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New environments and strategies for fostering students' participation

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Tuning Journal for Higher Education (TJHE), Tuning Journal in short, is an international peer-reviewed 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 a joint initiative of the University of Deusto (Spain) and the University of Groningen (The Netherlands) that is run by the Tuning International Academy (http://tuningacademy.org/): an international meeting point for fostering innovative teaching, learning, and research in higher education.

The main goal of the Journal is to promote quality research into the 'Tuning Methodology' for designing, implementing, and assessing context-sensitive degree programmes and to subject the tools developed during Tuning projects and other educational projects to full academic scrutiny and debate among students, teachers, policy makers, administrators, and academics across societies, cultures, professions, and academic disciplines. To this end, the Journal invites applications for thematic issues, conference proceedings or monographs from all stakeholders. Guidelines for the preparation and submission of manuscripts are appended to this Issue and available at the web of the Journal: http://www.tuningjournal.org/

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Tuning Journal for Higher Education (TJHE)

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Editorial

Editorial

Luigi F. Donà dalle Rose
Editor

Anna Serbati
Assistant Editor

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In our quickly changing world, Higher Education (HE) institutions may or have to play an important role. This is also at the root of the huge paradigm shift which is occurring at worldwide level in order to adapt higher education to the needs of both local and global society.

This Issue of TJHE highlights ways through which universities and other HE institutions can try to develop conditions favourable to foster the growth of their own students and ways through which, at different levels, academic staff together with students are implementing curricular innovation.

Students are the main protagonists of university life, and are therefore entitled actors who can valuably contribute to educational practices, sharing their voices which instructors and policy-makers should take into account to inform their actions.

The first half of contributions hosted in this Issue addresses important cornerstones in the life of an open academic environment, two of them directly involving students in the learning and teaching process, i.e. participation in the curricular planning both in general terms and more specifically on the issue of the student workload. The third contribution deals with the so called third mission of the HE institutions, i.e. how responsible institutions can contribute to the well-being of local and often much more extended societies.

The second half of contributions focuses on experiences of competence-based education implemented in specific contexts. More specifically, the fourth contribution analyses the degree of importance and perceived achievement of the specific competences by Psychology students, the fifth focuses on application of prior knowledge in problem solving situations during more advanced classes, whereas the sixth one describes a qualitative study with academic staff regarding generic competences in life sciences.

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More specifically, the Issue begins with a paper by Jane Iloanya, which discusses two experiences of "student voice" in two institutions of higher learning in Botswana. Democratisation of teaching and learning is interpreted as a crucial tool for the implementation of the Tuning Approach in the teaching and learning process in higher education, not only for consulting and involving students, but also for giving them right and responsibility to participate and be partner with staff in the entire educational process. The research highlights participatory approaches already in use in the institutions as well as areas of improvement to really give students the opportunity to actively engage with and contribute to the development and implementation of the curriculum.

The contribution of Alsaeed Alshamy also embraces the "student voice" perspective, but with a specific focus on Credit Hour System and Student Workload. The research was carried out at Alexandria University (Egypt) and investigating the perceptions of both academics and students on student workload. Diversity of these perceptions suggests that transparency on the topic of required hours of students' independent work should increase, as part of a wider paradigm shift from input and staff-centred programmes to output and student-oriented ones. The author highlights implications for policy and practice to enhance the process of determining student workload in Higher Education in Egypt.

The paper by Javier Villar Olaeta addresses another cornerstone of an open academic environment, which is the university social responsibility and the so-called third mission of academic institutions in Latin America. The article discusses the connection and implementation of ethical competences at individual and organisational level (Ethical Conduct competence and Organisational Competence of Responsible University Social Innovation) and reflects on possible methodological implications, in order to respond to the new challenges to professional training in today's world.

Within the second group of contributions, the paper by Denise Benatuil and María Juliana Laurito analyses the degree of importance and perceived achievement of the specific competences set out in the Tuning Latin America Project, among psychology students of a private university in the City of Buenos Aires (Argentina). Ratings for competences are discussed in order to identify current educational needs for psychologists and thus enhance quality and adjust psychological practice to current social needs.

The contribution by Peter Kwaira describes an experience of applying knowledge, acquired in first year classes, in problem solving situations during more advanced classes for serving teachers enrolled in a B.Ed. degree programme at the University of Zimbabwe. The data offers a reflection both

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on students' learning and ability to elaborate and apply prior knowledge as well as on subject integration and relevance of each course to the common purpose of skills development within the context of outcome/competence-based learning.

The paper by Lazarus Nabaho addresses the current discourse on generic competences and their alignment with dental surgery and nursing education at Makerere University in Uganda. The findings reveal that problem solving, lifelong learning and interpersonal competences are aligned with life sciences and that the most used three approaches to developing generic competences are problem-based learning, conducting generic course units, and role modelling, therefore combining both single subject level as well as curriculum level.

As the European Commission's Report on improving the quality of teaching and learning in Higher Education Institutions[1] highlights, different ways of promoting the quality of higher education can be implemented. One of them, described as one of the sixteen recommendations of the Report, fosters higher education institutions to encourage, welcome and consider student feedback to improve teaching and learning, and another one suggests the development of curricula through dialogue and partnerships among teaching staff, students, graduates and labour market actors.

Students are partners and change agents in explorations of pedagogical practice and can richly contribute to academic development.[2] This Issue offers to readers examples and opportunities to think and reflect on learner-centred approach and "student voice" perspective as central components to transform higher education and to answer to the needs of students and society.

[1] European Commission, *Report to the European Commission on Improving the quality of teaching and learning in Europe's higher education institutions* (Luxembourg: Publications Office of the European Union, 2013).

[2] A Cook-Sather, "Student-faculty partnership in explorations of pedagogical practice: A threshold concept in academic development," *International Journal for Academic Development* 19, no. 3 (2014), 186-198, doi: 10.1080/1360144X.2013.805694.

Articles

Democratisation of Teaching and Learning: a tool for the implementation of the Tuning Approach in Higher Education?

Jane Iloanya*

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Abstract: Teaching and learning in Contemporary Higher Education is experiencing a change of paradigm in the approach used for curriculum design and instruction. This paper examines the application of democratisation of teaching and learning as a crucial tool for the implementation of the Tuning Approach in the teaching and learning processes in higher education. A qualitative research approach was used to collect information from two institutions of higher learning in Botswana. Findings from the study indicate, that, there are democratic elements in the teaching and learning processes as evidenced by the use of the learning –outcomes approach in lesson planning by the lecturers, and in the various ways students are engaged in teaching and learning processes. However, the study revealed that students are not fully involved in planning curriculum and workload.

Keywords: Democratisation; Higher Education; Learning; Teaching; Tuning Approach.

I. **Introduction**

The Tuning approach emphasises on student –centred methodological approach to teaching and learning. It focuses on the fact that students' voices should be heard both in planning curriculum, lesson plans and through the ways they are engaged in the teaching and learning processes. Teachers need to create a culture that operates on the principles of equality and functions as integrated, interactive and evolving whole.[1] Student/

* JANE ILOANYA (jane.iloanya@bothouniversity.ac.bw), PhD in Education, is Associate Professor and Coordinator of Post-Graduate Programme Research at the Department of Education of Botho University, Botswana. *More details are available at the end of this article.*

[1] Alice Lesnick and Alison Cook- Sather, "Building civic capacity on campus through a radically inclusive teaching and learning initiative," *Innovative Higher Education* 35, no. 1 (2010). http://repository.brynmawr.edu/cgi/viewcontent.cgi?article=1013&context=edu_pubs.

teacher partnership based on educational interests would help promote democratic principles in higher education. Democratisation of teaching and learning is a concept that advocates for equal opportunity in the classroom. Equal opportunity in this case involves an enabling environment that allows for equal access to appropriate learning tools, the subversion of barriers that hinder students' participation in teaching and learning sessions and of course, the blurring of lines that demarcate traditional student-teacher roles. Democratisation of teaching and learning processes allows for the equalisation of student-teacher roles in influencing the nature, creation and transmission of knowledge.[2] It involves the subversion of social and cultural barriers that hinder participation and equal access to appropriate learning tools.

The 21st century Higher Education teaching and learning process is experiencing a paradigm shift from what used to be the teacher dominated and teacher centred learning, to a more contemporary and democratic approach, which is student centred teaching and learning. In student –centred approach to teaching and learning, the learner is the focus of the learning process. The interest of the learner should be the main concern of the teacher who is there to play the role of a facilitator rather than dictating the teaching and learning processes. Students are allowed to make their voices heard, rather than being subdued as mere listeners, who should tread carefully in order not get into trouble with the teacher.

This paper examines the utilisation of democratisation of the teaching and learning processes in Institutions of Higher Learning in Botswana. In 1977, Botswana's First National Policy on Education was unveiled. The philosophy which informed the 1977 Education Policy was "Social Harmony". The philosophy of social harmony has four main principles: Unity, Development, Democracy and Self-Reliance. These principles were meant to permeate all aspects of lives of the people of Botswana, including, how teaching and learning is conducted in institutions of higher learning.[3] This study examines the application of democratisation of teaching and learning as a tool that could be used for the implementation of the Tuning Approach in Higher Education. Democratisation of teaching and learning allows for decentralisation of learning and teaching processes, loosens what could be termed strictly vertical and top-down approach to

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[2] D. Croxon, "Fair go with web 2.0: Effective strategies for the democratisation of learning and teaching process using web 2.0 technologies," *Macquarie Matrix* 4, no. 1 (2014), http://studentjournal.mq.edu.au/issue4_1.html.

[3] Republic of Botswana, *Education for Kagisano: Report of the national policy on education* (Gaborone: Government printer, 1977).

teaching and learning, thereby creating enabling opportunities for increased bottom-up and horizontal learning contexts to take place. The School of thought which advocates for democratisation of teaching and learning argues that, the bottom-up control of educational practices which comes with democratic principles, allows students to have an increased degree of learning responsibility, self-regulated learning processes, avenues for formative feedback to be given to their teachers and dynamic peer-to-peer interactions which permit collaborative and cooperative learning.[4] The Massification of Higher Education in the 21st century has contributed to the diversified nature of learner populations across the globe, and Africa is not left out in this phenomenal development in the higher education system. With increased enrolment in the higher education arena, comes the issue of how best to make teaching and learning effective and worthwhile. The provision of inclusive, equal learning and teaching experiences to higher education students through democratisation of teaching and learning will help to unravel what kind of learning our students are exposed to, and how best we can engage them to achieve desirable learning -outcomes.

II. **Problem statement**

Contemporary teaching and learning lays emphasis on the need to reach out to the students and allow them the freedom to be co-drivers of the learning process. Encouraging a student- centred approach to teaching and learning has been a long-term process which is becoming more prominent with Massification of higher education in the 21st century. Most institutions, through research studies have realised the need for student –centred learning over the traditional pedagogy, of active learning over passive listening and of experiential learning over abstruse lectures.[5] Despite the strides in creating an awareness of the usefulness of student –centred approach to teaching and learning, some faculty members and institutions of higher learning still sing the song of the traditional teacher –centred approach to learning and emphasise unduly on curriculum content rather than the

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[4] Alexandra I. Cristea and Fawaz Ghali, "Towards adaptation in e-learning 2.0," *New Review of Hypermedia and Multimedia* 17 (2011): 205, accessed October 13, 2016, http://dx.doi.org/10.1080/13614568.2010.541289; Anastasia Kitsantas and Nada Dabagh, "The role of web 2.0 technologies in self-regulated learning," *New Directions for teaching and learning* 126 (2011): 99, 102, accessed October 13, 2016, http://onlinelibrary.wiley.com/doi/10.1002/tl.448/abstract.

[5] Claus Nygaard and Clive Holtham, *Understanding Learning-Centred Higher Education* (Denmark: Narayana press, 2008).

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effectiveness of the learning process. In this era of globalisation where people are overwhelmed by huge information- based realities, there should be a paradigm shift from, students learning content disseminated, to knowing how to find out facts by themselves. Democratisation of teaching and learning entails that our students should be set free in the process of teaching and learning, and be provided with the opportunities and freedom to learn and discover things by themselves. This study examines the exercise of democratisation of teaching and learning in Botswana to determine if it is a necessary tool for the implementation of the Tuning student –centred approach in higher education.

Research objectives:

1. This paper examines the implementation of the principle of democracy in teaching and learning at higher education level in Botswana.
2. The study sets to find out if higher education students are involved in planning the curriculum used for instructions
3. The paper discusses the extent of democratic activities in the teaching and learning processes in Botswana's Institutions of Higher Learning

The following questions were addressed:

1. Is the learning –outcome approach applied in lesson planning?
2. How engaged are the students in the teaching and learning process?
3. Are students involved in planning curriculum?

III. **Democratisation of Teaching and Learning in Higher Education**

Democracy allows people to participate in decisions that affect their lives in political, community, social and economic affairs. For democratic principles to be made functional, individuals must have ample information to make wise choices and decisions, which should be respected and taken into account by decision makers at all levels of governance.[6] There are different models of democracies promoted by theorists in recent years. These models present democratic practices in different perspectives.[7] The 'interest' model

[6] Republic of Botswana, *Education for Kagisano: Report of the national policy on education* (Gaborone: Government printer, 1977).

[7] Jane E Iloanya, "Basic Education and the Actualisation of Botswana's Philosophy of Education: Implementers' and Students' Perspectives" (PhD Thesis, University of Botswana, 2010).

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positions the goal of democracy as a decision making process to decide what leaders, rules and policies will best serve the greatest number of people, where each person defines his or her own interests. The model of 'deliberative' democracy defines democracy as a process that allows the public to come together and talk about collective problems, goals, ideals and actions.[8] In deliberative democracy, participants do not rest until the "force of better argument "compels them to all accept a conclusion.[9] A third model of democracy called 'communicative' theory, encourages an equal priviledging of any forms of communicative interaction where people aim to reach an understanding without using argument to persuade others. These could be in the form of greeting, rhetoric and storytelling. Socrates, a well-known Greek Philosopher of ancient times, believed in the use of rhetorical tricks to capture the minds of his audience. The educational implication of the democratic principles is that the teachers should be aware of the different teaching –learning environments; to avoid a situation where students might be misconstrued for exercising what they feel is their civil right.

Democratisation of teaching and learning in higher education can take place through the amplification of students' voices, creating an open and cordial space for teaching and learning, working in partnership with students, faculty and teaching staff, dialogue between students and their teachers, empowerment of students in different facets of learning; including being involved in curriculum development and engaging students in actual teaching and learning.[10] By working in partnership with students, everyone is actively involved in, and will benefit either way from the teaching and learning processes. It is an effective way of developing students' engagement, enhancing teaching and learning, and promoting the relevant democratic principles in the teaching and learning environment.

Some schools of thought have described students as the 'university's unspent resource'. This takes us to the fact that, in the coming years, universities will rely on the active participation of students in the meaningful

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[8] Seyla Benhabib, *Democracy and difference: contesting the boundaries of the political* (Princeton: Princeton University Press, 1996), 10-12.

[9] Robert E Young, *A Critical theory of education: Habermas and our children's future* (Sydney: Harvester Wheatsheat, 1989), 50.

[10] Alison Cook-Sather, "Amplifying Students Voices in Higher Education: Democratising Teaching and Learning through changing the Acoustic on College Campus," *Revista de Educacion* 359 (2012); Mick Healey, Abbi Flint, and Kathy Harrington, *Engagement through partnership: students as partners in learning and teaching in higher education* (York: The Higher Education Academy, 2014).

development of the higher education sector.[11] Various institutions and individuals are becoming more aware of the need to actively engage students in the teaching and learning processes. Students could be meaningfully engaged by allowing and encouraging them to choose and write their own essay titles, choosing their own textbooks, designing worksheets for themselves and other students, co-evaluating a course with their teachers, co-assessing their work with their lecturer and choosing assessment methods. The more students are engaged in the learning and teaching activities, the more democratic the higher education set up will be. Developing a partnership and democratic approach in higher education teaching and learning, allows students to be active participants in the learning process, rather than passive recipients of knowledge. Democratisation of teaching and learning equips students with the power, authority and courage to co-create knowledge, learning and teaching at the higher education institutions.[12]

Research suggests that there is a very crucial difference between an institution that listens to students and responds accordingly, and an institution that gives students the opportunity to explore and discover areas they deem significant and needed solutions which will manifest in required and desirable changes.[13] Listening to students is important in its own ways, but, allowing students to be change agents acknowledges the view of students being active collaborators and co-producers, which in effect positions them as potential innovators. When Students and staff work and learn together, peer relationships are promoted, and students are engaged in areas where originally, in the traditional education setting, they are excluded from. Contemporary higher education gives credence to the fact that, democracy in teaching and learning is just not only about listening to the students' voices and allowing them take part in the decisions that affect them. Democratic relationship in teaching and learning involves creating an enabling environment where both students and teachers are involved in setting the priorities, content and direction of the learning experience.[14]

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[11] Johan Gardebo and Mattias Wiggberg, *Students the university's unspent resource: Revolutionising higher education through active student participation* (Upsala: Upsala University, 2013), 31- 40.

[12] "Student Engagement Toolkit," Higher Education Academy and National Union of Students, accessed October 10, 2016, www.nusconnect.org.uk/Student.

[13] Elisabeth Dunne et al, *Students as change agents – new ways of engaging with learning and teaching in higher education* (Bristol: Higher Education Academy Publication, 2011), 102- 116.

[14] "Policy Statement on higher education," Welsh Government, accessed October 06, 2016, http://wales.gov.uk/topics/educationandskills/highereducationpolicystatement.

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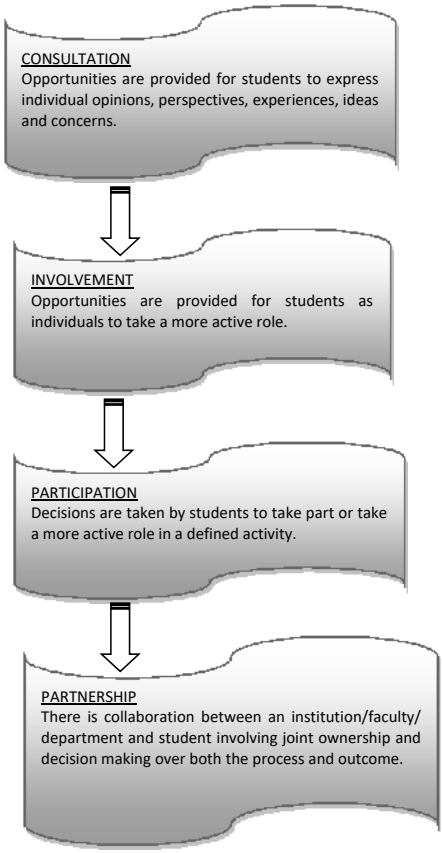

Stages of student engagement
in democratic teaching and learning context

Source: See Footnote.[15]

Partnership in teaching and learning should be viewed as a process of student engagement rather than an achieved state or result of engagement. It is necessary to allow students to put in enough time and efforts in their own learning. This of course demands that institutions and faculty members encourage and empower students to shape their own learning experiences. When students are given the opportunity to participate in the planning and

[15] "Student Engagement Toolkit," Higher Education Academy and National Union of Students, accessed, October 06, 2016, www.nusconnect.org.uk/StudentEngagementtoolkitresources.

execution of their learning activities, they have that confidence and trust in themselves, which motivate them to aim higher to achieve and manufacture more knowledge in the realm of higher education. The essence of students actively engaging as partners in shaping the nature and quality of their learning experiences should be acknowledged by different stakeholders interested in improving students' democratic experiences in higher education.

