were the first to be called upon to respond to the crisis, focusing on the study of the COVID-19 virus and, consequently, as expected, new topics and many new opportunities for funding emerged. However, at the early stage of the pandemic, they perceived a more significant negative impact on knowledge transfer and dissemination than researchers in the other disciplines.

In contrast, Social Sciences researchers were the ones that perceived a more positive impact of the COVID-19 pandemic in all the assessed areas, including knowledge transfer and interdisciplinary collaborations, showing that the COVID-19 pandemic has had a positive impact on promoting change toward the RRI principles in these disciplines. Interestingly, the immediate social consequences (e.g., economic, psychological, and educational effects) in the early stage of the pandemic and the lockdowns seem to have promoted interdisciplinary collaborations, collaborations with non-academic sectors and knowledge transfer to respond to the current social demands to a greater extent in the Social Sciences than in the other disciplines. In addition, Social Science researchers perceived that the COVID-19 pandemic provoked the emergence of new research topics and more funding opportunities. Thus, it

seems the COVID-19 pandemic stimulated beyond Health Sciences. Social Scientists perceived more benefits for their discipline than researchers in the other disciplines. This is a surprising result, as the Health Sciences, especially medicine, seemed to dominate the interest and focus of the first strategies to deal with the crisis. However, these disciplines were already much better funded and publicly valued than others before the pandemic (European Commission 2020). In contrast, while still in the background of crisis management, Social Sciences researchers perceived a significant increase in funding, new research topics, and the public's interest and recognition of their disciplines.

On the other hand, Science, and Architecture and Engineering researchers were more likely to perceive no impact on the RRI-based practices and opportunities in their disciplines. It seems that, at the beginning of the pandemic, when this study took place, these disciplines were not summoned to face the pandemic and its consequences, despite calls for interdisciplinary collaborations and the omnipresence of technology in the way people coped with the situation (Kara and Khoo 2020; Vargo et al. 2021). It is unknown whether the role of these disciplines changed in later phases of the pandemic.

Finally, Humanities researchers were the least positive in their perception of the impact of the pandemic on their discipline. They were more likely to report a negative impact on the RRI-based practices (interdisciplinary collaborations, collaborations outside academia and knowledge transfer), the emergence of new topics, and funding opportunities. They also perceived a decrease in resources for research in the Humanities during the COVID-19 pandemic.

III.3. *What are the researchers' perceptions about the impact of the COVID-19 pandemic on citizens', politicians', media's, and professionals' perception of science?*

Regarding the third objective, analysing researchers' views about the impact on the perceptions that citizens, politicians, media, and professionals had about science (see Figure 2), overall, researchers reported a positive impact of the COVID-19 pandemic, especially on citizens' (78.3%) and media (70.9%) perceptions. They were less positive about the impact on the views of politicians (47.6%).

Although results show an overall positive impact of the COVID-19 pandemic on the perception of science in all societal sectors, according to researchers, they were more sceptical about the impact on politicians.
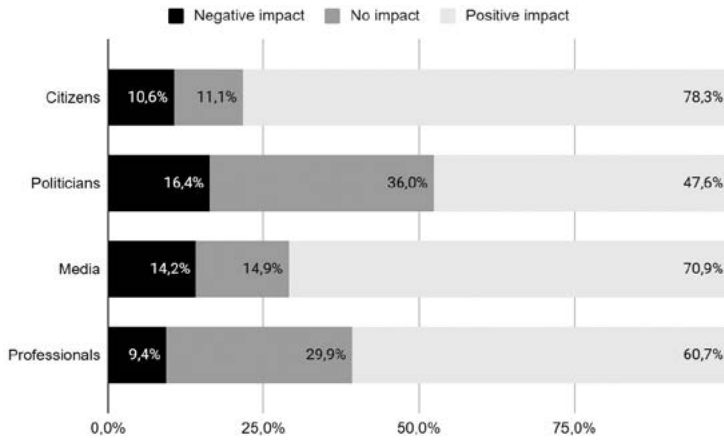
Figure 2

Impact of the COVID-19 pandemic on citizens, politicians, media, and professionals' perception of science

III.4. *What are the differences among disciplines in researchers' perceptions of the impact of the COVID-19 pandemic on citizens', politicians', media, and professionals' perception of science?*

Further analysis into researchers' perceptions of the impact on societal actors showed statistically significant differences among disciplines regarding changes in science perceptions of the four different agents: citizens (X^2 (8) = 30.373, p < 0.001), media (X^2 (8) = 29.126, p < 0.001), professionals (X^2 (8) = 33.990, p < 0.001), and politicians (X^2 (8) = 28.339, p < 0.001) (see Table 3).

Table 3

Impact of the COVID-19 pandemic on citizens, politicians, media, and professionals' perception of science according to researchers in each discipline

	Science	Social Sciences	Humanities	Health	Engineering and Architecture
Citizens					
Negative impact	40 (9.7%)	40 (10.4%)	47 (18.1%) z = 4.3	15 (6.1%) z = -2.5	17 (8.5%)

	Science	Social Sciences	Humanities	Health	Engineering and Architecture
No impact	40 (9.7%)	37 (9.6%)	34 (13.1%)	25 (10.2%)	31 (15.6%) z = 2.1
Positive impact	331 (80.5%)	307 (79.9%)	178 (68.7%) z = -4.1	206 (83.7%) z = 2.3	151 (75.9%)
Media					
Negative impact	58 (14.1%)	43 (11.2%) z = -2.0	62 (23.9%) z = 4.9	27 (11%)	23 (11.6%)
No impact	65 (15.8%)	60 (15.6%)	34 (13.1%)	30 (12.2%)	34 (17.1%)
Positive impact	288 (70.1%)	281 (73.2%)	163 (62.9%) z = -3.1	189 (76.8%) z = 2.2	142 (71.4%)
Professionals					
Negative impact	37 (9%)	32 (8.3%)	41 (15.8%) z = 3.9	17 (6.9%)	14 (7%)
No impact	131 (31.9%)	105 (27.3%)	821 (31.7%)	55 (22.4%) z = -2.8	75 (37.7%) z = 2.6
Positive impact	243 (59.1%)	247 (64.3%)	136 (52.5%) z = -3.0	174 (70.7%) z = 3.5	110 (55.3%)
Politicians					
Negative impact	61 (14.8%)	54 (14.1%)	69 (26.6%) z = 4.9	28 (11.4%) z = -2.3	34 (17.1%)
No impact	151 (36.7%)	136 (35.4%)	85 (32.8%)	91 (37.0%)	77 (44.2%)
Positive impact	199 (48.4%)	194 (50.5%)	105 (40.5%) z = -2.5	127 (51.6%)	88 (44.2%)

These most significant differences were between Health and Humanities researchers. Despite generally having positive views of the impact of the COVID-19 pandemic on societal actors' perception of science, researchers from *Health Sciences* were more likely to perceive a positive impact on citizens (83.7%), media (76.8%), and professionals (70.7%) and less likely to perceive a negative impact on politicians (11.4%). In contrast, researchers from the *Humanities* were less likely to perceive a positive impact on the four groups of societal actors: citizens (68.7%), media (62.9%), professionals

(52.5%) and politicians (40.5%) and were also more likely to report a negative impact on the views of these groups (18.1%, 23.9%, 15.8% and 26.6%, respectively) than researchers in the other disciplines.

Similar to the impact perceived on their disciplines, Humanities researchers were the most critical regarding the impact of the COVID-19 pandemic on societal actors' views of science, and, as expected, Health Sciences researchers perceived a more positive impact on the four social agents. This is not surprising as their disciplines were central in the COVID-19 pandemic and took the spotlight in debates everywhere.

III.5. *What are the lessons learnt and future opportunities emerging from the COVID-19 pandemic from researchers' perspective?*

Finally, regarding the fifth objective, we identified four topics regarding the lessons learnt and future opportunities emerging from the COVID-19 pandemic among researchers' responses to the open-ended question (n = 494). These topics were the following: the relevance of science for citizens and society, *fake news* and the role of media, the importance of improving the relationship between science and politics, and the need to improve research investment.

III.5.1. Relevance of science to citizens and society

In line with the main aim of the RRI principles, promoting societal actors' engagement with science, researchers highlighted the importance of the connection between science and citizens and society by making science more accessible to citizens. Comments included the need to promote citizens' interest and appreciation of the value of science and to open science to society.

III.5.1.1. Maintaining citizens' interest and appreciation of the value of science in improving society

Some respondents acknowledged an improvement in the awareness of the value of science due to the COVID-19 pandemic and highlighted the need to maintain and increase citizens' interest in science and their perception of science as a useful and necessary way to improve society ("Citizens' awareness of the need for science and research should be maintained", SS3846). In addition, many researchers also mentioned the need to recognise researchers' role in society ("Social recognition of science and scientists for their contribution to progress and improvement of social conditions", EA3749).

III.5.1.2. Opening science to society

Secondly, researchers in our study perceived the COVID-19 pandemic as an opportunity to open science to society. Participants highlighted the need for science to be available and easily accessible for everyone to promote a better and more rigorous understanding of the world. The following two excerpts are illustrative examples of this theme: "All research should be interesting for the non-specialised public and should be available to everybody" (S905), and "I think it has been an opportunity for citizens to get closer to science and research than ever, but we need to keep working and making science accessible to everybody" (SS1374).

III.5.2. Fake news and the role of media

The second category was related to the media's mediation in the relationship between science and citizens during the pandemic. Despite researchers clearly valuing the role of media in disseminating scientific advancements during the COVID-19 pandemic, they were worried about the increase of *fake news*, a phenomenon that has been one of the most critical challenges during the crisis (Van Der Linden 2020). Many participants mentioned the importance of fake news in disseminating research during the COVID-19 pandemic and how this influenced citizens' trust in science. They also suggested ways to fight them back, mainly through scientific education and rigorous dissemination. Some respondents claimed for more rigorous dissemination of science, while others stressed the danger of fake news and how science education would help fight them back. Researchers in our study joined the claims of others (Lu et al. 2021; Post et al. 2021) in advocating for better science education to be able to understand and use science and rigorous dissemination of science in the media as the most effective means to fight *fake news*.

III.5.2.1. Rigorous media dissemination of scientific advancement

Researchers stressed the need to maintain and increase the presence and interest of rigorous science and scientists in media, not only during the pandemic, to disseminate scientific advancements adequately and thus, again, to fight misinformation ("[what should be maintained is] the presence of rigorous scientific content in media", SS1168).

Moreover, researchers claimed that media should not only disseminate research knowledge directly connected to the COVID-19 pandemic but also those advances related to the other social, environmental, and economic

challenges that affect our society. The following is an illustrative example of these claims: "Evidently, I'd like scientists to replace talk show guests who want to talk about everything; this would improve the information citizens receive. However, the debate should not only focus on the pandemic but also on other social and economic issues that need to be treated by experts" (SS3996).

III.5.2.2. Fighting fake news through the improvement of scientific education

Researchers acknowledged the harm of these phenomena and stressed the need to fight against them to ensure rigorous scientific knowledge reaches society: "There is a general lack not only of interest but also of basic scientific knowledge. We have seen the worst misinformation situations. There is a terrifying amount of *fake news* that only increases mistrust of research" (S3359).

Better scientific education was considered a crucial element to fighting fake news and citizens' misinformation; for example: "Regarding citizens, a basic scientific education is crucial in moments like the one we are living now, and in our country, it doesn't exist" (SS912).

III.5.3. Importance of improving the relationship between science and politics

Another group of answers mentioned that one of the most important lessons learnt from the COVID-19 pandemic was the need to improve the relationship between science and politics by developing research-based policies and incorporating scientists into political bodies. They stress the importance of strengthening citizens' appreciation of science to promote the development of research-based policies and increase research funding (Rijs and Fenter 2020).

III.5.3.1. Developing policies based on scientific evidence

Some researchers claimed that politicians need to trust and collaborate with researchers to develop policies based on scientific evidence: *"Scientific evidence has to be the basis of the development of policies and media discourses"* (SS1278). The following excerpt also discusses the role that the public's interest in science can play in developing research-based policies ("it's good that public trust that politicians use scientific experts because this may lead to developing more research-based policies", SS957).

III.5.3.2. Increasing the presence of scientists in political bodies

Other participants stressed the need to listen to scientists to develop policies and to increase the means of collaboration ("Channels between politicians and scientists have been created, and they should think how to resize and maintain them in the future", H4029) and to incorporate scientists into political bodies to influence the day-to-day of politics ("give more importance to scientists as counsellors of the government and citizens", S3630).

III.5.4. Need for more public research investment and funding

Finally, a large group of researchers mentioned that the COVID-19 pandemic emphasised the need for more research investment in their context. These results resonate with the low R&D investment in Spain, below the EU average (European Commission 2020; Mejlgaard et al. 2019), which indicates problems in research conditions are not new, but participants in our study claimed the COVID-19 pandemic stressed even more the importance of solving this problem.

III.5.4.1. Investment for all scientific disciplines and improvement of researchers' work conditions

Many researchers acknowledged the increase in research funding to face the COVID-19 pandemic. However, they claimed that one lesson learnt from this crisis was the importance of maintaining and further increasing research funding to prevent future crises (social, economic, energetical, climatic, etc.): "the increase in R&D investment needs to be very significant" (H886). Some demanded that these raises be applied to all disciplines and research topics relevant to society, not only those connected to the COVID-19 pandemic. These comments were more frequent among researchers in disciplines other than Health Sciences, and especially from those in the Humanities and Social Sciences: "In general, society has noticed the importance of research in health fields. However, I think research in all knowledge areas is necessary for societal progress. This conception, though, I think was absent from the media" (H2988).

Connected to this, many researchers claimed the COVID-19 pandemic stressed even more the precarious work conditions of researchers in Spain and the difficulties of obtaining research funding, despite their high-level training and constant efforts to be at the forefront. Thus, they highlighted the need to develop public policies aimed at improving research conditions

(research projects funds and research staff): "The interest of citizens and politicians in science should be maintained so researchers' work would not be so precarious, and their work conditions would improve" (2893).

III.5.4.2. Maintain citizens' and media interest to pressure politicians to invest in research

Finally, some researchers also highlighted the recently gained interest in science, this time as a way to increase research funding through the increased reputation and recognition of the value of science. The following are two illustrative examples of these claims: "Changes in the perception of citizens and media should be maintained to put pressure on politicians, so research and science are more recognised" (HS3384) and "Citizens must see research as an investment, not as an expense. I think citizens now have a better vision of research, which is important, especially so finally everybody is aware of the need to increase investment in research" (S3882).

IV. Conclusions

This study aimed to analyse researchers' perceptions about the impact of the COVID-19 pandemic on the RRI-based practices of their discipline and the impact on citizens', politicians', media's and professionals' perception of science at the beginning of the COVID-19 pandemic. Differences between disciplines were analysed to understand researchers' perceptions better. In addition, the study aimed to identify the lessons learnt and future opportunities that emerged during the COVID-19 pandemic from the researchers' point of view.

Regarding the first and second aims, although nearly half of the respondents did not perceive an impact on the RRI-based practices in their discipline. This proportion was slightly smaller for the emergence of new topics and bigger for collaborations outside the academic field and interdisciplinary collaborations. More importantly, there were significant differences among disciplines. As expected, Health Sciences researchers had more positive views of the impact of the COVID-19 pandemic on the practices of their disciplines. This is not surprising given the nature of the crisis and its critical consequences on people's health. In Spain and elsewhere, great economic investments were made from the beginning of the pandemic to cope with the crisis. However, Health Sciences researchers perceived a negative impact on the transfer and dissemination of knowledge. These findings might be explained by the qualitative findings that showed

participants' concerns about misinformation, a problem particularly acute for these disciplines, as most pieces of fake news were directly connected to the virus and the pandemic (Hartley and Vu 2020; Van Der Linden et al. 2020).

Comparison among disciplines also provided some unexpected findings, namely the positive impact perceived by Social Sciences researchers in all the areas. It seems that researchers in these disciplines were well aware of the social consequences right from the beginning of the crisis and felt more compelled to take action than their counterparts. In contrast, researchers in the Humanities, Science, and Engineering and Architecture perceived no impact on the RRI-based practices and opportunities in their disciplines in the early reaction to the pandemic, despite it being the most global and critical crisis of recent years. Moreover, despite calls for addressing the consequences from all angles, this study shows that in Spain, at the beginning of the pandemic, the response to the COVID-19 pandemic focused on the health and social consequences. Future studies might explore whether the observed changes in RRI-based practices were maintained and whether other disciplines were involved in managing the crisis.

Regarding the third and fourth aims, results showed an overall positive perception of the impact that the COVID-19 pandemic had on the perception of science in the four actors, although researchers were slightly more sceptical about the impact on politicians' views. This scepticism might be explained by the qualitative findings on researchers' frequent claims for evidence-based policies and improving work conditions and funding in the different disciplinary areas. Researchers in the Humanities were again the most critical about the impact on societal actors' views of science, partly due to the lack of involvement of their disciplines in debating historical and philosophical implications of the pandemic.

Regarding the last objective concerning the lessons learnt and opportunities, results indicate that although RRI principles in science are not yet commonplace in Spanish research practices (European Commission 2021; Mejlgaard et al. 2019) and that researchers are aware of the need to promote them in order to address global challenges. Among RRI principles, researchers in our study stressed the importance of establishing stronger ties between science and other societal actors by making science more accessible to citizens, ensuring rigorous dissemination of scientific knowledge to fight *fake news*, and improving the connection between politics and science. Moreover, there is a great need for collaboration among all societal actors to advance scientific knowledge and especially to be able to cope with and overcome these and future crises (European Commission, n.d.; Hartley and Vu 2020; Kara and Khoo 2020; Lurie et al. 2021).

Finally, although researchers generally perceived increased funding opportunities in their field, through their answers, many participants demanded this improvement be extended to research conditions, including researchers' precarious work conditions and funding opportunities in all the disciplines, to enhance multi- and interdisciplinary approaches and to prevent future crises.

This study has some limitations. The results are based on a single questionnaire administered in the first months of the COVID-19 pandemic. Further research is needed to explore if researchers' perceptions about the pandemic's impact on their discipline have changed and how these changes are perceived in each discipline. Qualitative follow-ups, through interviews with key informants, would also help deepen the understanding of the effect of the COVID-19 pandemic on changes towards RRI-based practices, and especially on the consequences of these changes. Despite these limitations, this study offers interesting insights into the impact of the COVID-19 pandemic on research in Spain and how this impact may differ among disciplines. Results can guide further steps towards implementing the RRI principles in all the disciplines in the R&D ecosystem in Spain and elsewhere.

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Higher education during the COVID-19 pandemic in the opinions of students in Poland

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Abstract: The COVID-19 pandemic has completely changed the social life as we have known so far. Lockdown-type control measures resulted in numerous limitations in the operation of public and non-public institutions as well as limitations in social, family and cultural life. The measures taken due to COVID-19 have had an immediate effect on higher education in Poland. The aim of the study was to find out what experiences were gained by students participating in distance education in Poland during the COVID-19 pandemic. The long-term study was conducted in two stages. The study included 290 participants who were studying in various types of universities in Poland. As a result of the research it was found that from the perspective of students, the biggest advantage of online education were logistical and organisational issues. The greatest limitations of online education were: absence of personal interaction with teachers and other students, difficulty in organising online classes based on students' activity and learning-by-doing, lack of standardisation of platforms used for online education at the university, too much workload for students requiring independent learning, and risk of health problems as a consequence of too long work at the computer. In the second semester of distance education during the pandemic, there was an increase in student satisfaction with online education, mainly due to the more frequent conducting of synchronously classes The crisis caused by the COVID-19 pandemic situation initiated the educational revolution in Poland. It appears that online education will remain an integral part of Polish higher education system, but it will not replace stationary education after the pandemic.

Keywords: COVID-19 pandemic; higher education; distance education; e-learning; virtual classes.

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I. Introduction

The COVID-19 pandemic, announced by the World Health Organization (WHO) on March 11, 2020, has completely changed the social life as we have known so far. The global health emergency led to an education crisis. Most governments around the world have temporarily closed schools, universities and other educational institutions in an attempt to contain the spread of the pandemic. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), on March 11, 2020, schools and higher education institutions were closed in 27 countries, affecting 380,218,964 learners. For comparison, a month later schools and higher education institutions were closed in 194 countries, affecting 1,578,336,788 learners.[1]

The measures taken due to COVID-19 have had an immediate effect on higher education institutions all over the world. "They have impacted, often dramatically, the conditions under which higher education all of a sudden had to perform research and what is now often referred to as 'emergency online education'; students need assistance; staff face unprecedented challenges, including job insecurity; university leaders had to reinvent how to run their campus operations".[2] The changes that have occurred in higher education as a result of the pandemic can be described as rapid, total and unpredictable. The problems faced by universities concerned the organizational, research and didactic spheres.[3] Learning that till now relied on face-to-face educational environments has been replaced by "an environment driven by computers and digital technologies".[4]

At the beginning of the lockdown, it was difficult to predict how long virtual education would be conducted and whether, after a possible return to

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[1] "Education: From Disruption to Recovery. COVID-19 Impact on Education," UNESCO, accessed August 26, 2020, https://en.unesco.org/COVID19/educationresponse.

[2] Giorgio Marinoni, Hilligje van't Land, and Trine Jensen, *The Impact of COVID-19 on Higher Education around The World. IAU Global Survey Report* (Paris: International Association of Universities, 2020), 6.

[3] Wahab Ali, "Online and Remote Learning in Higher Education Institutes: A Necessity in light of COVID-19 Pandemic," *Higher Education Studies* 10, no 3 (2020): 16–25, https://doi.org/10.5539/hes.v10n3p16. Aleksander Aristovnik, Damijana Keržič, Dejan Ravšelj, Nina Tomaževič, and Lan Umek, "Impacts of the COVID-19 Pandemic on Life of Higher Education Students: A Global Perspective," *Sustainability* 12, no. 20 (2020): 8438, https://doi.org/10.3390/su12208438. Aleksander Kobylarek, "Edukacja w czasach zarazy. Przypadek uniwersytetu," [Education in times of the plague. The case of the university] *Ogrody Nauk i Sztuk* 10 (2020): 7-13.

[4] Ali Khaled Bawaneh, "The Satisfaction Level of Undergraduate Science Students Towards Using E-Learning and Virtual Classes in Exceptional Condition COVID-19 Crisis," *Turkish Online Journal of Distance Education* 22, no. 1 (2021): 52.

universities, it would be necessary to close them again or not. All actors involved in higher education (e.g. policy makers, teachers, students, administrative and support staff) were met with the necessity to face the immediate changes that were necessary to implement. Teaching and being accountable in 'universities without bodies' has become a challenge for academic teachers. On the other hand, learning in a new reality has become a challenge for students. Not all of them felt competent to participate in distance academic education, but they had to adapt to the new, difficult reality. An additional difficulty was the negative emotions experienced in connection with the epidemic situation in the world,[5] a real threat to one's own health and life, as well as the need to maintain social distance and limit interpersonal contacts.

The first case of a laboratory confirmed SARS-CoV-2 infection in Poland was that of the patient hospitalised in Zielona Góra, with confirmation announced officially on March 4, 2020. Lockdown-type control measures started from the beginning of March, 2020 in Poland. Rectors of few universities decided to cancel full-time education and suspend the possibility of using the university's teaching infrastructure from March 10, 2020, until further notice. The Polish government authorities announced the closure of educational establishments (including universities) from March 12, 2020 for a period of two weeks. This period was systematically extended. An official epidemic was declared in Poland on March 20, 2020. It resulted in numerous limitations in the operation of public and non-public institutions as well as limitations in social, family and cultural life. In the summer semester 2019/2020 the higher education was conducted as distance education. In the winter semester 2020/2021, classes at universities in Poland were planned to be carried out both remotely and stationary, depending on the form of classes. Due to the increase in the number of COVID-19 cases, virtual education was introduced as the leading one.

Hence, this study came to determine what experiences were gained by students participating in distance education in Poland during the COVID-19 pandemic. The study was also an attempt to recognize the students opinions about higher education in Poland during the pandemic. Most universities in Poland depend on the conventional teaching and learning methodologies, although some of them offer courses as e-learning or virtual classes. For this reason, many students had the opportunity to attend in distance education the first time.

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[5] Jeff Clyde Corpuz, "COVID-19 and Mental Health," *Journal of Psychosocial Nursing and Mental Health Services* 58, no. 10 (2020): 4, https://doi.org/10.3928/02793695-20200916-01.

I.1. Literature review

Distance education is a "form of education in which the main elements include physical separation of teachers and students during instruction and the use of various technologies to facilitate student-teacher and student-student communication".[6] Some characteristics distinguish the phenomenon of distance education. Firstly, distance learning and distance teaching dually make up distance education. It is carried out through institutions. Secondly, physical separation is appropriate to distance education. Also, time may separate learners and their teachers. Third, learners and teachers communicate with each other most often using digital technologies, but also traditional forms of communication. Education may be synchronous or asynchronous. Finally, distance education establishes a learning group which has got common goals, values, principles of work, etc.

Distance education includes correspondence education, open learning (learning through the open university), e-learning and virtual classes. Nowadays the most common are e-learning and virtual classes. Both of them are Internet-based education.

Typically, e-learning is based on enabling students to access their learning materials at any place and time. This modern learning method is also based on virtual classes that facilitate the process of communication between persons engaged in education. Algahtani described three models of using e-learning: adjunct e-learning, blended e-learning and online e-learning.[7] The first one is the situation which e-learning is employed as an assistant in the traditional classroom. Blended e-learning combines traditional learning method with e-learning. The third one is the online e-learning which assumes that teaching and learning processes are in virtual environment.

Virtual classes as the separate form of distance education provides a highly interactive online classroom environment.[8] It allows learners and teachers to conduct discussions, engage with meetings, work in groups, upload and receive files, etc. Virtual classes are similar to traditional education, but it is based on the use of IT applications enabling videoconferences. Physical presence in the classroom is not necessary.

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[6] Gary Berg and Michael Simonson, "Distance learning. Encyclopedia Britannica," accessed October 5, 2021, https://www.britannica.com/topic/distance-learning.

[7] Abdullah Faleh Algahtani, *Evaluating the Effectiveness of the E-learning Experience in Some Universities in Saudi Arabia from Male Students' Perceptions* (Durham: Durham University, 2011), 66.

[8] Ali Khaled Bawaneh, "The Satisfaction Level of Undergraduate Science Students Towards Using E-Learning and Virtual Classes in Exceptional Condition COVID-19 Crisis," *Turkish Online Journal of Distance Education* 22, no. 1 (2021): 54.

Increasingly universities provide distance learning opportunities. "Learning that initially relied on face-to-face educational environments is now being carried out in an environment driven by computers and digital technologies".[9] E-learning and virtual classes in higher education offer completely new opportunities for learners and teachers. According to many researchers,[10] the main benefits of these forms of education are: flexibility, time and space dependency, effective time management, adaptation to the individual differences of students, communing with cultural diversity, combination of structure and freedom, passing exams in comfortable and safe conditions, immediate feedback on tests, access to experts from around the world, attractiveness, reducing stress, cost effectiveness, inclusion of learners in existing global social relationships, better preparation to problem solving in the field of professional activities. At the same time, distance education is connected with numerous limitations. Disadvantages of distance education listed in various studies[11] include:

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[9] Bawaneh, "The Satisfaction Level," 52.

[10] Bryn Holmes and John Gardner, *E-Learning: Concepts and Practice* (London: SAGE Publications Ltd., 2006), 29-31. Abdullah Faleh Alqahtani, *Evaluating the Effectiveness of the E-learning Experience in Some Universities in Saudi Arabia from Male Students' Perceptions* (Durham: Durham University, 2011), 57-60. Valentina Arkorful and Nelly Abaidoo, "The role of e-learning, advantages and disadvantages of its adoption in higher education," *International Journal of Instructional Technology and Distance Learning* 12, no. 1 (2015): 34-35. Sawsen Lakhal, Dianne Bateman and Janie Bédard. "Blended synchronous delivery mode in graduate programs: A literature review and its implementation in the master teacher program," *Collected Essays on Learning and Teaching*, X (2017): 49–51. https://doi.org/10.22329/celt.v10i0.4747. Lazar Stošić, Sofiya Dermendzhieva and Łukasz Tomczyk, "Information and communication technologies as a source of education," *World Journal on Educational Technology: Current Issues* 12, no. 2 (2020): 133-134. Ali Khaled Bawaneh, "The Satisfaction Level of Undergraduate Science Students Towards Using E-Learning and Virtual Classes in Exceptional Condition COVID-19 Crisis," *Turkish Online Journal of Distance Education* 22, no. 1 (2021): 52-65. Munevver Esgice Gunduz, Engin Kursun, Selcuk Karaman and Turgay Demirel. "Problems, Expectations, and Amendments Regarding Distance Education Legislation in Higher Education Institutions in Turkey," *Turkish Online Journal of Distance Education* 21, no. 4 (2020): 186-190. https://doi.org/10.17718/tojde.803402.

[11] John Cowan, "The Advantages and Disadvantages of Distance Education," in *Distance Education for Language Teachers: A UK Perspective*, ed. Ron Howard, Ian McGrath, (Cleveland – Philadelphia – Adelaide: Multilingual Matters Ltd., 1995), 17-18. Valentina Arkorful and Nelly Abaidoo, "The role of e-learning, advantages and disadvantages of its adoption in higher education," *International Journal of Instructional Technology and Distance Learning* 12, no. 1 (2015): 34-35. Sevim Gunes, "What are the perceptions of the students about asynchronous distance learning and blended learning?" *World Journal on Educational Technology: Current Issues* 11, no. 4 (2019): 233. Jieun Lee and Gihan Osman, "Students' Experiences and Perceptions of Online Collaborative Learning in Higher

absence of personal interactions and relations (between students and teachers, but also between colleague learners), isolation, problems in communication (especially in asynchronous distance learning), less effectiveness than traditional methods of teaching/learning in selected areas, difficulty in developing practical skills and social competences (especially in the fields such as medical science and engineering), impossibility to conduct selected educational activities (e.g. laboratory exercises), greater risk of cheating and plagiarism.

II. Purpose of the study

The aim of the research was to find out what experiences were gained by students participating in distance education in Poland during the COVID-19 pandemic. The study was an attempt to recognize the students opinions about higher education in Poland during the pandemic. In general, the study aimed to answer the following questions:

1. What educational experiences did students gain in Poland through participation in online education during the COVID-19 pandemic?

2. What are the benefits and limitations of online education in the opinions of students based on their experience gained while studying under lockdown?

III. Methodology

III.1. Method and procedure

The long-term study was conducted in two stages: (1) during the first wave of COVID-19 pandemic, in June 2020 (after the students had completed the second semester of 2019/2020), (2) during the second wave of COVID-19 pandemic, in February 2021 (after the students had completed the first semester of 2020/2021).

Data was collected using two questionnaires developed by the researcher. The form used in the first stage of the study consists 18 questions, out of which 16 were closed and 2 open-ended. The survey instrument included questions relating to the following categories: previous (pre-pandemic) experiences in participation in distance education, forms of

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Education of Korea and the UAE," *Turkish Online Journal of Distance Education* 22, no. 1 (2020): 3-4.

conducting online classes at university during the pandemic, regularity of online classes, difficulties in online education, benefits and limitations of traditional and distance education, support received during distance education, preparation of academic teachers to conduct online education (including in real time education using appropriate information technologies). The form used in the second stage of the study was enriched with two additional questions. The aim of these questions was to determine the changes that have occurred in distance education at universities during the second wave of COVID-19 in Poland compared to the previous academic year.

The initial version of the research instrument was verified as part of the previously conducted pilot studies in a group of 40 students and PhD students. Taking into account the comments of the respondents, the content was corrected and the variants of the answers were supplemented.

To achieve the objectives of the study, the researcher followed the descriptive-analytical method.

III.2. Participants

Students and PhD students were invited to participate in the research via social media. The data was collected using online questionnaires. Filling in the form took several minutes on average.

The selection of the research group was random. The study included 290 participants (143 participants in the first stage of the study and 147 in the second one) of 20 to 48 years of age. The average age of the participant was 26. The majority of the research group were women (69.3%). Almost all participants declared Polish nationality (98.4%). The others declared Ukrainian, Nigerian and Kyrgyz nationalities. Most of the participants came from big cities (59.3%). Furthermore, 19.3% came from countrysides, 13.8% from medium-sized cities, and 7.6% from small towns. The most common type of university where participants studied was technical university (45.9%). The other types of universities were: university (29.7%), medical university (8.6%), nature of university (4.1%), academy of physical education (2.4%), other (9.3%). The respondents most often declared that they study at PhD studies (35.9%). The second most represented group were people studying at the 2nd level of the studies (28.9%). The other participants declared that they study at the 1st level of the studies (23.1%) and master studies (12.1%). The respondents most often declared full-time of studies (81.7%). The detailed information about the participants is shown in the Table 1.

Table 1

Study sample of students

		The first stage of the study (N=143)	The second stage of the study (N=147)	Total (N=290)
Gender	Male Female	N = 44 (30,8%) N = 99 (69,2%)	N = 45 (30,6%) N = 102 (69,4%)	N = 89 (30,7%) N = 201 (69,3%)
Nationality	Polish Ukrainian Nigerian Kyrgyz	N = 139 (97,2%) N = 2 (1,4%) N = 1 (0,7%) N = 1 (0,7%)	N = 146 (99,3%) N = 1 (0,7%) N = 0 N = 0	N = 285 (98,4%) N = 3 (1%) N = 1 (0,3%) N = 1 (0,3%)
Place of residence	big city medium-size town small town countryside	N = 80 (55,9%) N = 25 (17,3%) N = 13 (9,3%) N = 25 (17,5%)	N = 92 (62,6%) N = 15 (10,2%) N = 9 (6,1%) N = 31 (21,1%)	N = 172 (59,3%) N = 40 (13,8%) N = 22 (7,6%) N = 56 (19,3%)
Type of university	university technical university medical university nature university academy of physical education others	N = 48 (33,6%) N = 66 (46,1%) N = 6 (4,2%) N = 6 (4,2%) N = 5 (3,5%) N = 12 (8,4%)	N = 38 (25,9%) N = 67 (45,6%) N = 19 (12,9%) N = 6 (4,1%) N = 2 (1,4%) N = 15 (%)	N = 86 (29,7%) N = 133 (45,9%) N = 25 (8,6%) N = 12 (4,1%) N = 7 (2,4%) N = 27 (9,3%)
Level of studies	the 1st level the 2nd level master studies PhD studies	N = 39 (27,6%) N = 53 (37%) N = 15 (10,2%) N = 36 (25,2%)	N = 28 (19%) N = 31 (21,1%) N = 20 (13,6%) N = 68 (46,3%)	N = 67 (23,1%) N = 84 (28,9%) N = 35 (12,1%) N = 104 (35,9%)
Form of studies	full-time part-time	N = 114 (79,7%) N = 29 (20,3%)	N = 123 (83,7%) N = 24 (16,3%)	N = 237 (81,7%) N = 53 (18,3%)

III.3. *Ethical consideration*

The researcher made ethical considerations in the conduct of this study. In particular, before starting the research, their potential participants were clearly informed about the objectives and the course of the research and the

planned publication of the results. They were also informed about the retention, sharing and any possible secondary uses of the research data. Additionally, researcher provided their own contact details to participants. At the start of the study the researcher obtained the consent to be involved in the study. The participants had the freedom to withdraw their consent for any reason and at any time they feel uncomfortable with their participation in the survey. Participation in the research was voluntary and anonymous, as stated in the instructions for the questionnaire.

IV. Findings

IV.1. *Experience with online education during the COVID-19 pandemic*

More than half (70.6%) of the respondents had not participated (i.e. before the COVID-19 pandemic) in distance education before. Thus, the pandemic situation in the world became a pretext to gain new educational experiences.

Most of the respondents stated that all classes included in the schedule were held. However, in the first semester of distance education due to the COVID-19 pandemic more classes were not delivered compared to the second semester. This problem was indicated by 31% of students participating in the first phase of the study, and 15% in the second phase. The following reasons for the lack of organization of classes were listed: lack of opportunities due to the form of classes (i.e. laboratory, sports classes, workshops, practice), lack of contact of the teacher, lack of competence of the teacher in conducting virtual classes, lack of willingness of the teacher, technical problems, teacher's illness. Some students were unable to identify the cause. It is worth mentioning that insufficient preparation of academic teachers to conduct on-line education was not indicated as a cause of cancellation of classes in the second stage of the study. Teachers were better prepared to conduct online classes in the second semester of distance education during the pandemic.

The research shows that academic teachers chose various forms of online classes. Additionally, there were visible differences in the ways of conducting online education between two semesters of higher education during the COVID-19 pandemic. The students were asked to indicate one form of conducting online classes that their teachers were choosing the most frequently during two waves of the COVID-19 pandemic. Their answers are presented in the Figure 1. The results confirm that synchronous distance education (i.e. teleconferences, videoconferences) was more common in the

second semester. It can be assumed that then academic teachers were properly trained in the use of information and communication technologies (ICT) in education. Moreover, some universities introduced an obligation of synchronous education. The choice of the method of conducting classes most often belonged to the teacher, and it was sporadically consulted with the students.
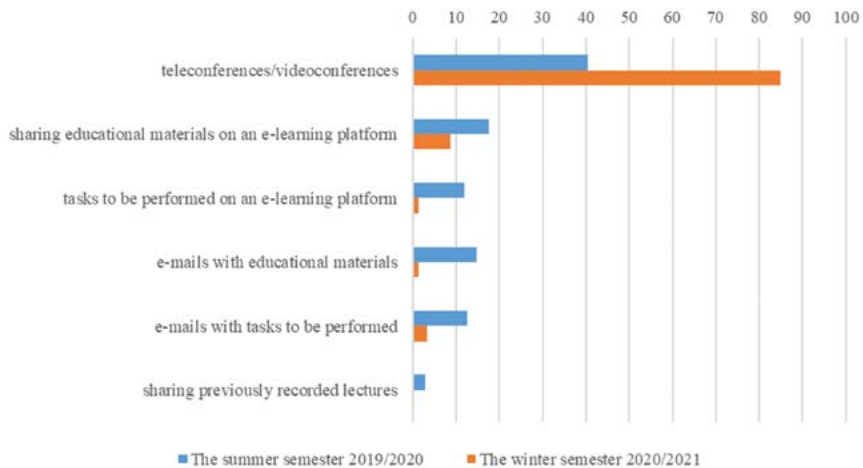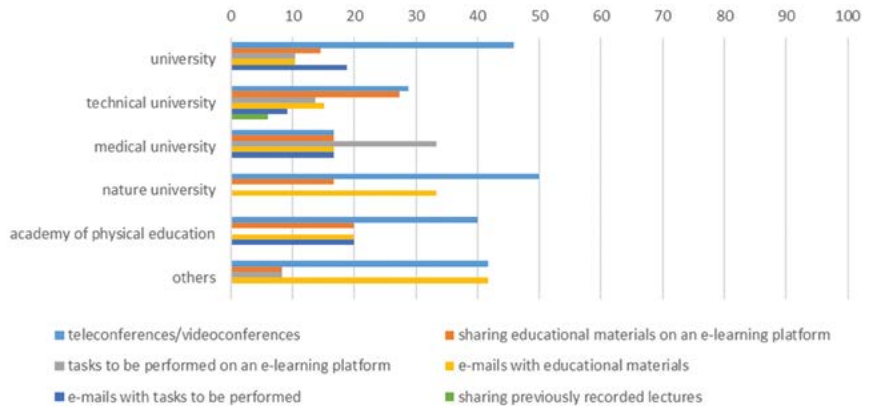

* Note: Values given in %.

Figure 1

Forms of online education during the COVID-19 pandemic

The Figures 2 and 3 present students' answers of different types of universities to the question about the most frequently chosen forms of distance education in two waves of the pandemic at their universities. Due to the large disproportions in the number of groups representing various types of university (see Table 1), the results show the percentage share of a specific form of distance education in the total number of responses obtained from students representing one type of university. Additionally, by comparing the data presented in the Figures 2 and 3, it is possible to monitor changes that have occurred in teacher choices of various types of universities during the global health crisis. Regardless of the type of university, there has been a large increase in videoconferences/teleconferences in the second wave of the COVID-19 pandemic. The great variety in forms of distance education has been replaced by real-time education. Videoconferences/teleconferences

were the leading form of conducting classes, the others became accompanying or they were not used.

* Note: Values given in %.

Figure 2

Forms of online education in various types of universities
in the summer semester 2019/2020
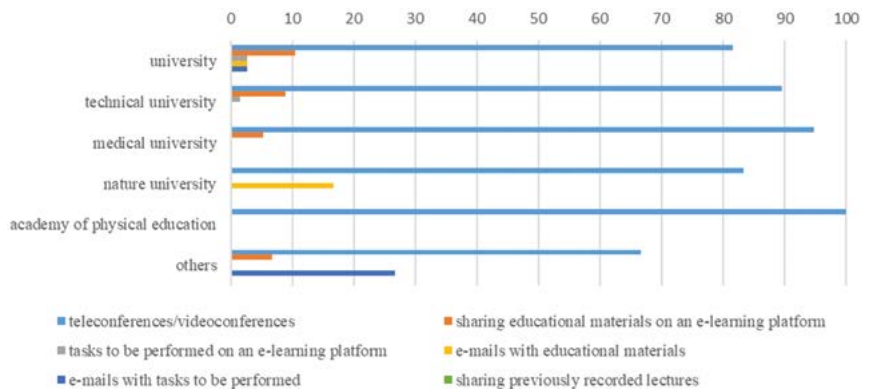
* Note: Values given in %.

Figure 3

Forms of online education in various types of universities
in the winter semester 2020/2021

IV.2. Barriers to online learning during the COVID-19 pandemic

Students indicated major barriers to online learning during the COVID-19 pandemic. The study found that there were significant differences in the respondents' answers compared to the semester that was assessed. Firstly, in the second semester of distance education during the pandemic, more students noticed the lack of face-to-face contact with other students as a barrier to learning. It is difficult to replace direct contact with the use of information and communication technologies. Secondly, the number of students experiencing negative emotions due to the pandemic has increased. Lengthening physical separation and limited communication in many social spheres (including distance education) deepened a mental crisis of students. Thirdly, more students got used to online education and were better at combining learning with other duties. The number of students experiencing overburdening has decreased. The analysis of collected data made it possible to distinguish five categories of barriers to online learning during the COVID-19 pandemic at universities in Poland: organizational and institutional, technical, social, emotional, competence.[12] The detailed barriers to online learning during the COVID-19 pandemic are shown in the Figure 4.
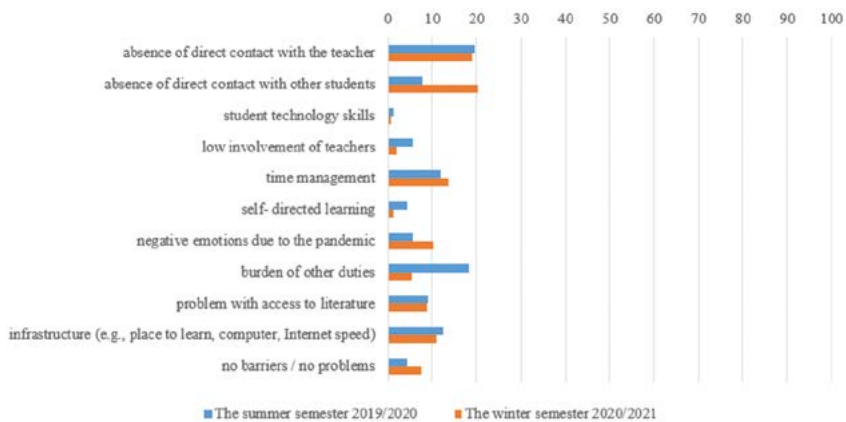
* Note: Values given in %.

Figure 4

Barriers to online learning during the COVID-19 pandemic

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[12] Emilia Mazurek, "Barriers to Online Learning during the COVID-19 Pandemic at Universities in Poland," *Proceedings of the 37th International Business Information Management Association (IBIMA)*, (Cordoba: IBIMA, 2021), 8245-8247.

Students participating in the research received support of other people in learning. The most of them (47.5%) could count on help of their colleagues who study with them. Students also received support from their family members (18.5%), other students from the university where they study (13%), academic teachers (12%), and from other people (9%). Teachers most often supported students through individual consultations using e-mail correspondence or teleconferences/videoconferences. Occasionally, they provided additional materials.

IV.3. *Advantages and disadvantages of online education*

The educational experience gained during the COVID-19 pandemic became the basis for the evaluation of distance education. Students noticed many advantages and disadvantages of online education. They are presented in the Figures 5 and 6.

The students presented their own expectations and proposals for changes in online academic education. In the first phase of research students expected more videoconferences, which on the one hand provide direct contact with the teacher, learning from an expert, and on the other hand enable discussions, and thus help to improve social competences. Students also expected better organization of synchronous classes and adaptation of the sent didactic materials for mediated education (e.g. more explanations and comments, visual attractiveness). Some respondents directly suggested the necessity to train academic teachers in the field of online education whereas they emphasized the need to train students in this field much less often. In the second stage of research, the students appreciated that most of the classes were conducted synchronously. Further expectations of students concern teachers' attitudes towards teaching in a crisis situation, although at the same time they perceive the difficult situation of academic teachers resulting from the need to immediately change the current teaching. They expect greater involvement from the lecturers, maintaining systematic online contact, providing feedback in the case of assignment evaluation, precise definition of requirements and "reasonable" planning of the learning process.

Despite the advantages of online education, students are not convinced to replace traditional education with online education. Over half of the respondents (58%) stated that they prefer blended-learning. In turn, 33% of respondents prefer stationary education, and only 9% online education.
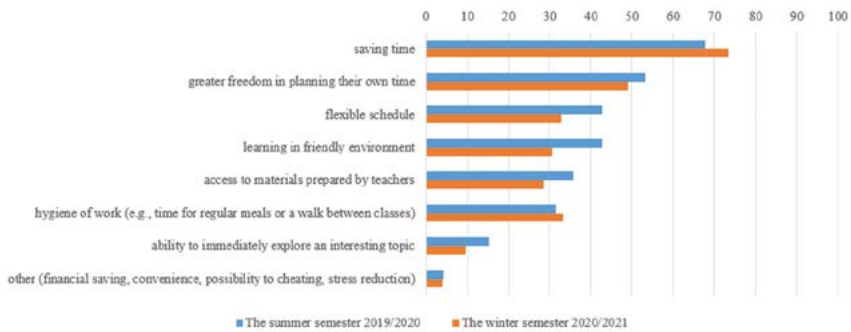
* Note: Values given in %. Respondents could choose more than one answer.

Figure 5

Advantages of online education
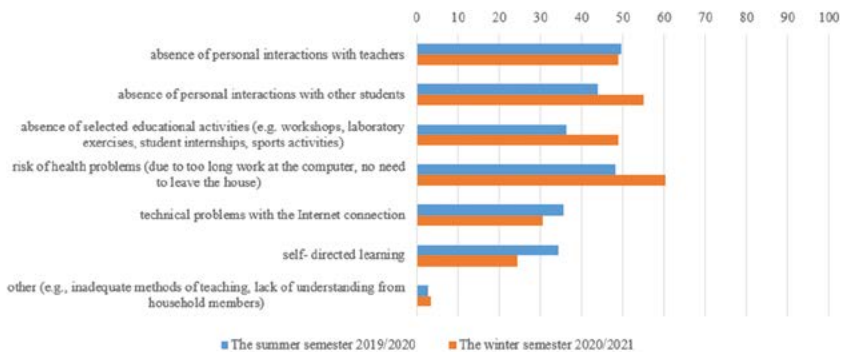
* Note: Values given in %. Respondents could choose more than one answer.

Figure 6

Disadvantages of online education

V. Discussion

The pandemic COVID-19 has caused a colossal impact on the higher education system in Poland. The epidemic situation forced academic teachers to quickly undertake actions aimed at adapting the education conducted so far to the new conditions. Significant difficulties were the short time to prepare for conducting classes in a completely new form, the lack or little

experience in conducting online education, the lack or insufficient knowledge of information and communication technologies for online education and poor preparation to use them. Deficiencies in this regard, unfortunately, translated into the quality of academic education during the pandemic. However, in the second semester of distance education, there was an increase in student satisfaction with online education, mainly due to the more frequent conducting of synchronously classes. The research shows that from the perspective of students, the greatest limitations of online education during the pandemic were: absence of personal interaction with teachers and other students, difficulty in organizing online classes based on students' activity and learning-by-doing, lack of standardization of platforms used for online education at a university, too much workload for students requiring independent learning, and risk of health problems as a consequence of too long work at the computer. The biggest advantage of online education, on the other hand, are logistical and organizational issues, which allow, above all, to better plan one's own time.[13]

It can be concluded that online education will become an inseparable part of academic education both during and after the COVID-19 pandemic. "The higher education institutions and universities need to plan the post-pandemic education and research strategies to ensure student learning outcomes and standards of educational quality".[14] The urgent task is both the selection of optimal technological solutions supporting distance education in universities and the appropriate preparation of academic teachers to conduct online classes.[15] This preparation should not only consist in acquiring the skills to use applications and platforms, but above all in making people aware of the basic limitations resulting from mediated communication between the teacher and students. One of the basic human needs is the need for closeness and building

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[13] Valentina Arkorful and Nelly Abaidoo, "The role of e-learning, advantages and disadvantages of its adoption in higher education," *International Journal of Instructional Technology and Distance Learning* 12, no. 1 (2015): 34-35. Sevim Gunes, "What are the perceptions of the students about asynchronous distance learning and blended learning?," *World Journal on Educational Technology: Current Issues* 11, no. 4 (2019): 233. Jieun Lee and Gihan Osman, "Students' Experiences and Perceptions of Online Collaborative Learning in Higher Education of Korea and the UAE," *Turkish Online Journal of Distance Education* 22, no. 1 (2020): 10-13.

[14] Shazia Rashid and Sinishtha Singh Yadav, "Impact of COVID-19 Pandemic on Higher Education and Research," *Indian Journal of Human Development* 14, no 2 (2020): 340, https://doi.org/10.1177/0973703020946700.

[15] Pushkar Dubey and Deepak Pandey, "Distance learning in higher education during pandemic: challenges and opportunities," *International Journal of Indian Psychology* 8, no. 2 (2020): 45. https://doi.org/10.25215/0802.204.

interpersonal relationships with other people.[16] In a pandemic adversely affecting the psychological well-being of a person, this need increases. Therefore, in the conditions of online education, it is necessary to pay special attention to the quality of relations and communication,[17] as well as the attention of academic teachers, expressed in recognizing the needs (including educational) of students and the difficulties they experience. Based on the research conducted, it can be concluded that this area was not fully noticed and properly taken care of in distance education initiated by the first wave of the COVID-19 pandemic. Hence the feeling of frustration and dissatisfaction of many students when listing the mistakes made by their teachers.[18] Meeting the basic needs of students (including safety, respect and recognition, access to information) is conducive to learning and achieving learning outcomes. Building relationships based on trust, respect, empathic care and supporting students in learning in new circumstances is the basis for their better adaptation to distance education and for acquiring resistance to harmful factors resulting from both the epidemic situation and the dramatic change in their education. Through open communication, it is also possible to develop a certain consensus between teachers' expectations of students' learning independence and students' expectations of being supported by teachers. An important task of university managers is also to develop a strategy and implement actions aimed at emotional support of academic staff and students in a situation of crisis aggravating mental problems and disorders. Therefore, building a relationship between a student and an academic teacher and supporting students in a difficult situation is a prerequisite for ensuring education that is effective and of high quality. Modern technologies play a supporting role in this context,[19] their use alone does not ensure the achievement of the intended goal.

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[16] Jacek Pyżalski, "Co jest obecnie ważne, a co mniej w działaniach szkół i nauczycieli?," [What is currently important, and what is less, in the activities of schools and teachers?] in *Edukacja w czasach pandemii wirusa COVID-19. Z dystansem o tym, co robimy obecnie jako nauczyciele [Education during the COVID-19 pandemic. Keep in mind what we are doing today as teachers]* ed. Jacek Pyżalski (Warszawa: EduAkcja, 2020), 26.

[17] Marek Kaczmarzyk, "Neurobiologiczny kontekst edukacji zdalnej," [Neurobiological context of online education] in *Edukacja w czasach pandemii wirusa COVID-19. Z dystansem o tym, co robimy obecnie jako nauczyciele, [Education during the COVID-19 pandemic. Keep in mind what we are doing today as teachers]* ed. Jacek Pyżalski (Warszawa: EduAkcja 2020), 20-24.

[18] Aleksander Aristovnik, Damijana Keržič, Dejan Ravšelj, Nina Tomaževič, and Lan Umek. "Impacts of the COVID-19 Pandemic on Life of Higher Education Students: A Global Perspective," *Sustainability* 12, no 20 (2020): 8438. https://doi.org/10.3390/su12208438.

[19] Jun Sun, "Multi-dimensional alignment between online instruction and course technology: A learner-centered perspective," *Computers & Education*, 101 (2016): 102–114. https://doi.org/10.1016/j.compedu.2016.06.003.

Online academic education has also made people aware of the importance of applying the principle of individualization in education. Taking into account the individual resources and limitations of students (including students with special educational needs) requires identifying them and then adapting the forms of support to them. During distance education, diagnosis in this area is difficult due to mediated communication. It is the teacher's responsibility to take the initiative and offer her/his help. Online education needs a learner-centered perspective.

VI. Conclusion

The COVID-19 pandemic has brought about profound changes in society. The global health emergency led to an education crisis. All schools from primary to academic level faced an unprecedented challenge: the widespread transition from in-school to online education. This challenge appeared suddenly and required immediate action, with the simultaneous lack of preparation of teachers and students for distance learning, insufficient infrastructure of higher education institutions, pessimistic moods caused by the feeling of threat to health and life.

The crisis caused by the pandemic situation in many universities initiated, and accelerated in others, a new way of thinking about education and the implementation of new technological solutions supporting education.[20] In conditions of relative calm, the changes introduced during a pandemic would probably take many years. Meanwhile, we participated in the educational revolution in which all educational entities gained new experiences. Certainly, some universities have coped with this challenge better than others. It was difficult for everyone to avoid mistakes and omissions, but on the basis of their analysis, it is possible to develop new solutions and recommendations for use in education in subsequent (possible) waves of a pandemic and in a post-pandemic situation. The obtained research results indicate the essence of the relational and communicative dimensions in distance education. Hence, there is an urgent need to introduce systemic measures in higher education institutions aimed at better preparation of academic teachers for recognizing the students' educational needs and building relationships with students in terms of remote cooperation. It would be worth to implement

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[20] Wahab Ali, "Online and Remote Learning in Higher Education Institutes: A Necessity in light of COVID-19 Pandemic," *Higher Education Studies* 10, no. 3 (2020): 16–25, https://doi.org/10.5539/hes.v10n3p16. Pushkar Dubey and Deepak Pandey, "Distance learning in higher education during pandemic: challenges and opportunities," *International Journal of Indian Psychology* 8, no. 2 (2020): 44. https://doi.org/10.25215/0802.204.

following solutions in higher education institutions: teacher training, academic tutoring, peer-group consultation, peer class observation, expert class observation, university guidance, digitalization programs, etc.

It should be assumed that online education will remain an integral part of many higher education systems. The introduction of distance education in higher education has confirmed that some forms of teaching can be conducted online, while others require a residential mode. Moreover, the personal meeting of the student with the teacher and direct communication are perceived as one of the greatest advantages of traditional education. Hence, it can be concluded that online education will not replace residential education after the pandemic. Combining both models and implementing hybrid education seems more realistic.

VII. Limitations of study and suggestions of future research

The difficulty in finding an equivalent number of participants caused a limitation of the study. The results of this study are a subject to the limitation of generalisation. The results of this study do not reflect the entire population of students in Poland. For this reason, the presented study is not national in scope (in Poland). Although participants of the study were students and PhD students of various universities in Poland, they did not represent all universities in this country. Therefore, it cannot be concluded that the obtained results relate to higher education throughout Poland. They only illustrate a certain range of experiences gained by some students in Poland during the COVID-19 pandemic.

It is necessary to conduct further studies concerning the experiences gained by students participating in online education during the global health crisis. This knowledge may be useful to develop new solutions and recommendations for planning higher education in subsequent waves of the pandemic and in a post-pandemic situation. For better understanding the situation of higher education during the global health crisis in different countries, the future studies in this area should consolidate representativeness, extend to a well-justified national scope, take into account the existing traditions in conducting distance education in educational systems, incorporate the faculty's vision, etc. Subsequent research should, on the one hand, be based on the methodology of quantitative research, enabling the consolidation of the representativeness of the studied population. On the other hand, qualitative research (case studies, etnographic research, action research, biographical research, etc.) should also be carried out, deepening the understanding of the problem at hand. It would be valuable to conduct

research on a large scale within international research networks. International sharing of experience in this area becomes a value.

VIII. Compliance with ethical conventions

The study was conducted according to the Guidelines of the Declaration of Helsinki as well as to the "Ethical Guidelines for Educational Research" elaborated by British Educational Research Association [BERA] (2018). The approval of the Ethics Committee was not required.

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World Health Organization. "WHO-Director General Speeches." Accessed October 15, 2020. https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-COVID-19---11-march-2020.

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Preparing for the unexpected in a COVID-19 world: The teaching dilemmas of a mid-semester faculty change

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Abstract: Despite the perceived rarity of mid-semester faculty changes, there is a shortage of literature to guide administrators and faculty on best practices for handing the dilemmas associated with mid-semester faculty changes. This is particularly concerning given the uncertainty of situations like the COVID-19 global pandemic and recent research that finds that future extreme epidemics are likely to happen. This paper seeks to answer two questions (1) What can faculty and administrators do to prepare students who are experiencing a mid-semester faculty change, and (2) What procedures and processes are in place to assist the incoming faculty? Data were collected through a survey of students who had underwent a mid-semester faculty change and interviews with administrators who deal with personnel issues like this one. The data suggest faculty should *first* meet with students to assess their progress before jumping into an established lesson plan (the opposite of how faculty normally prepare to teach a class). Clear communication about expectations, organization of the course materials, and instructor flexibility was identified as keys to student success during a teaching disruption. These findings align with decades of research on teaching and learning. Administrators should create contingency plans that go beyond the personnel transaction and that help faculty quickly prepare for a transition that is student focused. More research is needed to identify the best administrative processes and procedures to assist faculty in a smooth transition when taking over a course mid-semester.

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I. Introduction

This paper seeks to shed light on a narrowly defined teaching dilemma–the mid-semester faculty change. The authors acknowledge the rarity and sensitivity of these occurrences yet these are the very reasons that makes a paper such as this one, useful. For the purposes of this paper, 'mid-semester' is used to refer to any in-progress course at the post-secondary level. This applies to any class format (semester, term, quarter, etc.) or delivery option (on-campus, hybrid, online, etc.). Specifically this paper seeks to answer two questions so that students, faculty, and administrators can better prepare for the unexpected mid-semester faculty change: (1) What can faculty and administrators do to prepare students who are experiencing a mid-semester faculty change, and (2) What procedures and processes are in place to assist the incoming faculty?

Considerable research over the past few decades exists which has investigated the underlying causes of turnover in academia.[1,2,3,4] While this study focuses on the United States, turnover in higher education has also been studied in Australia,[5] Latin America,[6] Europe,[7,8] and the United

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[1] Mark H. Conklin and Shane P. Desselle, "Job Turnover Intentions among Pharmacy Faculty," *Am J Pharm Educ* 71, no. 4 (2007): 62–62, https://doi.org/10.5688/aj710462.

[2] Ronald Ehrenberg, Hirschel Kasper, and Daniel Rees, *Faculty Turnover at American Colleges and Universities: Analyses of AAUP Data* (1994).

[3] Lasun Gbadamosi and Nwosu Jonathan Chinaka, "Organizational Politics, Turnover Intention, and Organizational Commitment as Predictors of Employees' Efficiency and Effectiveness in Academia," *Proceedings of Informing Science & IT Education Conference* (2011): 305–14, accessed June 15, 2021, http://proceedings.informingscience.org/InSITE2011/InSITE11p305-314Lasun205.pdf.

[4] Yonghong Jade XU, "Faculty Turnover: Discipline-Specific Attention Is Warranted," *Research in Higher Education* 49, no. 1 (2008): 40–61, https://doi.org/10.1007/s11162-007-9062-7.

[5] Saima Ahmad, Syed Muhammad Fazal-E-Hasan, and Ahmad Kaleem, "How Ethical Leadership Stimulates Academics' Retention in Universities," *International Journal of Educational Management* 32, no. 7 (2018): 1348–62, https://doi.org/10.1108/ijem-11-2017-0324.

[6] Yaquelín Puebla González, José Luis Almuiñas Rivero, Euclides Catá Guilarte, and Aníbal Isaac Silva, "EnTorno Al Dilema De La Fluctuación Laboral Del Personal Docente Universitario / around the Dilemma of the Fluctuation of the University Teaching Staff," Estudios del Desarrollo Social: Cuba y América Latina, accessed August 2, 2022, http://www.revflacso.uh.cu/index.php/EDS/article/view/261/239.

[7] Saima Ahmad, Syed Muhammad Fazal-E-Hasan, and Ahmad Kaleem. "How Ethical Leadership Stimulates Academics' Retention in Universities," *International Journal of Educational Management* 32, no. 7 (2018): 1348–62. https://doi.org/10.1108/ijem-11-2017-0324.