IV. **Benefits of democratisation of Teaching and Learning in Higher Education**

Democratisation of teaching and learning in higher education empowers students and gives them that sense of belonging and worth, that they are useful in the process of learning. Some scholars are of the idea that involving students actively in the learning process leads to enthusiasm for learning and increased passion for enhancement activities in the learning and teaching environment.[16] Staff -student relationship in learning and teaching has a laudable effect on learning and teaching, development and enhancement of learning, learning to learn, raising the profile of research into learning and teaching, and, the development and enhancement of employability skills and attributes. All these attributes are needed by contemporary higher education graduates to prosper both within and outside the work environment in the society.

As some scholars assert, partnership with students through democratisation of teaching and learning, can go a long way in empowering traditionally marginalised students and lead to sharing authority and responsibility with staff in the development of culturally sustainable pedagogy.[17] It tends to produce similar outcomes for both students and teachers, as engagement helps in enhancing motivation and learning, developing meta-cognitive awareness, strong sense of identity and improving teaching and learning experience in the classroom. Students have the confidence that they are seen as partners in the teaching and learning process. This sense of confidence and belonging in turn helps to create a conducive and peaceful learning environment for both

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[16] Suzanne SooHoo, "Students as partners in research and restructuring schools," *The Educational Forum* 57, no. 4 (1993): 387.

[17] Alison Cook-Sather and Praise Agu, "Student consultants of colour and faculty members working together toward culturally sustaining pedagogy," in *To improve the academy. Resources for faculty, instructional, and organisational development*, eds. James E. Groccia and Laura Cruz (San Francisco: Jossey-Bass, 2013), 271- 85.

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teachers and learners, where there is mutual understanding and trust for both parties.

Engagement outcomes for students lead to enhanced confidence, motivation and enthusiasm in learning. Students are motivated to actively get involved in the process and outcomes of learning. They are ready to claim responsibility for and ownership of their own learning, thereby, having a deepened understanding of, and contributions to the entire academic community. The faculty members also have a lot to benefit from democratisation of teaching and learning. Teachers, who are exposed to the democratic principles in teaching and learning, have the opportunity of experiencing transformed thinking about, and for the practice of teaching. They have a changed understanding of learning and teaching through experiencing different viewpoints from their students and having a re-conceptualisation of learning and teaching as collaborative processes.[18] The idea of making students' voices heard leads to transformation in learning for both teachers and students, thereby challenging in a very constructive manner, the constraints and hurdles which the traditional form of teaching encounters. A situation where teachers act as the sole custodians of knowledge which they regurgitate, and students are there to receive without questioning the authenticity of certain practices, does not engender democracy in the teaching and learning process.

V. **Challenges of democratising Teaching and Learning**

Democratic education is characterised fundamentally by dialogue, which is the principal vehicle for discussion, deliberation, reconsideration and transformation. Dialogue is a participatory endeavour where people speak with the possibility of being heard, touching hearts and changing minds. In dialogue, one listens and respects other people's views.[19] The burning issue is, how easy is it to work with higher education students and allow them to participate actively and freely in class, taking full control and responsibility in listening and taking care of teaching and learning processes? We talk about students and teachers partnering in the design of the curricular, students being involved in the assessments design and marking; how possible is it?

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[18] Alison Cook-Sather, Catherine Bovil, and Peter Felten, *Engaging students as partners in teaching and learning*: *A guide for faculty* (San Francisco: Jossey-Bass, 2014), 55-57.

[19] Alfred J. Ayer, "The problem of knowledge, and probability and evidence," *British Journal for the philosophy of science* 49, no. 1 (2004): 89-121.

Critics believe that students are neither disciplinary nor pedagogical experts. Rather, their experience and expertise typically is in being a student –something that many faculty members have not been for many years. They understand where they and their peers are coming from, and often, where they think they are going. Can students be very useful in planning teaching and learning when they bring no concrete experience of doing such to the table? Would the students know when and where to draw the line as they democratically plan and work with their teachers? These are some of the challenges of democratisation of teaching and learning in higher education.

Partnership in teaching and learning is not easily attainable and sustainable, nonetheless. The development of a co-learning, co-enquiring, co-developing, co-designing and co-creating approaches in higher education teaching and learning, challenges the traditional status quo relationships. It involves a cultural change of how the traditional higher education system was instituted and ran, and this cultural change will be difficult for some to adopt and adapt to.[20] None the less, if all parties involved work very hard, with positive attitude and determination to make it work; the challenges associated with democratisation of teaching and learning will not be insurmountable.

VI. **The Tuning Approach to Teaching and Learning**

The Tuning approach to teaching and learning in higher education develops a reference point for common curricular in higher education, based on the development of competencies in the students, which will make them useful not only as graduates but, as future employees in the world of work. It is basically a change of paradigm in higher education teaching and learning, where learning has shifted from staff oriented to student -centred teaching and learning.[21] It is geared towards helping higher education to develop programmes which are based on learning outcomes and credits, to improve the recognition of qualifications and all kinds of prior learning. Some key factors at the forefront of the Tuning approach include: a greater focus on competencies to prepare students for employability and citizenship, international recognition of different

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[20] Alison Cook-Sather, Catherine Bovil, Peter Felten, *Engaging students as partners in teaching and learning*; Mick Healey, Abbi Flint, and Kathy Harrington, *Engagement through partnership: students as partners in learning and teaching in higher education*.

[21] Robert Wagenaar, "Learning outcomes. A fair way to Measure Performance in Higher Education: The Tuning Approach" (Programme on Institutional Mangement in Higher Education, 2008), http://www.oecd.org/site/eduimhe08/41203784.pdf.

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degree programmes and the accompanying periods of study and a more precise method, aimed at the recognition of prior learning and periods of study.

The Tuning methodology lays emphasis on the development of competencies in the higher education students. Through the learning outcomes approach to teaching and learning, students become the centre of the instructional process. Learning outcomes, according to the Tuning methodology should be formulated in terms of competencies which should be obtained by the students. Competencies represent a dynamic combination of knowledge, understanding, skills and abilities which are formulated in various course units and are assessed at different stages. It is the object of educational programmes to foster competencies in the students. The fostering of competencies according to the Tuning methodology can only materialise through the desirable learning outcomes constructively formulated by the academic staff in higher education. It is pertinent to note that the tuning methodology is based on desired learning outcome not on minimum requirement. The Tuning approach allows specialists in the subject area/ discipline to formulate the learning outcomes after a productive consultation with the required stakeholders.

VII. **Methodology**

VII.1. *Context of the study*

This research was carried out in Gaborone, the capital city of Botswana. There are about ten institutions of higher learning in Gaborone which are both public and privately owned. Two higher institutions of learning were used for this study and both are members of the Tuning Africa Project two. One of the institutions used is a public university, while one, is a private university. I decided to use these two institutions because being members of the Tuning project, it is necessary to find out if they are implementing the Tuning approach of student –centred learning. It is also necessary to determine how the Tuning methodology is being applied in a public and private higher education institution respectively.

VII.2. *Selection of the participants*

A qualitative research approach was used for this study. Participants were purposefully selected at course level from the Faculties of Education of

both universities used for the case study. Qualitative approach was appropriate for this study because, in qualitative research, the researcher carries out studies about people's experiences in their natural settings and humans are the focus of the research.[22] The phenomenon of democratisation of teaching and learning can best be studied through a qualitative research approach which allows the researcher to interact with the participants in the study and draw out meanings from their experiences on the issue being researched about. Six lecturers were purposefully selected at course level from the Faculties of Education of the two universities used for the study, making it a total of twelve lecturers for the study. A phenomenological research should not necessarily require more than six participants.[23] Often times, ten participants would be ideal for a qualitative study.[24] Drawing the participants of this study from the faculties of education of the universities used as the case study was appropriate because, the Faculty of Education of any university should be at the forefront of the methodology of instruction's implementation realities. Ten final year students from the Faculties of Education of both universities were purposefully selected for the study. The choice to include final year students in the study was inspired by the fact that, students are the recipients of the teaching and learning processes. It was therefore necessary to find out from the students how they experience teaching and learning at their universities. Final year students were selected for the study because, they have spent almost four years in the university and would be in a better position to relay their experiences on how teaching in learning take place in their institutions.

VII.3. *Data collection instruments and procedure*

Qualitative research approach allows the use of a variety of techniques such as interviews, observations and focus group discussions and the findings are recorded mainly in words rather than in numbers.[25] In this study, semi-

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[22] Bagele Chilisa and Julia Preece, *Research methods for adult educators in Africa* (Cape Town: CTP book printers, 2005) 120- 130; Yvonna Lincoln and Egon Guba, *Naturalistic inquiry* (Beverly Hills, C.A: Sage Publications. Inc, 1986) 45-47.

[23] Terrence H and Mclaughlin, "Philosophy and educational policy: possibilities, tensions and tasks," *Journal of Education Policy* 15, no. 4 (2000): 441-457.

[24] John Creswell, *Qualitative inquiry and research design: Choosing among five traditions* (Thousands Oaks, California: Sage, 2013).

[25] William Wiersma and Stephen Jurs, *Research Methods in Education: An Introduction* (University of Virginia: Pearson Publication, 2005).

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structured interview questions were used to collect information from six lecturers in each of the two universities used for the study. Semi- structured interviews in qualitative studies allow the participants to freely express their feelings and experiences in the phenomenon under study. The use of interviews allows the data to speak for themselves and through a deeper understanding of the lived experiences of the participants; important themes emerge from the study.[26] Focus group discussions were used to elicit information from ten students, from each of the two universities used for the study. The use of focus group discussions allowed the students to speak extensively about their perceptions on the approaches to teaching and learning in their universities. Focus group discussions served the same purpose as the use of interviews in this study; the only difference is that, it was like a group discussion.

The interviews and focus group discussions were designed to speak to the research objectives and research questions of the study. Descriptive questions were designed to explore the lived experiences of the participants on democratisation of teaching and learning in higher education. The questions centred around the engagement of students in the teaching and learning processes, students' involvement in curriculum design and the use of student –centred learning outcome approach in lesson planning. Documentary sources were used to discuss the rationale behind democratisation of teaching and learning in higher education, and the Tuning approach on outcome-based learning and the need for infusing the development of competences in our curriculum design and instruction. The use of interview methods, focus group discussions and documentary sources allowed data triangulation which is a basic requirement in qualitative research approach, to ensure validity and reliability of the research data collected.

VIII. **Major findings**

The findings of the study addressed the three research questions used for data collection. Themes emerged from the study based on the interview questions used to collect data from lecturers and students who formed participants of the study. The interview questions spoke directly to the research objectives and research questions.

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[26] Trsih A. Hatch, *Professional challenges in school counselling: organization, institutional and political (*San Diego State University, 2002); Herbet J. Rubin and Irene S. Rubin, *Qualitative interviewing: The art of hearning data*, 2nded. (Thousand Oaks, CA: Sage, 2005).

Research question 1, addressed the issue of learning –outcomes being used for lesson planning by the university lecturers. Lecturers interviewed in both universities used for the study, admitted that they are familiar with Bloom's taxonomy of educational objectives and that they do apply the different domains of the taxonomy in their lesson planning. They admitted that a paradigm shift is expected in the current higher education system with regard to courses that are taught and learned. These should no longer be teacher centred, but, should be geared towards preparing students not only, for the world of work but, also, for their future role in the society. The issue of lecturers knowing about the existence of the learner -centred approach to learning is not enough in the context of democratisation of teaching and learning in higher education. The issue here is, lecturers knowing the importance of applying the student-centred approach in their lesson planning and being honest to implement the approach in their day to day academic engagements with the students. While preparing a learner-centred curriculum, lecturers should bear in mind a few areas to develop and implement a learning-centred curriculum needed to improve students' learning outcomes.[27] Such areas include: 1) being prepared to rethink students' learning processes, and regard them as active participants rather than passive recipients; 2) being prepared to implement new teaching and learning activities that could affect and change already established institutional practices; 3) assigning new roles to students, teachers, and faculties; 4) being prepared to assess from several dimensions whether learning has actually taken place. It is pertinent for institutions of higher learning to create an awareness of the need for faculty members not only to apply the learner- centred approach to lesson planning, but, to encourage them to positively implement it in their lesson delivery processes. This approach will benefit the students, teachers, the higher institutions of learning and the society at large. This is what democratisation of teaching and learning involves. The Tuning methodology recognises the importance of student –centred learning and the development of competences in the learners. The development of these competencies at both generic and subject specific levels encompasses the ability and willingness of our teachers and institutions to take implementation seriously. One of the lecturers interviewed clearly stated that "we need training and workshops to help new faculty members who do not have teaching qualifications understand more about the use of the learning –outcomes approach in lesson planning and teaching". Students interviewed in the two institutions used as case study, admitted that, their lecturers do use

[27] Claus Nygaard and Clive Holtham, *Understanding Learning-Centred Higher Education* (Denmark: Narayana Press, 2008).

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learning –outcomes approach for planning their lessons. This is evidenced by the manner in which the lecturers present their learning and teaching resources to the students. One of the students interviewed in the focus groups actually stated that "our lecturers usually read out the learning outcomes to us before facilitating classes, and they make sure we flow with the learning outcomes". Quite impressive to learn from the students, that, this aspect of the Tuning methodology is being executed in the teaching and learning processes at their institutions.

Research question 2, explored the engagement of the students in the teaching and learning processes. The lecturers interviewed in both institutions expressed their views on different methods used to engage students in teaching and learning activities. One of the universities, which is more of a university of technology, has modern ways of engaging students through the use of technology. Apart from teaching students face-to-face, where they are actively engaged through group discussions in class and classroom presentations, to and with fellow students, students are also engaged through the use of technologies in instructions. Students are provided with Tablets to enable them engage with their lecturers both within and outside the university premises. They use networks, blogs and Wikis to have academic conversations with their lecturers and fellow students. Through the use of the blackboard as a teaching and learning tool, lecturers set tests for the students, upload relevant academic material to be accessible to their students wherever they are. There is the blackboard discussion forum where lecturers upload academic topics and students actively engage by contributing to the discussion forums. In order to make sure that all students are engaged in the discussions, there are some graded discussion topics and marks are awarded which contribute to the final grade of the students. The use of technology for instructions is proving to be very productive in students' engagement and helping students construct and connect knowledge from social experience.[28] The students interviewed in this institution admitted that, they are fully engaged with various activities aimed at effective facilitation of teaching and learning. In the words of one of the students, "thanks to the use of technology in instruction; we can engage with our lecturers and fellow students even outside the confines of the classroom".

The other university used for the study, is more of a conventional university. The lecturers interviewed admitted that while there are many

[28] Dwi Sulisworo, "Designing the online collaboration learning using the wikispaces," *International Journal of emerging Technologies in learning* 7, no. 1 (2012): 58-61; George Siemens, "Connectivism: A learning theory for the Digital Age, 2005," http://www.itdl.org/journal/jan_05/article01.htm.

ways of engaging students in the teaching and learning process, they use more of the traditional face to face contact sessions. Students are engaged through class work activities, group discussions, questions and answer forums, tutorials, group and individual presentations in class. There is also the use of technology for instructions because lecturers use Moodle to post assignments and announcements to students, the use of emails and test messages to facilitate active engagements. Democratisation of teaching and learning is evidenced by the way students at the university freely express themselves in class. Students sometimes remind lecturers that Botswana is a democratic country and one is free to air one's views. It is though, unfortunate that sometimes, students misinterpret the concept of democracy in teaching. Responses from the students interviewed in this institution indicated that, democratic principles are being implemented in the teaching and learning processes. Students confirmed that, they are actively engaged through classroom presentations, questions and answers sessions and communications with their lecturers through emails, test messages and face to face contacts. In the words of one of the students who was interviewed, "there are free tutorial sessions for students who require these services and our lecturers keep us engaged with various activities to enhance teaching and learning".

An important theme which emerged from research question 2, is the issue of the use of students feedback in both universities. Both students and lecturers interviewed expressed their views on the usefulness of using feedback as a form of engagement and the exercise of democratic element in teaching and learning. At the middle of the semester and towards the end, students are given the feedback forms to tick and rate the performance of their lecturers in a given module or modules. At one of the universities, students' feedback is filled online while at the other university, the feedback is administered manually. While this could be considered as a very good avenue for students to exercise their democratic rights and freedom, some lecturers in these institutions expressed the fear that the students may not be fair enough due to one reason or the other, to give their lecturers a fair rating. So, the question is, is student feedback enough to judge the real performance of lecturers? One of the Lecturers interviewed lamented that "I do not know what wrong I have done to my students; I have never received favourable feedback from them since I started teaching in this institution". Perhaps, this could be seen as a reflection of how some teachers feel about democratisation of teaching and learning which involves amplification of students' voices in different aspects of the teaching and learning process. As evidence for institutional democracy implementation, the institutions used for the study indicated that students' feedback are

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usually analysed and corrective measures are taken to address matters that need special attention. In some cases, lecturers are invited by their Heads of Departments to be advised on how to improve in any area of concerns raised by the students in the feedback.

Research question 3 addressed the issue of how curriculum is planned in the universities used for the study. To be precise, are students involved in planning the curriculum? Do students know how the workloads in their Institutions are determined? Lecturers and students from both institutions admitted that students are not fully involved in planning the curriculum. In one of the institutions used for the study, student representatives are consulted during curriculum planning at the course level. The extent to which their input is utilised in the actual planning was not established. If the tuning methodology is anything to go by, learner –centred approach demands that the learners should be the central focus of teaching and learning. The Tuning process was launched for a number of reasons, one of which was transparency and comparability of higher education programmes, to facilitate prior learning in the learner centred context, and to raise awareness about the role of employability and citizenship when setting up and implementing degree programmes.[29] The Tuning method emphasises on basing degree programmes on clear professional and academic profiles which would serve as a basis for identifying the appropriate set of competencies to be attained in the framework of the educational process. This is all about students and producing the right set of students for the right job market and to serve the suitable societal purposes. It is unfortunate that students' voices are not properly heard in the area of curriculum planning and determination of students' workload in our institutions of higher learning in Botswana. Democratisation of teaching and learning in higher education cannot be fully implemented, if we do not have a rethink of how curriculum planning and determination of students' workload, should involve elements of students' voices. Although we engage students in various ways to exhibit the democratic touch, more is yet to be done by making sure that students' voices are amplified in planning the curriculum that concerns them.

IX. **Conclusion**

The main objective of this study was to find out if democratisation of teaching and learning could serve as a useful tool for the implementation of

[29] Robert Wagenaar, "Learning outcomes. A fair way to Measure Performance in Higher Education: The Tuning Approach."

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the Tuning approach in higher education institutions in Botswana. Two institutions of higher learning in Botswana were used as case studies. Findings from the study indicate that, the lecturers in these two higher institutions of learning use the learning –outcomes approach in planning their lessons. The learning-outcomes approach of lesson planning places the learner at the forefront of the teaching and learning processes. The idea is to lead the learners to discover learning themselves and be able to develop critical thinking and problem solving skills needed for the world of work. The study also revealed that lecturers from these institutions actively engage students in the learning process through discussions in class, group and individual presentations and the use of modern technology in instructions.

Findings from the study point out to the fact that, lecturers from both institutions used for the study, do not fully engage students in planning the curriculum and the workload that inform their learning. Although student representatives from one of the institutions are consulted at the course level when planning the curriculum, that is not the case with the other institution. This is one area in which democratisation of teaching and learning is not positively manifested in the two institutions used for the study. If the Tuning approach is to be promoted through democratisation of teaching and learning, students' voices should be heard both at the level of planning and implementation of the curriculum. This study has shed some light on the implementation realities of the principle of democracy enshrined in Botswana's Education philosophy of 1977. Although democracy is being implemented in certain aspects of the institutions' academic activities, more is needed in the area of students' voices in curriculum planning and workload.