[8] Miroslava Federičová, "Teacher Turnover: What Can We Learn from Europe?" *European Journal of Education* 56, no. 1 (2020): 102–16, https://doi.org/10.1111/ejed.12429.

Kingdom,[9] for example. Despite turnover being fundamentally acknowledged as 'a practical research concern...due to the costly monetary and academic consequences that the institutions have to bear,[10] essentially no research has focused specifically on the academic consequences of mid-semester emergency-related turnover.

The hallmark work of Windschitl[11] on dilemmas in teaching underscores the need to acknowledge that the art and science of teaching and learning is not a neat process. Lohr and Ursyn[12] aptly describe education as more complicated than rocket science. This has much to do with the fact that education is a process which has many different stakeholders who contribute to an endless number of complex challenges.

Though not well documented because of legal and/or privacy reasons, faculty turnover resulting in a mid-semester faculty change *can and does* occur. This type of faculty turnover results in the urgent need to quickly find a replacement for the unexpected departure of the faculty member assigned to teach the course. Conventional wisdom suggests the quick decision-making lies with the department head[13] and the incoming faculty must quickly create and execute a plan for teaching the course. Meanwhile, the students enrolled in the course need to continue the course with a new and unexpected instructor. In the best of circumstances, planned transitions like maternity/paternity leave and voluntary separations occur at a semester break or at another logical point within a course. Conversely, emergencies such as illness, accidents, death, or suspension are unpredictable, but this does not negate the responsibility of contingency planning for such occurrences. Rare as a mid-semester faculty change was perceived in the past, the recent global pandemic brought uncertainty to almost all aspects of life, particularly university life.

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[9] Rob Gandy, Patricia Harrison, and Jeff Gold, "Talent Management in Higher Education: Is Turnover Relevant," *European Journal of Training and Development* 42, no. 9 (2018): 597–610, https://doi.org/10.1108/ejtd-11-2017-0099.

[10] Yonghong Jade Xu, "Faculty Turnover: Discipline-Specific Attention Is Warranted," *Research in Higher Education* 49, no. 1 (2008): 40.

[11] Mark Windschitl, "Framing Constructivism in Practice as the Negotiation of Dilemmas: An Analysis of the Conceptual, Pedagogical, Cultural, and Political Challenges Facing Teachers," *Review of Educational Research* 72, no. 2 (2002): 131–75, https://doi.org/10.3102/00346543072002131.

[12] Linda Lohr and Anna Ursyn, "Visualizing the Instructional Design Process: Seven Usability Strategies for Promoting Creative Instruction," *Design Principles and Practices: An International Journal* 4, no. 2 (2010): 65–75.

[13] Haydn Mathias, "The Role of the University Head of Department," *Journal of Further and Higher Education* 15, no. 3 (1991): 65–75, https://doi.org/10.1080/0309877910150308.

The overarching objective of this research is to provide insight on this circumstance to better guide administrators and faculty members who are faced with mid-semester faculty change so that students can still succeed. The paper will examine the literature on teaching dilemmas, discuss the research methodology used to address the two research questions, and conclude with the results and practical advice for faculty and administrators.

II. Dilemmas faced in Constructivist Teaching

This aim of this study it to explicate the challenges of the mid-semester teaching change from a teaching and learning perspective. The scope of teaching dilemma research varies from frameworks of teaching dilemmas to the dilemma's faculty face in different aspects of their teaching.[14] Teaching dilemma research also varies from country to country and has been studied worldwide.[15,16,17,18]

Unlike other dilemma frameworks, Windschitl[19] provides a *teaching* framework from which to examine turnover and defines four frames of reference for conceptualizing the dilemmas faced in constructivist teaching: conceptual, pedagogical, political, and cultural. Conceptual dilemmas are those that relate to 'grasping the underpinnings of cognitive and social constructivism.[20]

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[14] Şeyda Selen Çimen and Şevki Kömür, "Dilemma Situations in Teaching Practice: What Do Student Teachers Reflect?" *Gaziantep University Journal of Social Sciences* 18 (2019): 168–77, https://doi.org/10.21547/jss.599356.

[15] Kristina Hansson and Per-Olof Erixon, "Academisation and Teachers' Dilemmas," *European Educational Research Journal* 19, no. 4 (2019): 289–309, https://doi.org/10.1177/1474904119872935.

[16] George Z.F. Bereday, "The Social Dilemma in the Education of Teachers in Western Europe," *Journal of Teacher Education* 7, no. 4 (1956): 293–303, https://doi.org/10.1177/002248715600700403.

[17] Stephen Harvey, Christopher Cushion, and Paul Sammon, "Dilemmas Faced by Pre-Service Teachers When Learning about and Implementing a Game-Centred Approach," *European Physical Education Review* 21, no. 2 (2014): 238–56, https://doi.org/10.1177/1356336x14560773.

[18] Karin Scager, Sanne F. Akkerman, Albert Pilot, and Theo Wubbels, "Teacher Dilemmas in Challenging Students in Higher Education," *Teaching in Higher Education* 22, no. 3 (2016): 318–35, https://doi.org/10.1080/13562517.2016.1248392.

[19] Mark Windschitl, "Framing Constructivism in Practice as the Negotiation of Dilemmas: An Analysis of the Conceptual, Pedagogical, Cultural, and Political Challenges Facing Teachers," *Review of Educational Research* 72, no. 2 (2002): 131–75, https://doi.org/10.3102/00346543072002131.

[20] Mark Windschitl, "Framing Constructivism in Practice as the Negotiation of Dilemmas: An Analysis of the Conceptual, Pedagogical, Cultural, and Political Challenges Facing Teachers," *Review of Educational Research* 72, no. 2 (2002): 133.

Pedagogical dilemmas focus on how to balance the importance of allowing students to think for themselves against remaining true to the theoretical concepts of the subject matter and managing discussion, facilitation, and discourse in the classroom. Political dilemmas are those that 'confront issues of accountability with various stakeholders.'[21] Finally, cultural dilemmas are rooted in perceiving, acknowledging, and understanding the culture that exists in each class–such as discourse patterns and 'the local knowledge of students with varied cultural backgrounds'.[22]

The dilemma of mid-semester faculty change situations crosses between Windschitl's[23] political dilemma and cultural dilemma. Faculty members in this situation must weigh the needs of administrators whose goal is to quickly (and often quietly) replace a faculty member who had an established presence in the classroom, against the classroom culture created by that same faculty member. This dilemma is further complicated by the often unplanned (and discreet) nature of the situation, which makes it difficult to collect data about these occurrences.

II.1. *The political dilemma: Turnover, termination, and unexpected leaves*

Identifying the extent to which the mid-semester faculty dilemma is faced by students and faculty on a global scale is complicated given the vast number of country specific agencies that report on higher education trends and statistics.[24] In addition, higher education or post-secondary education is defined differently by different countries.[25]

The United States National Center for Education Statistics publishes a report every 10 years that compares U.S. education to the 20 countries in the G-20 including: Argentina, Australia, Brazil, Canada, China, France, Germany,

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[21] Mark Windschitl, "Framing Constructivism in Practice as the Negotiation of Dilemmas: An Analysis of the Conceptual, Pedagogical, Cultural, and Political Challenges Facing Teachers," *Review of Educational Research* 72, no. 2 (2002): 133.

[22] Mark Windschitl, "Framing Constructivism in Practice as the Negotiation of Dilemmas: An Analysis of the Conceptual, Pedagogical, Cultural, and Political Challenges Facing Teachers," *Review of Educational Research* 72, no. 2 (2002): 133.

[23] Mark Windschitl, "Framing Constructivism in Practice as the Negotiation of Dilemmas: An Analysis of the Conceptua, Pedagogical, Cultural, and Political Challenges Facing Teachers," *Review of Educational Research* 72, no. 2 (2002): 131–75, https://doi.org/10.3102/00346543072002131.

[24] Gudmund Hernes and Gabrielle Gottelmann-Duret, Rep. *Organization of Ministries of Education*, Paris, France: International Institute for Educational Planning, (2001).

[25] Gudmund Hernes and Gabrielle Gottelmann-Duret. Rep. *Organization of Ministries of Education*, Paris, France: International Institute for Educational Planning, (2001).

India, Indonesia, Italy, Japan, Mexico, the Republic of Korea, the Russian Federation, Saudi Arabia, South Africa, Turkey, and the United Kingdom. The report indicates there are 321 million students in the G-20 ages 19-29 studying in a formal higher education program in 2011; data were unavailable for China and Japan.[26] Conventional wisdom suggests that even if a mid-semester faculty change only affects 5% of the G-20 university population, more than 16.5 million students are affected by a mid-semester faculty change every year. Though mid-semester faculty changes may occur in different ways or for different reasons across the globe, the fact remains that mid-semester faculty changes are a global challenge.

The literature suggests there are three categories for why a faculty member might be replaced mid-semester: (1) typical reasons for voluntary departures (e.g. better opportunities, more prestige, etc.), (2) extenuating motivations (e.g. changing family dynamics, unexpected death, health issues, working conditions, etc.), and (3) punitive catalysts for departure (performance issues, criminal activity, etc.). The foundational work addressing faculty turnover in higher education by Ehrenberg[27] looked primarily at the impacts of compensation, rank, and duration of employment. In a qualitative study, Ramasamy and Abdullah[28] explored individual reasons for faculty resignation, identifying seven themes: employer image, availability of external job opportunities, social media bullying, unfair performance measurement, unfair compensation, work overload, and job insecurity. In the United States COVID-19 has contributed a new reason for voluntary departures for example, the *Chronicle of Higher Education* reports that 35% of faculty in higher education have seriously considered a planned career change to leave higher education because of the global pandemic.[29] The aforementioned factors encompass reasonably well the variety of reasons one might voluntarily leave a position in any given field.

Possible reasons for voluntary and involuntary turnover in individual faculty cases range broadly. Examples may often include extenuating

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[26] "Comparative Indicators of Education in the United States and Other G-20 Countries: 2015," National Center for Education Statistics (NCES) Home Page, a part of the U.S. Department of Education, (2015), https://nces.ed.gov/pubs2016/2016100/index.asp.

[27] Ronald G., Ehrenberg, ed., *What's Happening to Public Higher Education?: The Shifting Financial Burden,* (Baltimore: Johns Hopkins University Press, 2008).

[28] Vijayan Ramasamy and Nor Hanzana Abdullah, "Faculty's Turnover in Private Higher Learning Institutions: A Phenomenal Inquiry," *Business and Economic Horizons* 13, no. 2 (2017): 169–81, https://doi.org/10.15208/beh.2017.13.

[29] Alina Tugend, "On the Verge of Burnout: Covid-19's Impact on Faculty Well-Being and Career Plans," *Chronicle of Higher Education* (2020) https://connect.chronicle.com/rs/931-EKA-218/images/Covid%26FacultyCareerPaths_Fidelity_ResearchBrief_v3%20%281%29.pdf.

circumstances unrelated to the work itself, such as death, personal or family health needs, a change in family structure, or the a direct or underlying COVID-19 reason.[30] The *Chronicle of Higher Education* also reports that faculty are mentally exhausted and feeling far more stressed since the onset of the pandemic. Moreover, the effects of the pandemic have not been felt equally– "The stress that women, Black, brown, gay, nonbinary, and disabled faculty members face in more normal tines to proves themselves is greatly heightened; faculty of color also often come from or have family or friends in communities with high rates of COVID-19."[31] Certainly, the global pandemic has created circumstances in which faculty may have to unexpectedly leave, and not return, for a semester.

An additional category could be summarized as performance-driven or punitive, depending on precise nuance. This category may include concerns with performance, allegations of inappropriate activity or activity that does not align with institutional conduct policies, criminal investigations, or other similar circumstances.[32]

Even though there is a stated or unstated agreement that faculty members are committing to teach a course in full, these individuals may end up departing from their commitments for the same reasons that any employee at any organization might depart from an employment commitment. Conventional wisdom suggests that sudden, 'no advance notice' circumstances create fewer desirable outcomes for mid-semester faculty changes than do pre-planned, 'some notice' circumstances, since these latter experiences provide more time for careful contingency planning.

II.2. *The cultural dilemma: Established classroom practices*

A key cultural dilemma of a mid-semester faculty change relates to classroom culture and classroom practices. 'From a cultural perspective, teaching is more than addressing content, it is also about bringing all students to a shared understanding of what a lesson is and how to participate it in'[33]

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[30] Samad, Ataus, Michael Muchiri, and Sehrish Shahid, "Investigating Leadership and Employee Well-Being in Higher Education," *Personnel Review* 51, no. 1 (2021): 57–76, https://doi.org/10.1108/pr-05-2020-0340.

[31] Alina, Tugend, "On the Verge of Burnout: Covid-19's Impact on Faculty Well-Being and Career Plans," *Chronicle of Higher Education* (2020), 5.

[32] Donna R. Euben, "14th Annual Legal Issues in Higher Education Conference," In *Termination and Discipline*, 1–18, (Burlington, Vermont: AAUP, 2004).

[33] Mark Windschitl, "Framing constructivism in practice as the negotiation of dilemmas: An analysis of the conceptual, pedagogical, cultural, and political challenges facing teachers. *Review of Educational Research* 72 (2002), 150.

Much research has been conducted on the culture of the classroom. For example, work done by Bruner[34] Mehan,[35] and Rogoff[36] all examined how faculty contribute to, and are influenced by, the culture of the classroom. Research by Schupak[37] addresses the modern-age challenge of how to bring together students in the classroom who come from diverse religious, racial, and ethnic backgrounds. Research conducted by Joseph[38] examined (1) how the power relationships between students and faculty members can influence classroom culture and (2) the influence of what behaviors are prized and rewarded and which are not. Bledsoe and Baskin's[39] research on identifying student classroom fear (and how to handle it) is certainly of note, given the certain fear students feel when an existing instructor is replaced with a new instructor in the middle of a semester.

Other research has focused on the educator's historical experience as a student and how those past experiences guide him/her in instruction.[40,41,42,43] Still more has been written on the use of specific teaching strategies to sculpt specific outcomes in terms of class culture. For instance, Kremenitzer, Mojsa, and Brackett discuss how strategies such as having high and positive expectations for learners, demonstrating high visible caring for learners,

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[34] Jerome S. Bruner, *The Culture of Education* (Cambridge, Mass, MA: Harvard Univ. Press, 2003).

[35] Hugh Mehan, Gordon C. Chang, Makeba Jones, and Season S. Mussey, *In the Front Door: Creating a College-Going Culture of Learning* (London: Routledge, 2016).

[36] Barbara Rogoff, *Apprenticeship in Thinking: Cognitive Development in Social Context* (New York: Oxford University Press, 1990).

[37] Esther B. Schupak, "Listening Rhetoric in the Diverse Classroom: Suggestions for Praxis," *College Teaching* 67, no. 3 (2019): 196–204, https://doi.org/10.1080/87567555.2019.1614899.

[38] Pamela Bolotin Joseph, *Cultures of Curriculum* (Mahwah, NJ: L. Erlbaum Associates, 2000).

[39] T. Scott Bledsoe and Janice J. Baskin, "Recognizing Student Fear: The Elephant in the Classroom," *College Teaching* 62, no. 1 (2014): 32–41, https://doi.org/10.1080/87567555.2013.831022.

[40] C. W. Kennisonn, "Enhancing Teachers' Professional Learning: Relationships Between School Culture and School Teachers' Beliefs, Images, and Ways of Knowing" (PhD diss. Florida State University, 1990).

[41] Hugh Munby, and Tom Russell, "Reflective Teacher Education: Technique or Epistemology?" *Teaching and Teacher Education* 9, no. 4 (1993): 431–38, https://doi.org/10.1016/0742-051x(93)90009-6.

[42] Freema Elbaz, "The Teacher's 'Practical Knowledge': Report of a Case Study," *Curriculum Inquiry* 11, no. 1 (1981): 43–71, https://doi.org/10.1080/03626784.1981.11075237.

[43] Kenneth M. Zeichner and B. Robert Tabachnick, "Are the Effects of University Teacher Education 'Washed Out' by School Experience?" *Journal of Teacher Education* 32, no. 3 (1981): 7–11, https://doi.org/10.1177/002248718103200302.

developing standard routines and procedures, constructing more formal expectations for behavior such as a class charter, and modeling emotional intelligence can aid in sculpting an emotionally intelligent classroom culture.[44] Tal and Kedmi engaged in research encouraging a pedagogical 'shift from a traditional content-based and value-free approach, to a sociocultural approach' that can foster an expectation for more active participation in dialogue and decision-making in the classroom culture.[45]

It seems even the tools a faculty member selects can have an impact on the classroom culture. Adams specifically examines how the use of Microsoft PowerPoint software and the constraints of its related templates can create default patterns in both the sharing and receiving of information as part of the classroom culture.[46] An example would be that a reliance on bullet-pointed lists of information suggests a teaching style focused on transmission that can stymy more complex and inquiry-rich models of information acquisition.

Thus, it is certain that mid-semester faculty changes create a dilemma for classroom culture because the incoming faculty member has not had the opportunity to foster classroom culture as one might do from the onset of a class; e.g., perhaps through an ice breaker exercise, reviewing the syllabus, the introduction of students and faculty, or by making key choices about tools and teaching methodology. Instead, the culture, whether good or bad, was previously established by the outgoing faculty member, and it becomes the burden of the incoming instructor to quickly join, navigate, and adjust to that culture as necessary.

III. Methodology

This study was conducted in the context of an actual unexpected mid-semester faculty change at a mid-sized North American university. Two research questions evolved from this event (1) What can faculty and administrators do to prepare students who are experiencing a mid-semester faculty change, and (2) What procedures and processes are in place to assist

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[44] Janet Pickard Kremenitzer, Justyna K. Mojsa, and Marc A. Brackett, "Creating an Emotionally Intelligent   Classroom Culture," In *Emotional Intelligence: Theoretical and Cultural Perspectives*, edited by R. J. Emmerling, V. K. Shanwal, and M. K. Mandal, 191–207 (New York, NY: Nova Science Publishers, 2008).
[45] Tali Tal, and Yarden Kedmi, "Teaching Socioscientific Issues: Classroom Culture and Students' Performances," *Cultural Studies of Science Education* 1, no. 4 (2006): 615–44, https://doi.org/10.1007/s11422-006-9026-9.
[46] Catherine Adams, "PowerPoint, Habits of Mind, and Classroom Culture," *Journal of Curriculum Studies* 38, no. 4 (2006): 389–411, https://doi.org/10.1080/00220270600579141.

the incoming faculty? To answer these questions, this study adopted a mixed-methods research design. Specifically, data were collected using a two-pronged approach that included (1) surveys administered to students who had undergone a mid-semester faculty change and (2) short structured interviews conducted with administrators at seven peer institutions who had also experienced mid-semester faculty changes.

Given the sensitive nature of this topic, neither sets of faculty members (the departed faculty or the incoming faculty) were included as participants in this research. Collecting data on sensitive topics is not new to researchers and there is a bevy of research on defining exactly what a sensitive topic is and how to research sensitive topics.[47,48] The literature generally defines a sensitive topic as any topic that can pose a risk to the participant or the researcher. Research that poses a risk to one's personal privacy, employment or career, medical or mental health, or the risk of legal exposure are examples of research topics that are considered sensitive.[49,50,51,52] Institutional review was not required for this study because no identifiable private information was collected from the respondents which is one of the threshold requirements for institutional review at the mid-sized North American university where the study was conducted.

III.1. *Prong one: Students*

III.1.1. Participants

A convenience sample of 61 students (sophomores and juniors) in 2 sections of an introductory business class whose instructor was placed on an emergency administrative leave during the fifth week of a 16-week semester,

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[47] Barbara Johnson and Jill Macleod Clarke, "Collecting Sensitive Data: The Impact on Researchers," *Qual Health Res* 13, no. 3 (2003): pp. 421-434, https://doi.org/10.1177/1049732302250340.

[48] Raymond M. Lee, *Doing Research on Sensitive Topics* (London: Sage, 1993).

[49] E A Davies, S M Hall, C R Clarke, M P Bannon, and A P Hopkins, "Do Research Interviews Cause Distress or   Interfere in Management? Experience from a Study of Cancer Patients," *Journal of the Royal College of Physicians of London* 32, no. 5 (1998): 406–411.

[50] Sue Cannon, "Social Research in Stressful Settings: Difficulties for the Sociologist Studying the Treatment of Breast Cancer," *Sociology of health & illness* 11, no. 1 (1989): 62–77.

[51] Carol Komaromy, 2020. "The Performance of Researching Sensitive Issues," *Mortality* 25 (3): 364–77, doi:10.1080/13576275.2019.1635104.

[52] Teresa Sandra Perez, "In Support of Situated Ethics: Ways of Building Trust with Stigmatised 'waste Pickers' in Cape Town," Qualitative research : QR 19, no. 2 (2019): 148–163.

was used.[53] Neither the incoming faculty member nor the students were made aware of the reason for the leave. Prong one was designed to answer the first research question: what can faculty and administrators do to prepare students who are experiencing a mid-semester faculty change?

III.1.2. Procedures and materials

Students were asked to participate in a five-question exploratory survey. Survey questions were designed to (1) determine how frequently students have experienced a mid-semester faculty change, (2) evaluate student perceptions of their learning and performance in the mid-semester faculty change, and (3) solicit student recommendations for faculty members taking over a class mid-semester. The survey questions are found in the results section of this paper. Students were offered 20 extra credit points (3% of their final grade) to participate in the anonymous survey. Forty-two students responded resulting in a 68.8% response rate. Students who did not want to complete the survey were given the option of completing an alternative extra credit assignment that would take about 8 minutes of their time. Two students completed the alternative assignment.

III.1.3. Analyses

The authors analyzed questions 1-4 using descriptive statistics in an excel spreadsheet. The student responses for question 5 of the survey were imported into NVivo software and content analysis was used to analyze the data. Content analysis, a qualitative approach to analyzing data, was used for this study by importing the data into NVivo software version 11.3.2 (QSR International, Melbourne, Australia). The three main types of content analysis are conventional, directed, and summative.[54] Summative content analysis is an appropriate research method when the main concept is known to the researcher and when the analysis does not stop at key word searches but instead tries to understand the contextual meaning of the concept.[55,56] A

[53] Joseph F. Hair, David J. Ortinau, and Dana E. Harrison, *Essentials of Marketing Research* (New York, NY: McGraw Hill, 2021).

[54] Hsieh, Hsiu-Fang and Sarah E. Shannon, "Three Approaches to Qualitative Content Analysis," *Qual Health Res* 15, no. 9 (2005): 1277–88, https://doi.org/10.1177/1049732305276687.

[55] O.R. Holsti, *Content Analysis for the Social Sciences and Humanities* (Reading, MA: Addison-Wesley, 1969).

[56] Nancy L. Kondracki, Nancy S Wellman, and Daniel R Amundson. "Content Analysis: Review of Methods and Their Applications in Nutrition Education," *J Nutr Educ Behav* 34, no. 4 (2002): 224–30, https://doi.org/10.1016/S1499-4046(06)60097-3.

summative content analysis approach was used to analyze 2,273 words of data collected from students.

We used a text search query to identify themes in how students responded when asked 'What advice would you give to a faculty member who is taking over a class mid-semester'. This technique was chosen in order to better identify patterns and related meanings in student responses, as explained by the hallmark work of Berelson[57]. Berelson lists 17 uses of content analysis including 'to describe trends in communication content'[58] and 'to reflect attitudes, interests, and values (cultural patterns) of population groups'.[59] Similarly, Krippendorf contends that content analysis 'is a technique that allows researchers to analyze unstructured data in view of the meanings, symbolic qualities, and expressive contents they have and of the communicative roles they play in the lives of the data's sources.'[60]

III.2.2. Prong two: University administrators

The authors conducted short interviews with university administrators for the second prong of data collection so that we could better understand how common mid-semester faculty turnover is, the way the circumstances surrounding it are handled, and if any commonalities exist. More specifically, to answer research question two: what procedures and processes are in place to assist the incoming faculty who takes over a class mid-semester?

III.2.2.1. Participants

The second prong of data collection consisted of short interviews with university administrators from peer institutions to better understand how common mid-semester faculty turnover is, the way the circumstances surrounding it are handled, and if any commonalities exist. Twenty-five university administrators were contacted for interviews by phone; 14 declined to be interviewed for privacy reasons (e.g. my employer might not want me to talk about this) further highlighting the difficulty of collecting data on this topic. No identifiable private information was collected from the

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[57] Bernard Berelson, *Content Analysis in Communications Research* (New York: Free Press, 1952).

[58] Bernard Berelson, *Content Analysis in Communications Research* (New York: Free Press, 1952), 28.

[59] Bernard Berelson, *Content Analysis in Communications Research* (New York: Free Press, 1952), 30.

[60] Klaus Krippendorff, *Content Analysis: An Introduction to Its Methodology* (Los Angeles, CA: SAGE, 2013), 40.

administrators, all respondents were assured their responses would remain anonymous and that their university name would not be disclosed as a participant in the research. Four university administrators did not respond to the inquiry for a short interview. The administrators consisted of staff from various operational areas such as eLearning/online education, teaching and learning, information technology, and office of the registrar. Because of the sensitive nature of the interviews (e.g. administrators divulging personnel decisions), the interviews were not recorded however 12 pages of handwritten notes were taken and the notes were manually coded using the same summative content analysis coding method as was used on the student's open-ended survey question.

III.2.2.2. Procedures and materials

A short script and list of questions was prepared in advance of the structured short interviews. Structured interviews were chosen over unstructured or semi-structured interviews because the research topic was narrow.[61] Researchers wanted to limited the discussion to mid-semester faculty changes and not deviate into other forms of turnover. The interviews were opened with a short description of the purpose of the interview and all respondents were asked permission for the interviewer to take notes. Respondents were reassured that personally identifiable information would remain confidential and no private information was collected. The respondents were asked 5 questions during the interview. Probing and follow up questions were asked when appropriate (e.g. "can you give me an example," or "can you tell me more about"). The 5 questions include:

1. How often does your university experience a mid-semester faculty change?
2. Does your university formally track mid semester faculty changes and if so how?
3. Does your university have formal procedures on how to handle mid semester faculty changes?
4. What resources, if any, are there for faculty who take over a class mid-semester?
5. Can you think of any other formal or informal policies, procedures, or resources that are available at your university to assist in a mid-semester faculty change?

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[61] Jaber F. Gubrium, James A. Holstein, Amir B. Marvasti, and Karyn D. McKinney, *The SAGE Handbook of Interview Research : The Complexity of the Craft*, Edited by Jaber F. Gubrium, James A. Holstein, Amir B. Marvasti, and Karyn D. McKinney, Second edition (Thousand Oaks, California: SAGE Publications, 2012).

III.2.2.3. Analyses

Open coding of in the margins of the handwritten notes was first completed to break the notes up into discrete parts.[62] Selective coding was then performed to group the open codes into themes.[63] While the low participation rate could be a limitation to this study the results suggest there are commonalities across participants. Seidman and others suggests that the saturation point, the point at which no more interviews are necessary, is reached when no new information is gained through further interviews.[64,65] After the point of saturation, interviewing 1-3 more participants 'for insurance' is recommended.[66] While this study didn't have the benefit of an additional 1-3 'insurance' interviews, Cober and Adams (2020) suggest that "the number of people one plans to interview is not the first question to be answered," the first question to be answered is how many *differing* opinions can there be on a topic?[67] Saturation was reached as evidenced by the commonalties across the participants and the topic is narrow suggesting that fewer opinions (interviews) are acceptable.[68]

IV. Results and discussion

IV.1. *Prong one: Student survey results*

Table 1, Figure 1, and Table 2 respectively, show the results from the first prong of this study. Table 1 provides a tabulation of the students' responses to the first four survey questions while Figure 1 shows the NVivo qualitative output for the open-ended survey question. Table 3 shows the themes that emerged from the open-ended survey question (question 5).

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[62] Juliet M. Corbin, and Anselm Strauss, "Grounded Theory Research: Procedures, Canons, and Evaluative Criteria," *Qualitative Sociology* 13, no. 1 (1990): 3–21, https://doi.org/10.1007/bf00988593.

[63] Juliet M. Corbin, and Anselm Strauss, "Grounded Theory Research: Procedures, Canons, and Evaluative Criteria," *Qualitative Sociology* 13, no. 1 (1990): 3–21, https://doi.org/10.1007/bf00988593.

[64] Irving Seidman, *Interviewing as Qualitative Research : a Guide for Researchers in Education and the Social Sciences* 4th ed. (New York: Teachers College Press, 2013).

[65] Julius Sim Saunders, Tom Kingstone, Shula Baker, Jackie Waterfield, Bernadette Bartlam, Heather Burroughs, and Clare Jinks, "Saturation in Qualitative Research: Exploring Its Conceptualization and Operationalization," *Quality & quantity* 52, no. 4 (2017): 1893–1907.

[66] William Cober and Betty Adams, "When Interviewing: How Many Is Enough?" *International Journal of Assessment Tools in education* 7, no. 1 (2020): 73–79.

[67] William Cober and Betty Adams, "When Interviewing: How Many Is Enough?" *International journal of Assessment Tools in Education* 7, no. 1 (2020): 76.

[68] Timothy Teo, *Handbook of Quantitative Methods for Educational Research*, Edited by Timothy Teo (Rotterdam: Sense Publishers, 2013).

The results in Table 1 show that the majority of the students in this class had experienced a mid-semester faculty change at least one time in their college experience, while 22% had experienced a mid-semester faculty change twice. The sample size of this study was small and so caution should be taken generalizing the results however, it is surprising that almost a quarter of sophomores and juniors report having experienced a mid-semester faculty change twice. Time was of the essence in this study but with more time and financial resources a larger study involving multiple institutions should be conducted to confirm these results. If true across the wider college population, the results suggest that administrators should have policies and procedures in place for the incoming faculty and for students who experience this disturbance in their studies.

Ninety-one percent of students thought they would learn more from the instructor change and 83% of students believed their grade would improve. The results suggests that the incoming instructor successfully managed to contribute to student learning. More research into this aspect of the study is warranted to examine what specific teaching tools and strategies help bridge the gap between the outgoing and the incoming instructor.

Finally, the majority of students (59 percent) don't seem to care if an administrator introduces the new faculty member or if the new faculty member just assumes the faculty role with no formal introduction. Still, 8 students (24 percent) felt some form of communication about the change from an administrator would be beneficial. In this situation, the outgoing faculty member's circumstance was not revealed to the students or the incoming faculty member.