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About the Author

JANE ILOANYA (jane.iloanya@bothouniversity.ac.bw), Associate Professor and Coordinator: Post-Graduate Programme Research at the Department of Education of Botho University, Botswana. She holds a Bachelor of Education degree, a Masters degree in Education and a PhD in Education. Jane Iloanya has about 20 years experience in Teaching, Research and Educational Administration. She is a member of the Botswana Educational Research Association (BERA), South African Journal of Higher Education (SAJHE), the Tuning Africa Project on Harmonisation of African Higher Educationand arecipient of the prestigious UNICEF Botswana Research Award. Her research interest areas include: Higher Education Issues, Social Justice, Teacher Education, Philosophy and Educational Policy issues.

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Credit Hour System and Student Workload at Alexandria University: a possible paradigm shift

Alsaeed Alshamy*

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Abstract: The study aims at investigating the perceptions of both academics and students on student workload in Credit Hour System at the Faculty of Education at Alexandria University (Egypt). It uses the wider international experience of higher education reform, including Tuning Africa Project — II, to propose implications for policy and practice on how the real work hours needed by a student to achieve the learning outcomes specified in the curriculum and to pass a course or module are adequately estimated and to contribute to the definition of the basis of a Credit System for Africa. The data have been collected through questionnaires administered to 26 participants: 11 academics (one academic per course) and 15 students (each student surveyed 11 times across all courses of the Professional Diploma in Education). The main findings show significant differences between the perceptions of academics and students on student workload almost across all courses, where students' estimation of the number of hours needed to complete the independent work during the semester were much higher than that of academics except for fieldwork (site visits). The independent workload as estimated by academics is 62% of students' estimation. Significant differences were found between the perceptions of students on the number of hours required for each type of independent work across different courses except "*preparation and follow-up work for scheduled classes*". The highest average of estimations of the number of hours was given to course N. 11 (World Trends in Quality Assurance Systems); whereas the lowest average was given to course N. 5 (Assessment of Quality in Educational Institutions) across all different types of independent work. Only 36.4% of academics have taken students' feedback on workload into consideration when planning the workload for their courses. It was also found that 92% of students were not informed about the number of hours planned for independent work at the beginning of the course. In addition, 88% of students were not asked to express their feedback about workload. These findings indicate that there are no unified regulations among academics to the estimation of student workload. It is also made clear that the process of estimating student workload in Credit Hour System at Alexandria University is staff-centred

* Saeed Alshamy (saeed.alshamy@edu.alexu.edu.eg; saeed.alshamy@gmail.com), PhD in Education, is an assistant professor at Foundations of Education Department, Faculty of Education, Alexandria University, Egypt. *More details are available at the end of this article.*

rather than student-oriented as the majority of academics follow traditional methodologies in the estimation of student workload. It is also enunciated clearly that there is marginal coordination between academics teaching in the same programme. It can be concluded that student voice about their workload is not adequately considered as their feedback is not taken into consideration, which can be interpreted in light of the absence of a "paradigm shift" from staff-centred to student oriented approaches to the estimation of student workload.

Keywords: Alexandria University; Tuning Africa Project II; Credit Hour System; Student workload; Competence-based learning; higher education.

I. **Introduction**

The recognition that higher education is a major driver of economic competitiveness in the global knowledge economy has made its quality ever more important, and hence one of the most crucial challenges facing countries has been how to manage a rapidly growing higher education sector while maintaining its quality. In that respect, several countries all over the world have been trying to set credit systems and qualification frameworks which demonstrate students' academic progress or completion of their courses and degrees, facilitate student and staff mobility; improve transparency and mutual recognition between higher education institutions nationally and internationally.

The Course-Credit System or Credit Hour System, for instance, provided an effective means of measuring academic work for more than a century in the United States of America and has been successful in providing accountability, mobility, and regulation for a mass academic system.[1] In Europe, the European Credit Transfer System (ECTS) has been introduced in 1989 to promote comparability and compatibility, students and staff mobility, transparency and fairness to students and integrate European Higher Education Area (EHEA). It represents an approach to European learning and teaching which places the student at the centre of the educational process.[2] However, this is not the case for African higher

[1] Philip Altbach, "Measuring academic progress: the course-credit system in American higher education," *Higher Education Policy* 14 (2001): 37-44; Ayaka Noda, "How Do Credit Hours Assure the Quality of Higher Education? Time-Based vs. Competency-Based Debate" (CEAFJP Discussion Paper Series 16-05, Centre d'Etudes Avancées Franco-Japonais de Paris, 2016).

[2] "ECTS User's Guide," accessed September 10, 2016, https://ec.europa.eu/education/sites/education/files/ects-users-guide_en.pdf.

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education as there is no unified academic credit system shared by all African countries.

II. **Context and rationale for the study**

The study aims at investigating the perceptions of both academics and students on student workload in Credit Hour System at Faculty of Education — Alexandria University. The rationale for conducting this study is that there is no academic credit system shared by all African countries. Moreover, many higher education institutions in the African continent are still rather unfamiliar with a credit system purported to support curricular change and lead the shift towards a student-centred and competence-based higher education.[3]

During the second general meeting of Tuning Africa Project — II, a method was defined for estimating student workload using a questionnaire survey. There has been a call to develop a country report on Credit System in each of the African countries.[4] In response to this call, Alexandria University — as a Tuning member — has started surveying both academics and students on student workload in the programme "Professional Diploma in Education entitled: Quality of Educational Systems and Academic Accreditation" at Faculty of Education. This programme is being revised to be compatible with Tuning methodology and competence-based learning. The survey of student workload has been administered to academics and students in that programme.

Credit Hour System has been in place in the Faculty of Education, Alexandria University, since 2009.[5] It is implemented at the graduate level whereas the undergraduate level still follows the traditional system (One year composed of two semesters, each semester includes different courses rather than credits). The implementation of the Credit Hour System in Egypt varies from one university to another and at the same university from one faculty to another.

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[3] "What is Tuning Africa?," Tuning Africa — II, accessed March 20, 2016, http://tuningafrica.org/en/what-is-tuning-africa.

[4] "Tuning Africa II. Second general meeting. Addis Ababa, 29 February — 2 March," accessed March 20, 2016, http://tuningafrica.org/upload/evento/editor/doc/2/booklet_teacher-education_english.pdf.

[5] Supreme Council of Universities — Sector Committee for Education, *Student Guide for postgraduate studies according to Credit Hour System* (Alexandria: El Gomhoreya Press, 2010).

However, it might be noted that there is a misnaming of what is called Credit Hour System. Actually, what is applied is a *teaching hour system* focusing on Contact Hours[6] and has nothing to do with the real hours of independent work needed by a student to pass a course or module and be able to localize and process the information received, internalize, reflect and construct their own meanings to transform this information into knowledge and mobilize and contextualize this knowledge in simulated situations or practices that permit the consolidation of learning.[7] Thus, student workload is not currently taken into account at Faculty of Education — Alexandria University.

There are three different kinds of institutions of Teacher Education in Egypt: Faculties of Education (29), Faculties of Kindergarten (9) and Faculties of Specific Education (17). Credit Hour System is not adopted nationwide as some faculties adopt it whereas others follow the traditional system, the course based system. Those faculties adopting Credit Hour System implement it at graduate level whereas undergraduate level programmes adopt the traditional system. Moreover, there are variations between those different kinds of faculties in adopting Credit Hour System, as mentioned above. Accordingly, an effort has been launched by Sector Committee for Education[8] which has been approved by Supreme Council of Universities (SCU),[9] entitled: "Student Guide for post graduate studies according to Credit Hour System" to minimize such variations.[10]

In general, duration of an academic hour at Alexandria University, for all programmes at different departments, is equivalent to 60 minutes. 1 *Credit Hour* is a measuring unit for deciding the weight of each course in the semester, where it equals:

- 1 hour of theoretical lecture per week
- or 2 hours of practical work or laboratory work per week
- or 4 hours of field work per week across the whole semester

The number of *Credit Hours* per year differs from one programme to another. As far as the programme of "Professional Diploma in Education

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[6] Contact Hours represent the amount of time spent on face to face teaching in a particular unit/course/module (including lectures, seminars, clinical practices, supervised labs, project work and field work) as well as on-line interaction in the framework of a learning module and personal counseling.

[7] "What is Tuning Africa?," Tuning Africa — II.

[8] The Education Sector Committee is the entity responsible for discussing all issues related to Faculties of Education and giving its recommendations to SCU.

[9] The entity responsible for regulation of higher education at the national level.

[10] Supreme Council of Universities, *Student Guide for postgraduate studies*.

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entitled**:** Quality of Educational Systems and Academic Accreditation" is concerned, number of *Credit Hours* per year is 22 (22 *contact hours*: nine compulsory courses (two hours each) and four elective ones, two of which can be chosen and studied across two semesters). Since the courses are split into two semesters, the number of *contact hours* per week in each of the two semesters is respectively 12 and 10 as indicated in Table 1. According to the regulations of Credit Hour System at Alexandria University, the semester is composed of 16 weeks: 14 weeks of contact between academics and students and two weeks for oral and written exams.[11]

Table 1

Compulsory and Elective Courses in "Professional Diploma in Education entitled: Quality of Educational Systems and Academic Accreditation"

First Semester: Fall		
Code	Course title	Credit Hour
Compulsory courses		
1.	Conceptual Introduction to Quality	2
2.	Philosophy of Academic Accreditation	2
4.	Educational Research	2
6.	Professional Development and Educational Quality	2
8.	Preparing Students for Knowledge Society	2
Elective Courses		
10.	Readings in Quality Assurance and Academic Accreditation	2
12.	Standards of Implementing Quality Management in Education	2
Second Semester: Spring		
Code	Course title	Credit Hour
Compulsory courses		
3.	Quality Assurance Management in Education	2
5.	Assessment of Quality in Educational Institutions	2

[11] Ibid., 49.

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Second Semester: Spring		
Code	Course title	Credit Hour
7.	Approaches to School Enhancement	2
9.	Preparing Educational Institutions for Knowledge Society	2
Elective Courses		
11.	World Trends in Quality Assurance Systems	2
13.	Social and Cultural Aspects of Quality Assurance	2

Having stated that the programme of "Professional Diploma in Education entitled: Quality of Educational Systems and Academic Accreditation" is composed of 22 *Credit Hours* per year split into two semesters, 12 and 10 respectively, it should be noted that courses from N. 1 to N. 9 are compulsory courses whereas courses from N. 10 to N. 13 are elective ones as indicated in Table 1.

Since there are four elective courses, two of which can be chosen and studied across two semesters, it was expected that there would be diversity among students in choosing elective courses but this was not the case. Due to the fact that the number of students in that Diploma is limited (15 students) and that they are graduated almost from the same programme, they tend to agree upon choosing a certain elective course in each semester. This is a common phenomenon in most postgraduate programmes at Faculty of Education, where the number of students is limited. In the academic year where this investigation was conducted, all students agreed upon choosing elective course No. 10 "Readings in Quality Assurance and Academic Accreditation" in the first semester and elective course No.11 "World Trends in Quality Assurance Systems" in the second semester. Moreover, according to the postgraduate bylaw at Faculty of Education, each elective course should be assigned to one academic as there are not enough academics to assign more than one for each elective course due to academics' heavy workload.

The number of *Credit Hours* used for different levels (Diploma, Master, Ph.D.) is variable. As far as Faculty of Education — Alexandria University is concerned; there are five different graduate programmes:[12]

[12] Ibid., 25-37.

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- **General Diploma in Education**: one-year programme for none-education graduates — graduates who have qualifications other than Education Studies — and would like to work as teachers to be equivalent to education graduates. Graduates of this programme are awarded the degree of "General Diploma in Education". They are eligible to teach in both middle and secondary schools. General Diploma is *30 Credit Hours* (30 *contact hours*: 28 compulsory and 2 elective).

- **Professional Diploma in Education:** one-year programme for education graduates and holders of the degree of General Diploma in Education, where students start to specialize in a chosen discipline. It is *22 Credit Hours* (22 *contact hours*: 18 compulsory and 4 elective).

- **Special Diploma in Education:** one-year programme for *holders of Professional Diploma in Education to pursue advanced levels in the chosen the specialization. It is 24 Credit Hours* (24 *contact hours*: 18 compulsory and 6 elective).

- **MA in Education:** One-year programme composed of *32 Credit Hours* (32 *contact hours* divided into 24 hours for courses and 8 hours for thesis writing upon the completion of the required courses). As far as courses are concerned, they differ from one department to another and from one programme to another. In general, two courses are elective whereas the rest is compulsory.

- **Ph.D. in Education:** One-year programme composed of *42 Credit Hours* (42 *contact hours* divided into 21 hours for courses and 21 hours for thesis writing upon the completion of the required courses). The 21 *contact hours* cover a group of courses. The number of courses differs from one department to another and from one programme to another. In general, two courses are elective whereas the rest is compulsory.

The way *Credit Hours* are allocated to a degree programme is usually regulated by the Supreme Council of Universities (SCU) for Education studies upon recommendations of the Education Sector Committee.[13] It is worth noting that this stage is followed by consultations at departmental levels at each Faculty to decide the allocation of credits and courses.

[13] "Responsibilities of the SCU," accessed March 1, 2016, http://portal.scu.eun.eg/Responsiblities.html.

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At the national level, Alexandria University wishes to have a unified Credit Hour System which could facilitate student mobility from a university to another in Egypt. At the continental level, Alexandria University aims to have a *Credit System* which is comparable to other African universities to facilitate harmonization process and student mobility within the continent. This issue is of paramount importance when bearing in mind that Cairo University has a branch in Sudan whereas Alexandria University has a branch in South Sudan[14] and a branch under construction in Republic of Chad and is planning to have branches in other African countries.[15]

The main aim of this study, therefore, is to use the wider international experience of higher education reform, including Tuning Africa Project — II, to propose implications for policy and practice on how the real hours of work needed by a student to achieve the learning outcomes specified in the curriculum and pass a course or module are adequately estimated and to contribute to the definition of the basis of a *Credit System* for Africa. This aim can be achieved through addressing the following research questions:

1. What are the perceptions of academics on student workload in Credit Hour System in the revised programme at Alexandria University?
2. What are the perceptions of students on their workload in Credit Hour System in the revised programme at Alexandria University?
3. What are the foreseeable implications — according to study findings — for policy and practice?

III. Student Workload in Higher Education programmes: the Tuning Approach

While some less widely used credit systems are based on various criteria such as the importance of a subject or the number of contact hours in a course; the European Credit Transfer and Accumulation System (ECTS)[16] — the most commonly used basis for measuring student workload

[14] "Alexandria University's Branch in Sudan," accessed June 1, 2016, http://www.portal.alexu.edu.eg/index.php/en/about-au/branches/south-sudan-2.

[15] "Alexandria University's Branch in Republic of Chad," accessed June 1, 2016, http://www.portal.alexu.edu.eg/index.php/en/about-au/branches/chad.

[16] "ECTS User's Guide."

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in European higher education — describe only student workload in terms of time employed to complete a course or a course unit. ECTS was instituted in 1989, within the Erasmus programme, as a way of transferring credits that students earned during their studies abroad into credits that counted towards their degree, on their return to studying in their home institution. It represents an approach to European learning and teaching which places the student at the centre of the educational process. ECTS is a central tool in the Bologna Process for promoting comparability and compatibility, student and staff mobility, transparency and fairness to students in European Higher Education.[17]

Student workload in ECTS consists of the time required to complete all planned learning activities such as attending lectures, seminars, independent and private study, placements, preparation of projects, examinations, and so forth. It was agreed that one regular year of student work is equivalent to 60 ECTS credits, in any degree course at any level (either undergraduate or postgraduate). On the average, according to several surveys, this corresponds to 1500 hours of annual student's workload, i.e. 1 ECTS credit is equal — again on the average — to 25 hours of student workload. Credits are allocated to all educational components of a study programme (such as modules, course units, etc.) and reflect the quantity of work each component requires to achieve its specific objectives or learning outcomes in relation to the total quantity of work necessary to complete a full year of study successfully. Approaches to teaching, learning and assessment have an impact on the workload required to achieve the desired learning outcomes and, consequently, on credit allocation.[18]

The Tuning Approach for determining student workload in Higher Education programmes consists of four steps as shown in Figure 1 (see next page).[19]

First, *introducing modules/course units*. A choice must be made between the use of a modularized or a non-modularized system. In a non-modularized system each course unit can have a different number of credits although the total credits for each academic year will still be 60 credits. In a modularized system, the course units/modules have a fixed number of credits, 5 credits for

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[17] Robert Wagenaar, "Educational structures, learning outcomes, workload and the calculation of ECTS credits," in *Tuning Educational Structures in Europe. Universities' contribution to the Bologna Process. An introduction*, 2nd ed., ed. Julia González and Robert Wagenaar (Bilbao: University of Deusto Press, 2008).

[18] Julia González and Robert Wagenaar, eds., *Tuning Educational Structures in Europe II. Universities' Contribution to the Bologna Process* (Bilbao: University of Deusto Press, 2005), 158-160.

[19] González and Wagenaar, eds., *Tuning Educational Structures in Europe II,* 163-166.

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example, or a multiple of this number. The use of a modularized system in an institution facilitates the use of the same modules by students enrolled in different programmes.

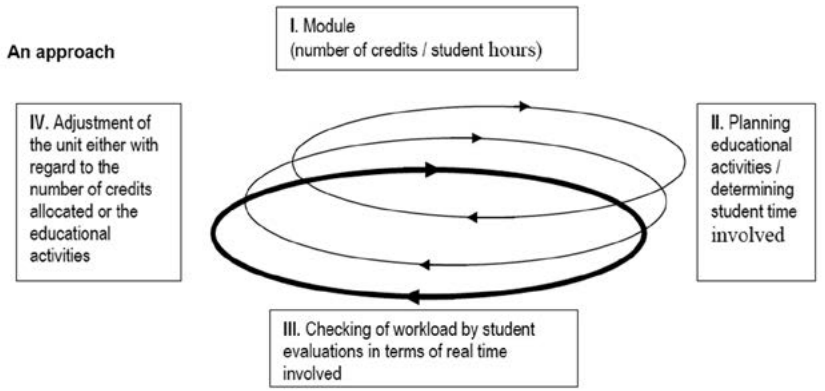

Figure 1

Tuning Approach for determining student workload in Higher Education Programmes

Second, *estimating student workload*. The workload of a module/course unit is based on the total amount of learning activities a student is expected to complete in order to achieve the foreseen learning outcomes. It is measured in time (in work hours); for example, a module of 5 credits allows for around 125-150 hours of work of a typical student. Educational activities can be defined by considering several aspects such as: modes of instruction; types of learning activities; and types of assessment.

Third, *checking the estimated workload through student evaluations*. There are different methods to check whether the estimated student workload is correct. The most common method is the use of questionnaires to be completed by students, either during the learning process or after the completion of the course.

Fourth, *Adjustment of workload and/or educational activities*. An adjustment of workload and/or activities is required when the monitoring process reveals that the estimated student workload does not correspond to the actual workload.

It is worth noting that the process of planning educational activities/ estimating student workload; checking the estimated workload through student evaluations; and adjustment of workload and/or educational activities

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is a continuous process, which keeps students at the centre of the educational process.

IV. **Research design and procedures**

The study is located within a broadly interpretive methodology, using a case study approach with questionnaires on student workload administered to academics and students at Faculty of Education — Alexandria University as the main method of data collection, utilizing qualitative and quantitative data and approaches in all its components. It is worth noting that the study has used the same questionnaires for student workload, which were developed in Tuning Africa Project — II.

The interpretive methodology is viewed as suitable as it is believed that there are multiple interpretations of, and perspectives on, single events and situations (student workload) and that reality is multilayered and complex. An interpretive approach is primarily concerned with human understanding, interpretation and intersubjectivity, in essence lived experience or lived truth in its natural social context from the standpoint of individuals who are part of the ongoing action being investigated.[20] However, precautions have been taken to overcome the risk of bias and subjectivity.[21] These include data triangulation (through gathering multiple viewpoints: academics and students) and cross-referencing cases within the sample together with other precautions to enhance validity and reliability and ensure rigour of the findings that will be discussed later in the study.

This study is a detailed investigation of the perceptions of academics and students of Faculty of Education, Alexandria University — as a case study — on student workload. Questionnaires were administered to academics and students with a view to an analysis of the context and processes involved in the phenomenon under study. The selected cases have enabled the researcher to develop detailed knowledge of the experience of participants on student workload at Alexandria University and an examination of the strengths and weaknesses of existing system, leading to an identification of implications for policy and practice for enhancing the quality of Teacher Education Programmes in Egyptian higher education.

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[20] Noella Mackenzie and Sally Knipe, "Research Dilemmas: Paradigms, Methods and Methodology," *Issues In Educational Research* 16, no. 2 (2006): 193-205.

[21] Norman K. Denzin and Yvonna S. Lincoln, *Handbook of Qualitative Research* (London: Sage, 2002).

A case study approach is viewed as suitable as case studies examine relationships between cause and effect but do not claim to establish a direct causal link. The strength of a case study is that it enables researchers to observe effects in real contexts, recognizing that context is a powerful determinant of both causes and effects. Another strength of the approach is that it provides fine-grain details[22] as means for seeing situations through the eyes of participants. They are widely used in organizational studies in the social sciences.[23] Lastly, the multiplicity of the variables and sources of evidence that characterize a case study inquiry are a holistic approach which investigates the case as a whole, recognizing its real-life context, rather than dealing with isolated factors.[24]

A mixed sample of academics and students was approached for two main reasons. Firstly, to avoid a methodological problem concerning the possibility of academics having an interest in creating a successful image of the programmes provided at their faculties to show a good impression of their own effort.[25] Secondly, having a mixed sample allows for triangulating the data through comparing the perceptions of participants on issues under investigation.

The total sample of this investigation is 26 split into 11 academics (one academic per course) and 15 students who have been investigated 11 times for their perceptions on student workload across 11 courses of the Diploma (15 students surveyed 11 times once for each course of the Diploma under investigation, that is, 165 surveys/cases: 11 surveys for each student).

The survey process has been conducted in two stages. The first stage took place after the final assessment of the first semester was finished and the results were announced; both academics and students were asked about their perceptions on student workload across the six courses of the first semester. The second stage took place after the final assessment of the second semester was finished and the results were announced; both academics and students

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[22] Louis Cohen et al., *Research Methods in Education*, 6th ed. (London: Routledge, 2007).

[23] Christine Benedichte Meyer, "A Case in Case Study Methodology," *Field Methods* 13, no. 4 (2001): 329-325.

[24] Robert K. Yin, *Case Study Research: Design and Methods*, 3rd ed. (London: SAGE, 2003).

[25] Bjrn Stensaker, "Trance, Transparency and Transformation: the impact of external quality monitoring on higher education," *Quality in Higher Education* 9, no. 2 (2003): 151-159; Viktoria Kis, "Quality Assurance in Tertiary Education: Current Practices in OECD Countries and a Literature Review on Potential Effects" (paper presented as a contribution to the OECD Thematic Review of Tertiary Education, 2005), accessed July, 1 2012, http://www.oecd.org/dataoecd/55/30/38006910.pdf.

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were asked about their perceptions on student workload across the five courses of the second semester. Having given these details, it is clear that the time at which the survey was conducted is chosen consistently with what is asked for in the questionnaires, especially question 11-f (the estimated number of hours needed for preparing for summative assessment), which is feasible for all participants. Before filling out the questionnaire, a brief background was given to academics and students about the aim of the study and they were well-informed that the collected data would be totally anonymous and confidential. All questions of the survey were answered by all respondents.

V. **Findings and discussion**

Overall, it is striking to note that students' estimation of the number of hours needed to complete the independent work across all courses during the semester were much higher than that of academics except for fieldwork (site visits) where academics' estimations came higher than those of students. Table 2 and Figure 2 show the differences between the perceptions of both students and academics concerning the estimation of student workload across different courses of the Professional Diploma in Education.

Table 2

Students and Academics' perceptions on the estimation of student workload

No.	Survey Questions	Count		Mean		Median		Percentile 25		Percentile 75		Standard Deviation	
		Students	Academics	Students	Academics	Students	Academics	Students	Academics	Students	Academics	Students	Academics
10-	How many CONTACT HOURS in total are there in your unit/course/ module during the SEMESTER?	165	11	28.0	28.0	28	28	28	28	28	28	.00	.00
11-a	Reading materials (including internet search)	165	11	19.0	10.3	15	10	10	7	28	14	13.34	3.98

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No.	Survey Questions	Count		Mean		Median		Percentile 25		Percentile 75		Standard Deviation	
		Students	Academics	Students	Academics	Students	Academics	Students	Academics	Students	Academics	Students	Academics
11-b	Fieldwork (site visits, etc.)	165	11	.2	1.8	0	0	0	0	0	0	1.72	6.03
11-c	Laboratory work (not counting in contact hours)	165	11	.0	.0	0	0	0	0	0	0	.00	.00
11-d	Preparation of assignments	165	11	17.9	10.0	15	14	10	6	28	14	13.02	5.14
11-e	Preparation and follow- up work for scheduled	165	11	14.6	9.7	14	14	14	5	18	14	8.93	5.24
11-f	Preparation for assessment, final examinations, tests, etc. (summative assessment)	165	11	38.1	23.6	35	28	30	12	42	30	16.64	8.43
11-g	Other	165	11	.1	.0	0	0	0	0	0	0	.66	.00
12	How many hours does an AVERAGE student need to complete all the requirements in this SEMESTER	165	11	118	83	116	77	88	58	139	100	37	22.10
13	How many hours does an AVERAGE student need to complete all the requirements per WEEK	165	11	8	6	8	5	6	4	10	7	3	1.49
TOTAL INDEPENDENT WORKLOAD per Course				89.9	55.45	RATIO Academics over Students = **61.69%**							
TOTAL INDEPENDENT WORKLOAD per year				988.8	610								

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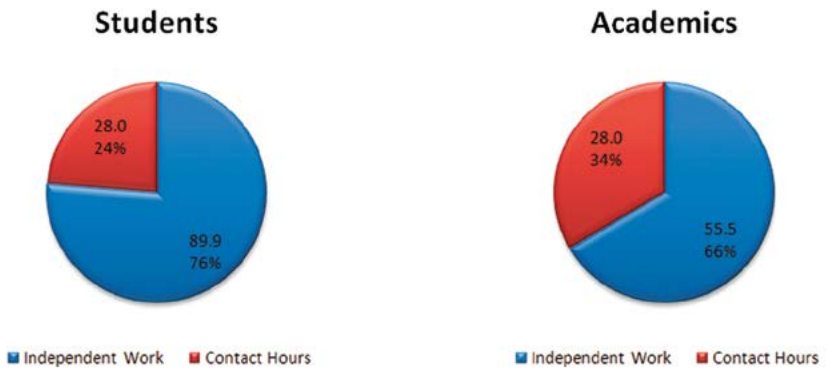

Figure 2

Students and Academics' perceptions on the estimation of student workload

It is clear from Table 2 and Figure 2 that the total number of Contact Hours of a given course unit is the same (28 hours) for both academics and students as according to the regulations of Credit Hour System at Alexandria University concerning the Diploma under investigation, the semester is composed of 16 weeks: 14 weeks of contact between academics and students — two hours each — and two weeks for oral and written exams. It is also clear that both academics and students gave no hours for laboratory work as the nature of this Professional Diploma in Education does not require any laboratory work. The questionnaire is consisted of 15 points/questions and points 1 to 9 have been informed by the university so participants are invited to respond to the items 10-15 (See Annex I: Questionnaire for Academics; and Annex II: Questionnaire for Students).

It is prominent to note that students' estimation of the number of hours needed for "reading materials (including internet search) and preparation of assignments" was almost double the number of hours estimated by academics.

It is also clear that students' estimation of the number of hours needed for "preparation and follow-up work for scheduled classes and preparation for assessment, final examinations, tests, etc." was almost one times and a half the number of hours estimated by academics.

On the other hand, academics' estimation of the number of hours needed for "fieldwork (site visits)" was much higher than students' estimation. When students were asked to add any other ways of learning they used that are not included in the survey, only 2 out of 165 cases mentioned site visits to both accredited schools and none-accredited schools to meet teachers,

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head teachers and students. They also mentioned site visits to the National Authority of Quality Assurance and Accreditation in Education (NAQAAE) to meet people in charge of applying quality assurance systems in education in Egypt.

The above results in Table 2 indicate that there is a significant gap between the perceptions of academics and students on student workload in Credit Hour System at Alexandria University, where students' estimation of the number of hours needed to complete independent work were much higher (89.9 hours per course) than those of academics (55.45 hours per course). The figures in Table 2 also indicate that the independent workload as estimated by academics is 62% of students' estimation.

A significant gap between the perceptions of academics and students was also found in their responses to Questions N. 14 and N. 15 of the survey as shown in Table 3 and Figure 3. Question N. 14 asked academics if they have estimated the hours students will have to spend on independent work when planning their courses and asked students, on the other hand, if they were informed about the number of hours planned for independent work at the beginning of the course. Question N. 15 asked academics if they took students' feedback on workload into consideration when planning the workload for their courses and asked students, on the other hand, if they were given the opportunity to provide feedback about the workload in the course.

It has been observed that 82% of academics have estimated the hours students will have to spend on independent work when planning their courses. However, only 36.4% of those academics have taken students' feedback on workload into consideration when planning the workload for their courses whereas the other 63.6% never took students' feedback on workload into consideration as shown in Table 3 and Figure 3.

On the other hand, it was found that 92% of students were *not* informed about the number of hours planned for independent work at the beginning of the course. In addition, 88% of students were *not* given the opportunity to express their feedback about the workload in the courses of the diploma.

Table 3

Responses of Academics and Students to Questions N. 14 and N. 15

	Q.14		Q.15	
Academics	Yes	No	Yes	No
	81.8%	18.2%	36.4%	63.6%
Students	7.9%	92.1%	12.1%	87.9%

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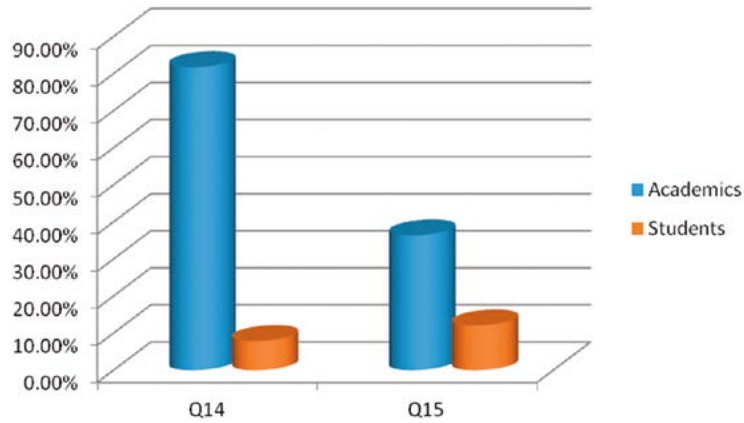

Figure 3

Responses of Academics and Students to Questions N. 14 and N. 15.

These findings indicate that there are no unified regulations among academics for the estimation/allocation of student workload. It is also made clear that the process of estimating student workload in Credit Hour System at Alexandria University is staff-centred rather than student oriented as the majority of academics follow traditional methodologies in their estimation of student workload. It can be concluded that student voice about their workload is not adequately considered as their feedback is not taken into consideration.

Concerning these findings, the Tuning approach for determining student workload in Higher Education programmes offers two forms that can be helpful in informing students about the number of hours planned for independent work at the beginning of the course, taking their feedback and making decisions on adjustment of the student workload accordingly. The first form is for academics to plan the educational module and estimate the student working hours involved. The second is for the student to indicate the actual amount of time spent on the module, thus providing an opportunity to check whether the estimated workload corresponds to reality. Students are given the form completed by the teacher where only the estimated workload is not shown. By using these forms both academics and students become aware of the learning outcomes, their relationship to the competences being developed and the average student time involved for each of the tasks.[26]

[26] González and Wagenaar, eds., *Tuning Educational Structures in Europe II*, 163-166.

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Having found a marked gap between the perceptions of academics and students concerning the estimation of student workload across different courses of the Professional Diploma in Education, different statistical tests have been used to decide the significance of such findings. Two tests of normality (Kolmogorov-Smirnov and Shapiro-Wilk) have been used to check the normality of the data and it was found that none of the variables distribute normally as the sample of this study is a paired/dependent sample (i.e. both academics and students were surveyed for their perceptions on student workload and the same students were asked the same questions on each course of the diploma).[27] So, there was a need for non-parametric tests. Thus, two non-parametric tests (Wilcoxon Signed Ranks Test and Friedman Test) have been used.[28] A significance level $\alpha\% = 5\%$ was adopted for all tests.

As stated before, the total number of the sample is 26 split into 11 academics (one academic for each course) and 15 students (each student surveyed 11 times on his/her perceptions on student workload across all courses of the Diploma, that is 165 questionnaires/cases). This explains why Wilcoxon and Friedman Tests were used. Wilcoxon Test was used as there are two related/dependent samples, academics and students. Friedman Test was used as the same 15 students have been asked 11 times (repeated measures/several related samples) about their perceptions on workload across all courses of the diploma.

Wilcoxon Signed Ranks Test has been used to check if there are significant differences (at a significance level $\alpha\% = 5\%$) between the perceptions of students and academics concerning the estimation of student workload across different courses of the Professional Diploma in Education as shown in Table 4 (see next page).

Wilcoxon Signed-Ranks Test also considers information about both the sign of the differences and the magnitude of the differences between pairs, academics and students. Here are the Null and Alternate Hypotheses which were tested using Wilcoxon Test.

H_o: (Academics Perceptions – Students Perceptions) = 0
H_1: (Academics Perceptions – Students Perceptions) ≠ 0

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[27] Gerard Dallal and Leland Wilkinson, "An analytic approximation to the distribution of Lilliefor's test statistic for normality," *The American Statistician* 40, no. 4 (1986): 294-296 (Correction: 41: 248).

[28] Sidney Siegel and John Castellan, *Nonparametric statistics for the behavioral sciences* (New York: McGraw-Hill, Inc., 1988).

Table 4

The differences between the perceptions of students and academics concerning the estimation of student workload across different courses of the Professional Diploma in Education Using Wilcoxon Signed Ranks Test

Survey Questions \ Courses	Test Statistics	Course 1	Course 2	Course 3	Course 4	Course 5	Course 6	Course 7	Course 8	Course 9	Course 10	Course 11
11-a) Reading materials (including internet search)	Z	-2.498	-1.911	-2.111	-3.38	-3.87	-2.81	-2.644	-0.904	-3.243	-3.304	-3.367
	Asymp. Sig.	.012	.056	.035	.001	.000	.005	.008	.366	.001	.001	.001
11-b) Fieldwork (site visits, etc.)	Z	0.000	0.000	0.000	0.000	0.000	-1.000	0.000	0.000	0.000	0.000	-3.690
	Asymp. Sig.	1.000	1.000	1.000	1.000	1.000	.317	1.000	1.000	1.000	1.000	0.000
11-d) Preparation of assignments	Z	-1.352	-1.481	-3.238	-3.87	-3.87	-2.85	-2.965	-3.308	-3.41	-2.793	-3.204
	Asymp. Sig.	.176	.139	.001	.000	.000	.004	.003	.001	.001	.005	.001
11-e) Preparation and follow- up work for scheduled	Z	-2.043	-2.207	-2.333	-1.84	-3.4	-0.52	-2.49	-2.375	-2.798	-0.213	-0.828
	Asymp. Sig.	.041	.027	.020	.065	.001	.600	.013	.018	.005	.832	.408
11-f) Preparation for assessment, final examinations, tests, etc. (summative assessment)	Z	-0.74	-2.556	-3.302	-3.42	-3.42	-0.81	-2.018	-2.836	-2.804	-3.414	-2.312
	Asymp. Sig.	.459	.011	.001	.001	.001	.420	.044	.005	.005	.001	.021
11-g) Other	Z	-1.000	-1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Asymp. Sig.	.317	.317	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12- How many hours does an AVERAGE student need to complete all the requirements in this SEMESTER	Z	-2.386	-2.637	-3.411	-3.41	-3.3	-2.96	-3.068	-3.408	-3.352	-3.17	-2.784
	Asymp. Sig.	.017	.008	.001	.001	.001	.003	.002	.001	.001	.002	.005
13- How many hours does an AVERAGE student need to complete all the requirements per WEEK	Z	-2.509	-2.812	-3.468	-3.22	-3.41	-3.1	-3.09	-2.95	-3.315	-3.246	-3.134
	Asymp. Sig.	.012	.005	.001	.001	.001	.002	.002	.003	.001	.001	.002

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The above highlighted cells in the table show significant differences between the perceptions of academics and students on student workload almost across all courses of the Professional Diploma in Education. The negative sign of "Z" test shows that the estimation of student workload from the point of view of students were always higher than those of academics almost across all courses of the Professional Diploma in Education.

Concerning *the number of hours an AVERAGE student needs to complete all the requirements during the SEMESTER and per week*, it is clear that there are significant differences between the perceptions of academics and students across all courses of the Professional Diploma in Education.

Concerning *reading materials*, it is clear that there are significant differences between the perceptions of academics and students across all courses of the Professional Diploma in Education except courses (N. 2 "Philosophy of Academic Accreditation" & N. 8 "Preparing Students for Knowledge Society") as shown in Table 1.

Concerning *preparation of assignments*, it is clear that there are significant differences between the perceptions of academics and students across all courses of the Professional Diploma in Education except courses (N. 1 & N. 2).

Concerning *preparation for assessment, final examination, tests, etc. (summative assessment)* it is clear that there are significant differences between the perceptions of academics and students across all courses of the Professional Diploma in Education except courses (N. 1 & N. 6).

Concerning *preparation and follow-up work for scheduled classes*, it is clear that there are significant differences between the perceptions of academics and students across all courses of the Professional Diploma in Education except courses (N. 4 & N. 6 & N. 10 & N. 11).

Concerning *fieldwork (site visits, etc.)*, it is clear that there are significant differences between the perceptions of academics and students at only one course (course N. 11). The data shows that this is the only course where the academic asked his students to make use of fieldwork (site visits).

These findings lead us to reject the Null Hypothesis and accept the Alternate Hypothesis as Wilcoxon Signed Ranks Test has proved that there are significant differences between the perceptions of students and academics concerning the estimation of student workload across different courses of the Professional Diploma in Education.

Friedman Test has been used to check if there are significant differences (at a significance level $\alpha\% = 5\%$) between the perceptions of students on the number of hours required for each different type of independent work across all courses of the Professional Diploma in Education as shown in Table 5.