Table 1

Student survey results

	Student Responses [Section 1] (31)		Student Responses [Section 2] (30)		Total Student Responses (61)	
	n=23	%	n=19	%	n=42	%
1. How often in your college life here at XYZ University or elsewhere, have you experienced a mid-semester faculty change?						
Once	17	74%	15	79%	32	76%
Twice	5	22%	4	21%	9	22%
Three	1	4%	0	0%	1	2%
Four or More	0	0%	0	0%	0	0%
	23	100%	19	100%	42	100%

	Student Responses [Section 1] (31)		Student Responses [Section 2] (30)		Total Student Responses (61)	
	n=23	%	n=19	%	n=42	%
2. As a result of the faculty change this semester, do you feel you learned more, less, or about the same?						
More	21	91%	16	84%	37	88%
Less	0	0%	0	0%	0	0%
About the same	2	9%	3	16%	5	12%
Total	23	100%	19	100%	42	100%
3. As a result of the faculty change this semester, do you feel you will earn a final grade that is better, about the same, or lower?						
A better final grade	19	83%	14	74%	33	79%
About the same final grade	4	17%	4	21%	8	19%
A lower final grade	0	0%	1	5%	1	2%
Total	23	100%	19	100%	42	100%
4. Would the transition to a new faculty have been better if you received some form of communication about the faculty change from an administrator?						
Yes	8	35%	2	11%	10	24%
No	2	9%	5	26%	7	17%
Does not matter to me	13	57%	12	63%	25	59%
Total	23	100%	19	100%	42	100%

The data from Figure 1 shows the results of the NVivo text search query for the survey question 'What advice would you give to a faculty member who is taking over a class mid-semester:' Five themes emerged from the content analysis. The largest number of student comments focused on the theme of the 'previous instructors' performance' (29.2 percent of all responses). This may be because the students were shocked by the mid-semester faculty change event itself, or simply needed to vent about their experience. The second most common response theme to 'course materials' (for the incoming instructor) with 12 (25 percent of all responses). The themes also suggest that students' value 'clear communication' with 10

responses (20.8 percent of all responses) and 'patience and flexibility' with 6 responses (12.5 percent of all responses).

Students also suggested that incoming faculty 'assess the current situation' with 6 responses (12.5 percent of all responses). This may suggest that the outgoing faculty member's teaching ability, organization, and style may weigh heavily on the success of the incoming faculty member. In the case of this specific class, the previous instructor appeared to struggle with course content and organization.
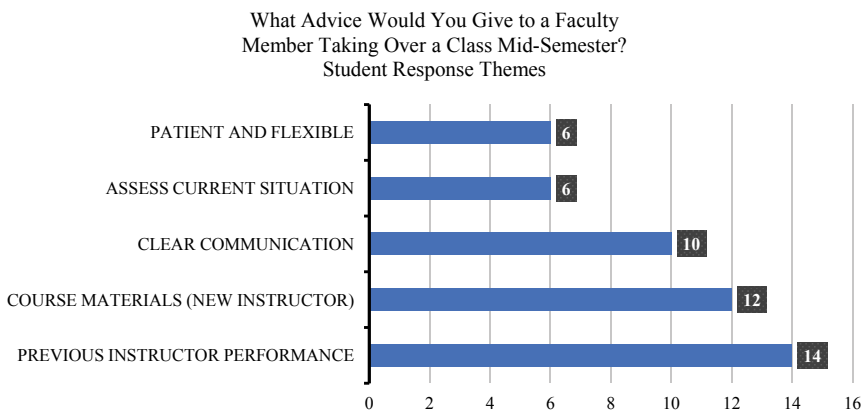

What Advice Would You Give to a Faculty Member Taking Over a Class Mid-Semester? Student Response Themes

Figure 1

NVivo content analysis results of survey question five

It is not surprising that the results align with many research articles that have focused on the positive relationship between teaching practices like effective course organization and preparation, instructional clarity, and feedback on student academic outcomes like increased knowledge, content mastery, and growth of cognitive and intellectual skills and the data.[69,70,71]

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[69] Ty M. Cruce, Gregory C Wolniak, Tricia A Seifert, and Ernest T Pascarella, "Impacts of Good Practices on Cognitive Development, Learning Orientations, and Graduate Degree Plans During the First Year of College," *Journal of College Student Development* 47, no. 4 (2006): 365–83, https://doi.org/10.1353/csd.2006.0042.

[70] Ernest T. Pascarella, Tricia A. Seifert, and Elizabeth J. Whitt, "Effective Instruction and College Student Persistence: Some New Evidence," *New Directions for Teaching and Learning*, no. 115 (2008): 55–70, https://doi.org/10.1002/tl.325.

[71] Ernest T. Pascarella and Patrick T. Terenzini, *How College Affects Students: A Third Decade of Research*, (San Francisco: Jossey-Bass, 2005).

The results from the open ended question, 'What advice would you give to a faculty member who is taking over a class mid-semester' also align with previous research.

Table 2

Sample of student feedback organized by themes

Previous Instructor Performance	Course Materials (New Instructor)	Clear Communication	Patient and Flexible	Assess Current Situation
14 references coded, 18.21% coverage	12 references coded, 15.95% coverage	10 references coded, 15.40% coverage	6 references coded, 9.60% coverage	6 references coded, 5.29% coverage
Talk with the students to figure out what did and did not work with the last instructor and model the class after what did work while putting your own spin on the class.	I would suggest taking a full day to review/ cover all of the material we were expected to learn up until that point. The professor could maybe even give a short ungraded quiz to see what the students know and have learned this far.	The initial week of taking over is crucial. It is important to discuss all class changes and assignments and to immediately get on track with the course. This helped me stay on top of things and better adapt.	Be patient in the beginning; be forgiving when someone forgets an assignment because we were used to the previous professor's structure and had to be thrown into a new class structure unexpectedly.	I liked that the new professor reviewed a bit of what the older professor taught, and then picked up where he left off.

Table 2 shows the NVivo output with the corresponding themes, the data coded under each theme, and an example of student responses to the open-ended survey question. The responses are organized by the five themes derived from the NVivo text search query (as shown in Figure 1). It is not surprising that the majority of students (14 and 12 respectively) suggested that the incoming faculty should not jump right in to the existing syllabus. Instead students suggest that the incoming faculty should take some time to

determine what students *do* know and to make time to review material that they *should* know. Yet semesters are finite and faculty may feel pressured to jump right to the assigned lesson so that all of the required material is covered. It may be counterintuitive to go into a mid-semester faculty assignment with a mindset that all of the required material might not be covered, but remaining flexible is important.

About a third of students (10 and 6 respectively) reported that clear communication and remaining patient and flexible is important to reassure students that they can succeed in the class. The insecurity felt by nearly everyone during the global pandemic has caused higher education to look more closely at the ways in which faculty can manage flexibility both inside[72,73] and outside[74] of the classroom. Flexible teaching strategies include adopting more novel assessment tools like open book exams, offering content using different types of media (audible books and podcasts), adopting an active learning or flipped classroom experience, or offering students an opportunity to choose their own pace, content or sequence of material.[75]

IV.1.2. Prong two results: Short interviews with administrators

Table 3 shows the results of the emerging themes of the 12 pages of notes taken from interviews with 7 university administrators who are familiar with mid-semester faculty changes. The two emerging themes were 'policies and practices' and 'course modality.' The results of the content analysis is consistent across the 7 interviews suggesting that additional interviews were unlikely to yield new information.[76,77]

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[72] Sayem Ahmed, Hasin Md. Muhtasim Taqi, Yeasir Iqbal Farabi, Mohiuddin Sarker, Syed Mithun Ali, and Bathrinath Sankaranarayanan, "Evaluation of Flexible Strategies to Manage the COVID-19 Pandemic in the Education Sector," *Global journal of flexible systems management* 22, no. Suppl 2 (2021): 81–105.

[73] Sir John Daniel, "Education and the COVID-19 Pandemic," *Prospects (Paris)* 49, no. 1-2 (2020): 91–96.

[74] Trena Paulus and Jessica Nina Lester, *Doing Qualitative Research in a Digital World* (Los Angeles: SAGE, 2022).

[75] Seshasai, Srinivasan, Juan Antonio Lopez Ramos, and Nasim Muhammad, "A Flexible Future Education Model–Strategies Drawn from Teaching During the Covid-19 Pandemic," *Education sciences* 11, no. 9 (2021): 557–567.

[76] Irving Seidman, *Interviewing as Qualitative Research : a Guide for Researchers in Education and the Social Sciences* 4th ed. (New York: Teachers College Press, 2013).

[77] Benjamin Saunders, Julius Sim, Tom Kingstone, Shula Baker, Jackie Waterfield, Bernadette Bartlam, Heather Burroughs, and Clare Jinks, "Saturation in Qualitative Research: Exploring Its Conceptualization and Operationalization," *Quality & quantity* 52, no. 4 (2017): 1893–1907.

Table 3

Short Interviews with Administrators

Policies and practices	Course modality
1. Lack of formal procedures on how to handle a mid-semester faculty change 2. 5/7 have no specific pedagogical advice/instruction for the incoming faculty 3. No official tracking of mid-semester faculty changes 4. Yearly occurrences of mid-semester faculty changes happen	1. All 7 report that mid-semester faculty changes occur in both online and in-person courses 2. Six of 7 institutions report they have online courses where the online class is created by one faculty member and then used by other faculty at the institution 3. One institution reports that the online classroom is the sole intellectual property of the faculty creator

The feedback received from the interviewees revealed with consistency that there was a lack of specific information or procedural detail within any single institution. None of the respondents were able to provide definitive information about the frequency of mid-semester faculty replacements. The most precise estimate was 5-10 times each year at a school operating more than 10,000 course sections annually. Some indicated approximations of 'a few times' each year, while others stated they lacked information because administration is decentralized and addressed within the affected academic department. Despite the absence of exact numbers, all seven institutions reported the occurrence of yearly mid-semester faculty changes.

The lack of procedure or formal practice to prepare faculty for a mid-semester faculty change was also a consistent concern for nearly all of the institutions. The majority of respondents (6/7) indicated that faculty are not required to complete training for online instruction or any other circumstance (e.g. stepping in mid-semester). Of course the feeling of a lack of preparedness was never more real than during the global pandemic. A recent study by the McKinsey Institute reports that while faculty are eager to prepare for adopting new classroom technology, they need more institutional support to do so.[78]

An unexpected finding was that the course modality matters particularly for online courses where intellectual property can have an effect on the

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[78] Cladio Brasca, Charge Krishnan, Varun Marya, Katie Owen, Joshua Sirois, and Shyla Zaire, "How Technology Is Shaping Learning in Higher Education" (McKinsey & Company, June 15, 2022).

classroom itself (normally an online course shell). While the majority of the institutions (6/7) use the course enterprise model, one university does not and this can create complications. The course enterprise model is a model for designing one online course for multiple users.[79] In other words one faculty member creates a course shell and gives the university permission to share their intellectual property with other faculty assigned to teach the course. Only one of the seven universities does not use the course enterprise model and when a mid-semester faculty change happens in an online course, the original instructor must agree to allow the incoming faculty access to the class (because the course shell is their intellectual property).

In summary, the data suggest that on the one hand students depend on an incoming faculty member who is organized and prepared yet on the other hand, administrators appear to agree that they don't have formal procedures to help faculty to get organized and prepared. While the mid-semester faculty change is not a 'standard' problem faced by faculty or administrators the recent global pandemic has demonstrated that contingency and succession planning is even more important in today's educational environment.

IV.2. *Limitations of this study*

Care should be taken with the findings of this study and more research should be conducted to substantiate the findings. The elusive and sensitive nature of the mid-semester faculty change makes it difficult to identify and collect data on this topic. However, the need for succession planning in higher education was made evident during the recent global pandemic[80] and the probability of future endemics.[81] Future research on the departed and incoming faculty who are involved in a mid-semester faculty change would further inform this topic particularly as it relates to succession planning.

A probability sample design of students who have faced a mid-semester faculty change would make an ideal dataset from which to explore the mid-

[79] Shihua Liu, Hao Zhang, Zhanxiang Ye, and Gang Wu, "Online Blending Learning Model of School-Enterprise Cooperation and Course Certificate Integration during the COVID-19 Epidemic," *Science Journal of Education* 8, no. 2 (2020): 66, https://doi.org/10.11648/j.sjedu.20200802.16.

[80] Alina Tugend, "On the Verge of Burnout: Covid-19's Impact on Faculty Well-Being and Career Plans," *Chronicle of Higher Education* (2020) https://connect.chronicle.com/rs/931-EKA-218/images/Covid%26FacultyCareerPaths_Fidelity_ResearchBrief_v3%20%281%29.pdf

[81] Marco Marani, Gabriel G. Katul, William K. Pan, and Anthony J. Parolari, "Intensity and Frequency of Extreme Novel Epidemics," *Proceedings of the National Academy of Sciences* 118, no. 35 (2021), https://doi.org/10.1073/pnas.2105482118.

semester faculty change dilemma.[82] However, time, funding constraints and a global pandemic were hurdles faced by the authors conducting this research. The results of this study suggest that finding and qualifying students who have faced a mid-semester faculty change is an obstacle, but not an unsurmountable one (22% of respondents indicated they have faced this situation two times in their college experience). With time and appropriate funding a survey could be created and administered to students across multiple universities and countries, creating a robust sample size.

Faculty were not included in this research because of time and funding limitations. A survey of faculty who have taken over a class mid-semester would certainly add to the lack of literature on this topic. The institutions that were interviewed for this study did not track data on mid-semester faculty changes and were unable to provide exact numbers of occurrences. This may suggest that identifying and qualifying a large enough faculty dataset may be too difficult of a hurdle to overcome.

The small sample size is limitation of this research. While the survey data collected in this study cannot be generalized to the entire population of college students in higher education this study does provide some initial evidence that mid-semester faculty changes may not be as rare of an event as once thought.

The number of institutions who were interviewed for this study is a limitation on one hand, but on the other hand the data were consistent across all of the respondents. Future research is warranted perhaps in the form of a survey which might yield higher participation rates than interviews because of the sensitivity of the topic. Future research on how mid-semester faculty changes are addressed in other countries would also add to the literature. Conventional wisdom suggests that cross-cultural communication and values might differ across countries.[83]

V. Recommendations

While there are limitations to this study the results fall in line with conventional wisdom and previous research on student learning. It is broadly accepted in the academic literature that faculty members play a pinnacle role in student learning and that their teaching practice has significant impact on

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[82] Joseph F. Hair, David J. Ortinau, and Dana E. Harrison, *Essentials of Marketing Research* (New York, NY: McGraw Hill, 2021).
[83] Geert H. Hofstede, *Culture's Consequences, International Differences in Work-Related Values* (Beverly Hills: Sage, 1984).

student persistence and retention.[84],[85],[86] A mid-semester faculty change is a multifaceted situation but still, the objective of higher education is to educate students so they can lead productive lives and have meaningful careers even in atypical situations. So, it is incumbent on faculty and administrators to effectively prepare for interruptions like the mid-semester faculty change. The literature on student learning suggests there is a correlation between effective practice and positive student and academic outcomes.[87],[88],[89],[90],[91],[92] Effective teaching practices and procedures should be created so that a mid-semester faculty change disrupts student learning as little as possible.

V.1. *What can faculty and administrators do to prepare students who are experiencing a mid-semester faculty change?*

Clear communication about expectations and organizing the course materials so they bridge the gap between the incoming and outgoing faculty

[84] Nicholas J. McCormick and Marva S Lucas, "Student Retention and Success: Faculty Initiatives at Middle Tennessee State University," *Journal of Student Success and Retention* 1, no. 1 (2014): 1-12, https://pdfs.semanticscholar.org/505e/672a24d557d486ddfae77233179327da21da.pdf.

[85] Vincent Tinto, "Research and Practice of Student Retention: What Next?" *Journal of College Student Retention: Research, Theory & Practice* 8, no. 1 (2006): 1–19, https://doi.org/10.2190/4YNU-4TMB-22DJ-AN4W.

[86] Paul D. Umbach and Matthew R. Wawrzynski, "Faculty Do Matter: The Role of College Faculty in Student Learning and Engagement," *Research in Higher Education* 46, no. 2 (2005): 153–84, https://doi.org/10.1007/s11162-004-1598-1.

[87] Ty M. Cruce, Gregory C Wolniak, Tricia A Seifert, and Ernest T Pascarella, "Impacts of Good Practices on Cognitive Development, Learning Orientations, and Graduate Degree Plans During the First Year of College," *Journal of College Student Development* 47, no. 4 (2006): 365–83, https://doi.org/10.1353/csd.2006.0042.

[88] George D. Kuh and Shouping Hu, "The Effects of Student-Faculty Interaction in the 1990s," *The Review of Higher Education* 24, no. 3 (2001): 309–32, https://doi.org/10.1353/rhe.2001.0005.

[89] Ernest T. Pascarella, Ty M Cruce, Gregory C Wolniak, and Charles F Blaich, "Do Liberal Arts Colleges Really Foster Good Practices in Undergraduate Education?" *Journal of College Student Development* 45, no. 1 (2004): 57–74, https://doi.org/10.1353/csd.2004.0013.

[90] Ernest T. Pascarella, Tricia A. Seifert, and Elizabeth J. Whitt, "Effective Instruction and College Student Persistence: Some New Evidence," *New Directions for Teaching and Learning* 2008, no. 115 (2008): 55–70, https://doi.org/10.1002/tl.325.

[91] Ernest T. Pascarella, Mark H. Salisbury, and Charles Blaich, "Exposure to Effective Instruction and College Student Persistence: A Multi-Institutional Replication and Extension," *Journal of College Student Development* 52, no. 1 (2011): 4–19, https://doi.org/10.1353/csd.2011.0005.

[92] Ernest T., Pascarella and Patrick T. Terenzini, *How College Affects Students: A Third Decade of Research*, (San Francisco: Jossey-Bass, 2005).

are important first steps in preparing students for a mid-semester faculty change. In addition, preparing to set aside time to foster community in the classroom will also enhance student success.

The data collected from this study suggest that clear communication is important to student success when students are faced with a faculty change mid-semester. The research bears out this finding. For example, Komarraju, Musulkin, and Bhattacharya[93] validated earlier research suggesting that approachability, respectful nature, and availability for frequent communications of faculty can strengthen student academic and psychosocial outcomes. A study that examined answers on student evaluation surveys determined that clear and specific communication and clear and specific content organization are the two most frequently cited areas from students for how to enhance the practice of teaching.[94] Conventional wisdom suggests clear and specific communication about expectations is even more important when there has been a disruption in the classroom.

Rhetorical behaviors in faculty communication like clarity, humor, nonverbal immediacy, and caring have also been shown to enhance student outcomes such as learning, satisfaction, and motivation.[95] Opening the class with a little humor like "Well, it's week 5 and we finally get to meet," or "Hey everyone, I'm now the pilot of this plane, don't pull the parachute out just yet" will lighten the mood and provide a segue to "So, let's get started, we're in this together!" Though organizational policies, issues of legality, respect for personal privacy, or lack of knowledge about the circumstances may leave faculty without many details, communication, transparency, and humor about these constraints are valued by students.

The data in this study also suggest that the incoming faculty should assess the students' perception of the outgoing faculty performance and adjust their own course materials to address gaps in learning or content. This implies that the incoming faculty should first meet with students and *then* create a plan of action for the remaining weeks in the semester. This is the opposite to how faculty typically prepare for a course. In this teaching

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[93] Meera Komarraju, Sergey Musulkin, and Gargi Bhattacharya. "Role of Student–Faculty Interactions in Developing College Students' Academic Self-Concept, Motivation, and Achievement." *Journal of College Student Development* 51, no. 3 (2010): 332–42, https://doi.org/10.1353/csd.0.0137.

[94] "Student Evaluations of Teaching," *Vanderbilt University*, Accessed September 15, 2021, https://cft.vanderbilt.edu/guides-sub-pages/student-evaluations/.

[95] S. A. Myers and Alan Goodbye, "College Student Learning, Motivation, and Satisfaction as a Function of Effective Faculty Communication Behaviors," *Southern Communication Journal* 79, no. 1 (2014): 14–26.

situation faculty should prioritize and adjust course content and remain flexible about achieving the course outcomes instead of rigidly sticking to the course syllabus.

This finding aligns with many studies that suggest meeting the student's need for clear organization is crucial for success. Hundreds of research articles have focused on the relationship between teaching practices like effective course organization and preparation, instructional clarity, and feedback to student academic outcomes like increased knowledge, content mastery, and growth of cognitive and intellectual skills.[96],[97] The more that students understand the alignment and conditional progression of the course holistically (and in individual sessions in terms of units, learning outcomes, milestones, and assessments) the more they understand how to be successful within these parameters.[98] Clear organization can alleviate stress and anxiety borne from uncertainty and change.

The global pandemic affected college enrollments in the United States and globally, but studies suggest that students who feel a sense of community in the classroom have a higher rate of attendance, participation, and persistence.[99],[100] These findings were echoed in research that focused on the importance of community during the COVID-19 pandemic.[101],[102] According to Elliot et al, there are four components to fostering community in college

[96] Ty M. Cruce, Gregory C Wolniak, Tricia A Seifert, and Ernest T Pascarella, "Impacts of Good Practices on Cognitive Development, Learning Orientations, and Graduate Degree Plans During the First Year of College," *Journal of College Student Development* 47, no. 4 (2006): 365–83, https://doi.org/10.1353/csd.2006.0042.

[97] Ernest T. Pascarella, Tricia A. Seifert, and Elizabeth J. Whitt., "Effective Instruction and College Student Persistence: Some New Evidence," *New Directions for Teaching and Learning* 2008, no. 115 (2008): 55–70, https://doi.org/10.1002/tl.325.

[98] Ernest T. Pascarella, and Patrick T. Terenzini. *How College Affects Students: A Third Decade of Research* (San Francisco: Jossey-Bass, 2005).

[99] Dedreiana Elliot, Marlen Gamino, and Jenkins J Jennifer, "Creating Community in the College Classroom: Best Practices for Increased Student Success," *International Journal of Education and Social Science* 3, no. 6 (2016), http://www.ijessnet.com/wp-content/uploads/2016/07/5.pdf.

[100] Scott Principal Friedman, and Tiffany Fishman, "Covid-19 Impact on Higher Education," Deloitte United States, (May 29, 2020), https://www2.deloitte.com/us/en/pages/public-sector/articles/covid-19-impact-on-higher-education.html.

[101] Sarah Elizabeth Barrett, "Maintaining Equitable and Inclusive Classroom Communities Online during the COVID-19 Pandemic," *Journal of Teaching and Learning* 15, no. 2 (2021): 102–16, https://doi.org/10.22329/jtl.v15i2.6683.

[102] Saleh Al-Omoush, Khaled, Maria Orero-Blat, and Domingo Ribeiro-Soriano, "The Role of Sense of Community in Harnessing the Wisdom of Crowds and Creating Collaborative Knowledge during the COVID-19 Pandemic," *Journal of Business Research* 132 (2021): 765–74, https://doi.org/10.1016/j.jbusres.2020.10.056.

classes: creating a shared space, reinforcing openness and acceptance, helping students find common interests, and creating a sense of belonging.[103]

V.2. *What procedures and processes are in place to assist the incoming faculty with a mid-semester faculty change?*

The results of this study suggest that procedures and processes to assist faculty in quickly taking over a class mid-semester are lacking and the literature supports this finding. There is a dearth of literature on what procedures and processes should be in place to assist incoming faculty on how to take over a class mid-semester.

Faculty success relies to some extent on a supportive culture, including infrastructure, which can ease faculty transitions in cases where a new faculty member steps in mid-semester. Put another way, 'the ability of faculty to focus on improving their teaching and their ability to bring new ideas and knowledge into practice depends on the institutional context.'[104] Regardless of the reason for turnover, as noted earlier, such a situation is inherently challenging. Therefore, the success of the faculty member is more likely dependent on the support and availability of institutional resources.

This investigation of the mid-semester faculty change indicates an opportunity for institutions to do better. This includes not only doing better at supporting faculty as they take over in-progress courses but to also consider the quality of the experience for students. Doing so is not only appropriate but is also business-savvy, as undergraduate enrollments are predicted to continue declining for several more years.[105]

Institutions would be well-served by abandoning ad-hoc management of mid-semester faculty change to more effectively support faculty. Setting aside the potentially delicate circumstances which can surround a given situation, institutions should begin by acknowledging that these situations occur and that they occur frequently enough to merit constructing procedures

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[103] Dedreiana Elliot, Marlen Gamino, and Jenkins J Jennifer, "Creating Community in the College Classroom: Best Practices for Increased Student Success," *International Journal of Education and Social Science* 3, no. 6 (2016), http://www.ijessnet.com/wp-content/uploads/2016/07/5.pdf.

[104] William Condon, Ellen R Iverson, Cathryn A Manduca, Carol Rutz, Gudrun Willett, Mary Taylor Huber, and Richard Haswell, *Faculty Development and Student Learning: Assessing the Connections* (Bloomington: Indiana University Press, 2015), 8.

[105] Paul Fain, "Latest Data on Enrollment Declines." *Inside Higher Ed*, (2018). https://www.insidehighered.com/admissions/article/2018/05/29/new-data-enrollment-and-where-declines-are-greatest.

for consistently and effectively handling mid-semester faculty changes. While procedures would include some of those which already occur at some institutions; e.g., providing access to the course in the LMS, providing content, providing access to class rosters, etc., more meaningful actions would also be beneficial. For these additional actions, the authors recommend drawing from the instructional strategies shared earlier in this article and to determine the necessary support.

Where possible, technical support for adjusting materials housed in the LMS, replacing the course syllabus, addressing potential changes in required materials, could also be provided. Offices of the registrar and similar administrative offices, as units which are among the first to know of faculty changes, may be the best candidates to initiate the activities described above. As central offices managing faculty assignments, it may also be required of such offices to actively track and report on the actual frequency of mid-semester faculty changes.

Transparency is also key in effectively transitioning a course, mid-semester, from one faculty member to another. While, as noted earlier, certain privacy restrictions might prevent a department chair or other official from being entirely forthcoming about the circumstances surrounding a mid-semester faculty change, the degree to which open communication can occur may be valuable to buoy student motivation and engagement.[106] The authors recommend, when possible, that students receive a message in person or electronically from a department chair or other recognized authority to support the aim of transparency, to demonstrate a sense of professional respect for all parties involved, to offer an advance introduction to the new faculty member, and thereby to set the stage for success for students in the remaining weeks of the semester.

VI. Conclusion

This study sought to shed light on how faculty and administrators can help students succeed when they are faced with a mid-semester faculty change. What has historically been an atypical university classroom staffing problem may become more typical in the future. Couple the onset of the COVID-19 global pandemic with the World Health Organization's recent declaration that Monkey Pox is a public health emergency, the likelihood for

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[106] S. A,. Myers and Alan Goodbye, "College Student Learning, Motivation, and Satisfaction as a Function of Effective Faculty Communication Behaviors," *Southern Communication Journal* 79, no. 1 (2014): 14–26.

future global pandemics may be on the rise.[107] "Faculty and staff members are leaving colleges and universities in droves," and higher education turnover is nearly at a crisis point.[108]

More research is needed to understand the best teaching practices to implement during disruptions in the classroom especially if these disruptions become commonplace. The data from this study suggest that the incoming faculty should first meet with students to assess their learning and then construct a plan to move forward with the semester. The students surveyed in this study reported that clear communication about expectations, organizing the course materials well, and remaining flexible were important to their success.

Further research is also warranted to identify those universities (if any) who have processes and procedures in place when a mid-semester faculty change occurs. It would also be useful to know if the mid-semester faculty change is managed in an ad hoc manner and/or to what extent the bureaucracy of higher education impedes this process. Best practices for administrators like department chairs, university teaching and learning centers, and human resources departments should be identified or developed so that universities are prepared for the unexpected.

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[107] Marco Marani, Gabriel G. Katul, William K. Pan, and Anthony J. Parolari, "Intensity and Frequency of Extreme Novel Epidemics," *Proceedings of the National Academy of Sciences* 118, no. 35 (2021), https://doi.org/10.1073/pnas.2105482118.

[108] Doug Lederman, "EP.77: Turnover, Burnout and Demoralization in Higher Ed." Inside Higher Ed. Kaplan, (April 14, 2022), https://www.insidehighered.com/audio/2022/04/14/ep77-turnover-burnout-and-demoralization-higher-ed.

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Achievement emotions of university students in on-campus and online education during the COVID-19 pandemic

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Abstract: Feelings and emotions play a prominent role in the motivation and academic performance of students. Considering this importance, this study aimed to compare the achievement emotions of students in two educational environments, traditional face-to-face classes and online classes, grown after the outbreak of the COVID-19 pandemic. To achieve this goal, 92 university students who had the experience of the two modes of education evaluated their emotions in these contexts. The findings indicated that university students had better class-related and learning-related feelings (enjoyment, hope, and pride) in traditional face-to-face education. These students also reported feeling angrier in online classes. Differences in other emotions, such as anxiety, hopelessness, boredom, and shame, were not significant. Test-related emotions of students were rather similar in these two educational contexts. Although traditional face-to-face education produced more positive emotions in students, 29.7% of the students preferred to continue their studies in online mode. Blended education can help students make optimum use of available resources. The findings can be of use to educational policymakers, curriculum planners, teachers, and students.

Keywords: COVID-19; emotions; online classes; face-to-face classes; university students.

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I. Introduction

The onset of COVID-19 in December 2019 forced the World Health Organization (WHO) to declare this disease a global pandemic. The COVID-19 pandemic caused serious difficulties and severe damage in nearly every corner of the world. Besides health problems, it has posed many social, economic, and psychological challenges to people worldwide. This infectious and refractory disease severely affected numerous industries, different sectors, and the routine lives of individuals.

This global pandemic and its ensuing consequences have also affected education. In response to this unwelcome guest, many countries closed their institutions, schools, universities, and colleges temporarily, but when they realized this pandemic was not going to go away soon, they made efforts to adjust to this tricky situation (Jirásek and Stránský 2022; König, Jaeger-Biela, and Glutsch 2020). Although universities were quick to replace traditional face-to-face classes with online and distance instruction, teachers and students found it a little challenging to adapt to the new situation (Barrot, Llenares, and del Rosario 2021). The transfer from campus-based learning to online learning forced teachers and students to get acquainted with the nuts and bolts of online education. Ministries of education and university authorities saw this type of education as the fast solution to cope with the disruption in education, and they urged instructors to "maximize online collaborative learning (OCL) opportunities for their students" (Lei and Medwell 2021, 169). However, the lack of necessary equipment for online teaching and learning, such as suitable cellphones, computers, and technical infrastructure, were significant setbacks for this marked shift. Poor and developing countries were more affected by these severe setbacks (Mathrani, Sarvesh, and Umer 2021; Zarei and Mohammadi 2021).

In addition, learners' feelings and emotions in educational settings are essential for their health, learning, motivation, identity development, and performance (Pekrun et al. 2002). Education in the new context, imposed on teachers and students after the outbreak of COVID-19, brought about changes in the emotions students experienced in class, learning, and assessment. Moving from a typical school environment to home confinement poses a risk of emotional problems (Tannert and Gröschner 2021, 498). These emotions relate significantly to students' learning and performance (Pekrun et al. 2011). Therefore, examining students' emotions in these two different environments can provide helpful information for education policymakers, teachers, and even students.

The current study is going to compare the achievement emotions of students in traditional face-to-face and online classes. Most studies on

emotions have focused on just one aspect of emotions, such as test anxiety (Bieleke et al. 2021, 1). This study aims to consider the integrative nature of these emotions and assess students' feelings in these two academic contexts. In the following sections, first, the concept of achievement emotions will be discussed and elaborated. Next, a brief comparison of two educational settings (face-to-face and online) will be presented.

I.1. Achievement emotions

Achievement emotions include emotions related to achievement activities (e.g., studying and sports) or achievement outcomes produced by successes and failures (Pekrun 2006, 317). Different variables and factors determine the type and strength of these emotions. Personal competencies, cognitive appraisals of situational demands, the likelihood of success and failure, and the value assigned to these outcomes are among these contributing factors. According to Pekrun's (2006) control value theory (CVT), differences in control over performance and values appraisals lead to different achievement emotions. In other words, individuals experience different achievement emotions, considering the extent to which they feel they have control over achievement activities and the value they attribute to achievement activities and possible outcomes.

Part of Pekrun's (2006) control-value theory is demonstrated in a three-dimensional taxonomy of achievement emotions (Pekrun et al. 2007, 16–17). In this taxonomy, emotions are classified into *activity* versus *outcome* emotions with respect to the *object focus*. Activity-related emotions (e.g., enjoyment) focus on the action rather than the result of the action, which is the focus of outcome-related emotions (e.g., pride). Next, positive (i.e., pleasant) versus negative (i.e., unpleasant) emotions (e.g., hope vs. hopelessness) are distinguished in terms of the *valence* of emotions. Finally, the taxonomy has made a distinction between *activating* (e.g., anger) and *deactivating* (e.g., boredom) emotions with regard to the behavioral impact of the emotion. For instance, enjoyment can be described as a positive, activating, activity-related achievement emotion.

In educational environments, these emotions are felt by students in various achievement situations, such as learning, doing homework, participating in class, or taking exams. The emotions posited in this taxonomy influence the cognitive resources required to focus attention on achievement tasks and the motivation to do these tasks. These emotions also affect the self-regulation of learners and the use of flexible learning strategies (Pekrun et al. 2007, 27). Positive activating emotions such as enjoyment have a

positive relationship with achievement and academic performance (Pekrun et al. 2002, 92; Pekrun et al. 2011, 38), but the effect of positive deactivating emotions such as relaxation on learning and achievement is ambiguous and variable. These emotions can reduce the attention on a task, can harm the current motivation while simultaneously reinforcing the motivation to reengage with the task, and can promote superficial information processing (Pekrun 2006, 326).

Regarding the impact of negative activating emotions such as anxiety and shame on learning and achievement, the researchers have reported complex and variable effects. Although the majority of studies (e.g., Linnenbrink 2007; Pekrun et al. 2011) have reported adverse effects for these emotions, some studies (e.g., Turner and Schallert 2001; Zeidner 1998) have shown better performance for students who felt these negative activating emotions. The enhanced academic performance of students who feel shame and anxiety can be explained by the motivational effects of these emotions on students who are committed to future goals (Pekrun 2019, 152). Negative deactivating emotions such as boredom and hopelessness are expected to jeopardize the overall performance of students because they reduce cognitive resources, harm their motivation, and increase superficial information processing (Pekrun 2006, 326). Given the immediate and long-term effects of emotions on learning and achievement, it is essential that educational decision-makers and teachers should promote adaptive achievement emotions during learning and performance tasks.

Traditional studies on the role of emotions in education and learning were limited to investigating separate outcome-related emotions such as anxiety and shame (Goetz and Hall 2013, 192; Pekrun et al. 2002, 103; Pekrun and Stephens 2010, 238). During the 1990s, the role of emotions (in addition to anxiety) in human cognition and motivation attracted the attention of educational scientists (Pekrun 2005, 497). The last two decades have seen a growing interest in studying activity-related emotions (e.g., enjoyment and boredom). However, the concept of achievement emotions presented an integrative and multi-componential approach to emotions. Achievement emotions involve different types of emotions students experience in learning in different types of achievement settings (class, learning, and test) and different temporal specifications (trait, state, and course-specific emotions) (Pekrun et al. 2005, 5).

Many studies have reported a positive relation between enjoyment and achievement (e.g., Baek and Touati 2017; Pekrun et al. 2017; Ranellucci, Hall, and Goetz 2015), but a few studies (e.g., Beck 2011) have shown no relationship and even negative correlation between them. Tze et al. (2016)

explored the relationship between boredom and educational performance in a meta-analysis. They found negative correlations between boredom and academic motivation as well as between boredom and learning strategies. A moderate negative correlation was also found between boredom and overall performance. Chamaco-Morles et al. (2020) reviewed 68 studies on the relationship between activity-related emotions and educational outcomes. Their findings showed a positive relation between enjoyment and academic performance, but anger and boredom correlated negatively with academic performance. The relation between frustration and academic performance was near zero.

Stephan, Markus, and Gläser-Zikuda (2019) compared students' achievement emotions in an online and on-campus course in teacher education. Their findings showed that students who attended the online course experienced a higher level of boredom, anger, and anxiety, but less enjoyment. The difference in students' reported emotions of hope, shame, anxiety, and hopelessness was not statistically significant. They collected the data from two groups of students instructed in two different educational environments (online and on-campus). The possible individual differences between the two groups and not having the experience of the other mode of education may have affected their findings. The current study explores these emotions in students who had the experience of both modes of education.

I.2. *On-campus vs. online education*

Distance education is a relatively old concept. Some trace its history to the 1800s and even the 1700s. Since the late 1800s, a few significant advancements, such as the inventions of the radio and television, have shaped and pushed distance learning forward. During the 1980s, the electronics revolution and the introduction of broadband technologies helped the advance of this education. The personal computer with internet access was the next major invention that had a pivotal role in the popularity of distance education and online classes in the 1990s. The increasing advancement of distance education continues into the 21st century. Parker, Lenhart, and Moore (2011, 1) have reported that 89% of 4-year public colleges in the U.S. and 60% of private institutions offered online classes at that time.

Although distance education has proliferated due to advances in technology and changes in the lifestyle of students in the past two decades, face-to-face education is still the dominant form of education and learning worldwide. Over the past two years, the coronavirus outbreak has forced

more students and universities to employ online and distance learning courses. Due to the increasing growth of online education and the continuing popularity of face-to-face education, it is essential to assess the academic achievement of students in these educational settings and also to examine the affective factors related to both educational environments.

Electronic learning environments can be categorized into three types: synchronous, asynchronous, and blended (Salmon 2013). In synchronous learning environments, the teacher and students in the course take part in education at the same time, but from different locations. It takes place in real-time, with the instructor and learners interacting with each other. Virtual classrooms, live webinars, and video conferencing are examples of this mode of education. In asynchronous electronic learning, the teacher and the learners are not engaged in the learning process at the same time. Blogs and prerecorded webinars can be used to implement this type of education. There is no real-time interaction with other people. A blended environment combines an asynchronous set of electronic activities with synchronous education.

There are considerable differences between face-to-face traditional classes and remote online education. These differences have provided real advantages and disadvantages for the two educational settings (Gherheş et al. 2021). Among these differences, convenience, flexibility, contact hours, self-paced nature, and cost are usually cited as the main advantages of online education. Decreased student-teacher interaction and student-student interaction, giving a sense of isolation to students, placing a heavy burden on students, lack of qualified teachers for online education, and the reliability of assessments are the main drawbacks of online instruction, compared to face-to-face education.

Regarding the comparative effectiveness of face-to-face and online education, the findings of most studies (e.g., Enkin and Mejías-Bikandi 2015; Goertler and Gacs 2018; Rubio, Thomas, and Li 2018) have shown that the students' achievement in online classes was at least as good as their achievement in traditional classes. Wu (2015) reviewed 12 studies on the relative effectiveness of fully online or hybrid formats versus traditional or face-to-face environments conducted between 2013 and 2014. He found that students who participated in online and hybrid formats performed as well or better than those who attended the traditional versions of comparable courses. Of course, few studies (e.g., Brown and Leidholm 2002; Figlio, Rush, and Yin 2013; Kaupp 2012) have reported opposite findings. For instance, Kaupp (2012) examined course outcomes at California community colleges and found significantly better course grades for students in face-to-face classes than for online students. The methodological issues, such as randomization and the small sample size, are the main drawbacks of some studies conducted in this domain.

Of course, the difference between planned distance education and emergency remote education should not be neglected. Distance education relies on deliberate and advanced design, and the teachers and students in these programs expect in advance that they will have some or all courses in modes other than face-to-face education. However, emergency remote education is a temporary and abrupt shift to remote instructional delivery due to crises, such as weather, war, or health. The main objective in these circumstances is to adapt to the demands of the new situation. Teachers and students have to adopt this instruction, and most of them do not have enough training and preparation for these unexpected scenarios. Therefore, the findings of this study, which is done during online education after the outbreak of the COVID-19 pandemic, will apply to emergency remote education, and its application to usual distance education environments should be considered with caution.

In general, the majority of previous studies on students' emotions in online and on-campus settings have focused on one or two emotions, and the participants in these studies usually had the experience of one mode of education–either online or on-campus classes. The present study aims to examine the possible differences in the achievement emotions of the university students who had the experience of both educational settings.

II. Method

II.1. Participants

Ninety-two Iranian university students enrolled in 4-year programs to get a Bachelor of Arts (B. A.) degree participated in the study voluntarily. They studied humanities and social studies (e.g., psychology, translation, educational sciences) in the fifth semester. They had a minimum of two semesters of experience in on-campus education and two semesters of experience in online education. The participants were selected based on purposeful sampling, including both male (39.13%) and female (60.87%) students. Their age ranged from 20 to 45 years. Before the outbreak of coronavirus, the students attended traditional face-to-face classes, but after the outbreak of this pandemic, they had to switch to online education.

II.2. Instrumentation

The Achievement Emotions Questionnaire (AEQ) developed by Bieleke et al. (2021) was utilized to assess different emotions of university students, related to class, learning, and testing, in on-campus and online educational settings.

This questionnaire was a short version of the questionnaire developed by Pekrun et al. (2011). The Beileke et al.'s (2021) AEQ had 96 items, which assessed different emotions of students, including enjoyment, hope, pride, anger, anxiety, shame, hopelessness, boredom, and relief across different academic settings. Eight emotions are assessed in each part with 32 items (4 items for each scale). The students were asked to respond to the online questionnaires about the two modes of education (face-to-face and online) they had experienced. Therefore, each respondent had to answer 192 items. The respondents showed their evaluation of each item by selecting one of the options from "highly disagree" to "highly agree" on a 5-point Likert scale. The questionnaire was translated into Persian to make it more intelligible for the participants, and some minor changes were made in their wording to make it more suitable for the goals of the current study. Due to the closure of universities and considering the length of the questionnaire, the online version of the questionnaire was administered to the participants. The reliability index of the questionnaire was calculated using Cronbach. The obtained α was above .8 for all scales, indicating the high reliability of the questionnaire. The validity of the instrument was also established by Bieleke et al. (2021). In addition, the validity of the translated questionnaire was examined and confirmed by a panel of experts in psychology, education, and translation. Six experts (two in each field of study), who held Ph.D. and had more than ten years of experience in teaching and research in their own field, read the questionnaire carefully and approved its validity.

II.3. Procedure

Ethical guidelines for research have been observed in conducting this project. Before beginning the study, the participants filled in the informed consent form. They were not required to write their names in the questionnaires, and were assured that every effort would be made to keep their personal information confidential. The participants were informed about the aims of the study and about their freedom to accept or refuse the invitation to take part in the project. The AEQ was administered to the participants online. The questionnaire link was shared with respondents in WhatsApp groups whose members had the required characteristics for this study. Ninety-two students completed the questionnaires. The respondents were asked to reflect on the experience they had in two educational environments (on-campus and online) and show their opinion on each item by choosing one of the options from 'highly disagree' to 'highly agree'. The participants also answered a question on their preferred mode of education for the post-COVID era. They were also encouraged to write their reasons for their choice and make brief

comments on their experience in the two educational environments. The collected data were analyzed using SPSS 22 software.

III. Results

In order to analyze the collected data, first, the normality of the distributions of the data was assessed using normality tests (e.g., Kolmogorov-Smirnov and Shapiro-Wilk tests). Because the results of the tests showed that the distributions were not normal ($p<0.05$), a non-parametric test was utilized to explore different emotions that university students experienced in on-campus and online education. When the assumptions underlying parametric tests (e.g., normality of data, sample size) are violated, non-parametric alternatives should be utilized (DePoy and Gitlin 2019, 304). Table 1 shows descriptive statistics for class-related emotions of university students in on-campus and online education.

Table 1

Descriptive statistics for class-related emotions

Emotion	Education	Mean	Std. Deviation	Median
Enjoyment	Online	2.84	1.21	2.62
	On-campus	3.77	1.00	4.00
Hope	Online	3.11	1.13	3.25
	On-campus	3.82	.98	4.00
Pride	Online	3.09	1.05	3.25
	On-campus	3.65	.90	3.75
Anger	Online	2.58	1.12	2.37
	On-campus	2.23	1.09	2.00
Anxiety	Online	2.53	1.07	2.50
	On-campus	2.39	1.03	2.25
Shame	Online	2.06	.94	2.00
	On-campus	2.36	1.13	2.00
Hopelessness	Online	2.26	1.11	2.00
	On-campus	2.09	1.09	2.00
Boredom	Online	2.65	1.09	2.62
	On-campus	2.49	1.08	2.25

To assess students' class-related emotions in two educational environments, the Wilcoxon Signed Rank Test was run. The analyses showed a significant difference in students' enjoyment (T= 2923, Z= 4.53, $p<0.05$), hope (T=2474.50, Z=3.83, $p<0.05$), pride (T=2504, Z=3.46, $p<0.05$), and anger (T=1276.50, Z=2.27, $p<0.05$). Students' anxiety (T=1429.50, Z=1.08, $p>0.05$), shame (T=1603.50, Z=1.86, $p>0.05$), hopelessness (T=1338, Z=1.01, $p>0.05$), and boredom (T=1172.50, Z=1.33, $p>0.05$) did not change significantly in online instruction and in-person classes.

The analysis of the second part of the questionnaire, learning-related emotions, indicated differences in achievement emotions of students. Table 2 summarizes means, standard deviations, and medians of students' emotions. The results of the Wilcoxon Signed Rank Tests showed a significant difference in enjoyment (T= 1949, Z= 2.77, $p<0.05$), hope (T= 1816, Z= 2.06, $p<0.05$), and pride (T= 1478.50, Z= 2.12, $p<0.05$) of university students in face-to-face and online education. There was not a significant difference in anger (T= 1225, Z= 1.40, $p>0.05$), anxiety (T= 1208.50, Z= 1.82, $p>0.05$), shame (T= 1509.50, Z= .89, $p>0.05$), hopelessness (T= 1244, Z= .39, $p>0.05$), and boredom (T= 1035.50, Z= .03, $p>0.05$) of students who had experienced the two modes of education.

Table 2
Descriptive statistics for learning-related emotions

Emotion	Education	Mean	Std. Deviation	Median
Enjoyment	Online	3.51	.89	3.50
	On-campus	3.84	.80	4.00
Hope	Online	3.62	.84	3.62
	On-campus	3.89	.80	4.00
Pride	Online	3.52	.85	3.50
	On-campus	3.79	.82	3.75
Anger	Online	2.32	1.01	2.12
	On-campus	2.19	.95	2.00
Anxiety	Online	2.63	.90	2.50
	On-campus	2.47	.90	2.50
Shame	Online	2.60	.90	2.75
	On-campus	2.57	.99	2.50

Emotion	Education	Mean	Std. Deviation	Median
Hopelessness	Online	2.20	1.00	2.00
	On-campus	2.15	.98	2.00
Boredom	Online	2.58	1.08	2.50
	On-campus	2.54	.97	2.50

Students' evaluations of their emotions in testing did not indicate a significant difference between in-person and online tests. Table 3 demonstrates the differences in means, standard deviations, and medians of the obtained data.

Table 3

Descriptive statistics for test-related emotions

Emotion	Education	Mean	Std. Deviation	Median
Enjoyment	Online	3.41	1.10	3.50
	On-campus	3.17	.96	3.25
Hope	Online	3.65	.94	4.00
	On-campus	3.47	.99	3.50
Pride	Online	3.38	.91	3.25
	On-campus	3.39	.87	3.50
Relief	Online	3.54	.83	3.75
	On-campus	3.57	.76	3.50
Anger	Online	2.64	1.00	2.75
	On-campus	2.68	.89	2.75
Anxiety	Online	2.83	.89	3.00
	On-campus	2.95	.85	3.00
Shame	Online	2.12	.92	2.00
	On-campus	2.20	.95	2.00
Hopelessness	Online	2.13	.91	2.00
	On-campus	2.30	1.01	2.25

The Wilcoxon Signed Rank Test indicated that the difference in test-related emotions was not statistically significant in enjoyment (T= 1323, Z= 1.75, *p*>0.05), hope (T= 1423.50, Z= 1.28, *p*>0.05), pride (T= 1600.50, Z= .28, *p*>0.05), relief (T= 1292, Z= .51, *p*>0.05), anger (T= 1386.50, Z= .00, *p*>0.05), anxiety(T= 1515, Z= .68, *p*>0.05), shame (T= 1272.50, Z= .17, *p*>0.05), and hopelessness(T= 1591.50, Z= .88, *p*>0.05). In other words, students' evaluations of the emotions in on-campus and online testing were rather similar. Regarding the participants' preference for post-COVID classes, 65 participants (70.7%) liked to return to their face to classes and 27 participants (29.7%) preferred to continue the online classes.

IV. Discussion

Achievement emotions play a significant role in the motivation and academic performance of students. Therefore, studying these emotions in different educational environments is essential for educational practitioners and decision-makers. Considering the rapid growth of online education in recent years (especially after the outbreak of COVID-19), this study attempted to investigate the different emotions of university students in on-campus and online education.

Our findings with respect to the class-related and learning-related emotions demonstrated a similar pattern. Students' class related emotions including, enjoyment, hope, pride, and anger, were significantly different in these two modes of education. In the first three emotions (enjoyment, hope, and pride), students reported higher emotions for on-campus education, but these students felt angrier in online classes. In learning-related emotions, the participants reported higher degrees of enjoyment, hope, and pride in the face-to-face education. The main reason for these findings, as the participants wrote in their comments, may be the lack of teacher-student and student-student interaction in online education. 62.5% of the participants who explained their reasons for choosing on-campus education and commented on their experience stated this factor as one of the main reasons. Some students (50%) also believed teachers were not qualified enough to teach in remote and online classes. Teachers' inability to make effective use of technology in online classes and their audio lectures (sometimes without visual aids) promoted negative feelings in students. Considering the fact that our participants and teachers had to adapt themselves to online education abruptly, due to the outbreak of the COVID-19 pandemic, this reason can be acceptable. In addition, the effects of the COVID-19 pandemic on the emotional state of students should not be ignored. Loneliness and lockdown

measures taken to control this threatening pandemic have increased the depressive symptoms, anxiety, indignation, and stress (e.g., Li et al. 2020). The study of Varma et al. (2021) has proved that the youth are at a greater risk of poor mental health during this pandemic.

Among class-related emotions, anxiety, shame, hopelessness, and boredom of university students were not considerably different in the two educational environments. In addition to these emotions, the university students also reported similar degrees of anger while engaged in learning in these two educational contexts. These feelings are affected by individuals' perception of their ability to cope successfully with assigned tasks as well as by the environmental demands. For instance, regarding boredom, some students commented that the lack of interaction between teacher and students and also among students created a monotonous and boring atmosphere in online classes. On the other hand, some students believed that going to university and sitting on chairs for long hours in face-to-face classes was really tedious for them.

The story is different with regard to test-related emotions. The students reported similar degrees of achievement emotions in two modes of testing. Of course, the comparison of means and medians indicated that students felt a little more enjoyment, hope, and relief but less pride and hopelessness in online tests. However, the differences were not statistically significant. These findings seem somewhat extraordinary if we know that students' scores and GPA (grade point average) have risen in the distance and online testing. Test-related emotions of students are affected by their performance and achievement in assessments and also by the testing environments. It seems that the characteristics of each test delivery mode (in-person and online) had a negligible effect on students' emotions. The positive emotions which arose from the benefit of not having been monitored by a strict teacher or invigilator during in-person exams were counterbalanced by the negative emotions caused by the time pressure, internet connection problems, power outages, and possible technical problems during online exams. This fact should also be emphasized that in some developing and even developed countries, a few students do not have the suitable equipment (e.g., internet, mobile phone, and computer) for online tests.

Overall, we can conclude that university students who were enrolled for on-campus education felt better in in-person education and preferred to pursue their education face-to-face after the end of the COVID-19 pandemic. Of course, considering the interest of some students in pursuing their studies in online classes, enough attention should be paid to this kind of education. Blended education, which integrates in-person classes with online education, can satisfy the needs, wants, and aspirations of a wide range of students.

The limitations of the current study should not be ignored. The small sample size of the participants and the somewhat unplanned nature of online education are the main shortcomings, which make generalization of the findings to other contexts rather tricky. Notwithstanding these limitations, this study extends current knowledge of achievement emotions in different educational environments. The findings can be helpful for students, teachers, educational practitioners, and policymakers. Future studies can explore achievement emotions in face-to-face, online, and blended education. Also, the relationship between these emotions and individual factors such as age, marital status, and socioeconomic status of the students can be investigated.

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Teaching-learning process through virtual mode during the pandemic time: Systematic literature review and gap analysis

Ajay Kumar Singh and Mukesh Kumar Meena*

Abstract

***Purpose*:** Due to the COVID-19 pandemic, the Higher Education Institutes (HEIs) was closed temporarily. During this historical lockdown, the face-to-face mode classroom was temporarily got replaced by a virtual classroom. The objective of this study was to analyze the impact of nationwide lockdown on the benefits of the virtual classroom for the teaching-learning process for teachers and students due to change in the teaching-learning process in higher education during the COVID-19 pandemic.

***Design*:** A total of 893 responses have been used for this study. We have collected data through a structured questionnaire on a Likert scale from 305 teachers and 588 students of Higher Education Institutes (HEIs) from all India levels. Descriptive and frequency statistics, t-test was used in SPSS software to analyze the data collected through the primary source**.**

***Findings*:** The mean difference between expected benefits from the virtual classroom and actual benefits from the classroom is positive for students as well as faculty members. That indicates the overall mean of expected benefits is higher than the overall mean of actual benefits, and that difference value is 0.250055, with a Sig.

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(2-tailed) value of 0.036 which is less than 0.05 for teachers and 0.3872827, with a Sig. (2-tailed) value of 0.000 which is less than 0.05 for students. That indicates the significant difference between means of actual benefits and expected. The mean value of the expected benefit is higher than the mean value of actual benefits for 11 pairs and 08 pairs in the case of teachers and students respectively.

Discussion: Technical barriers are the reasons for not being able to attend the expected benefits from virtual classrooms in full capacity by students as well as by faculty members. Poor digital skills of teachers and students, lack of electricity facilities, less availability and accessibility of internet, connection issues, inadequate facilities, training, funding, and unacceptability of technology, etc. were the barriers to online education at the time of closure of colleges due to COVID-19 pandemic Onyema et al. (2020). Students can also have a casual attitude, less attendance, feeling of isolation and less interaction can lead to mental distress, spending more time in front of a computer could be hazardous for health too Surkhali and Garbuja (2020). Higher Education Institutes (HEIs) faculty members, as well as students, were not able to perceive actual benefits in full in comparison to expected benefits due to the presence of challenges in the virtual classroom as moderators. The higher education authorities, colleges/institutes/universities need to fix the above issues to enhance the quality of the teaching-learning process. The higher education authorities, institutes/colleges/universities must work together to resolve the issues and challenges of virtual classrooms to improve their effectiveness of the virtual classroom. Higher Education Institutes (HEIs) may provide technical support, and training to the faculty members as well as students for a better experience in the virtual classroom. Students who are lacking technical infrastructures such as computers/laptops and internet connectivity may be provided by Higher Education Institutes (HEIs) with financial and technical support to these students.

Keywords: virtual classroom; COVID-19; pandemic; higher education; teaching-learning process; teachers; students.

I. Introduction

The world is facing an unprecedented situation that has arisen due to the novel COVID-19 pandemic. Coronavirus which is known as COVID-19 is an infectious disease that was first reported in Wuhan city of Hubei Province of China in early December 2019 after that it started spreading in other countries as well then on 11th March 2020 WHO declared it a pandemic. Although various pandemics have been faced by the world in previous decades such as in 1918 Spanish flu was caused by the H1N1 virus, in 1957 Asian flu was caused by the H2N2 virus, in 1968 Hong Kong flu was caused by the H3N2 virus, and in 2009 Swine flu caused by H1N1 virus but the situation which has been created due to COVID-19 is unprecedented. As per the WHO report, the COVID-19 global outbreak in 216 countries with

581,837,714 confirmed cases infected with the virus, and 6,419,151 confirmed deaths till 13ᵗʰ July 2022. Although COVID-19 affected all sectors of the economy whether it is the manufacturing and service sectors by distrusting the supply chain and reducing the demand and tourism sector by restricting traveling among countries. But one of the most affected sectors because of COVID-19 has been the Education sector as the lockdown resulted in the closure of schools and colleges across countries.

UNESCO estimated that the pandemic affected 1,576,873,546 learners worldwide which was 90.1% of the total enrolled learners in 190 countries till mid-April 2020 due to the closure of schools but it reduced to 572,324,061 learners which is 32.7% of the total enrolled learners in 30 countries till the 1ˢᵗ November 2020. Global Monitoring of School Closure locally and countrywide and School Open during COVID-19 as per UNESCO, Government of India announced a first countrywide lockdown on 25ᵗʰ March 2020 for 21 days, as the cases were still increasing, the lockdown further extended till 3ʳᵈ May after that it continued but govt. started giving relaxation regarding economic activities such as open manufacturing sector, various Government offices, and other activities with rules and regulations regarding social distancing, wearing the mask, avoiding unnecessary travel, etc. But schools and colleges remain closed. COVID-19 has disrupted the teaching-learning process of learners and teachers because of the closure of schools and colleges. The examinations were canceled or postponed till uncertain periods, which lead to uncertainties among students, especially for those who were about to complete their schooling and were supposed to take admitted to colleges and among final year students of universities who were likely to take jobs. As per UNESCO total number of 32,07,13,810 learners were affected due by the COVID-19 lockdown in India. Two years into the pandemic, schools have been fully closed for 20 weeks and partially closed for an additional 21 weeks, on average across countries. Data from the UNESCO Global Monitoring of School Closures reveal that about 1 in 10 countries have fully closed their schools for over 40 weeks. School children around the world have missed an estimated 2 trillion hours and counting of in-person learning since the onset of the pandemic and subsequent lockdowns. According to UNESCO at the end of February 2022, while a majority of countries have fully opened schools, 42 countries have opened schools partially and six countries still have their schools fully closed.

Onyema et al. (2020) concluded that COVID-19 disrupted learning, increased student debt, limited access to education facilities, increased job loss in the education sector, and reduced loss of learning among students. Management of schools and colleges encouraged their students and teachers

to continue the learning process through online teaching. In this technology-driven world, with the help of digital platforms such as Zoom, Skype, Google Meet, Microsoft Team, Google Classroom, YouTube, etc., teachers and students can continue their teaching-learning process during this pandemic period. In this period, all the Higher Education Institutes (HEIs)/universities/colleges were closed after instructions from the Ministry of Education (MOE), University Grants Commission (UGC), and All India Council for Technical Education (AICTE). All the teaching-learning practices had been conducted through virtual mode during the lockdown. This was the best time to analyze the actual benefits perceived from the virtual classroom by the teachers and students of higher education in India. The virtual classroom was the best solution available during the lockdown to save the academic year. Students and faculty members were expecting something good with the presence of a virtual classroom in the lockdown time.

II. Review of literature

Online teaching and learning could be advantageous through which teachers can motivate students, complete syllabus, provide accessibility to learning and teaching from any time and any place, etc. Online learning is more flexible in access as it can provide content and instruction at any time, from any place (Castro and Tumibay 2019). However, technological and infrastructure support is required for the successful implementation of online teaching and learning. Online teaching and learning can be fruitful for students as well as teachers to complete their syllabus and assessment, provide moral support, and reduce stress levels during the COVID-19 pandemic. it would also enable the interaction between the teachers and learners. But for effective learning and teaching, infrastructure and technological support are required. A study by Cheawjindakarn et al. (2012) recognized five critical success factors for online learning such as institutional management which comprises the framework, operation ability, and cost of the program, learning environment which consists of the course management system, technical infrastructure, access and navigation of the program, an instructional design which includes objectives, content quality, learning strategies, the psychology of learning and learning assessment of the course, services support for the course as training, communication tools, help desk, and course evaluation. Kuo et al. (2013) analyzed the interaction between learner and content of the study such as the design of online study material, document layout, use of videos, learner-instructor interaction as a level of communication between learners and instructor, and self-efficacy of the

students on internet measured as the ability of the students to use the internet were the main factors of student's satisfaction in online education programs.

Online teaching can have challenges such as poor internet connectivity, non-availability of appropriate electronic devices, lack of a teaching environment at home, and less ICT knowledge among students and teachers can result in less engagement of students and teachers in the teaching and learning process. Onyema et al. (2020) found that poor digital skills of teachers and students, lack of electricity facilities, less availability and accessibility of internet, connection issues, inadequate facilities, training, funding, and unacceptability of technology, etc. were the barriers to online education at the time of closure of colleges due to COVID-19 pandemic. The success of online learning depends on various factors. Students can also have a casual attitude, less attendance, feeling of isolation and less interaction can lead to mental distress, and spending more time in front of a computer could be hazardous for health too (Baid et al. 2017; Kang and Sindhu 2015; Ran et al. 2020; Surkhali and Garbuja 2020; Trotter 2002; Gilbert 2001; Wahyu et al. 2020) concluded spending more time in front of a computer could result in health problems and it was difficult for the teacher to ensure participation of students due to less in-person conversation and less socialization and less participation can result in mental distress. They also stated the problem of accessibility and affordability of internet connection was the main problem of virtual learning. They also found that low internet bandwidth and technical disturbance, less interaction, and minimum participation led to less engagement and disturbance during online classes. Although online teaching is helpful to maintain the continuity of the teaching and learning process it also requires various technological and infrastructure facilities for the smooth functioning of online learning and the limited availability of these faculties could affect the quality of education. Various research studies have been done to know the challenges faced by teachers in online teaching. Through online teaching students can interaction with the teacher which could be helpful to provide moral support and reduce the stress level of students during the COVID-19 Pandemic. Yulia (2020) concluded that online teaching is effective during this COVID-19 pandemic time for preventing the students from going away from home.