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Table 5

The perceptions of students on the number of hours required for each different type of independent work across all courses of the Professional Diploma in Education

Using Friedman Test

No.	Survey Questions \ Courses	Students Mean											Row Averages		Friedman Test	
		Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Subject 7	Subject 8	Subject 9	Subject 10	Subject 11			Chi-Square	Asymp. Sig
10	How many CONTACT HOURS in total are there in your unit/ course/module during the SEMESTER?	28	28	28	28	28	28	28	28	28	28	28	28.00			
11-a	Reading materials (including internet search)	25.47	19.6	15.6	13.3	0	11.6	21.47	20.13	25.87	23.07	32.87	19.00	76.474	.000	
11-b	Fieldwork (site visits, etc.)	0	0	0	0	0	0.67	0	0	0	0	1.87	0.23	15.333	0.12	
11-d	Preparation of assignments	18.6	20.4	15.47	0	0	12.9	24.07	27.53	25.33	23.8	28.33	17.86	96.17	0.000	
11-e	Preparation and follow- up work for scheduled	19.47	18.93	5.87	6.93	16.4	8.8	20.53	20.53	14.53	14.27	14.8	14.64	66.004	0.000	
11-f	Preparation for assessment, final examinations, tests, etc. (summative assessment).	43.47	44.47	43.27	33.9	34.8	31.8	35.27	40.47	40.33	35.4	35.87	38.10	17.752	0.059	
11-g	Other	0.4	0.4	0	0	0	0	0	0	0	0	0	0.07	10.00	0.440	

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Table 5 (continued from preceding page)

The perceptions of students on the number of hours required for each different type of independent work across all courses of the Professional Diploma in Education

Using Friedman Test

No.	Courses / Survey Questions	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6	Subject 7	Subject 8	Subject 9	Subject 10	Subject 11	Row Averages	Friedman Test	
		Students Mean												Chi-Square	Asymp. Sig
12	How many hours does an AVERAGE student need to complete all the requirements in this SEMESTER	135.40	131.80	108.20	82.13	79.20	93.73	129.33	136.67	134.07	124.53	141.73	117.89	81.345	0.000
13	How many hours does an AVERAGE student need to complete all the requirements per WEEK	9.8	9.33	7.67	5.73	5.67	6.73	9.07	9.73	9.47	8.87	9.93	8.36	83.534	0.000
TOTAL INDEPENDENT Workload per Course		107.41	103.8	80.21	54.13	51.2	65.77	101.34	108.66	106.06	96.54	113.74	89.9		
Hours of INDEPENDENT Workload needed per each contact hour		3.84	3.71	2.86	1.93	1.83	2.35	3.62	3.88	3.79	3.45	4.06	3.21		
TOTAL WORKLOAD per year = 1296.79								**STUDY/ COMMITTMENT HOURS per week = 46.00**							

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Friedman tests the Null hypothesis that k related variables come from the same population. For each case, the k variables are ranked from 1 to k. Here are the Null and Alternate Hypotheses which were tested using Friedman Test.

H_o: *The perceptions of students are equal in all samples.*

H_1: *At least one of the perceptions of students is different (drawn from different population).*

The above highlighted cells in Table 5 indicate significant differences between the perceptions of students on the number of hours required for each different type of independent work across different courses.

It is clear that there are significant differences between the perceptions of students on the number of hours required for each different type of independent work across different courses, with the highest average of estimations of the number of hours was given to course N. 11 "*World Trends in Quality Assurance Systems*", whereas the lowest average was given to course N. 5 "*Assessment of Quality in Educational Institutions*" across all different types of independent work except "*preparation and follow-up work for scheduled classes*".

Concerning "reading material*"*, the highest average was given to course N. 11 (32.87), whereas the lowest average was given to course N. 5 (0). Concerning "preparation of assignments*"*, the highest average was given to course N. 11 (28.33), whereas the lowest average was given to courses N. 4 "*Educational Research*" and N. 5 (0 and 0). Concerning *"the number of hours an average student needs to complete all the requirements across the semester"*, the highest average was given to course N. 11 (141.7), whereas the lowest average was given to course N. 5 (79.3). Concerning "*the number of hours an average student needs to complete all the requirements per week"*, the highest average was given to course N. 11 (9.93), whereas the lowest average was given to course N. 5 (5.67). As for "preparation and follow-up work for scheduled classes", the highest average was given to courses N. 7 "*Approaches to School Enhancement*" and N. 8 "*Preparing Students for Knowledge Society*" (20.53), whereas the lowest average was given to courses N. 3 "*Quality Assurance Management in Education*" and N. 4 (5.87 and 6.93 consecutively).

These findings lead us to reject the Null Hypothesis and accept the Alternate Hypothesis as Friedman Test has proved that there are significant differences between the perceptions of students on the number of hours required for each different type of independent work across all courses of the Professional Diploma in Education.

Looking at the internal consistency of students' estimation of independent work hours required for one contact hour across courses of the Diploma as shown in the last row of Table 5, there is an obvious heterogeneity in the data. The estimated number of independent work hours required to the students for one contact hour ranges from 1.83 to 4.06 hours with an average of 3.21 of independent work hours required for each contact hour. This finding indicates that — according to students — some courses require more independent workload than others. For instance, whereas students need to spend 4 hours of independent work for one contact hour in course N. 11, they spend less than 2 hours of independent work for one contact hour in courses N. 4 and N. 5. This means that Course N. 11 requires double the number of hours of independent work required to Courses N. 4 & N. 5. As shown previously in Table 2, the independent workload as estimated by academics was 62% of students' estimation. This implies that the number of hours for independent workload as estimated by academics is — on the average — only 2.0 for one contact hour whereas the number of hours for independent work as estimated by students is — as an average — 3.21 for each contact hour, even though it ranges from 1.83 to 4.06 hours according to the given course. These findings can be very useful in the collegial discussions within the group of academics teaching in that Professional Diploma in Education to allow them the opportunity to discuss and negotiate one of the most important parameters about Credit Systems.

A couple of key parameters in the comparative debate about Credit Systems, i.e. annual and weekly student workload, are shown in Table 6 which gives a summary of workload hours as perceived by students and academics. Moreover, the ECTS credits corresponding to the annual workload could be easily inferred from the first data row (students' data).

Table 6

A Summary of Workload Hours as perceived by Students and Academics

	WORKLOAD Hours as perceived by survey data	Contact Hours	Hours of independent work	Total
Students	**Annual Workload**	**308.00**	**988.86**	**1296.8**
	Workload per week (1st Semester, courses: **1,2,4,6,8,10**).	12.00	38.31	50.3
	Workload per week (2nd Semester, courses: **3,5,7,9,11**).	10.00	32.33	42.3
Academics	**Annual Workload**	**308.00**	**610.04**	**918.0**

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As a matter of fact, the students' data seem reasonable numbers (308 Contact Hours and 988.86 hours of independent work), even though the total annual workload (1296.8) is lower than the average point of several Tuning Europe surveys, which — as already stated above — is around a total of 1500 hours per year.[29] It can be argued that this lower number is clearly related to a shorter academic year duration of this particular degree-course, i.e. 28-32 weeks whereas in Europe for usual degree-courses, the duration of the academic year ranges from 34 to 40). Indeed, the number of hours per week in TABLE 6 turns out to be higher (42-50 hours per week) than the number usually accepted in Europe (40-42 hours per week). This latter finding might be due either to a more intense learning approach of the Programme itself or to a "*weak/excessive*" overestimation made by the students. In that respect, it should be noted that student workload is not currently taken into account at Faculty of Education — Alexandria University and that this was the first-hand experience for those students to be asked about their perceptions on student workload. Therefore, there is a possibility for improvement.

Again, for the sake of comparative and common debate, the data in Table 6 allow in principle the calculation of the number of hours corresponding to one ECTS credit, as defined in the European Higher Education Area. This can be simply done, dividing the total annual workload by 60. The students' data yield 21.6 hours whereas academics' data show that one ECTS credit equals 15.3 hours. This latter seems excessively low, when compared to the average of 25 hours corresponding to one ECTS credit in most European degree-courses.[30]

These findings, again, indicate that there are no unified regulations among academics for the estimation/allocation of student workload. It also shows that the process of estimating student workload in Credit Hour System at Alexandria University is staff-centred rather than student oriented. It is also indicated that there is marginal coordination between academics teaching in the same programme. This is made clear in Table 5 where the highest average of estimations of the number of hours was given to course N. 11 and the lowest average was given to course N. 4 across almost all different types of independent work.

VI. **Concluding remarks**

The main findings show significant gaps between the perceptions of academics and students on student workload almost across all courses of the

[29] González and Wagenaar, eds., *Tuning Educational Structures in Europe II*, 382.
[30] Ibid.

"Professional Diploma in Education" (the programme under investigation), where students' estimation of the number of hours needed to complete the independent work across all courses during the semester were much higher than that of academics except for fieldwork (site visits).

Significant differences were found between the perceptions of students on the number of hours required for each different type of independent work across different courses, with the highest average of estimations of the number of hours was given to course N. 11, whereas the lowest average was given to course N. 5 across all different types of independent work except "preparation and follow-up work for scheduled classes".

Only 36.4% of academics have taken students' feedback on workload into account when planning the workload for their courses. It was also found that 92% of students were not informed about the number of hours planned for independent work at the beginning of the course. In addition, 88% of students were not given the opportunity to express their feedback about workload.

These findings indicate that there are no unified regulations among academics to the estimation of student workload. It is also made clear that the process of estimating student workload in Credit Hour System at Alexandria University is staff-centred rather than student oriented as the majority of academics follow traditional methodologies in their estimation of student workload and 63.6% of academics never took students' feedback on workload into consideration when planning their courses. It is also enunciated clearly that there is marginal coordination between academics teaching in the same programme. It can be concluded that student voice about their workload is not adequately considered as their feedback is not taken into account, which can be interpreted in light of the absence of a "paradigm shift" from staff-centred to student oriented approaches to the estimation of student workload. Accordingly, there is a fundamental need for a way forward to highlight the needed paradigm shift.

VII. **The Way forward: implications for policy and practice**

Based on the analysis and discussion of key findings of the study and through the insights from a comparative perspective that can arise from a careful process of policy learning, this section draws out their emergent implications for policy and practice to enhance the process of determining student workload in Higher Education in Egypt, as indicated earlier in the third research question: "What are the foreseeable implications — according to study findings — for policy and practice?"

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There is an indication that effort and intentional strategies should be put in place to minimize the gaps between the perceptions of academics and students on student workload. This calls for the adoption of a "*paradigm shift*" from input and staff-centred programmes to output and student oriented ones. In order to achieve such a "*paradigm shift*", several actions concerning policy and practice should be promoted. Among them, the study proposes:

- There should be a unified Credit System which could facilitate student mobility from a university to another in Egypt and to provide transparency and fairness to students. It should be comparable to other African universities to facilitate the compatibility and harmonization process and student and staff mobility at the continental level.
- Moving from Credit (teaching) Hour System to a Credit System similar to ECTS where the focus is on the student workload required to achieve the objectives of a programme, objectives specified in terms of the learning outcomes and the required competences.
- There should be coordination and cooperation between academics teaching in the same programme in terms of determining student workload.
- Rethinking about the revised programme "Professional Diploma in Education entitled: Quality of Educational Systems and Academic Accreditation" taking into account the necessity of informing students about the number of hours planned for independent work at the beginning of the course, taking their feedback and making decisions on and adjustment of the student workload accordingly. Students' feedback at the beginning of the academic year would be difficult on the side of the students — who have not yet gone through the needed learning activity — but it would be relatively helpful as academics can do minor changes/ adjustments to their estimation of student workload. However, for this task to be done properly, academics have first to collect the data through the whole academic year since students can give feedback only after having gone throughout the whole process. At this point, academics can adjust/negotiate their estimates of student workload, which would be presented at the beginning of the new academic year. The study proposes using the two forms offered by the Tuning Approach for determining student workload in Higher Education programmes for that purpose.[31]
- Students, alongside academics, should have a crucial role in the monitoring process to determine whether the estimated student workload is realistic.

[31] González and Wagenaar, eds., *Tuning Educational Structures in Europe II,* 167-176.

Last, but not least, the proposed implications for Policy and Practice provided for the researcher's own university might be of relevance for other universities in Egypt and for other countries having similar educational context. Finally, working according to a new paradigm or coping with a new paradigm requires time and effort but the outcome would be worthwhile, hopefully in respect of enhancing the process of determining student workload in Egyptian higher education.

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About the Author

SAEED ALSHAMY (saeed.alshamy@edu.alexu.edu.eg; saeed.alshamy@gmail.com) is an assistant professor at Foundations of Education Department, Faculty of Education, Alexandria University, Egypt. He holds PGCE and PhD in Education from University of Birmingham (UK). His PhD dissertation mainly addresses global trends in funding mechanisms and quality assurance systems in higher education. His principal research interests include: educational policy, comparative and international education, funding mechanisms, quality assurance systems, assessment and evaluation in higher education, competence-based learning, educational research, educational leadership and change management.

Annexes

Annex I Questionnaire for Academics

Dear Colleague,

This study is part of the Tuning Africa II project. We are conducting a survey to estimate the workload of students by collecting information from **ACADEMICS** and **STUDENTS**. Please fill out the form and answer the questions in the unit/course/module which was taught by you during the last academic year. The collected data will be totally anonymous and confidential.

The project Tuning Africa II appreciates your collaboration in providing us with this information.

Instructions for completion:

Each University has informed Points 1-9 by 30 March 2016. You are invited to respond to the items 10-15. Please underline or circle one answer ("Yes" or "No"), if answer is "Yes" please specify the amount of time.

1. Subject area: _____
2. University: _____
3. Programme: _____
4. Semester/year[32]: _____
5. Unit/Course/Module: _____
6. Number of calendar weeks in the semester: _____
7. Academic hour in your university is _____ minutes.
8. Number of credits per year (if applicable): _____
9. Number of hours per credit (if applicable): _____

10.	How many **CONTACT HOURS**[33] in total are there in your unit/course/module during the **SEMESTER**?	_____ hours

[32] Only in case semesters are not equal in duration or in case of a trimester system you are asked to respond to this item for a full academic year.

[33] Contact hours represent the amount of time spent on face to face teaching in a particular unit/course/module (Including lectures, seminars, clinical practices, supervised labs, project work and field work) as well as on-line interaction in the framework of a learning module and personal counselling.

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11.	From the list below, specify the types of **INDEPENDENT WORK** you require in the unit/course/module during the **SEMESTER**. Enter the estimated number of hours which, in your opinion, the student should spend in order to complete the independent study in the unit/course/module.	_____ hours	
a.	Reading materials (including internet search)	Yes, _____ hours	No
b.	Fieldwork (site visits, etc.)	Yes, _____ hours	No
c.	Laboratory work (not counting in contact hours)	Yes, _____ hours	No
d.	Preparation of assignments (essays, reports, design work, modelling, interviews, presentations, etc.)	Yes, _____ hours	No
e.	Preparation and follow- up work for scheduled classes	Yes, _____ hours	No
f.	Preparation for assessment, final examinations, tests, etc. (summative assessment).	Yes, _____ hours	No
g.	Other (specify):	_____ hours	No
12.	How many hours does an AVERAGE student need to complete all the requirements of **your** unit/course/module in this **SEMESTER** (taking into account CONTACT HOURS and INDEPENDENT WORK)?	_____ hours	
13.	How many hours does an AVERAGE student need to complete all the requirements of **your** unit/course/module per **WEEK** (taking into account CONTACT HOURS and INDEPENDENT WORK)?		
14.	When planning your unit/course/module, did you estimate the hours students will have to spend on independent work?	Yes	No
15.	Did you take students' feedback on workload into consideration when planning the workload for your course?	Yes	No

Thank you for participating in the survey.

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Annex II Questionnaire for Students

Dear,

This study is part of the Tuning Africa II project. We are conducting a survey to estimate the actual workload of students by collecting information from **ACADEMICS** and **STUDENTS**. Please fill out the form and answer the questions in the unit/course/module that you have studied, finalized and passed in the last academic year. The data collected will be totally anonymous and confidential.

The project Tuning Africa II appreciates your collaboration in providing us with this information.

Instructions for completion:

Points 1-9 are pre-filled by the university staff. You need to respond to the items 10-15. Please underline or circle one answer ("Yes" or "No", if answer is "Yes" please specify the amount of time.

1. Subject area: _____
2. University: _____
3. Programme: _____
4. Semester/year[34]: _____
5. Unit/Course/Module: _____
6. Number of calendar weeks in the semester: _____
7. Academic hour in your university is _____ minutes.
8. Number of credits per year (if applicable): _____
9. Number of hours per credit (if applicable): _____

10.	How many **CONTACT HOURS**[35] in total were you given to study this unit/course/module during the **SEMESTER**?	_____ hours

[34] Only in case semesters are not equal in duration or in case of a trimester system you are asked to respond to this item for a full academic year.

[35] Contact hours represent the amount of time spent on face to face teaching in a particular unit/course/module. (including lectures, seminars, clinical practices, supervised labs, project work and field work) as well as on-line interaction in the framework of a learning module and personal counselling.

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11.	Using the list below, specify the types of **INDEPENDENT WORK** you used in the unit/course/module during the **SEMESTER**. Under g. add any other ways of learning that you use that are not included here. Enter the estimated number of hours that you needed to complete the independent work on unit/course/module.	_____ hours	
a.	Reading materials (including internet search)	Yes, _____ hours	No
b.	Fieldwork (site visits, etc.)	Yes, _____ hours	No
c.	Laboratory work (not counting in contact hours)	Yes, _____ hours	No
d.	Preparation of assignments (essays, reports, design work, modelling, interviews, presentations, etc.)	Yes, _____ hours	No
e.	Preparation and follow- up work for scheduled classes	Yes, _____ hours	No
f.	Preparing for assessment final examinations, tests, etc. (summative assessment).	Yes, _____ hours	No
g.	Other (specify):	_____ hours	No
12.	How many hours did you spend in the **SEMESTER** to complete all the requirements of **this** unit/course/module (taking into account CONTACT HOURS and INDEPENDENT WORK)?	_____ hours	
13.	How many hours per **WEEK** did you spend (both CONTACT HOURS AND INDEPENDENT WORK) to complete all the requirements of **this** unit/course/module?		
14.	At the beginning of the unit/course/module, were you informed about the number of hours planned for independent work?	Yes	No
15.	Were you given the opportunity to provide feedback about the workload in this unit/ course/module?	Yes	No

Thank you for participating in the survey.

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Ethical Competencies and the Organizational Competency 'Responsible University Social Innovation': looking at new ways of understanding universities and the competency-based education model in the context of significant social changes in Latin America[*]

Javier Villar Olaeta[**]

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Abstract: Ethical competencies are included in all competency-based education models and are considered essential for the professional preparation of students, especially in terms of their professional conduct and workplace preparedness. As such, the Tuning Academy, along with incorporating ethical competencies in its group of generic competencies, also considers the organizational competency *Responsible University Social Innovation* (RUSI) as part of its Tuning ALFA II Latin América project. This competency, in the area of organizational character, addresses innovation in the context of social responsibility, which it assumes each university should have, in terms of ethical responsibility toward the members of a community. This concept incorporates the equal relationship between the university's internal community and civil society. By means of interviews with experts in the areas of service-learning, social responsibility, and ethical civil and professional education from the University of Deusto and the Zerbikas Foundation, this article discusses the connection and implementation of both generic ethical competencies and the RUSI organizational competency in higher education in order to respond to the new challenges to professional training in today's world, all of which ultimately assumes a change in universities' understandings of themselves as institutions and the role of higher education in general.

Keywords: ethical competency; Responsible University Social Innovation; Tuning Latin America Project; service learning; higher education.

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[**] Javier Villar (jvillar@uct.cl) is professor at Catholic University of Temuco (Chile), where he teaches professional ethics courses for various areas and careers. *More details are at the end of this article*.

I. **Introduction**

In 2009, a report from The United Nations Educational, Scientific, and Cultural Organization's (UNESCO[1]) World Conference on Higher Education highlighted the significant challenges facing higher education in present times. Under the framework of the social responsibility of higher education, the report assumes in the first place that higher education is a public good and, as such, is the responsibility of all of society, especially governments.

The context of modern humanity demands the help of higher education to better understand multidimensional social problems and its example to holistically emphasize that which is most urgent, i.e. issues of food security, climate change, water management, intercultural dialogue, renewable energies, and public health.

To do so, the report calls on higher education institutions to promote interdisciplinary collaboration, critical thinking, and active citizenship, thereby contributing to the sustainable development, peace, and overall wellbeing of society, as well as making human rights — including gender equality — a reality.

In short, higher education must provide solid competencies for today's world. And although the UNESCO report uses the word "also," it is perhaps more appropriate to understand not simply *in addition*, but *by means of these competencies*, higher education must contribute to the formation of citizens who are equipped with ethical principles, committed to building peace, and unwavering in the defense of human rights and democratic values.

Common sense, along with the reality of humanity almost a decade after the initial UNESCO report and new understandings about the roles and practices of all types of organizations, makes us understand that this social responsibility is not merely an option but an essential requirement of universities and therefore is strategic for the survival of society and of the universities themselves. Thus, the challenge of universities is to integrate themselves and respond to the new requirements of the people and societies in which they live and serve.

This article will address the results of interviews and reflections with experts in the areas of social responsibility, social innovation, service learning, and professional and civil ethics from the University of Deusto in an attempt to understand the connections between the ethical conduct competency at Catholic University of Temuco, which is based on the Tuning

[1] Unesco, "World Conference on Higher Education 2009. Final Report," (2010), accessed April 20, 2016, http://unesdoc.unesco.org/images/0018/001892/189242e.pdf.

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model, and the Tuning organizational competency Responsible University Social Innovation (RUSI). Additionally, I will propose some ways of planning and developing these competencies, both concerning their comprehension as well as implementation, in the context of UNESCO's requirements for higher education.

The source of this reflection and research is within Latin America. When considering the particular elements of Latin America as context for this research, one must also take into account the experience of the years of cooperation for the construction and implementation of a competency-based education model in Chile and throughout Latin America as indicators of Social Responsibility and Social Innovation. Along with the realities and challenges of the universities, this experience has revealed a glimpse of the world, and it directs us toward shared global spaces for the comprehension and definition of ethical competencies and, in general, toward the competency-based model both *in* and *for* a global world. It is for this reason that this model was chosen by UNESCO so that it might appreciate and propose new perspectives for further understanding concerning the needs and purposes of higher education. This manner of working makes it possible to recognize common models and purposes, even with consideration of differences among each local, national, and regional identity.

That being so, for the person who chooses the perspective of understanding through higher education, what can be understood as a mark of the Chilean and Latin American local identity in this global context? And what is the role of the academic community in this regard? Compared with the European model (since this work largely represents the context of the University of Deusto with whom we performed our research), could there be among the countries of the first world a historical awareness of colonial and economic subjugation? Could there be a coexistence which acknowledges the great historical debts which are owed to native peoples of non-Western cultural roots? And considering the great economic and material conditions of poverty which are shared among the continents of the Global South, could there be a call to action for social construction in which universities would collaborate as part of an intercultural society? Furthermore, could all of this extend from deliberate political, social, symbolic, and practical processes? These questions remain to be answered. For if not, we would be speaking of the same practices that today are happening more and more clearly in Europe concerning legal and illegal immigration, the crossing of cultures, and the immense pockets of poverty that have become embedded in the model of neoliberal financial speculation. That is to say, in this global world which is increasingly blurring not only physical borders but also those of our minds,

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rather that speaking of separated worlds, should we not speak about worlds within worlds and their interaction with each other?[2]

Critical approaches to competency-based models suggest that these are continuations of the neoliberal mentality and training models which consider the characteristics of professional training to cover essential market needs.[3]

Faced with these critical approaches, our proposal is that ethical competencies within a competency-based model, along with the proposal of an organizational competence centered on social innovation, take responsibility for the conception of a plan, along with the critical formative results, which is oriented towards justice and the common good. In this way, not only might market needs be solved, but human social needs as well, as we have described from UNESCO. Critics then assume a perspective of education which focuses on the practical wisdom that every person and society should have and which is oriented towards the practical achievement of a good life in and for others within just institutions.[4] (That is to say, our epistemological concept of competence (in terms of competent professionals and universities) corresponds to making intelligent practices and institutions that adequately respond to the permanent conflicts that occur in every society regarding the dynamics of the recognition of dignity, identity, and justice.[5]

II. **The Social Responsibility of organizations**

Beginning with discussions of corporate social responsibility, over the last 15 years the concept of *social responsibility* has come to the forefront of discussions concerning the moral responsibilities of organizations. Then, in 2010, multiple organizations led by the International Organization for Standardization (ISO) proposed a certification standard, voluntary in nature, that in reality proposed a new type of organization: one that sustains the integral and unifying concept of social responsibility as the responsibility of organizations.[6]

An organization, then, must be understood as comprised of various dimensions whose socially responsible interactions rest on the respect and

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[2] Manuel Castells, "La edad de la información," *Sociedad y Cultura"* no. 3 (2006): 188-191.

[3] Prudenciano Moreno and Gabriela Soto, "Una mirada reflexiva crítica al enfoque por competencias," *Educar,* October - December (2005): 73-79.

[4] Paul Ricoeur, *Si mismo como otro* (México: siglo XXI, 2006).

[5] Paul Ricoeur, *Caminos del reconocimiento: tres ensayos* (México: Fondo de Cultura Económica, 2006).

[6] ISO, "ISO 26000-Social responsibility," (2014), accessed February 5, 2016, https://www.iso.org/iso-26000-social-responsibility.html.

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promotion of human rights and the environment. So then, how an organization is governed, its relationship with its consumers or users, its practices and processes of operation, its participation and development of the community, and its labor practices are part and parcel of the organization and its social responsibility.

From the creation to the consolidation of an approach toward social responsibility, it should be noted that this process has led to the conception of a new type of organization. This goes to show that in today's world, there can be socially responsible organizations that have been conceived as something other than what has traditionally been considered an organization. We are talking about organizations ultimately as groups of people united by different interests in a permanent interaction with other social groups that make up a multifocal society which is structured in versatile solidarity. An innovative concept of a practical and social nature has generated a change in the traditional understanding of organizations, and in this case in particular, universities.-As Villa describes: "This action (CSR) results in the creation of new partnerships and new spheres for existing relationships (…) with respect to social dialogue, equal opportunities, anticipation and management of change; the protection of health, environmental protection and respect for fundamental rights."[7]

A socially responsible university under this new organizational approach can be understood as a university that trains professionals and creates and manages knowledge from a holistic and comprehensive approach to its institutional structure and is organized around the solution of problems.

De la Cruz, Perua, and Vallaeys[8] propose a university based on four pillars: a responsible campus, professional and civil education, social participation, and the social management of knowledge based on a democratic and participative approach toward learning.

III. **The Competency-based education model in Higher Education**

Likewise with organizations, competency-based models in higher education are also educational innovations that direct these new organizational approaches and that construct an awareness which responds to society by

[7] Aurelio Villa, trans., *Un modelo de evaluación de la innovación social universitaria responsable* (Bilbao: Universidad de Deusto, 2013), 92.

[8] Francois Valleys, Cristina de la Cruz, and Peru Sasía, *Responsabilidad social universitaria. Manual de primeros pasos* (Mexico: Mcgraw-Hill editores, 2009).

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generating new ways of understanding its identity as an institution of higher education and its integration into the society in which it exists.[9]

III.1. *The Tuning Latin America Project and Responsible University Social Innovation*

Initially, Tuning was an experience and creative achievement pertaining uniquely to European higher education. In 2003, it was extended to Latin America, and today the Deusto International Tuning Academy also has works in Africa and Asia.[10]

Its proposal in Latin America, based on a competency-based education model and through the participation of more than 200 mostly Latin American universities (though including some European universities as well), is characterized by the identification of in-common generic competencies in coordination with discipline-area/specific competencies in 15 areas of knowledge in the form of meta-profile professionals. And along with the creation of a system of transferable Latin-American credits which enable academic and student mobility, in 2011 a competency was created which was not only curricular but also organizational — the Responsible University Social Innovation (RUSI) competency — that was converted to the institutional component. This competency is strategic within the Tuning model for the identification of the university in its organizational and daily practices, all of which function in response to the challenges generated by society and the world.

> Responsible University Social Innovation is an organizational competency which extends through substantive areas (teaching, research, development, and management) in order to transform and promote solutions to the challenges within a university's social and global environment. These innovative responses to social and global problems are developed with the participation of the subjects and social participants, and with characteristics of speed, relevance, effectiveness, efficiency, sustainability, and justice in order to prioritize values and social transformation.[11]

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[9] Aurelio Villa, trans., *Un modelo de evaluación de la innovación social universitaria responsable*, 97.

[10] Deusto Tuning Academy, "Tuning Latin America Project 2004-2008," (2010), accessed April 5, 2016, http://tuning.unideusto.org/tuningal/.

[11] Aurelio Villa, trans., *Un modelo de evaluación de la innovación social universitaria responsable*, 104.

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This definition was developed by the Alfa Group tunnig Project. Social innovation is defined as "new ideas (…) at the same time that can meet social needs and create new social relationships or collaborations. In other words, they are innovations that are good for society and improve the ability of society to act. Social innovation are practices and concepts such as service learning, social engagement, social entrepreneurship, care for the environment among others. Successful social innovation experiences are typical of the creativity of the poor to seek solutions to their difficult living conditions of communities; With the local government support, as well as actors outside the community; training and training of those directly involved in the project; and participation of the sectors in some cases empresarials.[12]

This definition supports at least two key elements:

- Emphasis on external factors: Social innovation in the university should contribute to the community. This requires clear information about the actual impact the university is having on its surroundings and its population by the actions carried out in the central operations of the university: social innovation in the curriculum, research, social development, and university management.

- Presents a commitment with respect to concrete social values: Both at an external and internal level, it presents a commitment to certain social and ecological areas and concerning specific groups in which it wants to contribute.

III.2. *The competency of ethical conduct in the competency-based model*

Ethical competencies are included in all classifications and proposals for all competency-based education models. They are considered essential to achieve a professional profile of excellence and therefore are defined as generic competencies, i.e. contributing to form the overall profile of all university professionals.

A competency-based model is considered an educational innovation because instead of a learning process based on subject-area content and traditional academic formats, it proposes a learning process based on competencies or abilities, since the main reason for professional education is

[12] Aurelio Villa, trans., *Un modelo de evaluación de la innovación social universitaria responsable*, 92.

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that the graduate is capable of successfully performing the work which is expected of him/her as a professional.[13]

This means in the first place having a permanent connection with the social, economic, and labor environment in which the professional graduate will insert him/herself in order to begin defining those expected competencies for the professionals. It is worth mentioning that the greatest demands of society with respect to its professionals have to do with general and essential aspects such as capacity for teamwork, sociability, ability to continually adapt, management of information and complex contexts, improvement and criticism for continued advancement, and above all, the capacity to make *good* decisions that take care of the needs of all those affected and interested, along with the consequences of these actions on all levels. Obviously, one hopes that a professional would know the technical aspects of his/her work, but paradoxically, this knowledge is considered secondary because techniques change and evolve with new contexts. It is important, therefore, that a professional know how to learn continually, but if he/she does not have all of the previously mentioned characteristics, it will be difficult to actually be able to do it.

Therefore, it is the large competencies — that have to do with personal elements such as emotions, values, and attitudes — which are valued by society. As such, a good professional action in modern day is inconceivable without its implicit ethical or value-based component since the complex work contexts continually experience ethical dilemmas that challenge and evaluate any professional action itself.

Secondly, speaking of competencies raises the question of their educability. Can these competences be taught considering that we are talking about aspects or dimensions much more complex than teaching subject-area content? One positive response to this question, but which requires assuming responsibility for it, challenges us to seek favorable educational environments and significant inductive processes by which the students can connect with their emotions, their interiors, their identities, their values, and so forth.

We are also challenged to think that the participating professional educators are not only those in the university but all those interested and affected by the future actions of the professionals. Once again, we find that educational innovations demand institutional or organizational changes or

[13] Universidad Católica de Temuco, *Competencias genéricas para la formación integral de los profesionales* (Temuco: Ediciones Uc Temuco, 2013), accessed April 25, 2016, http://www.cedid.uct.cl/img/info8/ModeloEducativoUCT% 20 (1) _3_20140829222942.pdf.

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harmonization. The competency-based education model demands a greater and more integrated interaction of the university with society in order to enable adequate training environments and processes. Furthermore, it demands adequate methodologies that perhaps exceed considering the classroom as the only formative environment and moving the hypothesis of such a framework to reality itself, where a professional should perform and be accountable for his/her professional performance. There develops a necessary and appropriate overlap between the educational space of the classroom — the predominately reflective and discursive space — and other social spaces where problems are addressed and connected with real participants in society and therefore with the professional's own problems as well.

III.2.1. Ethical Competencies in the Tuning model

The first Tuning Latin America Project[14] identified several generic competencies that are related to the formation of professional ethics. They are as follows, listed here with their corresponding number of Tuning classification:

- 5 — Social responsibility and civic engagement
- 20 — Commitment to environmental preservation
- 21 — Commitment to socio-cultural
- 22 — Value and respect for diversity and multiculturalism
- 26 — Ethical commitment

The paradox here is that in a subsequent study realized in 160 Latin American universities evaluating the importance between the competencies, the first four ethical competencies were the worst evaluated of all the generic competencies in relation to their importance for higher education. Instead, *ethical commitment* was the highest evaluated of all of the generic competencies.[15]

This in itself indicates that there is a significant reductionist bias from what is considered the ethical dimension in the educational process and in professional profiles. However, even with this deficiency, it still verifies the

[14] Deusto Tuning Academy, "Tuning Latin America Project 2004-2008," (2010), accessed April 5, 2016, http://tuning.unideusto.org/tuningal.

[15] Deusto Tuning Academy, "Tuning Latin America Project 2004-2008," (2010), accessed April 5, 2016, http://tuning.unideusto.org/tuningal.

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essential nature that is given to the ethical profile for vocational training in higher education in the academic world and in the Latin American educational context. Further, it motivates us to continue delving into the reality of the competency and its role in shaping higher education in connection with Responsible University Social Innovation.

III.2.2. The Ethical Conduct Competency at Catholic University of Temuco

For the purposes of this research, I worked with the ethical conduct competency of Catholic University of Temuco, Chile, since the Tuning Latin America ethical competency(ies) simply identify the competency, while the universities are left to articulate and develop them within their curricula. This was the case with Catholic University of Temuco, which based its curricula on the Tuning Academy, among others, to define and develop its own competency of ethical conduct. The ethical conduct competency of Catholic University of Temuco is defined as follows:

> Demonstrating an ethical reasoning based on the principles and values of justice, common good, and the absolute dignity of the human being, which translates to the attitudes and actions of responsible service toward the community and in response to her needs as a person, as a citizen and as a professional.

The main characteristics of the development of this competency are taken from an autonomous, responsible, and integral vision of the university incorporating in an integral form the different Tuning ethical competencies.

The competency, based on the education and practice of ethical discernment, grades its own performance of this process in the different stages of the curricula by the same logic as a the methodology of discernment. It starts with the processes of analysis, reflection, and comprehension of reality in order to continue to a critical reflection corresponding to the ethical framework. This establishes the moral values from a universal perspective and human rights perspective through the gradual practice of resolving challenging professional ethical dilemmas.[16]

It is from this relationship that the Tuning competency-based education model arises. It is a critical educational innovation within the scope of the

[16] Universidad Católica de Temuco, *Competencias genéricas para la formación integral de los profesionales* (Temuco: EdicionesUcTemuco,2013), accessedApril25,2016.http://www.cedid.uct.cl/img/info8/ModeloEducativoUCT% 20 (1) _3_20140829222942.pdf.

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entire world which came about only in the last 15 years. The fundamental role of ethical competencies and the building of the Tuning model of organizational competency RUSI in the context of organizational transformation in general and universities in particular is the object of this research. Furthermore, this research is intended to deepen the interactions of these competencies through analysis of the opinions of academic experts at the University of Deusto in areas related to social responsibility, ethical teaching, service learning, and social innovation in higher education. Finally, the article looks toward the visualization of current and future contributions which can respond to the aforementioned challenges of higher education.

The relevance of developing an understanding with scholars from the University of Deusto arose because this university participated in the Tuning Latin American Project, as a European partner university, in the creation of the RUSI competency and its evaluation model. As an European university aligned with the process of Bologna, it has a competency-based education model and similarly a generic ethical competency and innovative educational methodologies that account for new forms of understanding universities today in relation to their identities, missions, and links with society, as in service learning, to train their professionals. And it is also the university that hosts the overall Tuning Academy project.

With respect to its methodology, the research shows that all the work of construction and implementation of a competency-based educational model (which includes the definition of ethical-action competencies in general, a definition and implementation of ethical-action competencies in UC Temuco, and the construction of an ISUR organizational competency by the majority of Latin American universities) is the initial point of comparative contrast that a Latin American perspective brings to this research when attempting a dialogue with the experts from the University of Deusto. In reality, we could say that this work intends to validate these constructions made from Latin America, starting with their own experiences and points of view regarding their construction and correlation. Thus, the signal that distinguishes this research from among others is that it is understood from the global framework of identities and challenges of Higher Education. This idea maintains similarities with the epistemological possibilities in which the great ethical concepts of justice for social transformation and sustainable human development are understood.

So it is with respect to the formative role of professional ethics as we seek to understand the consciousness of a university that transforms itself to connect and respond to social challenges. For as the research shows, the relationship between ethical competencies such as that of UC Temuco and

ISUR is connatural on the same comprehensive horizon in which they were constructed. Justice and sustainable human development are imperative in order to succeed in the task that facing universities: to build knowledge and train professionals for societies which demand new transformations, not only for the business market.

IV. **Research results**

IV.1. *Research categories*

Interviews of a mixed nature were held with University of Deusto scholars who are experts in topics such as social university responsibility, social innovation, ethical education, contextualized methodologies and experiences, and in particular, service learning in various areas:

- 9 Personal Interviews:
  - — Teaching and ethical research and social responsibility: 5 scholars
  - — Teaching and sociological and theological research: 1 scholar
  - — Teaching and service learning research: 2 scholars
  - — Educational innovation: 1 scholar
- 1 Group Interview: Teaching and research in service learning: 4 scholars
- 1 Seminar and discussion about service learning in the context of social innovation and the social responsibility of universities and in general: 13 scholars

The content of the interviews were organized around 5 major themes and were approximately one hour in duration. Prior to the interview, two documents with descriptions and explanations of both competencies were sent to participants by email.[17]

(1) Ethical Conduct Competency (ECC[18])

Comprehension and opinion concerning the definition of the competency

[17] Documents made by the author of the internal character to the center of ethics and social responsibility of UC Temuco.

[18] In Spanish, Competencia de Actuación Ética (CAE).

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(2) Organizational competency of Responsible University Social Innovation (RUSI[19])

Comprehension and opinion concerning the definition of the competency

(3) Interconnectivity between both competencies

Is interconnectivity between competencies possible?
With respect to the topic?
With respect to implementation?