Moore (1991) observed the emergence of the personal computer industry and related technologies during the 1970s and 80s. He noted that technical innovations are adopted by different market segments in sequence. Online teaching-learning has benefits but various challenges and drawbacks are also associated with it. Various infrastructure and logistical facilities are required for the effectiveness of online teaching and learning. Geoffrey Moore's

concept is the Technology Adoption Life Cycle (Moore 1991, 1995, 2002, 2005). Based on Everett Rogers' observations on the diffusion of innovations specifically, adoption or diffusion of innovation occurs as adoption by a sequence of adopter segments. Online learning has been initiated by various schools and colleges without providing the necessary infrastructure and technical assistance and training for usefulness for online teaching and learning.

Various studies have been done to determine the challenges and drawbacks faced by teachers and students during online classes. Students' participation was less due to the lack of in-person conversations with teachers which could result in mental stress for students and teachers (Surkhali and Garbuja 2020). They also reported that an accessible and affordable internet connection was the main problem faced by students and teachers and less participation, interaction, and technical disturbance led to less engagement and disturbance in online classes. Teachers found technical, logistical, and pedagogical problems during online classes because of an unprepared transition from face-to-face teaching to online teaching. More efforts were required from the teachers' side to ensure that students are studying the correct study material and providing information about the assignment. Students opted for online education because it offered greater flexibility but required more self-discipline by students (Daymont 2011; Squire 2021; Jain et al. 2021; Willermark 2021; Neuwirth et al. 2020; Egielewa et al. 2021). Students' perceptions of vocational studies on online mode stated that as vocational studies require not only knowledge but skills as well, at the same time online learning did not improve student's productivity. The students' experience was not up to expectations (Syauqi et al. 2020).

II.1. *Systematic literature review of COVID-19 and education*

II.1.1. Bibliometric search

The search for articles to be included in the review was guided by a search strategy that we developed consists of four stages: database search, scholarly filtration, language filtration, and subject filtration (Fig. no. 2).

In the Stage one database search. The Scopus database has been selected due to the following reasons: Its coverage of publications that met a stringent set of requirements for indexing (e.g., scientifically and scholarly relevant), and its comprehensiveness of bibliometric information for publications that it indexes. Indeed, Scopus is suitable for endeavors seeking to curate a large corpus for

review (Paul et al. 2021), and it is a scientific database that is often recommended for bibliometric reviews (Donthu et al. 2021). The Scopus database has been recognized as a high-quality source for bibliometric data (Baas et al. 2020), and the correlation of its measures with those available from alternative scientific databases such as Web of Science is "extremely high" (Archambault et al. 2009), though the latter's coverage is less than the former (Paul et al. 2021).
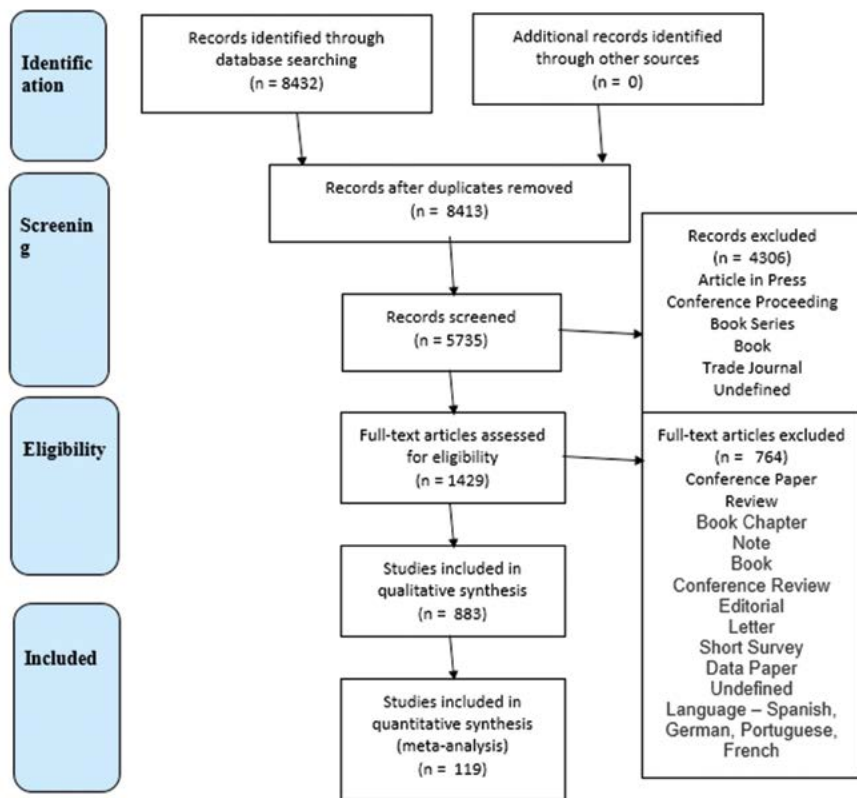

Figure 1

PRISMA flow chart for bibliometric review

The second stage is scholarly filtration. We chose to include only journal articles and conference proceedings, as they are usually evaluated on the grounds of novelty, subjected to rigorous peer review, and both. The third stage is language filtration. We chose to include articles written in English that were retained in Stage second only. This filtration was required as we are native English speakers. The Fourth stage is subject filtration. We choose to include articles with keywords. The formula we utilized for it:

> Title-Abs-Key (("COVID-19" OR "Covid" OR "Pandemic" OR "Epidemic" OR "Disease" OR "Sars-Cov-2") AND ("Education" OR "Teaching" OR "Learning" OR "E-Learning" OR "Virtual Classroom" OR "Virtual" OR "Online" OR "Teaching-Learning") AND ("Faculty" OR "Teacher" OR "Student" OR "Pupil" OR "Learner") AND ("Challenges" OR "Drawbacks" OR "Benefits"))

In the first search of literature total of 8432 papers were found on COVID-19 and Education, after that filters were applied for the search. Further, the search was limited to title-abstract-keywords for more close studies. Then 5735 studies were found. Further, the most important keywords were applied, here we excluded 4306 articles. After that, we again applied filters of language, final publication stage, and journal articles. Here we excluded 764 articles. After that final 119 articles were found usable for extensive literature work which is important based on keywords (figure no. 1).

II.1.2. Publication trend of research paper on pandemic and education
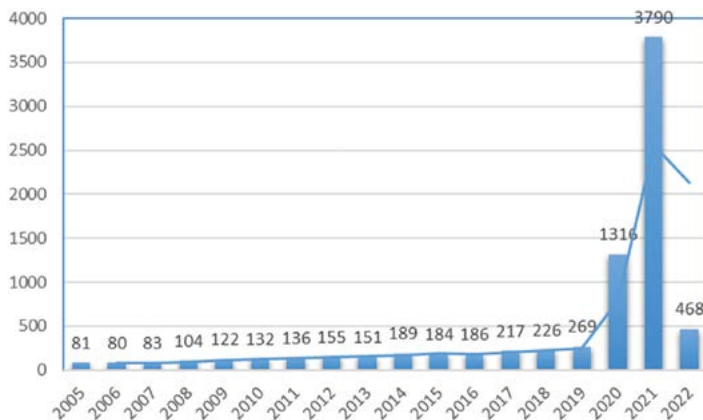

Figure 2

Publication trend of pandemic and education

From the bibliometric analysis results for the Scopus database, in 2016 186 research papers were published, then 217 articles in 2017, 226 articles in 2018, 269 articles in 2019, 1316 articles in 2020, 3790 articles in 2021, as on February 26, 2022, 468 articles published in 2022. Now this pandemic and education research has become a trending research area, which is continuously going on (figure no. 2).

II.1.3. COVID-19 and education research across countries

Figure no. 3 is showing the results from the bibliometric analysis. Figure no. 3 is showing major contributing countries in COVID-19 and education research articles. The United States is at the top position by providing 2993 research articles on COVID-19 and education, which is followed by the United Kingdom with 752 articles, Australia with 436 articles, Canada with 398, India with 354, Germany with 283 articles, China with 276, Spain with 235 and South Africa with 210 articles and so on.
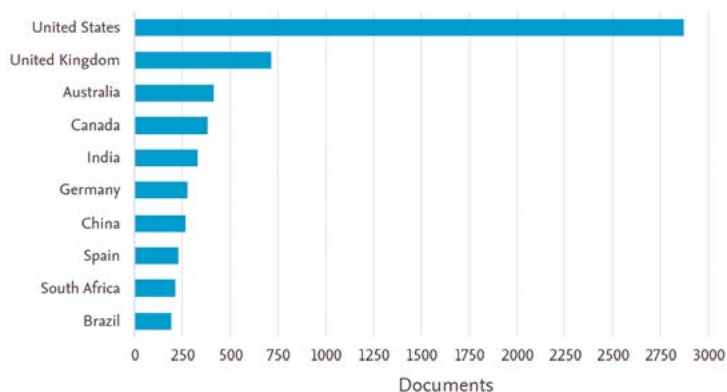
Figure 3

Number of articles – COVID-19 and education research across countries.

II.1.4. COVID-19 and education research paper's keywords

Figure no. 4 is showing the most frequent keywords of COVID-19 and education research. These keywords were provided by the authors in their research papers. Which are as follows: COVID-19, human, education, humans, pandemic, teaching, e-learning, online learning, article, medical education, higher education, learning, pandemics, sars-cov-2, education,

distance, curriculum, medical student, coronavirus disease 2019, students, online teaching, distance learning, male, female, procedures, student, students, medical, online education, adult, COVID-19 pandemic, questionnaire, epidemiology, internet, organization and management, emergency remote teaching, university, psychology, controlled study, computer-assisted instruction, education, medical, education, medical, undergraduate, blended learning, coronavirus, cross-sectional study, medical school, perception, distance education, nursing education, clinical competence, and surveys and questionnaires.

Figure 4
Most frequent authors' keywords

II.1.5. Journals contributing to COVID-19 and education research

Table no. 1. is showing the results of bibliometric analysis. Table no. 1 shows the most contributing journals in the field of COVID-19 and education research. sustainability (Switzerland) is the highest contributing journal with 38 papers followed by education sciences journal with 33 papers, bmc medical education with 20 papers, journal of chemical education with 20 papers, and so on.

Table 1

Top 5 Journals contributing to COVID-19 and education research

Sr. No.	Source	Documents	Citations
1	Sustainability (Switzerland)	38	420
2	Education sciences	33	232
3	Bmc medical education	20	361
4	Journal of chemical education	20	178
5	Frontiers in education	15	55

II.1.6. Most cited papers in COVID-19 and education

Table no. 2. is showing the results of bibliometric analysis for studies with the highest citations. Table no. 3 showing the most cited studies in the field of COVID-19 and education research. Daniel (2020) with 334 highest citations followed by Aristovnik (2020) with 273 citations, König (2020) with 178 citations, Watermeyer (2021) with 143 citations, and so on.

Table 2

Top 6 most cited research papers

Sr. No.	Document	Citations
1	Daniel s.j. (2020)	334
2	Aristovnik a. (2020)	273
3	König j. (2020)	178
4	Watermeyer r. (2021)	143
5	Mailizar (2020)	126
6	Webster c.a. (2015)	126

II.1.7. Most frequent keywords

The table no. 3 is showing the most frequent keywords of COVID-19 and education research. These keywords were provided by authors in their research paper which are as follows: COVID-19, human, education, humans, pandemic, teaching, e-learning, online learning, article, medical education, higher education, learning, pandemics, sars-cov-2, education, distance, curriculum,

medical student, coronavirus disease 2019, students, online teaching, distance learning, male, female, procedures, student, students, medical, online education, adult, COVID-19 pandemic, questionnaire, epidemiology, internet, organization and management, emergency remote teaching, university, psychology, controlled study, computer-assisted instruction, education, medical, education, medical, undergraduate, blended learning, coronavirus, cross-sectional study, medical school, perception, distance education, nursing education, clinical competence, surveys, and questionnaires.

Table 3
Top 21 most frequent keywords

Sr. No.	Keyword	Occurrences	Total link strength
1	COVID-19	470	2495
2	human	231	2606
3	education	202	1990
4	humans	192	2249
5	pandemic	186	1864
6	teaching	184	1669
7	e-learning	148	1135
8	online learning	144	456
9	article	119	1403
10	medical education	118	1359
11	higher education	107	409
12	learning	106	904
13	pandemics	98	1267
14	sars-cov-2	95	1185
15	education, distance	94	1260
16	curriculum	85	911
17	medical student	85	1170
18	coronavirus disease 2019	83	1082
19	students	80	572
20	online teaching	73	233
21	distance learning	70	386

II.1.8. Countries with the highest contribution in COVID-19 and education research

Table no. 4 is showing the results from the bibliometric analysis. Table no. 5 is showing major contributing countries to COVID-19 and education research articles. The United States is at the top position by providing 203 research articles on COVID-19 and education, which is followed by the United Kingdom with 85 articles, India with 73, and Australia with 45 articles, and so on.

Table 4

Top 5 contributing countries

Sr. No.	Country	Documents	Citations	Total link strength
1	United States of America	203	1199	15046
2	United Kingdom	85	740	14939
3	India	73	207	9454
4	Australia	45	274	10096
5	South Africa	40	136	5624

II.2. *Research questions*

- RQ1. What is the publication trend (number of articles by year) of papers focusing on the teaching-learning process through virtual mode during the pandemic time?

- RQ2. Where are the most influential publications (outlets, articles) of papers focusing on the teaching-learning process through virtual mode during the pandemic time?

- RQ3. Who are the most prolific contributors (authors, countries, and institutions) to a paper focusing on the teaching-learning process through virtual mode during the pandemic time?

- RQ4. What does existing research (themes, topics) inform us about the teaching-learning process through virtual mode during the pandemic time?

- RQ5. What can future research (avenues) explore to enrich our understanding of the teaching-learning process through virtual mode during the pandemic time?

The RQ1 to RQ4 have already been explained with the help of systematic literature review results. Further, we have framed objectives and hypotheses to analyze the RQ5. In this study, we have observed what could be the expected benefits of virtual classrooms. What was expected from the virtual classroom by faculty members and students, and whether the expected outcome of the virtual classroom is achieved or not? If not, what could be the possible reasons for the gap between the expected and actual outcomes? This study is conducted to find out benefits received from the virtual classroom and if any gap exists in expected and perceived benefits from the virtual classroom then what could be possible reasons for this gap at the time of the lockdown implemented due to the COVID-19 pandemic.

III. Objectives of the study

This study has the main objective to identify the most contributing authors, countries, and most frequently used keywords during the lockdown time period in studies based on virtual classroom teaching-learning practices. Another objective of this study is to analyze any significant gap between expected benefits and actual benefits perceived from virtual classrooms by teachers and students in higher education. On the basis of systematic literature review support, we also want to analyze the effect of the presence of challenges in achieving the expected benefits from virtual classrooms.

IV. Hypotheses

- H_A1: There are statistically significant differences between expected benefits and actual benefits perceived from virtual classrooms by faculty members in higher education institutions.

- H_A2: There are statistically significant differences between expected benefits and actual benefits perceived from virtual classrooms by students in higher education institutions.

V. Research methodology

We have collected data from the faculty members and students of higher education institutions at the undergraduate level, postgraduate level during the COVID-19 lockdown period. The class mode shifted from face-to-face mode to a virtual classroom. For this study, we have considered the 893 (305 faculty members + 588 students) total responses from faculty members and students of higher education institutes. Two structured questionnaires were shared through

digital platforms like Gmail, and personal messages on mobile, WhatsApp, and Facebook to the faculty members, and students of higher education respectively. Due to the nationwide lockdown face to face interaction was not possible. The structured questionnaire for students was shared with 4978 students of Higher Education Institutes (HEIs) at all Indian levels, 946 responses were received from students with a response rate of 19.5 percent. After the data cleaning process, and removing incomplete responses, only 867 responses from students were considered for this study. Out of the 867 students, only 588 students were using the virtual classroom, so we have considered 588 students for analyzing the benefits of virtual classrooms and the challenges faced by them during the virtual classroom. We have also asked the rest of the 267 students for their reasons for not joining the virtual classrooms. The structured questionnaire for faculty members was shared with 2392 faculty members of Higher Education Institutes (HEIs) at all India levels, 344 responses were received with a response rate of 14.3 percent. After the data cleaning process, and removing incomplete responses, only 335 responses from faculty members were found usable. Out of 335 responses from faculty members, only 305 faculty members were using the virtual classroom for the teaching-learning process, so we have considered only 305 responses from faculty members to analyze the gap between actual and expected benefits. We asked 30 faculty members to provide reasons for not using virtual classrooms.

To complete the analysis part of the study, SPSS 20 software has been used to compare the mean of actual benefits and expected benefits. AMOS 16 software was used to check the model fit and moderation analyses for perceived benefits from virtual classrooms.

This study has been done with the help of primary data collected through a questionnaire. To measure the actual and expected benefits from the virtual classroom a standardized questionnaire sun, P.C. et al. (2007), Arora and Srinivasan (2020) have been used. The whole questionnaire consisted of five sections consisting of expected benefits, actual benefits, and demographic information consisting one section for each. To check the internal consistency of the structured questionnaire. The Cronbach Alpha Reliability test has been used for the internal consistency of the questionnaire. Data analysis output is showing the results of internal consistency for each factor. The Cronbach's alpha test of internal consistency giving value $>= 0.7$ is considered to be good. From the teacher's sample of this study Cronbach's alpha value for expected benefits, the actual benefit is 0.927, and 0.939 for each respectively. From the student's sample of this study Cronbach's alpha value for expected benefits, actual benefits, challenges, and drawbacks are 0.953, and 0.960 for each respectively.

VI. Data analysis

VI.1. *Demographics of sample data*

Data analysis results are showing the demographic results of the faculty members and students. Out of 305 faculty members, 51.34 percent belonged to the age group of "up to 30" years, and 48.65 percent of faculty members were from the age group of ">30" years. Out of the total respondents, 68.65 percent of faculty members were female and only 31.34 were male faculty members. Among the total faculty members, 37.61 percent were with teaching experience of "0-3" years, 40 percent of faculty members had teaching experience of "4-10" years, and 20 percent of faculty members had more than 10 years of teaching experience. That means the majority of respondents were young and working as Assistant professors and Associate professors.

The demographic information of the students, out of 588 students, 99.88 percent belonged to the age group of "up to 30" years, and 0.11 percent of students were from the age group of ">30" years. Out of the total respondents, 65.62 percent of students were female and 34.37 percent were male students. Out of the total respondents, 79.12 percent of students were studying at the undergraduate level and 18.10 percent of students were studying at the postgraduate level.

VI.2. *Adoption rate of virtual classroom among teachers and students*

Out of the total 335 faculty members, only 91.04 percent of faculty members were using the virtual classroom to interact with students for the teaching-learning process during the nationwide lockdown due to COVID-19. When this study was conducted, 30 faculty members were not using the virtual classroom to interact with students and out of the total 867 students, only 67.80 percent of students were attending the virtual classroom for the learning process during the nationwide lockdown due to COVID-19, and 32.20 percent of students were not attending the virtual classroom when this study was conducted (Table no. 7). The respondents who were not using the virtual classroom for the teaching-learning process, were also communicated through Gmail to find out reasons for not using the virtual classrooms. Responses were received from 26 faculty members and 254 students, and 17 faculty members have cited the reason that they were thinking that virtual classrooms will not be easy for teaching. so they communicated with students through WhatsApp and Gmail. But after receiving positive reviews from their colleagues, they started using the virtual classrooms. These were conservatives/ late majority who were waiting to adopt until they see a clear

advantage specifically for their own situations and it is easy to use the technology offered (Moore 1991).

9 faculty members have cited the reason that when the lockdown was implemented they were able to complete the major part of the syllabus, and for the remaining part, they were using WhatsApp and Gmail. But in the new semester, there was no option left, so they started using virtual classrooms. These are Skeptics/ laggards who hold out until they have no choice but to adopt. Often they take pride in not adopting. They insist that the "old way" of doing something is good enough (Moore 1991).

103 students have cited the reasons for not attending virtual classrooms as non-availability of better quality internet, network issues, lack of computer/ laptop/Smartphone, etc. these students were facing infrastructural issues in the beginning. But after some time the majority of them made the arrangements when they find that the lockdown may go on for a long time, and 151 students cited the reason that the lockdown was just implemented for a month only in the beginning. Then it was continuously extended by one month again and again. When they realized that it is going long, they felt that it may create academic losses for them. There was no other option for them and then they started attending the virtual classroom. These are Skeptics/ laggards who hold out until they have no choice but to adopt. Often they take pride in not adopting. They insist that the "old way" of doing something is good enough (Moore 1991).

In this study, we are considering virtual classrooms as online live classrooms that can be conducted with the help of Microsoft Team, Google Meet, Zoom, and other live platforms. Those faculty members and students were attending classes on the above-mentioned platforms, and we have considered that those students and faculty members have adopted virtual classrooms for the teaching-learning process.

Those Faculty members and students who were not participating in the live online classrooms, we have considered as they have not adopted the virtual classroom for the teaching-learning process, they were just using online material available on the internet, old YouTube videos, etc. because in India when the lockdown was implemented for the first time, many faculty members were just sharing the study material with students through Gmail and WhatsApp. Because at the beginning of the lockdown there was no proper observation of online classes by the university administration, college principals, and heads of the departments.

VI.3. *Impact of COVID-19 lockdown on virtual classroom*

Out of the total 305 faculty members who were using the virtual classroom for interaction with students, 90.20 percent of faculty members started using

virtual classrooms after the COVID-19 pandemic. Only 30 faculty members were using virtual classrooms before the COVID-19 pandemic. Out of the total of 588 students who were attending a virtual classroom, 87.80 percent of students started using virtual classrooms after the COVID-19 pandemic. Only 12.20 percent of students were using virtual classrooms before the COVID-19 pandemic.

That shows the majority of teachers and students in Higher Education Institutes (HEIs) were not using virtual classrooms before the COVID-19 pandemic. The results are indicating a significant change in the teaching-learning process due to the COVID-19 pandemic in higher education.

VI.4. *Paired samples test results*

This study has been conducted based on a comparison of the expected benefits of the virtual classroom before attending with the actual benefits of the virtual classroom after attending. This concept has been used for both faculty members as well as students at the higher education level. Table no. 5 indicates the mean value of expected benefits and actual benefits of all 12 pairs for teachers and students respectively. The mean response value of expected benefits is higher than the actual benefits mean value in all 12 pairs for faculty members. That indicates that the actual benefits perceived from the virtual classroom are less than the expected benefits.

The mean response value of expected benefits is higher than the actual benefits mean value in 08 pairs for students. In one pair of students, expected benefits mean values are equal to actual benefits, and in one pair of students' expected benefits mean values are less than the actual benefits mean value. That indicates the major expected benefits of the virtual classroom are not perceived by students from the virtual classroom.

As we can see from table no. 5, the mean value of expected and actual benefits are more than the 3 on the 1 to 5 Likert scale for 11 pairs out of 12 pairs of expected and actual benefits. The mean value of the expected benefit is higher than the mean value of actual benefits for 11 pairs and 08 pairs in the case of teachers and students respectively. The reason behind this gap is network problems, lack of internet facilities, consistent connectivity issues, availability of infrastructure, and lack of classroom environment at home, and the gap in the mean value of expected benefits and actual benefits is higher in the case of students than in comparison to faculty members. Because teachers are having a monthly income, they can afford the expenditure for the development of online classroom infrastructure, laptops, internet connectivity, etc., and students are not supported by any personal

Table 5
Paired Samples Statistics

		Faculty				Students			
		Mean	N	Std. Deviation	Std. Error Mean	Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Convenient to Use -Expected	3.49	305	1.136	.065	3.47	588	1.146	0.047
	Convenient to Use - Actual	3.42	305	1.109	.064	3.09	588	1.267	0.052
Pair 2	Able to Connect with Teachers/students-Expected	3.54	305	1.181	.068	3.38	588	1.129	0.047
	Able to Connect with Teachers/students-Actual	3.46	305	1.141	.065	2.89	588	1.185	0.049
Pair 3	Able to Cover Syllabus Timely-Expected	3.54	305	1.141	.065	3.14	588	1.191	0.049
	Able to Cover Syllabus Timely- Actual	3.49	305	1.139	.065	2.70	588	1.238	0.051
Pair 4	Enhancing personal learning-Expected	3.49	305	1.159	.066	3.14	588	1.179	0.049
	Enhancing personal learning- Actual	3.46	305	1.106	.063	2.78	588	1.207	0.050
Pair 5	Enhance creativity-Expected	3.48	305	1.112	.064	3.00	588	1.201	0.050
	Enhance creativity- Actual	3.41	305	1.178	.067	2.60	588	1.197	0.049
Pair 6	Class attendance will increase-Expected	3.15	305	1.185	.068	3.10	588	1.284	0.053
	Motivate students (more students will join the class) - Actual	2.94	305	1.221	.070	2.61	588	1.239	0.051

		Faculty				Students			
		Mean	N	Std. Deviation	Std. Error Mean	Mean	N	Std. Deviation	Std. Error Mean
Pair 7	Introduces to education technology-Expected	3.61	305	1.071	.061	3.50	588	1.111	0.046
	Introduces to education technology- Actual	3.59	305	1.051	.060	3.19	588	1.207	0.050
Pair 8	Sharpened digital skills-Expected	3.71	305	1.078	.062	3.42	588	1.091	0.045
	Sharpened digital skills- Actual	3.70	305	1.026	.059	3.10	588	1.159	0.048
Pair 9	Schedule Flexibility-Expected	3.78	305	1.041	.060	3.35	588	1.131	0.047
	Schedule Flexibility- Actual	3.70	305	1.100	.063	2.96	588	1.186	0.049
Pair 10	Less Disturbance From Classmates-Expected	2.85	305	1.194	.068	3.15	588	1.228	0.051
	Less Disturbance From Classmates- Actual	2.83	305	1.183	.068	2.75	588	1.263	0.052
Pair 11	Able to Cover Practical Subjects Also- Expected	2.83	305	1.234	.071	2.68	588	1.300	0.054
	Able to Cover Practical subjects Also- Actual	2.79	305	1.345	.077	2.36	588	1.245	0.051
Pair 12	Effective time management-Expected	3.38	305	1.147	.066	3.24	588	1.193	0.049
	Effective time management- Actual	3.34	305	1.192	.068	2.80	588	1.184	0.049

Table 6

Paired Samples Test - Individual Effect for Faculty

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. error Mean	Std. Error Mean 95% Confidence Lower	Upper			
Pair 1 — Convenient to Use – Expected / Convenient to Use- Actual	-0.125	1.050	0.060	-0.243	-0.006	-2.072	304	0.039
Pair 2 — Able to connect with Students - Expected / Able to Connect with Students- Actual	0.089	1.071	0.061	-0.032	0.209	1.444	304	0.005
Pair 3 — Able to Cover Syllabus Timely – Expected / Able to Cover Syllabus Timely- Actual	-0.075	0.898	0.051	-0.177	0.026	-1.466	304	0.144
Pair 4 — Enhancing Personal Learning – Expected / Enhancing Personal Learning- Actual	-0.131	0.951	0.054	-0.238	-0.024	-2.409	304	0.017
Pair 5 — Enhance Creativity – Expected / Enhance Creativity- Actual	-0.043	0.926	0.053	-0.147	0.062	-0.804	304	0.422
Pair 6 — Class Attendance Will Increase – Expected / Class Attendance Will Increase - Actual	0.210	1.193	0.068	0.075	0.344	3.072	304	0.002
Pair 7 — Introduces to Education Technology – Expected / Introduces to Education- Actual	0.013	0.899	0.052	-0.088	0.114	0.255	304	0.799
Pair 8 — Sharpened My Digital Skills – Expected / Sharpened Digital Skills- Actual	0.007	0.874	0.050	-0.092	0.105	0.131	304	0.896

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. error Mean	Std. Error Mean 95% Confidence Lower	Upper			
Pair 9	Schedule Flexibility – Expected / Schedule Flexibility- Actual	0.082	0.912	0.052	-0.021	0.185	1.569	304	0.118
Pair 10	Less Disturbance From Students – Expected / Less Disturbance From Students- Actual	0.023	1.212	0.069	-0.114	0.160	0.331	304	0.023
Pair 11	Able to Cover Practical Subjects Also – Expected / Able to Cover Practical subjects- Actual	-0.052	1.025	0.059	-0.168	0.063	-0.894	304	0.012
Pair 12	Effective Time Management - Expected / Effective Time Management- Actual	0.046	1.053	0.060	-0.073	0.165	0.761	304	0.042

Table 07

Paired Samples Test - Individual Effect for Students

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. error Mean	Std. Error Mean 95% Confidence Lower	Upper			
Pair 1	Convenient to Use – Expected / Convenient to Use- Actual	0.381	1.165	0.048	0.287	0.475	7.929	587	0.000

		Paired Differences			Std. Error Mean 95% Confidence		t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. error Mean	Lower	Upper			
Pair 2	Able to connect with Students - Expected Able to Connect with Students- Actual	0.488	1.178	0.049	0.393	0.584	10.045	587	0.000
Pair 3	Able to Cover Syllabus Timely – Expected Able to Cover Syllabus Timely- Actual	0.447	1.276	0.053	0.344	0.551	8.502	587	0.000
Pair 4	Enhancing Personal Learning – Expected Enhancing Personal Learning- Actual	0.357	1.215	0.05	0.259	0.456	7.126	587	0.000
Pair 5	Enhance Creativity – Expected Enhance Creativity- Actual	0.401	1.196	0.049	0.305	0.498	8.139	587	0.000
Pair 6	Class Attendance Will Increase – Expected Class Attendance Will Increase - Actual	0.495	1.383	0.057	0.383	0.607	8.676	587	0.000
Pair 7	Introduces to Education Technology – Expected Introduces to Education- Actual	0.308	1.029	0.042	0.224	0.391	7.255	587	0.000
Pair 8	Sharpened My Digital Skills – Expected Sharpened Digital Skills- Actual	0.323	1.03	0.042	0.24	0.407	7.608	587	0.000
Pair 9	Schedule Flexibility – Expected Schedule Flexibility- Actual	0.388	1.138	0.047	0.296	0.48	8.266	587	0.000
Pair 10	Less Disturbance From Students – Expected Less Disturbance From Students- Actual	0.405	1.221	0.05	0.306	0.504	8.036	587	0.000

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. error Mean	Std. Error Mean 95% Confidence				
					Lower	Upper			
Pair 11	Able to Cover Practical Subjects Also – Expected Able to Cover Practical subjects- Actual	0.318	1.256	0.052	0.216	0.42	6.142	587	0.000
Pair 12	Effective Time Management - Expected Effective Time Management- Actual	0.439	1.214	0.05	0.34	0.537	8.766	587	0.000

Table 08
Paired Samples Test - Total Effect

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Faculty	Expected Benefits – Actual Benefits	0.250055	1.490276	0.028073	-0.005188	0.105297	2.783	304	0.036
Students	Expected Benefits – Actual Benefits	0.3872827	0.8126641	0.0335137	0.3214613	0.4531041	11.556	587	0.000

income. They were dependent on the family income only. During the pandemic time, even the university and colleges have not launched any financial support for students to develop the infrastructure for virtual classrooms.