(4) Contributions and suggestions

The interviews made it possible to highlight various categories that became the axis of the information required from the areas addressed to investigate the ECC and RUSI competency and that made it possible to group the diverse opinions of the respondents.

(1) RESPONSIBLE UNIVERSITY SOCIAL INNOVATION (RUSI)

- Conceptual and comprehensive relevance
- Institutional identity and coherence
- Justice and social transformation
- Social responsibility of universities

(2) ETHICAL CONDUCT COMPETENCY (ECC)

- Conceptual and comprehensive relevance
- Integration with the university education model
- Education for justice and social transformation

(3) CONNECTION AND IMPLEMENTATION OF RUSI AND ECC

- The complementary relationship between RUSI and ECC for the practical purposes of both
- The relationship between the university and social contexts
- The relevance of service learning as a synergistic methodology, harmonious with its coordinated implementation of both competencies

(4) CONTRIBUTIONS AND SUGGESTIONS

- The capacity for university transformation
- Proposals for curricular connection

[19] In Spanish, Competencia organizational de Innovación Social Universitaria Responsable (ISUR).

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IV.2. *Descriptions of the results by category*

(1) RESPONSIBLE UNIVERSITY SOCIAL INNOVATION (RUSI)

- Conceptual and comprehensive relevance of RUSI

The majority considered that the RUSI competency is accurate, understandable, difficult yet possible to implement, and relevant for universities. Their comments were as follows: "It is a utopian horizon — difficult, but not impossible. It is more successful than other focuses." "The RUSI is a new paradigm." "Its definition is cumbersome, wordy as all in academia, but its spirit is good." "It is oriented and focused toward those specifically affected: the poor."[20]

- Institutional identity and coherence

This category is in response to the link of the RUSI competency with institutional identity and its coherence, both practical and theoretical. This competency, in all interviews, is identified with the coherence of being a university. The finalizing of the responses regarding the perceived link between identity and consistency with the competence were explained in various ways and were overall positive: "It gives a coherence with the identity of the university." "The RUSI makes it that the university can more ethically educate, which is its work and should be carried out as a university." "It requires a clear choice of the university with respect to its social transformation." "The university already in itself is transformative of young people." "With competencies such as RUSI, the university further identifies itself." Additionally, it is considered perfecting of a competency-based model like we have in Deusto and in Temuco: "It is a good and novel approach to think of a competency-based model."

A minority manifested a critical opinion of RUSI in two directions. First, it was critical in relation to what is achieved regarding the university: "Its integration with the institutional model is weak and does not take responsibility for the plurality of the university as such." Secondly, it is a very generic and neutral competency in its definition with respect to the central participants of social innovation, which are the poor — or in this case, the victims: "RUSI is interesting as a whole but is very generic […] It specifically lacks the poor, who are better described as 'the victims.'"

[20] The literal citation quoted statements are a ratio of respondents who serve to substantiate the claims of the article and in turn serve to reflect the tenor of most of the interviews on the subject concerned. Levels of similarity in these responses on all items are of about 98%.

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• Justice and social transformation

All the interviews coincide concerning the connection between the RUSI competency and the search for justice and social transformation. That is to say, a university should seek to transform society towards greater justice and social equality.

The answers are divided as to whether a university ought to have as its own choice — as part of its identity — the cause of social transformation of not. Rather, a majority of the respondents considered that it should be declared intentionally as a purpose of the university. As such, the RUSI would help to better bring about this social transformation: "It is important to see how the university is organized so that from a priority of justice — though it also could be that of social innovation — it is identified more with the university itself. It is a matter of sense." "A competency as such requires being able to identify, for example, the injustices, in direct collaboration with them (the poor)."

Some respondents consider that social transformation is an implicit role of the university and that RUSI should be able to specifically improve the university's actions and direct the university's own innovative processes, saying: "The university is always innovating. RUSI is the possibility of a university to lead these innovations through justice and social transformation." Additionally, one respondent affirmed "the importance of service learning and the approach of social innovation to reposition the formation of citizens in the educational work." Furthermore, "RUSI [is useful] to attain levels of social justice, equality, and recognition of others in the processes of social innovation."

• Social responsibility of universities

This category speaks to the relationship that the respondents gave to the RUSI competency with respect to the social responsibility of universities and its use for institutions. The majority considered that the concept of the *social responsibility of universities* already has many of the ideas raised by the RUSI, but they consider that there traditionally has been a perversion or manipulation of the phrase through marketing and simple social welfare so that today the the phrase is associated with the cover-up of selfish and materialistic practices of organizations. That could equally happen to the RUSI competency. In general, they agree that RUSI will improve the approach to the social responsibility of universities: "The RUSI orients the SRU [social responsibility of universities] toward the 'affected' or 'specified stakeholders.'" "The RUSI can be an important incentive for universities with the risk that it could be perverted by misuse, marketing, banners, and medals that have generated skeptical resistance to the truth of it." "One must fight in order to not confuse RUSI with Christian morality."

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(2) ETHICAL CONDUCT COMPETENCY (ECC)

• Conceptual and comprehensive relevance

All respondents agreed that to understand and to value the comprehensive nature of the competency is not without its challenges: "It is understandable and simple in its definition and implementation." "The ECC is understandable but difficult to be proven in external instances from the university." A minority expressed concerns that the ECC does not reflect the civic dimension of professional ethics training in its proficiency levels or criteria.

• Integration in the university education model

This category responds to the coherence that the respondents required of the ethical conduct competency within the competency-based education model. In this respect, the majority opinion is that it is identified as a strength since it responds to both the model and the identity of the university regarding its mission and vision: "It is a strength of the competency in the context of the model and the social responsibility of the university." "It is integrated with the model and the identity of the university as with its mission and vision."

A minority considered that the competency-based model makes the ECC unable to evaluate the internal intentions or convictions of a university, instead focusing on visible and evaluable performances: "We can well evaluate the field of knowledge, partly the field of conduct in the unique space that we we know, which is the classroom; however, we cannot evaluate intentions or convictions — the interior character."

• Education for justice and social transformation

Most respondents agreed that the ethical conduct competency was defined, as its meaning was to educate for the sake of justice and social transformation. But they specifically considered the difficulty of this work within the complex reality of universities, reflected in the ethical tensions within society itself: "There is an ethical tension between an ethic of minimums and maximums that should be faced from the ethical conduct competency." "It is uncomfortable, including for students, to understand the ethical formation of a citizen in their professional formation." "The ethical conduct competency helps this dynamic of direction and social transformation toward justice."

(3) CONNECTION AND IMPLEMENTATION OF RUSI AND THE ECC

• The complementary relationship between RUSI and ECC for practical purposes of both

All of the respondents reiterated the relationship and relevance of the ECC and the RUSI competency. As the RUSI addresses organizational

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character, it would assess and orient the ECC toward a educational nature. And conversely, the ECC would help to finalize the practical claims of RUSI in the field of educational ethics, which is fundamental as part of the world of the university, and it assumes a different view from that which society considers as professional and oriented toward promoting social justice. However, both must be intentional for their connection. This does not mean that all the respondents considered that their implementation would be very difficult in practice: "Its connection and implementation is reasonable." "It is oriented to the graduate profile." "The RUSI is what can help make ethical learning intentional, which is more contextual than simply the actions of a particular teacher." "A connection between [RUSI and ECC] is possible but it must be intentional. They can exist separately." "The RUSI assesses the ECC and questions the traditional concept of being a professional." "The ECC is a forge of character and autonomy, and the RUSI promotes public spaces with experience of freedom and solidarity." "It invites professional perspectives to identify injustice from its formative process in ethical discernment." "We move in the context of instrumental rationality and calculation, and this would hinder the implementation of RUSI and ECC."

- The relationship between the university and social context

For the connection and implementation of both competencies, we must highlight as an essential element the form of learning within the university and how it puts into practice its link with society. This is assessed and transformed by the RUSI competency in connection with the ECC, particularly when compared to a traditional vision of the relationship between the university and its environment, which is to say, typically unidirectional and with no intention of allowing itself to be changed: "The university should be capable of appreciating and considering the knowledge of global social movements, even popular culture, which is the aim of RUSI." "RUSI [aims] to build conditions of peace or alternative social spaces." "A dialogue with society, with these non-functioning groups, which is open and respectful." "The RUSI and the ECC [aim] to form and recover the civic competency in the university."

- The relevance of service learning as a synergistic methodology, harmonious with its coordinated implementation of both competencies

The majority of respondents considered methodologies innovative which connect the students and the university with people and social problems. They emphasized the methodology of service learning as one of the most appropriate in the coordinated implementation of the ECC and the RUSI competency — something that was already considered by those who worked with one another or even separately: "Service learning is a methodology that

would ensure better joint implementation of both." "The formation of professionals that could be formed in this direction to be social innovators." "Service learning is a form that would help it be better integrated in the curriculum."

(4) CONTRIBUTIONS AND SUGGESTIONS

- The capacity for university transformation

In this category, which sums up very well what is the essential orientation of the RUSI competency, the capacity for transformation of the university itself is valued and questioned at the same time by the respondents. In this sense, the majority of the respondents reaffirmed the resistance and difficulties that would result from the implementation of these competencies in the current university context. Additionally, they offered various common suggestions: "The role of the university professor must be transformed, influencing him in social innovation training." "The practicums within the areas of study is a significant space if it falls in the area of service learning." "The university would not easily accept this focus on social innovation." "The weight of the institution will make transformation difficult, and it would only be unidirectional towards other social groups, as always." "It would have internal and external resistance in its implementation and coordination." "It is necessary to enable liberty and dissent within a university."

- Proposals for curricular coordination

The respondents suggested various initiatives on the way toward developing "friendly cities and juridic clinics [in legal training]." "The juridical clinics are another example of educationally well-intentioned social innovation working toward the professional training in the dynamic of service learning." "An example of social innovation is the Fiare Banca Ethica, which has participating scholars from the University of Deusto."

V. **Conclusions**

V.1. *Interpretation of Results*

The results of the interviews corroborate the context and the organizational and social trends that contextualize and challenge the ECC and RUSI competency. Both competencies require and themselves generate new organizational forms of higher education that presently are being formed in

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order to attune themselves to the social demands toward higher education, as previously discussed in this article, which demand profound changes in a university's understanding of its connection and integration with society. This extends from the production and management of knowledge to the scholar's role in the model and the processes of development, and it reflects a constant demand for the university to orient itself toward sustainability and participation and to assume an integral role in the social, cultural, political, and economic aspects of society. In terms of problem solving, the orientation must be toward social transformation, resulting in a society more just and beneficial for all.

Likewise, according to the interviewees, it reinforces the epistemological and educational suppositions that occurred in the formation and development of both competencies and the fundamental relationship that exists between them. The innovative educational character of the competency-based model is emphasized instead of an organizational competency.

Research shows that the Tuning model — in its attempt to build a unique, continental space for higher education for Latin America — is innovative and socially responsible because it integrates and articulates its profiles and curricula from the axis of the ECC and RUSI competency, as in the case of Catholic University of Temuco. These two competencies would thus become the soul of the project, as they are competencies that incorporate the senses along with the existential and social purposes, thus demonstrating a comprehensive and coherent image of the transformative role of education on the individual and on society at large. This is, in reality, more faithful to the traditional images of the critical and constructive role of academia in the world since the early creation of universities.

Research results, always according to the categories raised since the interviews, also show the relationship between both competencies in their implementation with service learning methodology. Resulting from a formative process, this methodology integrates the various dimensions which are considered essential in society and institutional and educational organizations, as emphasized in this article.

And finally, from the same answers of the interviewees, this goes to show how in current university models — still more of a traditional rather than innovative nature — comprehension and implementation of both competencies, including in a competency-based education model, result in low identification and resistance, explicit and inert, within university institutions. In relation to these findings, which mostly stem from interviews, one concludes the importance of promoting the organizational and cultural changes necessary for the effective comprehension and implementation of

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both competencies from the base of a permanent presence and permanent relational work. A *prophetic minority*, as economist Zamagni suggested to explain that major changes occur in groups that, although small, are confident, persevering, and seek dialogue. Achieving this was about Christian social and cultural transformations, without which it is very difficult to change individual practices.[21] To this, all have added the importance of producing evidence of improved educational and institutional results in order to identify and convince all of the key participants, not only the university authorities. And this includes increasing the initial research capacity and processes addressing the impacts of these results: for example, of how service learning achieves professional profiles, of the improvement of social welfare from collaborative work in the processes of social innovation, of satisfaction indicators from students, community partners, and practicum institutions, etc.

V.2. *Proposals for future work and research*

With the results of this research and their important future consideration we want to project next steps which will translate into new lines of research and operational work proposals. The proposals are as follows:

(1) To investigate the relevance of improving the comprehension and reasoning of ethical competencies and RUSI, whether in the Tuning model or in models with similar competencies, in social and university contexts which are increasingly more intercultural. This could be done through the narrative rationale which is based on the philosophical and anthropological understanding of a person as an essentially narrative being. Ultimately, this would promote a better foundation and understanding of both the educational model and the competencies themselves in their definitions and articulation for Latin America and the world in general. This is due to the existing cultural diversity and the awareness that the processes of identification, and social processes in general, are more linked with such rationale; yet, in this globalized world, it is in conflict with the strategic, logical rationale of a more Western character and hegemony.

[21] Stefano Zamagni, "Ethical Challenges in university teaching and research of the economy" (paper presented at a seminar at the Centre for Applied Ethics of the University of Deusto, Bilbao (Spain), February 4, 2016).

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(2) Starting from the aforementioned base, to develop a simplified RUSI evaluation model which corresponds to the competency. This seems necessary due to the previous model's complexity and apparent difficulty in the initial measurements that were performed.

(3) To invite the Tuning Academy to deepen its understanding and connection of the RUSI competency in the construction of professional meta-profiles in the Tuning model, along with curricula, teaching, and evaluation implementation.

(4) Similarly, to invite the Tuning Academy to create a Tuning center for reflection and research for Latin America in the areas of ethics and social innovation. This would help establish an alliance with other Latin American universities and would research and propose ways of education as well as report on the impacts of the ethical scope and social innovation of universities. In the same line as in Europe proposed by the Social Innovation Challenge.[22]

The process of social innovation is necessary in all areas of social life, yet it requires a collaborative work that poses a challenge to conventional priorities and requires humility on everyone's part to ultimately understand that the whole is greater that the sum of its parts. We need to change attitudes, generate mutual confidence, and start with important but not overly complex projects that involve the majority of the parties whose reflection and joint work would be an achievement and example to the citizens and all institutions of a country.[23]

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[22] "Vienna Declaration," (2011), accessed March 18, http://www.socialinnovation2011.eu/.

[23] Aurelio Villa, "La innovación social en el ámbito universitario. Una propuesta para su diagnóstico y desarrollo," 218.

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About the autor

JAVIER VILLAR (jvillar@uct.cl) is professor at Catholic University of Temuco, where he teaches professional ethics courses for various areas and careers. He is a researcher working cooperatively in the area of social innovation for Alfa Tuning II Latin America Project. His research focuses on issues of social responsibility and ethics for higher education. He is from the Basque Country (Spain). He lives in Chile since 1996. He was director of Ethical and Social Responsibility Center John Paul II between 2006 and 2012. He was collaborator of Construye País Proyect, focused on University Social Responsibility between 2001 and 2012. He was coordinator and collaborator of Social Agency of Araucanía, focused on Social Development, public and private policies to combat poverty in La Araucanía Region between 2003 and 2008. He is theologian, Magister in Ethical Social and Human Development and Magister in Religious and Philosophical Sciences. And finally, he was member of the Superior Council of Catholic University of Temuco between 2013 and 2015. This Superior Council is the principal governing organ of the university.

Specific competences in the Tuning Latin America Project: their degree of importance and achievement among a sample of psychology students

Denise Benatuil and María Juliana Laurito*

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Abstract: The implementation of the competence-based education approach at university level is a vehicle for the global transformation of the current Higher Education system. Over the past few decades, psychology has increasingly focused on the identification of core competences in the education of psychologists. The U.S., Canada and Europe have adopted competence-based education approaches. More recently, in 2013 the Tuning Latin America Project introduced the challenge to reach agreement on the education of psychologists in the region. The purpose of this research is to analyse the degree of importance and perceived achievement of the specific competences set out in the Tuning Latin America Project, among a sample of 100 advanced psychology students of a private university in the City of Buenos Aires. For such purpose, the Specific Competences Survey for students of the Tuning Latin America Project was used. All the competences obtained high ratings in terms of importance, in particular those related to professional ethics. In addition, the respondents considered that most of the competences are thoroughly developed during their university training. To conclude, further studies and analyses need to be carried out in order to identify current educational needs for psychologists and thus enhance quality and adjust psychological practice to current social needs.

Keywords: competences; training; Tuning; psychology; students.

I. Introduction

Over the past two decades, psychology has increasingly focused on the identification of core competences as a basis to define and measure students' learning outcomes.[1]

* Denise Benatuil (dbenatuil@iname.com), PhD in Psychology, is Director of Undergraduate Psychology Studies at Palermo University (Argentina). María Juliana Laurito (mlauri@palermo.edu), Master's in Higher Education (MEs), Secretary of Psychology Degree Programme at Palermo University (Argentina). *More details are available at the end of this article.*

[1] Nadya Fouad et al., "Competency benchmarks: A model for understanding and measuring competence in professional psychology across training levels," *Training and Education in Professional Psychology* 3, no. 4 (2009): 8.

The final version of the "International Declaration of Core Competences in Professional Psychology" was released this year at the International Congress of Psychology held in Yokohama. The Declaration states that the global professional identity of psychologists can be improved through the identification of a set of core competences that define professional practices.[2]

In addition, the Declaration identifies a set of internationally recognized competences that can serve as a basis for a coherent global professional identity and for equating professional training systems.[3]

In the United States and Canada, the Committees on Accreditation adopted competence-based approaches in the 1990s.[4] In Europe, in 2003 the Project "EuroPsy: A European Certificate in Psychology" sought to define the generic and specific competences of psychologists, as well as criteria for the creation of a European Certificate in Psychology.[5] More recently, in 2013 the Tuning Latin America Project included the area of Psychology in its second phase, thus introducing the challenge to reach agreement on the education of psychologists in the region.[6]

In Argentina, the psychology degree course came to be included in Article 43 of the Law on Higher Education N° 24521 sanctioned in 1995. The course thus gained the status of a public interest degree course, as it was considered that "its exercise may compromise public interest by directly putting at risk the inhabitants' health, security, rights or education". This implies an obligation to evaluate and accredit the career, based on nationally defined quality standards. The respective careers must be accredited periodically by the National Commission of Evaluation and University Accreditation (CONEAU) or by private entities constituted for this purpose duly recognized.[7]

In addition, in 2009 Argentina's Ministry of Education approved the Standards for training in psychology. According to such Standards, training in psychology must include general courses based on a twofold approach —

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[2] International Project on Competence in Psychology, "International Declaration on Core Competences in Professional Psychology," (2016), accessed October 24, 2016, http://www.asppb.net/news/news.asp?id=297538.

[3] Ibid.

[4] Nadine J. Kaslow, "Competencies in professional psychology," *American Psychologist* 59, no. 8 (2004): 774-781.

[5] Europsy, "*European Diploma in Psychology, 2005," a*ccessed November 19, 2016, http://www.europsych.org.

[6] Diego E. Rodríguez Cárdenas, ed., *Proyecto Tuning América Latina Educación Superior en América Latina: reflexiones y perspectivas en Psicología* (Bilbao: Universidad de Deusto, 2013).

[7] "Ley Nacional de Educación Superior N° 24.521," Ministerio de Educación de la Nación Argentina, accessed October 22, 2016. http://portal.educacion.gov.ar/centro/.