Table no. 6. is showing individual statistics of the teacher's expected benefits and actual benefits differences for all 12 pairs. The difference between expected benefits and actual benefits is significant (<0.05) for 7 pairs out of 12 pairs, and the difference is not significant for 5 pairs.

From table no. 07, we can conclude that the student's expected benefits and actual benefits pair differences are significant (<0.05) for all 12 pairs.

In this study, the paired sample t-test has been conducted in SPSS software to know whether there is any significant difference between expected benefit and actual benefits from the adoption of the virtual classroom during the COVID-19 pandemic to interact with students. The results of the paired-sample t-test have shown in tables no. 6, 7, and 8.

The mean difference between expected benefits from the virtual classroom and actual benefits from the classroom is positive for faculty members. That indicates the overall mean of expected benefits is higher than the overall mean of actual benefits, and that difference value is 0.250055, with a Sig. (2-tailed) value of 0.036 which is less than 0.05. That indicates the statistically significant difference between means of actual benefits and expected benefits. (Table no. 8)

So here we reject the null hypothesis "H_O1: There are not any statistically significant differences between expected benefits and actual benefits perceived from virtual classrooms by faculty members in higher education institutions", that is the true mean difference is equal to zero. We have sufficient evidence to reject the null hypothesis and accept the alternative hypothesis "H_A1: There are statistically significant differences between expected benefits and actual benefits perceived from virtual classrooms by faculty members in higher education institutions". From the above results, we can conclude that there is a significant difference between the means of expected benefits and actual benefits.

The common reason for this can be less attendance among students, the casual attitude among students, the possibility of proxy attendance, no strict monitoring of students in a virtual classroom, network connectivity, and lack of a professional environment at home. Network connectivity was the major challenge faced by the faculty members (mean value of 3.68) followed by 3.17 mean value for lack of professional environment at home, 3.03 for lack of teaching material at home, 2.92 for lack of personal computer/laptop (Singh and Meena 2022).

To know exactly out of 12 pairs of individuals which pair has a significant difference, further we have conducted t statistics for individual pairs. As per the output results shown in table no. 11, out of 12 pairs of benefits, seven pairs have a statistically significant difference in the mean score of expected benefits and actual benefits. The seven pairs of expected benefits are as follows: convenient to use, connect with students, increase in class strength, effective time management, less disturbance from the student, ability to cover practical subjects, and effective time management. We do not find any significant differences in the mean score of expected benefits and actual benefits for the remaining five pairs.

The mean difference between the expected benefit of attending the virtual classroom and actual benefits from the virtual classroom is positive for students. That indicates the overall mean of expected benefit is higher than the overall mean of actual benefits, and that difference value is 0.3872827, with a Sig. (2-tailed) value of 0.000 which is less than 0.05. That indicates the statistically significant difference between means of actual benefits and expected benefits. (Table no. 8)

So here we reject the null hypothesis "H_O2: There are not any statistically significant differences between expected benefits and actual benefits perceived from virtual classrooms by students in higher education institutions.", that is the true mean difference is equal to zero. We have sufficient evidence to reject the null hypothesis and accept the alternative hypothesis "H_A2: There are statistically significant differences between expected benefits and actual benefits perceived from virtual classrooms by students in higher education institutions." From the above results, we can conclude that there is a significant difference between the means of expected benefits and actual benefits.

The common reason for this may be less attendance among students, the casual attitude among students, the possibility of proxy attendance, no strict monitoring of students in a virtual classroom, network connectivity, and lack of a professional environment at home. Lack of professional environment at home (mean value of 3.59) was the major challenge faced by the students followed by 3.57 for lack of teaching material at home, 3.35 for network connectivity, and 3.31 for lack of personal computer/laptop (Singh and Meena 2022).

To know exactly out of 12 pairs individually which pair has a significant difference, further, we have conducted t statistics for individual pairs. As per the output results shown in table 8, out of 12 pairs of benefits, all 12 pairs have a statistically significant difference in the mean score of expected benefits and actual benefits.

VII. Conclusions, discussion, and recommendations

The difference between the mean value of expected benefits and actual benefits is found to be statistically significant in the case of faculty members as well as students. For the faculty members, the mean difference between expected benefits from the virtual classroom and actual benefits from the classroom is positive. That indicates the overall mean of expected benefits is higher than the overall mean of actual benefits, and that difference value is 0.250055, with a Sig. (2-tailed) value of 0.036 which is less than 0.05. That indicates the statistically significant difference between means of actual benefits and expected benefits. The mean difference between the expected benefit of attending the virtual classroom and actual benefits from the virtual classroom is positive for students. That indicates the overall mean of expected benefit is higher than the overall mean of actual benefits, and that difference value is 0.3872827, with a Sig. (2-tailed) value of 0.000 which is less than 0.05. That indicates the statistically significant difference between means of actual benefits and expected benefits.

Virtual classroom teaching and learning can be fruitful for students as well as teachers to complete their syllabus and assessment, provide moral support, and reduce stress levels during the COVID-19 pandemic. it would also enable the interaction between the teachers and learners. But for effective learning and teaching, infrastructure and technological support are required. Online teaching and learning could be advantageous as through which teachers can motivate students, complete syllabus, provide accessibility to learning and teaching from any time and any place, etc. Stated that Online learning is more flexible in access as it can provide content and instruction at any time, from any place. However, technological and infrastructure support is required for the successful implementation of online teaching and learning through virtual classrooms (Castro and Tumibay 2019). Through virtual classroom teaching students can interaction with the teacher which could be helpful to provide moral support and reduce the stress level of students during the COVID-19 Pandemic. Online teaching is effective during this COVID-19 pandemic time for preventing the students from going away from home. Online teaching can have challenges such as poor internet connectivity, non-availability of appropriate electronic devices, lack of a teaching environment at home, and less ICT knowledge among students and teachers can result in less engagement of students and teachers in the teaching and learning process (Yulia 2020).

The mean value of the expected benefit is higher than the mean value of actual benefits for 11 pairs and 08 pairs in the case of teachers and students respectively. Technical barriers are the reasons for not being able to attend

the expected benefits from virtual classrooms in full capacity by students as well as by faculty members. poor digital skills of teachers and students, lack of electricity facilities, less availability and accessibility of internet, connection issues, inadequate facilities, training, funding, and unacceptability of technology, etc. were the barriers to online education at the time of closure of colleges due to COVID-19 pandemic (Onyema et al. 2020). Students can also have a casual attitude, less attendance, feeling of isolation and less interaction can lead to mental distress, spending more time in front of a computer could be hazardous for health too (Surkhali and Garbuja 2020).

The reasons behind this gap in perceived benefits are network problems, lack of internet facilities, consistent connectivity issues, availability of infrastructure, and lack of classroom environment at home. The gap in the mean value of expected benefits and actual benefits is higher in the case of students than the faculty members. Because teachers are having a monthly income, they can afford the expenditure for the development of online classroom infrastructure, laptops, internet connectivity, etc., and students are not supported by any personal income. During the pandemic time, even the university and colleges have not launched any financial support for students to develop the infrastructure for virtual classrooms.

Higher Education Institutes (HEIs) faculty members, as well as students, were not able to perceive actual benefits in full in comparison to expected benefits due to the presence of challenges in the virtual classroom as moderators. Network connectivity was the major challenge faced by the faculty members with a mean value of 3.68 followed by a 3.17 mean value for lack of professional environment at home, 3.03 for lack of teaching material at home, and 2.92 for lack of personal computer/laptop. Lack of professional environment at home with a mean value of 3.59 was the major challenge faced by the students followed by 3.57 for lack of teaching material at home, 3.35 for network connectivity, and 3.31 for lack of personal computer/laptop. Virtual classrooms have challenges such as poor internet connectivity, non-availability of appropriate electronic devices, lack of a teaching environment at home, and less ICT knowledge among students and teachers can result in less engagement of students and teachers in the teaching and learning process. The findings of this study will help Higher Education Institutes (HEIs), the Ministry of Education, the University Grant Commission, and the teacher in effectively implementing the virtual classrooms during this pandemic. This study will help Higher Education Institutes to reduce the challenges of the virtual classroom. Students' participation was less due to the lack of in-person conversations with teachers which could result in mental stress for students and teachers

(Surkhali and Garbuja 2020). They also reported that an accessible and affordable internet connection was the main problem faced by students and teachers and less participation, interaction, and technical disturbance led to less engagement and disturbance in online classes. Teachers found technical, logistical, and pedagogical problems during online classes because of an unprepared transition from face-to-face teaching to online teaching. More efforts were required from the teachers' side to ensure that students are studying the correct study material and providing information about the assignment. Students opted for online education because it offered greater flexibility but required more self-discipline by students (Daymont 2011). Students' perceptions of vocational studies in online mode stated that as vocational studies require not only knowledge but skills as well, online learning did not improve student's productivity, and also the experience was not up to expectation (Syauqi et al. 2020).

The common reasons for the difference in expected benefits and actual benefits of the virtual classroom may be less attendance among students, the casual attitude among students, the possibility of proxy attendance, no strict monitoring of students in a virtual classroom, network connectivity, and lack of a professional environment at home. Network connectivity was the major challenge faced by the faculty members (mean value of 3.68) followed by 3.17 mean value for lack of professional environment at home, 3.03 for lack of teaching material at home, and 2.92 for lack of personal computer/laptop. Lack of professional environment at home (mean value of 3.59) was the major challenge faced by the students followed by 3.57 for lack of teaching material at home, 3.35 for network connectivity, and 3.31 for lack of personal computer/laptop. Virtual classrooms have challenges such as poor internet connectivity, non-availability of appropriate electronic devices, lack of a teaching environment at home, and less information and communication technology (ICT) knowledge among students and teachers. It implied less engagement of students and teachers in the teaching and learning process (Singh and Meena 2022).

The higher education authorities, colleges/institutes/universities need to fix the above issues to enhance the teaching-learning process. The higher education authorities, institutes/colleges/universities must work together to resolve the issues and challenges of virtual classrooms to improve their effectiveness of the virtual classroom. Higher Education Institutes (HEIs) may provide technical support, and training to the faculty members as well as students for a better experience in the virtual classroom. Students who are lacking technical infrastructures like computers/laptops, and internet connectivity. Higher education institutes (HEIs) may provide financial and

technical support to students, so the students can use the infrastructure for learning. Higher education institutes (HEIs) can also provide digital libraries, and journals access to the students at home, so they can improve their learning in the lockdown.

Whenever the higher education authorities are introducing new technology in ICT, the student and faculty members must be provided with practical training for the better implementation of that technology. Because as per the cycle of the technology adoption life cycle there are conservatives/late majority and ladders/ Skeptics (Moore 1991). The delayed adoption of technology is going to affect the consistent implementation of the technology.

VIII. Limitations further scope of the study

This study has been conducted taking teachers and students of higher education institutes (HEIs) as the target population. The semi-urban and rural higher education institutes (HEIs) may have faced a higher impact of COVID-19 than urban Higher Education Institutes (HEIs) due to infrastructure limitations. This will provide a more in-depth analysis of the impact of COVID-19 on the higher education teaching-learning process. The higher education institutes (HEIs) having good IT infrastructure have faced less impact of COVID-19 on the teaching-learning process. Possible reasons for high expectations are not fulfilled either for teachers or students, answers could be analyzed further. Further studies can also focus on higher education institutes (HEIs) operating in rural and semi-urban areas. Further studies can also include school-level students and teachers. A comparative study can be presented in the context of comparing the situation in another developing country.

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Teaching practicum for primary teacher education students during the COVID-19 pandemic

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Abstract: The paper presents results of the research on pre-service student teachers' assessment of the usefulness of their distance teaching practicum during COVID-19 for their professional development. The sample included 238 student teachers in the 3rd and 4th years of the bachelor's degree programme as well as those in the master's degree programme at the Faculty of Education, University of Ljubljana. The students answered the online questionnaire after completing their teaching practicum in spring 2020. The results show that the majority of the students spent more than half of their time during the teaching practicum preparing various teaching materials for the pupils. About a fifth of the students provided individual help to pupils, while only a small share of them conducted their lessons via videoconferencing. The 3rd year students rated the usefulness of preparing teaching materials and the overall usefulness of the distance teaching practicum statistically significantly lower than their senior colleagues. Whether the teaching practicum is implemented in an online environment or "live", it is important to insist that student teachers assist their pupils in all phases of the teaching process and adapt it to their individual characteristics and needs to the greatest extent possible.

Keywords: pre-service teacher education; student teachers; distance teaching practicum; COVID-19; professional development.

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I. Introduction

Adapting the mode of work to learning in the online environment due to COVID-19 occurred quite rapidly in spring 2020. In Slovenia, future primary school classroom teachers are educated according to the Bologna study system, the so-called 4 + 1 year model. The Faculty of Education of the University of Ljubljana includes practical pedagogical training in all four years of the bachelor's degree and one year of the master's degree programme. During their active inclusion in an authentic educational environment, pre-service student teachers (hereinafter: students) have the opportunity to learn more about the profession and assess their professional aspirations, their theoretical knowledge and its connection with practice, and their own qualifications, while gaining practical experience and various skills as they encounter the challenges of teaching. The active involvement of students in the teaching practice and the scope of their work increase with each year of their studies. While fully realising the utmost importance of direct contact with the pupils in the classroom, we had to find an alternative way of implementing the teaching practicum to allow students to continue and complete their studies despite the pandemic. This paper presents a study which provides insights into experiences that the 3rd and 4th year students of the first level and the 1st year students of the second level of the Primary Teacher Education study programme acquired within the distance teaching practicum during the COVID-19 pandemic in April 2020.

Throughout the world, many studies on the education and the teaching practicum of future teachers during COVID-19 have been conducted and experiences relating to how students were supported to develop their professional learning have been shared (Assuncao Flores and Gago 2020; Ferdig et al. 2020; Kidd and Murray 2020). Some studies stress the importance of collaborative professional learning and development both in times of crisis and calm (Alexandrou 2020), while others focus on the actual implementation of distance education. In Germany and some other European countries, such as France or Italy, many schools lag behind with respect to the expected information and communication technologies (ICT) transformation progress (König et al. 2020); there were no such problems in Slovenia (Rupnik Vec et al. 2020). An extensive national survey on distance education during the COVID-19 epidemic was carried out among teachers, pupils and headmasters in Slovenia in May and June 2020 (Rupnik Vec et al. 2020). The Slovenian schools reported that four weeks after the epidemic was declared, distance learning participation in primary schools was at 99.5% and just slightly lower in upper secondary education schools (Cedefop 2020). During their teaching practicum in 2020, all students of the Faculty of Education of the University

of Ljubljana had the appropriate ICT equipment to participate in online videoconferencing and were involved in the telecommunication network for teleworking. Primary schools responded flexibly to distance teaching: in some cases, they ensured daily lessons via videoconferencing, in others, students met occasionally in online groups, but in some cases, no videoconferencing took place and lessons were held only by providing online teaching materials to pupils. In these diverse conditions, students also had to adapt when implementing their distance teaching practicum at schools.

II. Emphases of the teaching practicum at the Faculty of Education in Ljubljana

The emphases of the teaching practicum in Slovenia are consistent with the European trends. The practicum in school "is considered an essential and integral part of teacher education in several European countries, and is planned with incremental degrees of difficulty throughout the programme, under the joint supervision and assessment of university and schoolteacher educators; the final year often entails student teachers experiencing the full range of teaching responsibilities" (Caena 2014, 12). Across Europe, there is a trend towards "remodelling Initial Teacher Education to ensure that student teachers learn in a school setting, so that they can get into real classrooms early in the programme, spend more time there, and receive stronger support in the process" (EC 2015, 4).

One of the earliest researchers in the field of teacher professional development, Fuller, emphasised the importance of the student teaching practicum and placed it in the initial phase of teacher professional development (Conway and Clark 2003). The more than 20-year-long trend of emphasising the significance of teacher education becoming more defined in the practicum (Allen 2009; Evelein et al. 2008; Korthagen et al. 2006; Zeichner 2010) also raises questions among experts as to what the practicum should be like in order to enable the development of an effective teacher with sufficient professional knowledge, reflective skills, and practical capabilities for teaching (Jenset et al. 2018; McDonald et al. 2014; Toom et al. 2019). The results of an American study (Ronfeldt 2014) showed that students who are included in a high-quality teaching practicum, closely related to what they are learning in the programme, feel better qualified in their independent work. Greater success in coping with demanding teaching work is also linked to perseverance in the profession and a lower teacher dropout rate and their leaving the profession. Goodnough et al. (2016) pointed out the importance of integrating and connecting theory and practice to most effectively support

student learning and development. They present a teaching practicum at a Canadian faculty of education where they use a variety of student-centred and active pedagogic approaches with the embedded practicum model that allows for gradual classroom participation and ensures explicit connecting between university courses and practicum experiences.

Some authors (Antoniou and Kyriakides 2013; Toom et al. 2019) emphasise the importance of teachers knowing how to use their knowledge and effectively handle complex and unpredictable situations in teaching before the occurrence of the COVID-19 pandemic. De Corte (2010) explains this as the ability to adapt, which is the goal of lifelong learning and teaching. It develops and upgrades routine expertise and represents an ability to use, in various situations, the acquired and meaningful knowledge and the developed skills in a flexible and creative way. Since the adaptation of teaching to the individual needs and characteristics of pupils represents the most complex teaching competency and can be fully developed only in the latest stages of teacher professional development (Van der Lans et al. 2017), it is even more important for students to plan, implement and reflect on teaching adaptation during their studies. In Finland (Darling-Hammond 2017), teacher education thus places special emphasis on learning how to teach pupils who struggle to learn. This is justified by the assumption that a teacher who understands and can respond to the individual needs of such pupils will be able to successfully teach all pupils. Special attention is paid to developing students' pedagogical thinking, exploring the process of the teacher's teaching and the pupil's learning, which also applies to exceptional circumstances during the COVID-19 pandemic. This is not possible without reflective thinking about their attitudes, conceptions, behaviours and their professional roles (Jay and Johnson 2002; Jenset et al. 2018; Korthagen and Vasalos 2005).

In recent decades, there has been frequent talk of reflective teachers, reflective practices, and reflective teaching. The American philosopher Dewey (Zeichner and Liston 1996) laid the foundation for reflection in education already in the 1930s by distinguishing between the routine and the reflective behaviour. This is important for teaching because the teacher's behaviour should be reflective based on the theory and experience they have. Later, Schön (1983) provided a more detailed definition of reflection on practice as a key element in the work of professionals, providing a clearer understanding of the teacher's reflection on their own practice, which leads them to a better understanding of what is happening in the classroom. Schön (1983) highlights reflection time as an important goal of reflection on the teacher's practice.

Today, the Faculty of Education in Ljubljana still gives great importance to reflection throughout the study programme and especially through the

whole teaching practicum process. Reflection is also one of the most important learning habits students can acquire. The reflection process should be deliberate, purposeful, and planned. Particularly important is the in-depth reflection of triggering incidents in the teaching practicum (Jay and Johnson 2002; Korthagen 2004; Marcos et al. 2011; Toom et al. 2019), whereby the more effective reflection is the one that is systematic, guided and narrowly focused on an area or a problem (Antoniou et al. 2011; Marzano et al. 2011; Toom et al. 2019). Finally, the way students and teachers reflect on the teaching practicum is effective when we understand its importance, not when it is done just because it is necessary (McIntosh 2010). Therefore, the reflection on the teaching practicum, which has already become a familiar practice, needs to be critically analysed several times to determine if it still serves its purpose and has not become a mere routine task.

The diverse ways of working tested by students during their studies provide them with a variety of experiences and expand their knowledge, capabilities and adaptability. In all their activities, teacher mentors should encourage and support them with quality feedback and by prompting them to reflect on their own work.

In the study of six teacher education programmes in Finland, Norway, and California, Jensen et al. (2018, 187) pointed out eight dimensions of good coursework based on practice: "plan for teaching and the teacher role(s); practice or rehearse teacher role(s); analyse pupils' learning; include teaching materials, artefacts, and resources; talk about field placement/ student teaching experiences; take pupils' perspective; see models of teaching and find a connection to the national or state curriculum." Under normal conditions, the teaching practicum would contain all elements of the above-mentioned dimensions. When researching an adapted (distant teaching) practicum, we highlighted only those that we believed could be implemented in collaboration with mentors at a distance. We were interested in the extent to which students had the opportunity to gain as many different experiences as possible by teaching different subjects, implementing different types of pedagogical work, and, in particular, creating instructional materials and analysing pupils' work and students' own work.

III. Adaptation of teaching practicum due to the COVID-19 pandemic

Under normal circumstances, the 3rd year students of the bachelor's degree programme Primary Teacher Education would carry out a three-week teaching practicum at primary schools in groups of three, with each of them teaching one third of the teaching programme (1–2 lessons a day). Students in

the 4th year of the bachelor's degree programme would spend all three weeks of the practicum in the same classroom individually, teaching all the lessons. Students of the master's degree programme could choose to perform their three-week practicum as teaching in a classroom or as pedagogical work with a group or an individual primary school pupil. All students would be under the guidance of primary school teacher mentors during the practicum.

When schools and faculties closed on 16th March 2020, the established practices changed quickly and educators showed 'pedagogical agility'. At the faculty, we looked for options to enable students to gain pedagogical experiences even without direct work in an authentic school environment. We all agreed that this particular situation could provide opportunities for acquiring new knowledge and experiences in the field of new learning approaches in distance learning and in the preparation of teaching materials for such study processes. Since this kind of pedagogical experience can only be gained in cooperation with primary school teachers involved in the practice, they were invited to participate. We proposed that students help find or prepare materials, activities or learning content for distance teaching, provide individual distance support to pupils and cooperate in all areas where teachers need them. We were aware that such cooperation should help teachers rather than be an additional burden. Therefore, each teacher and student agreed on which areas and how the student's help would be most meaningful and necessary. Some lead members of the primary school staff or individual teachers agreed to cooperate. Students also made direct contact with teachers and offered their assistance in distance teaching. The teaching practicum to help teachers in distance teaching lasted uninterruptedly for ten working days. In many cases, students helped teachers longer and even when pupils returned to schools.

In a normal teaching practicum, students would prepare a portfolio containing lesson preparations, analyses and evaluation of their own work. In the modified implementation of the teaching practicum, students who provided at least twenty hours of assistance in distance teaching kept records of the content and scope of their work, and evaluated their pedagogical experience afterwards.

Problems with the teaching practicum were also encountered elsewhere in the world and were solved in different ways. For example, the Canadian province of Ontario (Van Nuland et al. 2020) closed all educational institutions when COVID-19 emerged. Students had to stop their teaching practicum at primary schools and thus could not carry out the entire scope of practice envisaged for completing their studies. Similar to Slovenia, various learning and skill developing opportunities, which in the past did not need to

be applied, opened up to students who, even during this time, wanted to learn from teachers in a teaching practicum setting (Van Nuland et al. 2020, 7):

- helping teachers navigate learning with technology that they may not have used before;
- communicating with, encouraging, and providing support to students virtually;
- developing relationships with students in a virtual environment;
- learning about new online digital platforms.

The current state of the education segment and new challenges that arose during the COVID-19 pandemic were also considered by La Velle et al. (2020), who stressed the importance of an appropriate balance and connection of theory and practical experiences for students. They described the experiences of four faculties of teacher education in England and pointed out that the loss of a third of the time intended for the practical training of undergraduates will have consequences in their continued work. The authors explained that during the period when they were unable to practice in schools, students devoted more time to studying and reflection, which however will not compensate for the lack of practical experience. The very lack of experiences in a classroom will put additional pressure on the support and assistance from colleagues in the school environment where they will be employed. In England, the scope of practical pedagogical work is significantly wider than in Slovenia and can be compared to the period when our graduates work at schools as teachers before they take their teacher certification exam, usually during the first year of employment.

IV. Research

Until the emergence of the COVID-19 pandemic, students had no experience in the field of distance teaching; so, during their regular studies, educators did not offer them a set of methods for distance teaching. Shortly after the closure of the schools in March 2020, educators were looking for solutions on how to make the teaching practicum period as beneficial as possible for all the actors involved and how the technology-based environments could provide students with a teaching practicum experience. We did not know if students would adapt appropriately and how they would cope with the role of a teacher in distance teaching.

Our study was carried out in order to gain an insight into how the adapted practicum would be conducted and obtain a more detailed view of the content of the distance teaching practicum. Before COVID-19, Lawson et al. (2015)

realised that many research studies on the teaching practicum with pre-service teachers as the main participants comprised relatively small-scale studies since they were mainly focused on the quality and the findings derived from a relatively small sample. This suggests that more large-scale studies are needed in the field in order to provide greater insight into the teaching practicum. This study is a large-scale study and uses both quantitative and qualitative approaches.

The COVID-19 pandemic has raised awareness about the need to future-proof through resilient educational responses and sustainable educational offerings. The reactions of teachers and students play a key role in ascertaining what measures need to be in place and what adjustments could facilitate the guarantee of continuity and quality in the future (Greere 2022). With insight into selected details of the teaching practicum from the student's point of view, this study should contribute to the progress in this field of higher education. In this study, we were interested not only in the individual opinions of the students but also in the differences between students of different academic years of study since their experience with "independent" teaching in the previous academic year, i.e., before COVID-19, was different.

IV.1. *Research questions*

In the given situation, when only distant teaching was possible, we tried to find out the key characteristics of the teaching practicum during the COVID-19 pandemic. With regard to Jenset et al. (2018, 187) and the previously mentioned eight dimensions of good coursework based on practice, we wanted to pay special attention to the following dimensions: students practicing the teacher roles; including teaching materials, artefacts and resources; observing models of teaching; talking about students teaching experiences and analysing pupils' learning.

We wanted all the students to be able to successfully overcome technical problems with abundant online teaching experience and to progress in a teaching practicum in a way that was feasible. The general scope of this study was to get insight into selected segments of the teaching practicum during COVID-19 from the students' point of view and to find out what improvements would be needed in case of a potential repetition of the distance teaching practicum. It could help educational stakeholders evaluate the effectiveness of the distance teaching practicum.

In collecting students' opinions of their pedagogical work during the distance teaching practicum, we were interested in:

- how often students helped teachers in different primary school subjects during the distance teaching practicum;

- the share of all their work within the practicum taken up by particular types of work (the preparation of teaching materials, individual support to pupils, etc.);
- how much of the teaching material was prepared by students themselves and how much material they found online and then used in their work;
- how and how many times during the practicum they analysed pupils' work and their own work;
- how students assess the usefulness of each type of work for their professional development and the overall usefulness of experiences, gained from the distance teaching practicum;
- what differences occurred among students of different years of study.

IV.2. *Participants*

The survey included 238 students of the Primary Teacher Education at the Faculty of Education at the University of Ljubljana. This was the number of all the students who participated in the 3rd and 4th year of bachelor's and master's degree in this programme in the 2019/20 study year. Among them, 79 were the 3rd year students (33.2% of 238 students), 93 were the 4th year students (39.1% of 238 students), and 66 were the master's degree students (27.7% of 238 students).

IV.3. *Research method and structure of the survey instrument*

The study was based on a descriptive causal-non-experimental method of pedagogical research. A survey questionnaire designed for the purposes of this research was used to collect data on the types and quantity of work carried out by students, their assessment of the usefulness of the work performed and the usefulness of all experiences gained.

In the Primary Teacher Education Programme, we have been regularly monitoring the opinions of students after the teaching practicum for many years using a designed tool (and annually revised). We use it for the purpose of continuous evaluation and improvement of the study process. During the COVID-19 period, we wanted to continue this monitoring, but it was necessary to adapt the questionnaire to the current situation.

The questionnaire was built on the basis of author-composed closed-ended questions with one or more answers, combined type questions, 4-point descriptive and numerical grading scales, and an open-ended question which were used for data collection. The estimated Cronbach's alpha was 0.732 (for 31 items), which corresponds to acceptable reliability (Pallant 2007).

We used an online survey questionnaire which was a part of students' regular evaluation report after completing their teaching practicum. In advance, the participants were informed of the general purpose of the study in terms of getting the feedback of this year's teaching practicum and in terms of continuous improvement of the further pedagogical process. As part of the regular evaluation, the students were informed (each year of studies as a separate group) about the results of the research by giving them oral feedback and presenting graphs. Individual students were able to view and compare their teaching practicum with that of their peers. With students of the 4th year of the bachelor's and the master's degree programmes, it was possible to compare the implementation of this "COVID-19 teaching practicum" with the previous year of the "pre-COVID-19 teaching practicum". With the 3rd year students, this was not possible since these students had the teaching practicum in the form of direct work with pupils for the first time and the comparison with the previous year was not possible. In the research, we followed the ethical principles of pedagogical research. The anonymity and confidentiality of the data were ensured. The data were collected after the completion of the distance teaching practicum in June 2020. The students were informed also of the use of data in the research purpose.

IV.4. *Statistical procedures*

The data were statistically processed in accordance with the survey purpose and goals using the SPSS statistical programme. The data collected were processed at the level of descriptive and inferential statistics according to the nature and role of the variables. The following procedures were used: frequency distribution (f, f%) of attributional variables, the χ^2-test, the Kullback 2Î-test (where theoretical frequencies conditions were not met), the paired t-test, the one-way analysis of ANOVA variance, the Levene's variance homogeneity test, and the Tukey's post hoc test if the condition of variance homogeneity was fulfilled. If the condition of variance homogeneity was not fulfilled, we used Welch's statistical tests and the Tamhane's post hoc test.

V. Results with discussion

V.1. *Students providing their help to teachers in different primary school subjects*

In the beginning, we wanted to know how often students helped teachers teach particular subjects in the first five grades of primary school.
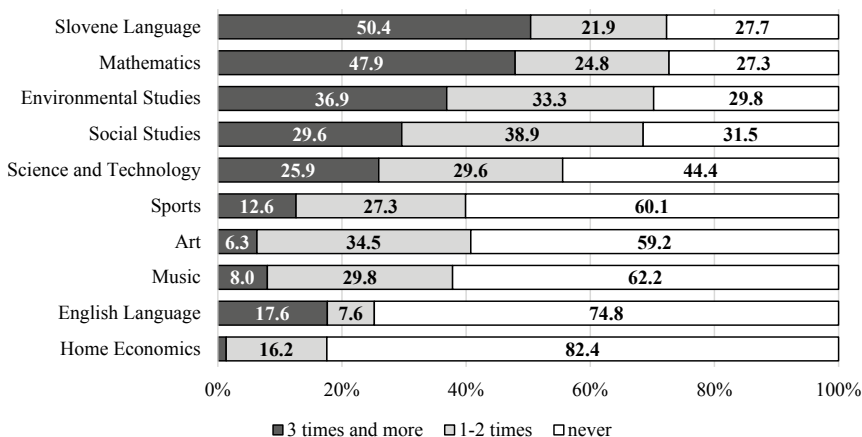
Figure 1

Frequency of students' work for specific primary school subjects

The data in Figure 1 show that about half of the students (50.4%) helped in the Slovene Language lessons, a little less than half of the students (47.9%) in Mathematics and more than a third of the students (36.9%) in Environmental Studies at least three times. The data show that teachers more often employed students' assistance for subjects which had a higher share of lessons in the curriculum and were more often on the schedule. This is consistent with the fact that Language and Mathematics lessons are also priorities for quality teaching in most other countries, while Environmental Studies lags behind these two subjects (Jenset et al. 2018; OECD 2020). More than a half of the students never helped in Art, Music or Sports lessons. A quarter of the students (25.2%) helped with English lessons at least once. Less than a fifth (17.6%) of the students who helped with distance teaching of fifth-graders also helped in Home Economics lessons. We were interested in the data on students' assistance in teaching different primary school subjects mainly because one of the aims of the teaching practicum in the higher years of study is to gradually gain practical experience of the learning process as a whole and not only in some primary school subjects. This also enables gradual enculturation into the teaching profession, which is important for promoting the theory-practice connections (Goodnough et al. 2016).

V.2. *Types of students' work*

As the faculty provided students and teachers no specific detailed instructions on cooperation in the distance practicum, students helped in

different ways. For each type of work, they were asked to assess the approximate share of the distance teaching practicum their work covered (100% in total). They chose from the following types of work: (1) preparation of teaching materials based on each student's own ideas, (2) preparation of teaching materials according to the teacher's instructions, (3) individual pupil(s) support, (4) other student work, (5) communication with pupils via video conference, (6) teaching via video conference. Figure 2 shows the shares of various types of work performed by students.
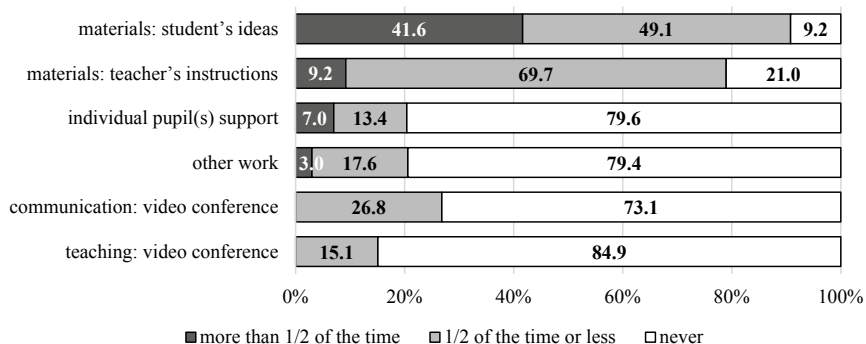
Figure 2

Shares of time spent on different types of work performed
by students during distance teaching practicum

78.9% of the students spent their time preparing teaching materials according to the teacher's instructions and 90.7% of the students prepared teaching materials based on their own ideas, so, they were not limited in their creative work. The study of six teacher education programmes in Finland, Norway, and California (Jenset et al. 2018) also shows that students in these countries have extensive opportunities to use teaching materials during their teaching practicum.

During the distance practicum, almost three quarters of the students (73.1%) never communicated with pupils via an online conference, while 84.9% of students never held lessons via an online conference. A large share of the teachers (79.6%) did not choose to give students the opportunity to provide individualised support. This was probably because they felt that students did not know individual pupils well enough. If mentors provided students with more such opportunities, they would have had better insight into pupil learning. Although teachers had the opportunity to include students

in the teaching process via a video conference, only a few did so. Thus, students also did not have the opportunity to interact directly with pupils. Other types of work, including videoconferencing with teachers, checking and correcting pupils' assignments and helping teachers to use ICT, were carried out by about a fifth (20.6%) of the students at least once.

We were interested in whether the assessed shares of the various types of work done by students when helping in distance teaching show statistically significant differences between the 3rd and the 4th year students and the master's degree students.

Table 1

Share of time spent on preparation of teaching materials based on student's own ideas and individual pupil(s) support by year of study (statistics)

The share of time used	Year of study									
	$\bar{x}$			Levene's test				ANOVA/		Post hoc test
	3rd year	4th year	Master's degree	F	g_1	g_2	p	F	p	p
Preparation of teaching materials based on student's ideas	38.95%	53.88%	47.20%	0.329	2	235	0.720	5.539	0.004	Tukey's post hoc test 3rd year - 4th year: 0.003
Individual pupil(s) support	29.59%	14.80%	16.74%	14.835	2	235	0.000	/	/	Tamhane's post hoc test 3rd year - 4th year: 0.033

We found out that statistically significant differences appear in only two types of work between the 3rd and the 4th year students. The results in Table 1 show that there are statistically significant differences between the 3rd and the 4th year students in their assessed shares of different types of work. Compared to the 3rd year students, the 4th year students spent more time on the independent preparation of materials (p = 0.003), while the 3rd year students offered individual assistance to one or more pupils in a higher share (p = 0.033). We assume that this difference was due to the fact that the 3rd year mentors communicated with their students one week later than the 4th year mentors. In just one week, several mentors saw an increased need to provide individualised support to pupils.

The results reflect the primary goal of this practicum: to support and assist teachers in distance teaching. Teachers themselves decided on the types of

support they needed. We see that students more often helped prepare teaching materials, while less often teachers made it possible for them to participate in all stages of the learning process and directly in classes via a video link. If we want the distance teaching practicum to remain of high quality, we must ensure that students are involved in all dimensions of the teaching practicum.

V.3. *Preparing teaching materials for pupils*

As students were most engaged in preparing teaching materials, we wanted to know how much of the material was found online and how much they prepared by themselves.

Table 2

Use of teaching materials: searched online
and prepared independently – paired t-test

Use of teaching materials	x̄	Paired t-test		
		t	g	P
Searched online	2.33	-6.131	237	0.000
Prepared independently	3.27			

With the paired t-test (Table 2), it was established that students statistically significantly prepared more materials themselves than they found online (p = 0.000). We can conclude that students prepared materials for specific groups of pupils or individuals, taking into account the specificities of classes and adjustments which were brought to their attention by teachers. It is very important to emphasise the relevance of the teacher's response to the pupils' needs, guided by the mindset and general principles of differentiation (Tomlinson and Imbeau 2010). Students should have the opportunity to try to adapt their teaching to different pupils. However, it should be noted that adapting instructions to pupil's individual needs and characteristics is the most complex teaching competence (Van der Lans et al. 2017). Van de Grift et al. (2014) found that the average student teacher struggles to adapt their instructions to address pupils' differences and learning needs.

Furthermore, we wanted to know how students assessed the usefulness of each type of pedagogical work for their professional development. The usefulness was assessed using a four-point scale ranging from extremely useful to useless work. They assessed only the types of work they had done in the distance teaching practicum.
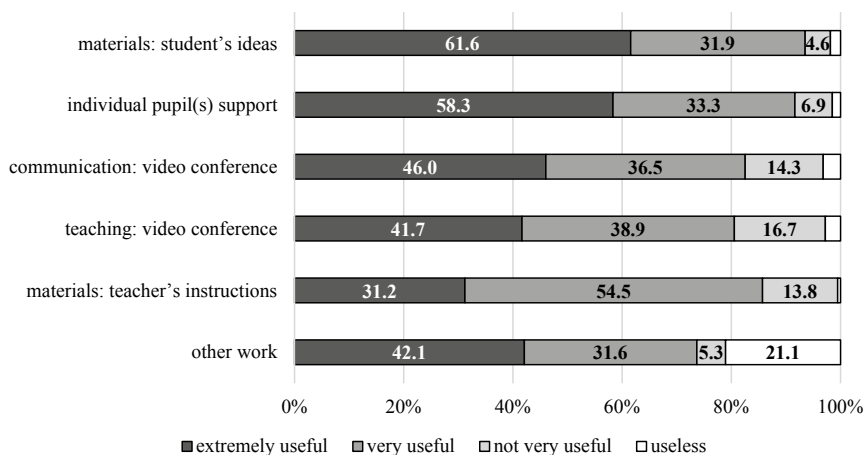
Figure 3

Assessment of usefulness of different types
of work in distance teaching practicum

As an extremely useful type of work, predominantly, most students determined independent preparation of teaching materials based on their own ideas (61.6%) and individual assistance to one or more pupils (58.3%). Only 20.4% of all the students (Figure 2) provided individual support to one or more pupils. 91.6% of these students (Figure 3) rated this work as extremely or very useful. As adapting instructions to individual pupil needs and characteristics is the most complex teaching competence (Van der Lans et al. 2017), this data is certainly important. In the future, special attention should be paid to the analysis of the quality of individual pupil support. Communication with pupils at the online conference was rated an extremely useful type of work by 46.0% of the students, and lessons through online conferencing by 41.7% of the students. As most useless or not very useful, the students rated the preparation of teaching materials according to the teacher's instructions (14.3%) and other work (26.4%). Students probably want to be creative, innovative and as independent as possible in their pedagogical work. They want to experiment with their original, non-traditional ideas.

Further analysis showed (Table 3) that a statistically significant difference in the assessment of the usefulness of teaching materials prepared on the basis of their own ideas (p = 0.002) was present only between the 3rd and the 4th year students. The usefulness of this type of work was rated statistically significantly lower by the 3rd year students than by the 4th year students.

Table 3

Assessment of usefulness of preparation of teaching
materials based on student's own ideas

Assessment of the usefulness	Year of study									
	x̄			Levene's test				ANOVA		Tamhane's post hoc test
	3rd year	4th year	Master's degree	F	g₁	g₂	p	F	p	P
Preparation of teaching materials based on student's ideas	3.30	3.69	3.36	6.799	2	213	0.001	/	/	3rd year – 4th year: 0.002

We see reasons for the difference in the assessed usefulness of the independent preparation of materials in the ability to use the acquired knowledge in an authentic pedagogical environment. Darling-Hammond explicate that many teacher educators have argued that "novices who have experience in classrooms are more prepared to make sense of the ideas that are addressed in their academic work and that student teachers see and understand both theory and practice differently if they are taking coursework concurrently with fieldwork" (Darling-Hammond 2014, 551). In our case, the 4th year students had already gained experiences with independent teaching during the 3rd year teaching practicum, with presentations and attendance at special didactic subjects in the 4th year, so, it was easier for them to include the preparation of teaching materials in the teaching process.

V.4. Analysing the pupils' work and students' own work

We also wanted to know how often students had the opportunity to see pupils' products. We asked them how and how many times they analysed pupils' homework.
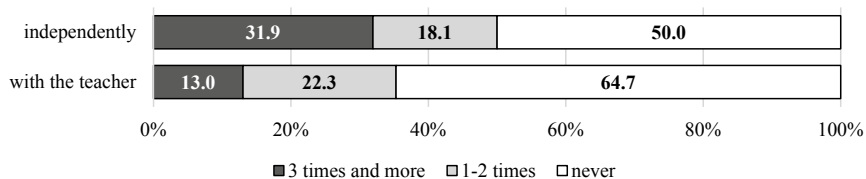
Figure 4

Frequency of students' analysis of pupils' homework

The data in Figure 4 show that students more often checked pupils' products independently than together with teachers. About a third (31.9%) did it independently three or more times, and a half (50.0%) never. Checking together with the teacher was less frequent than expected. In our study and in the study of six teacher education programmes in Finland, Norway, and California (Jenset et al. 2018), students had the fewest opportunities to analyse pupil learning. An important function of practical training is exactly the opportunity to accurately observe and analyse pupils' work and learning (Boyd et al. 2009), which forms the basis of learning to teach. Hiebert et al. (2007) emphasise that it is through the pupils' work that students realise how effective their teaching is.

Furthermore, we asked the students how often during the distance practicum they analysed their work together with the teacher or independently.

	3 times and more	1-2 times	never
with the teacher	65.5	22.3	12.2
independently	34.5	24.8	40.8
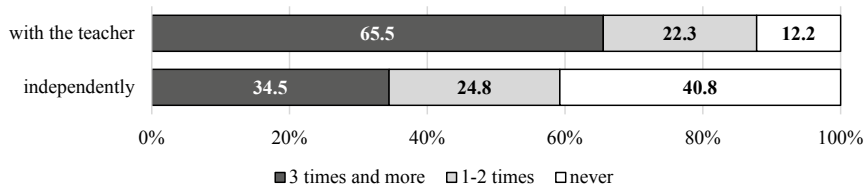
Figure 5

Frequency of students' analysis of their own work

Two-thirds (65.5%) of the students analysed their work with the teacher at least three times during the distance practicum, while over a third of the students (34.5%) did so at least three times independently. Surprisingly, 40.8% of the students never independently analysed their work during the practicum. Reflective thinking provides a deeper insight into a teacher's work and has a significant impact on their changing of attitudes, conceptions and behaviours (Korthagen and Vasalos 2005), and thus in the perspective of student's professional development such a high share of the students who never independently analysed their work is worrying. Interestingly, in a previous study on the teaching practicum of the 3rd year students at the Primary School Department at the Faculty of Education in Ljubljana, 63% of the students stressed the importance of the teaching practicum as learning through experience, of reflecting on their own and others' behaviours and experimenting (Pečar and Velkavrh 2006). This may indicate that students are aware of the importance of reflecting on their own work, but they plan no independent reflections, which is consistent with the findings by Darling-

Hammond et al. (2005). These explain that students need structure and support to reflect on their own work during practicum.

V.5. *Usefulness of experience from distance teaching practicum*

Furthermore, students also assessed the overall usefulness of this year's teaching practicum experiences for their professional development.
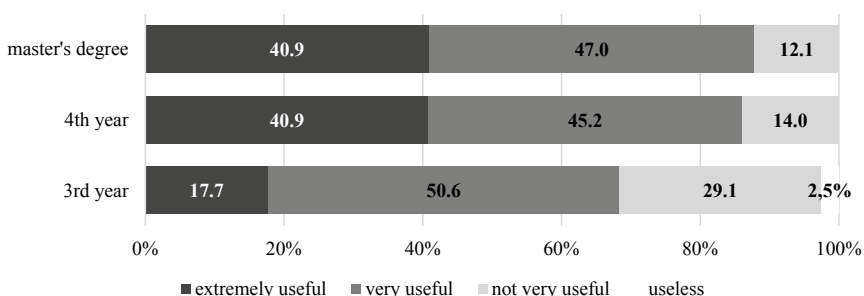

Figure 6

Assessment of overall usefulness of experiences
from distance teaching practicum by year of study

It is evident from the data in Figure 6 that the great majority of the master's degree students (87.9%) and the 4th year students (86.1%) assessed their experiences as extremely or very useful. Among the 3rd year students, less than a fifth (17.7%) defined their experiences as extremely useful and more than a half (50.6%) as very useful.

Compared to students of higher years, the 3rd year students on average rated the usefulness of experiences the lowest ($x^- = 2.84$), while older students rated them in a similar way (4th year: $x^- = 3.27$; master's degree students: $x^- = 3.29$). A detailed analysis (Table 4) showed that the 3rd year students assessed statistically significantly lower the overall usefulness of experiences gained during distance teaching than the 4th year students ($p = 0.000$) and the master's degree students ($p = 0.000$).

We believe that the reasons for lower assessments of the usefulness of the distance practicum can be attributed to the fact that during their studies, the 3rd year students have had no teaching practicum yet, where they could fully test their skills of independent teaching in a classroom. The 4th year and the master's degree students had already gained such experiences in the classroom, so they found distance teaching challenges more useful than the 3rd year students.

Table 4

Assessment of overall usefulness of distance
teaching practicum by year of study (statistics)

Assessment	Year of study									
	x̄			Levene's test				ANOVA		Tukey's post hoc test
	3rd year	4th year	Master's degree	F	g_1	g_2	p	F	p	p
Overall usefulness of distance practicum	2.84	3.27	3.29	0.055	2	235	0.947	10.365	0.000	3rd year – 4th year 0.000
										3rd year – 2nd degree 0.000

In the questionnaire, students answered an open-ended question 'Where did you make the most professional progress in this year's distance practicum?' Their answers were categorised and counted.

communication with parents
general experience of distant teaching
collaboration with other teachers — 5
assessment, evaluation of pupil's ashievements — 6
communicating with students, patience — 5
creativity, originality — 7 7
other: organization of time, teaching preparations… — 11 4
finding alternative solutions for active work — 12
adapting to COVID-19 situation, new circumstances — 7 3 8
selecting the contents, looking for the essence — 5 10 7
greater self-confidence, independence — 6 11 5
providing constructive feedback to pupils… — 7 17 6
individual work with pupils — 21 19 15
preparing teaching materials for pupils — 24 22 15
progress in the ICT area — 24 51 32

0   20   40   60   80   100   120

■ 3rd year   ▦ 4th year   □ master's degree

Figure 7

Where students made most progress during distance practicum
(number of students' answers)

Figure 7 shows that after the distance practicum students of all years of study most often highlighted their progress in the ICT area, covering both the field of teaching methods (e.g., self-check multimedia quizzes) and technical progress in terms of computer use skills.

Many students highlighted their progress in preparing teaching materials for pupils (they most often mentioned the adaptation of worksheets for distance learning) and their progress in individual work with pupils, pointing out their assistance to pupils with learning difficulties. Interestingly, most students did not individually assist pupils, but those who did were greatly impressed by it. Some students became more patient, others emphasised their higher self-confidence, noting they had a lot of useful knowledge in the ICT areas, that they are able to learn new things and to adapt faster and more successfully than teachers. Some students mentioned their own progress in critically assessing online materials, in giving clear instructions to pupils, in selecting contents (looking for the essence), in providing constructive feedback to individual pupils and in finding alternative solutions for active work of pupils and thinking outside the context of usual teaching methods. Most of the records indicated the students' progress in several different areas. Differences between individual years of study were also noticeable. More 4th year and master's degree students mentioned their progress in the ICT area than the 3rd year students. However, more 3rd year than senior students mentioned their progress in acquiring new ideas for teaching. Some students found it very important to make progress when training in activity scheduling, and they also mentioned more time for their calm consideration of the selection of activities as a positive facet of distance work.

Examples of students' original statements on their own progress during the distance teaching practicum:

- *I've learned to think about what is crucial for pupils to know and what is the shortest and the most interesting way to communicate this to pupils (a 4th year student).*
- *I have made progress in accurate and concise instructions, as students cannot immediately ask us if they do not understand something when they receive learning materials to work on their own (a 4th year student).*
- *I have made progress in organising work, finding alternatives for individual work of pupils, out-of-the-box thinking about conventional teaching (a 4th year student).*
- *I've made the most progress in realising that not every student can do everything. As a result, I have prepared several materials and marked the mandatory tasks that everyone had to do. Optional tasks could be*

tackled by each pupil according to their abilities (a master's degree student).

- *I have learned that the teacher can prepare interactive worksheets for pupils, who self-check whether their answers are correct and thus immediately get feedback (a master's degree student).*

VI. Conclusion

The students' teaching practicum is an important part of teacher education even during the COVID-19 pandemic. The results of the survey on the implementation of the distance teaching practicum among the students of primary school teaching at the Faculty of Education at the University of Ljubljana showed that during the distance practicum in April 2020 they acquired practical training competencies in different domains, but not all students acquired experiences in the same domains. This also happens during the "live" practicum, but mostly because of the differently developed competencies of each student and not because of the organisation of the teaching practicum in the virtual environment. We believe that students had less diverse experiences during the distance practicum because the teacher mentors were instructed to integrate students in the areas where they would be most helpful. However, they paid less attention to providing them with opportunities to actively participate in various pedagogical activities. Therefore, students most often helped teachers prepare various teaching materials. 51% of the students spent more than half of their time in practicum preparing teaching materials for pupils, mostly independently, and only in a small share according to the teacher's instructions. Some innovative pedagogies were developed. Direct lessons for the whole classroom were provided online by 15% of the students, while 20% of the students offered pupils individual assistance. These results reflect mentors' decisions on the frequency of students' involvement in different types of pedagogical work in the distance teaching practicum. There were differences between students of various years. As part of their practicum, the 4th year students independently spent more time preparing teaching materials for pupils than the 3rd year students, while the 3rd year students dedicated more time for individual assistance to pupils than the 4th year students. During the distance practicum, a great majority of students analysed their work with the teacher more than twice, while this was done without the teacher more than twice by only a little more than a third of the students. During the practicum, most students did not analyse pupils' work and products; those who did, did so mostly without the teacher. Teaching practice proved to have significantly contributed

to the effectiveness of the pedagogical process. Students made teachers' work easier, relieved them, offered support in ICT innovations and received invaluable pedagogical experiences. Senior students rated their practicum experiences as more useful for their professional development than the 3rd year students. We assume that this difference is due to the fact that senior students had prior classroom experience which younger students did not have, so they found the distance teaching practicum less useful.

The research found that during the distance teaching practicum, quite comparable to the usual practicum, students can develop their time management skills, plan and teach different subjects, take into account pupil diversity, include diverse teaching materials, and reflect on their work and the work of pupils together with teacher mentors. However, the question arises to what extent all the listed experiences that students can gain during a distance teaching practicum are comparable to the usual teaching practicum in a normal (non-COVID-19) educational setting.

In Slovenia, ICT equipment among students and pupils is on a satisfactory level. Under similar conditions, constant cooperation with mentors is crucial for the quality of the distance teaching practicum in the future. The distance teaching practicum could be improved so that students are:

- actively involved in all phases of the learning process (planning, conducting classes through videoconferencing, examination, assessment), and it is essential to increase the share of direct teaching;
- trained to select, prepare and integrate teaching materials and technically qualified to conduct lessons through online conferences even before the practicum;
- involved in the implementation of various forms of distance teaching with all pupils in the classroom, with individual groups or individual pupils (learning assistance, work with foreign pupils, work with pupils from a less supportive home environment, etc.). It is still necessary to promote individual work with pupils and to monitor their learning, since this has been lacking in the distance teaching practicum so far;
- paying attention to include more recreational activities in regular teaching, due to the largely sedentary mode of work;
- receiving daily reflection on their own work and that of their pupils' with their peers, mentors, and by themselves. In this way, students gain insight into the success of their teaching and recognise the need of adapting lessons; and
- better guided by teacher mentors, who need to be properly qualified for distance teaching and mentoring.

Some researchers question whether learning in an online environment can substitute for learning in a real classroom (Kidd and Murray 2020; Robinson and Rusznyak 2020), and some authors (Krzyszkowska and Mavrommati 2020) provide insights into enhancing collaborative learning in an online environment. It is important to distinguish the students' distance practicum from distance learning. We view the teaching practicum as more complex because it involves an intertwining network of the students' practical experiences in the school setting. Distance education should be viewed as a complement to traditional education rather than an alternative to it. As noted in the study by Krzyszkowska and Mavrommati (2020), who proposed the Community of Inquiry model as a didactic approach to improve learning design, students perceived the social component of distance education differently from the cognitive and teaching components. In their study, collaborative distance learning among students was the preferred way to develop a deeper understanding of knowledge, but there were still some opportunities for improvement in the social domain. The importance of interpersonal relationships and open communication among students in distance education is also highlighted by Garrison even before COVID-19 (2016). In this context, we believe that the distance practicum does not provide adequate experiences in identifying socially sensitive situations and developing quality relationships, developing organisational skills and the ability to lead a whole group of pupils in social interactions within real-life spaces (classroom, playground, school) even though it allows individual progress in some social skills. In their feedback, our students also reported that they gained many useful pedagogical experiences during the distance teaching practicum. However, they are in desperate need of experience in a "live" teaching setting, where they would have the opportunity to lead a whole group of pupils and would have to deal with direct interaction among the pupils and resolve any disagreements and discipline problems.

During the distance teaching practicum, students also could not gain insight into the functioning of the school as an institution. This is very important for the socialisation of student teachers. Ulvik, Helleve and Smith (2018) argue that when student teachers are treated as a part of the school staff, they gain access to a variety of experiences and what goes on in a school both inside and outside the classrooms. In some situations, this could be done through e-media, but in our situation, this was not the case because the school staff was overworked due to the new remote work situation and they could not be prepared in advance.

The main purpose of the study was to collect students' opinions of their pedagogical work during the distance teaching practicum. As a limitation of

the study, it should be noted that COVID-19 appeared suddenly and we had no support in the theory of learning in an online environment that would relate to the teaching practicum of future teachers. Due to the unique situation, previous studies in this research area were rare until recently. The study by Hebebci, Bertiz, and Alan (2020) showed some positive and negative opinions about distance education activities during COVID-19. The fact that classes can be conducted in a planned and timed manner even under exceptional conditions was highlighted as a positive, while problems such as limited interaction and lack of equipment were mentioned as negative. After the 2019/20 academic year, the COVID-19 situation adapted to the new conditions in the next year, so the teaching practicum was conducted differently (in a real school setting), and repeating /comparison of similar research was not possible. The study by Giner-Gomis et al. (2022), which examined the student teaching practicum during COVID-19, revealed many limitations to the distance teacher practicum, but also some positive consequences (initiation to online teaching, use of technological resources, ability to adapt and solve problems, the discovery of new forms of collaboration). The context of the pandemic, in particular, shed new light on the importance of interpersonal relationships in teaching. To gain better insight into the quality of this type of distant teaching practicum in 2019/20, we would need more detailed information about the quality of students' work, their peer cooperation, and their critical reflection on the teaching practicum with their mentors, which would contribute to better professional development. According to Van de Grift et al. (2014, 157), the quality of the teaching practicum is important because "the quality of student teachers' teaching skills is an important predictor of students' academic engagement." By comparing the distance teaching practicum in similar study programmes in other parts of the world, in the future, it will be possible to evaluate the actual value of our distance teaching practicum. The study by Tekel, Bayir, and Dulay (2022) provides a comparative study of the teaching practicum processes in 11 different countries around the world during the COVID-19 pandemic (Slovenia was not included). According to their findings, some countries eliminated or stretched the teaching practicum requirements during the COVID-19 pandemic, while other countries implemented the online teaching practicum in different ways: some implemented online courses in K-12 schools, others online peer teaching, and the third used VR technology. From the comparison with the results of this study, we can conclude that the Slovenian example presented in this paper is one of the examples of good practice. Our research has provided authentic insights into the COVID-19 students' practicum. In case of repeated organisation of the distance teaching practicum, one should

bear in mind that such a teaching practicum style is only a temporary substitute for practicum in an authentic environment, and that it offers students opportunities for new ways of working, some of which are likely to be developed in the future to be useful in non-epidemic situations, e.g., in case pupils are sick or absent for other reasons. Hebebci, Bertiz, and Alan (2020) also believe that distance education will be used more effectively in the future if the necessary improvements and training are made.

In a broader sense, the results of this study are likely to reflect important findings in the area of student and teacher flexibility under unpredictable circumstances in a particular part of Europe. In the appropriate context, the findings could assist educational stakeholders in further research to evaluate the effectiveness of the distance teaching practicum and also contribute to progress in the further development of improved future (regular) potential activities supported by modern technology in higher education. The results of the study also allow for a comparison of the distance teaching practicum with other countries in an international context.

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Editors' Acknowledgments

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It is our intention to notify authors of non-reviewed manuscripts within 21 days of submission acknowledgement. For manuscripts accepted for review, the process shall last 6 months. However, due to reasons beyond our control, the whole process (initial screening and peer review) can take longer time to be completed. Our editors and reviewers are indeed very busy people and they carry out their review tasks voluntarily. We therefore invite authors to be patient. If you have not heard from the Editor after 4 months following the submission acknowledgement, please send an inquiry to the Editor (Professor Mary Gobbi, PhD, mary.gobbi@deusto.es) and or Managing Editor (Ladislas Bizimana, PhD, ladislas.bizimana@deusto.es, tuningjournal@deusto.es). We understand that these deadlines may be too long for some authors. We therefore would respect, though regrettably, their decision to withdraw from the process, preferably prior to the peer review stage.

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Under the coordination of the Managing Editor (ME), accepted manuscripts are copyedited for publication. For each copyediting round, authors normally have up to three (3) working days to act upon suggested changes. Once copyediting is completed, the ME moves each paper to the typesetting and proofreading stage. By email attachment, authors receive PDF proofs for a final check (of basically typographical and formatting errors), altogether with the copyright transfer form (to be completed, dated, signed, and returned to the ME). Authors are expected to give their feedback within three (3) working days of receipt. Exceptionally, more than one round of proofreading by authors may take place. Substantive changes to the content and or structure of the manuscript at this stage require the approval of the Journal editor.

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More Information and Correspondence

Detailed and updated information, including names and contact addresses of the editorial team is available at <http://www.tuningjournal.org/>. Editorial correspondence should be sent to the Editor (Professor Mary Gobbi, mary.gobbi@deusto.es) and or Managing Editor (see below). The mailing address of the editorial office is the following:

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TJHE
Ethical Guidelines
for Publication

TJHE Ethical Guidelines for Publication

Final Version (March 2015)

Tuning Journal for Higher Education (TJHE), Tuning Journal in short, is an international journal publishing in English original research studies and reviews in all aspects of competence-based, student-centred, and outcome-oriented education reforms at university level across the globe. It is published by the University of Deusto's Publications department on behalf of the International Tuning Academy (Tuning Academy in short), a jointly managed project of the Universities of Deusto (Spain) and Groningen (The Netherlands). The Journal, essentially an open access, online and peer-reviewed publication, is committed to maintain the highest ethical standards. Hence, the involvement of any stakeholder in any function connected with TJHE, including acting as an editor, the reviewing of manuscripts, the management and production of the Journal and the authorship and submission of manuscripts implies acceptance of and adherence to **TJHE Ethical Guidelines for Publication**.

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1.1. The Editorial Board is appointed by the Tuning Academy in consultation with the Universities of Deusto and Groningen.

1.2. The Editorial Board is responsible for setting policy, appointing the Editor and Advisory Editors of the Journal.

1.3. The Editor is responsible for ensuring that publication policies set by the Editorial Board are carried out.

1.4. The Management Board is appointed by the Tuning Academy in consultation with the Universities of Deusto and Groningen.

1.5. The Managing Board is responsible for the commercial management of the Journal and appointing a Managing Editor.

1.6. The Managing Editor is responsible for ensuring that the commercial policies set by the Management Board are carried out.

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b) Author order should be agreed on by all authors as should any changes in authors and order that occur while the manuscript is under review or revision. Changes in authorship must be submitted to the Editor in writing and must be signed by all authors involved.

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3.8. Authors should reveal to the Editor any potential conflict of interest (e.g., a consulting or financial interest in a company) that might be affected by publication of the results contained in a manuscript. The authors should ensure that no contractual relations or proprietary considerations exist that would affect the publication of information in a submitted manuscript.

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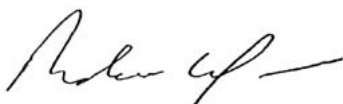
Date: 16 March 2015

Approved by the TJHE Editorial Board and signed on behalf of the Tuning Academy by:

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Perspectives, stakeholders, and competences

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