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professional and scientific. Moreover, the Standards set out minimum contents and a minimum theoretical and practical training workload, along with the preparation of a final paper as a requirement for graduation.[8],[9] While the Standards are a valuable and relevant contribution to the education of psychologists, they do not lay down the competences needed for such education.

This creates the need to reflect on the competences and core contents of graduate profiles and curricula, so that minimum contents and an adequate and proper training can be provided in the different areas of psychology.[10]

It is worthy of note that Argentina is one of the countries with the highest number of psychologists. In addition, psychology is one of the first five most popular degree choices in Argentina.[11] This situation should give rise to a permanent assessment of training in psychology, its strengths and weaknesses and improvement plans aimed at enhancing the quality of university education.

II. **The Tuning Latin America Project**

Since the adoption of the Bologna Declaration in 1999, the competence-based approach has been actively promoted by the European Union. These efforts led to the development of the Tuning Project for university training in Europe, which was later adopted by Latin American countries.[12]

The purpose of the Tuning Latin America Project was to exchange information and improve collaboration between higher education institutions,

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[8] "Resolución 343/09-ME. Educación Superior, *Los estándares para la acreditación de las carreras correspondientes a los títulos de Psicólogo y Licenciado en Psicología*, 2009, accessed July 11, 2016, http://www.psyche.unc.edu.ar/wp-content/uploads/resolucion-ministerio-de-educacion-343-20091.pdf.

[9] Resolución 800/11-ME. Educación Superior. *Los estándares para la acreditación de las carreras correspondientes a los títulos de Psicólogo y Licenciado en Psicología*, 2011, accessed July 11, 2016, http://servicios.infoleg.gob.ar/infolegInternet/anexos/155000-159999/158472/norma.htm.

[10] Mauricio González, Ingrid González, and Karol Vicencio, "Descripción del rol autopercibido del psicólogo y sus implicancias en los procesos de formación de pregrado," *Psicoperspectivas* 13, no. 1 (2014): 108-120.

[11] Modesto Alonso, Domenica Klinar, and Paula Gago. "*Los/as psicólogos/as en Argentina. Relevamiento Cuantitativo 2011"* (paper presented at the IV Congreso Internacional de Investigación y Práctica Profesional en Psicología, XIX Jornada de Investigación y 8º Encuentro de Investigadores de Psicología del MERCOSUR. Facultad de Psicología de la Universidad de Buenos Aires, Buenos Aires, Argentina, November 28-30, 2012).

[12] Pablo Beneitone et al., *Reflexiones y perspectivas de la educación superior en América Latina: informe final, proyecto Tuning América Latina 2004-2007* (Bilbao: Universidad de Deusto, 2007).

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in furtherance of the quality, effectiveness and transparency of qualifications and curricula.[13]

Sixty-two universities belonging to different Latin American countries took part in the Tuning Latin America Project. In addition, another relevant actor participated in the Project: the Tuning National Centres (TNC).[14]

The Tuning Latin America Project comprises four major lines of work: competences (both generic and specific to each thematic area); approaches to teaching, learning and assessment; academic credits; and quality of the curricula. With respect to competences, a questionnaire was administered to graduates, students, employers and academics of different discipline areas in which they were asked about the generic and specific competences of their respective disciplines. The respondents were requested to assess the importance and degree of achievement of each competence and to select the five competences they regarded as the most important. This allowed drawing up a list of generic and specific competences in each thematic area.[15]

The second phase of the Tuning Project included the area of Psychology, and thus the challenge arose to reach agreement on the education of psychologists in the region.[16]

Agreements were sought regarding the competences of those individuals holding undergraduate and graduate degrees in psychology and future professional scenarios. Additionally, teaching, learning and competence assessment strategies were outlined, along with certain considerations concerning students' workload during the course of their studies.[17]

III. **Psychology competences studies in Latin America's students**

In the past few years, studies have been conducted on the specific competences involved in the education of psychologists. However, there has been little research into the specific competences of psychologists set out in the Tuning Latin America Project.

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[13] Tuning América Latina, *Tercera Reunión General* (Bilbao: Universidad de Deusto, 2012).

[14] Julia González, Robert Wagenaar, and Pablo Beneitone, "Tuning-América Latina: un proyecto de las universidades," *Revista iberoamericana de educación* 35,1 (2004): 151-164.

[15] Beneitone et al., *Reflexiones y perspectivas de la educación superior en América Latina*.

[16] Rodríguez Cárdenas, ed., *Proyecto Tuning América Latina Educación Superior en América Latina: reflexiones y perspectivas en Psicología* (Bilbao: Universidad de Deusto, 2013).

[17] Ibid.

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In this sense, a research study into the specific competences of psychologists as laid down in the Project was conducted in Costa Rica in order to ascertain their degree of importance and achievement. All of the competences were rated as highly important in the study. The competences that obtained the highest ratings in terms of importance were related to the ethical aspects of professional practice, including ethical commitment and respect for diversity, as well as the capacity to translate theory into specific actions and the ability to understand and intervene in accordance with individuals' context and biopsychosocial reality.[18]

A research study aimed at establishing the competences of psychologists in Colombia's current professional practice found that knowledge of psychology principles, the use of technological tools and problem-solving abilities, along with initiative, human quality and professional ethics, are the most in-demand requirements of professional practice.[19]

In Chile, Álvarez and colleagues[20] conducted research into the competences that psychologists must have in order to enter the labour market. Students pointed out that such competences relate to adaptability, trustworthiness, innovation, team work and a global view. However, they also stated that they lack the following competences: problem analysis and assessment, technical and professional knowledge, energy, development of alliances, strategic job design, commitment, planning and organization, decision making and tolerance to stress.

Other research studies have sought to identify the competences in which students perceive themselves as more and less competent, and in some cases surveys have been conducted to determine the degree of importance of each competence. By way of example, Manzo[21] carried out a study in Argentina assessing the self-perception of competences acquired by advanced psychology students. The study found a high self-perception of clinical competences to the detriment of other professional areas.

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[18] Zaida Salazar-Mora and Jorge E. Prado-Calderón, "Valoración de competencias específicas del profesional en Psicología desde la Universidad de Costa Rica," *Revista Costarricense de Psicología* 31 (2012): 41-63.

[19] Maritza Ruiz, Bruno Jaraba and Lidia Romero, "La formación en psicología y las nuevas exigencias del mundo laboral," *Psicología desde el Caribe* 21 (2008): 136-157.

[20] Ernesto Álvarez, Jean Gómez, and Paula Ratto, "Competencias requeridas por el mercado laboral chileno y competencias actuales de estudiantes de Psicología con orientación laboral/organizacional, en una universidad privada," *Pharos* 11, no. 1 (2004): 113-133.

[21] Gustavo Manzo, "Autopercepción de competencias adquiridas en estudiantes de psicología de ciclo profesional (avanzado)," *Anuario de proyecto e informes de becarios de investigación de la Facultad de Psicología de la UNMdP* 6 (2009): 284-290.

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A study conducted by Herrera and colleagues[22] in Colombia was aimed at identifying the self-perceived strongest academic and professional competences of students and graduates. According to the study, they perceive themselves as more competent in the organisational area, given their special ability to work in interdisciplinary teams and carry out selection and recruiting tasks. It was found that they perceive themselves as less competent in the field of research and psychological evaluation. Students and graduates also acknowledge that they should improve their ability to communicate in English, to provide assessment and advice in sports activities, and to evaluate and intervene in the area of clinical neuropsychology.

Cabrera and colleagues[23] carried out a survey of the competences rated as most important by a sample of students and professors in Colombia. Such competences include: the ability to listen, management of knowledge, and assessment and understanding. On the other hand, technical abilities, such as the use of psychological tests, were not considered to be as important.

Another study surveyed the self-perception of practical competences of psychology undergraduate students in two state-owned universities in Argentina. Advanced students were asked to complete a questionnaire aimed at identifying the subjective perception of appropriation of the practical competences required for the exercise of the profession. The study contains an analysis of the basic and supplementary competences in the clinical assistance area.[24]

IV. **Method**

The purpose of this research is to analyse the degree of importance and perceived achievement of the specific competences set out within the framework of the Tuning Latin America Project, among a sample of advanced psychology students.

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[22] *Andrea Herrera, María F. Restrepo Álvarez, Ana F. Uribe Rodríguez and Claudia López Lesme,* "Competencias académicas y profesionales del psicólogo," *Diversitas* 5, no. 2 (2009): 241-254.

[23] Piedad Cabrera et al., "La formación en Psicología desde una perspectiva de competencias. Una contribución para el mejoramiento de la formación universitaria en Chile," *Calidad en la Educación* 33 (2010): 183-223.

[24] Catriel Fierro, "*La autopercepción de competencias prácticas en estudiantes avanzados de psicología en el marco de los procesos de acreditación*" (paper presented at V Congreso Internacional de Investigación y Práctica Profesional en Psicología XX Jornadas de Investigación Noveno Encuentro de Investigadores en Psicología del MERCOSUR, Facultad de Psicología de la Universidad de Buenos Aire, Buenos Aires, Argentina, November 30, 2013).

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V. **Participants**

The sample included 100 students that in 2015 were taking the last two years of the psychology degree course in a private university in the City of Buenos Aires. The students' ages ranged between 21 and 53 years, the mean age being 32 years. 73% of the participants were women.

Concerning to the psychology program consulted for this paper, it´s started 18 years ago, have a duration of 5 years, with training in different areas of psychology and a general view. The students do practical training in institutions linked to the different areas of professional practice supervised in the last stage of the career.

VI. **Instrument**

The Specific Competences Survey for students of the Tuning Latin America Project was used. This instrument consists of a list of 24 specific competences. The respondents were asked to rate the importance of each competence for professional practice and the degree of achievement of such competence.[25]

The survey used a four-point Likert scale ranging between 1=not important at all; 2=of little importance; 3= fairly important; and 4= very important.[26]

VII. **Procedure**

The questionnaire was administered to students of a private university in the City of Buenos Aires. In-person consultations were conducted. The students were asked to attend a meeting where the objectives and the characteristics of the survey were explained to them, and then the printed survey was given out to them.

VIII. **Results**

In order to evaluate the degree of importance and achievement given by psychology students to the specific competences set out within the framework

[25] Rodríguez Cárdenas, ed., *Proyecto Tuning América Latina Educación Superior en América Latina*.

[26] Beneitone et al., *Reflexiones y perspectivas de la educación superior en América Latina*.

of the Tuning Latin America Project, frequencies, mean scores, and highest and lowest ratings were calculated for each of the 24 competences.

IX. **Degree of importance of specific competences**

Specific competences in psychology obtained high ratings in terms of importance, the mean rating being of 3.51. All competences were rated above 2.93 and the highest mean rating was 3.85.

Table 1 shows the five competences with the highest mean ratings in terms of importance.

Table 1

Specific competences with the highest mean ratings in terms of importance

Competences	Lowest rating	Highest rating	Mean rating	Standard deviation
24. Accept the ethical commitment of psychological practice	3	4	3.85	0.35
11. Establish relationships between the theory and practice of psychology	1	4	3.82	0.52
8. Understand human beings' transitional stages throughout the life cycle	3	4	3.8	0.40
22. Respect individual and sociocultural diversity	2	4	3.78	0.46
13. Understand and intervene in human beings' psychological problems in accordance with their social, cultural and economic context	2	4	3.71	0.47

In turn, 22 competences obtained mean ratings above 3. This shows that they were considered as fairly and very important by the students surveyed. Only two of such competences obtained mean ratings below 3, although in both cases ratings were close to that value. Such competences were related to the integration of technological tools into professional practice (mean of 2.93) and the ability to design psychometric tools in a valid and reliable manner (mean of 2.99).

With respect to lowest and highest ratings, it was found that two competences obtained minimum ratings of 3 (none of the respondents rated such competences below that value). These competences were related to the

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acceptance of the ethical commitment of psychological practice and an understanding of human beings' transitional stages throughout the life cycle. These were two of the competences with the highest mean ratings.

Table 2 shows the five competences with the lowest mean ratings in terms of importance.

Table 2

Specific competences with the lowest mean ratings in terms of importance

Competences	Lowest rating	Highest rating	Mean rating	Standard deviation
19. Integrate technological tools into professional practice	1	4	2.93	0.78
21. Design psychometric tools in a valid and reliable manner	1	4	2.99	0.93
3. Carry out scientific research in the field of psychology	1	4	3.23	0.75
2. Know and understand the epistemological foundations of science	1	4	3.27	0.63
14. Mediate and/or negotiate in different aspects of psychological practice	1	4	3.31	0.76

In addition, the importance of the competences was analysed in connection with the five domains into which the 24 competences are classified. It is worth recalling that the Tuning Latin America Project in the area of Psychology not only included a list of specific competences, but it also developed a meta-profile in which the different competences are classified into several domains.

Regarding mean ratings for each domain, the highest mean was obtained by the Ethical Domain (3.77), followed by the Disciplinary Domain (3.67), while the Interdisciplinary Domain ranked third (3.49) and the Professional Domain was placed fourth (3.48). The Epistemological Domain ranked last (3.36). It may be noted that there is very little variation in the mean ratings of each domain.

X. **Self-perceived degree of achievement of specific competences**

Regarding the self-perceived degree of achievement, the mean rating was 2.96 — with values ranging between 2.39 and 3.43. The following table

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shows the five competences with the highest mean ratings of achievement according to students (Table 3).

Table 3

Specific competences with the highest mean ratings for self-perceived achievement

Competences	Lowest rating	Highest rating	Mean rating	Standard deviation
24. Accept the ethical commitment of psychological practice	1	4	3.43	0.79
3. Carry out scientific research in the field of psychology	1	4	3.35	0.78
7. Understand and explain psychological processes from a biopsychosocial perspective	2	4	3.35	0.62
8. Understand human beings' transitional stages throughout the life cycle	2	4	3.31	0.64
11. Establish relationships between the theory and practice of psychology.	2	4	3.29	0.76

For all competences, the highest rating was 4, and the lowest in these five competences was 2 (of little importance).

In relation to the five competences with the lowest mean ratings for achievement, the mean ratings varied between 2.68 and 2.39.

Table 4

Specific competences with the lowest mean ratings for self-perceived achievement

Competences	Lowest rating	Highest rating	Mean rating	Standard deviation
19. Integrate technological tools into professional practice	1	4	2.39	0.96
16. Design and develop programmes that promote the psychological well-being of individuals, groups and communities	1	4	2.41	0.85
21. Design psychometric tools in a valid and reliable manner	1	4	2.45	0.93

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Competences	Lowest rating	Highest rating	Mean rating	Standard deviation
14. Mediate and/or negotiate in different aspects of psychological practice	1	4	2.59	0.92
5. Integrate and make use of knowledge of other disciplines	1	4	2.68	0.80

XI. **Conclusion**

It is worth noting that the students regarded all the competences as highly important. This shows that, for the students in the sample, all the items listed entail different areas of knowledge and skills that are valued as highly necessary for the practice of Psychology. This is in line with the findings of the Tuning Latin America Project, in which all the competences were rated as important by students.[27]

It should be stressed that the competence considered by the students to be the most important was the one related to the ethical aspect of professional practice. Accepting the ethical commitment of psychological practice was the competence with the highest rating in terms of importance.

Similar findings were reported by the Tuning Latin America Project, as ethics-related general and specific competences obtained the highest mean ratings in terms of importance among all the groups surveyed.[28]

Along these lines, the need to include ethics in university curricula has been acknowledged and thus training in ethics has been gradually incorporated into the teaching and learning processes of the different professional disciplines.[29]

In this sense, university education is not only concerned with generating and transmitting knowledge, but it is also committed to providing students with integral training that includes specialised field knowledge, technical skills and a framework for ethical professional practice that should also be considered as a moral activity.[30]

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[27] Tuning América Latina, *Tercera Reunión General*.

[28] Tuning América Latina, *Tercera Reunión General*.

[29] UNESCO, "*Hacia las sociedades del conocimiento*. Informe mundial de la UNESCO," 2005, accessed October, 12, 2016, http://unesdoc.unesco.org/images/0014/001419/141908s.pdf.

[30] Antonio Bolívar, "El lugar de la ética profesional en la formación universitaria," *Revista mexicana de investigación educativa* 10, no. 24 (2005): 93-123.

It is widely recognised that education that prepares a prospective psychologist for a valuable intervention in the community needs to approach the profession's ethical-deontological dimension. [31]

Research studies carried out in Argentina,[32] Costa Rica,[33] Mexico[34] and Colombia[35] show that the most important competences are those related to the ethical aspects of professional practice, including ethical commitment and respect for diversity.

Therefore, ethical competences in professional education are considered to be of great relevance both for students and graduates. They also prove to be relevant in university curricula and professional regulations, in which ethical aspects play a central role. Ethics is a necessary component of current professional education, as it is considered by the different actors of the educational process to be the foundation for personal and professional development.[36],[37],[38],[39],[40]

On the other hand, it is relevant to make reference to some of the competences that obtained the lowest mean ratings in terms of importance. One of such competences is the ability to integrate technological tools into professional practice. The low importance given to this competence seems

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[31] Andrea Ferrero and Eugenia Andrade, "Propuestas vigentes para la formación ético-deontológica en Carreras de Psicología en el contexto del Mercosur. El caso argentino," *Fundamentos en Humanidades* 15 (2007): 163-178.

[32] María J. Sanchez Vazquez, "La ética y deontología profesional en el proceso de formación académica de los alumnos de la Facultad de Psicología," *Revista de Psicología-Segunda Época* 12 (2011): 109-125.

[33] Zaida Salazar-Mora and Jorge E. Prado-Calderón, "Valoración de competencias específicas del profesional en Psicología desde la Universidad de Costa Rica," *Revista Costarricense de Psicología* 31 (2012): 41-63.

[34] Guadalupe Ross Argüelles et al., "Evaluación de competencias y su relación con el desempeño de los estudiantes en la práctica profesional", *Revista El Buzón de Pacioli* 74 (2011): 1-15.

[35] Maritza Ruiz, Bruno Jaraba, and Lidia Romero, "La formación en psicología y las nuevas exigencias del mundo laboral," *Psicología desde el Caribe* 21(2008): 136-157.

[36] Ferrero, Andrea, and Eugenia Andrade, "Propuestas vigentes para la formación ético-deontológica en Carreras de Psicología en el contexto del Mercosur. El caso argentino," *Fundamentos en Humanidades* 15 (2007): 163-178.

[37] Ross Argüelles et al., Evaluación de competencias y su relación con el desempeño de los estudiantes en la práctica profesional, 1-15.

[38] Ruiz, Jaraba, and Romero, "La formación en psicología y las nuevas exigencias del mundo laboral," 136-157.

[39] Salazar-Mora and Prado-Calderón, "Valoración de competencias específicas del profesional en Psicología desde la Universidad de Costa Rica," 41-63.

[40] Sanchez Vazquez, "La ética y deontología profesional en el proceso de formación académica de los alumnos de la Facultad de Psicología," 109-125.

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remarkable if we consider the prominence of technology in today's society. Such low rating, however, does not seem to be an isolated finding in this study. Other studies have reported similar findings regarding the low importance placed on integrating technological tools into professional practice.[41] [42] [43]

Technological tools are gradually being implemented in Psychology, through the use of the Internet and new tools that assist in evaluation and intervention, such as simulation, virtual reality and augmented reality.[44] The possibilities that new technologies offer for psychology show a promising future, but their implementation poses a great challenge.[45]

Another competence rated with a low level of importance was the ability to design psychometric tools in a valid and reliable manner. This is a competence that is generally regarded by students and graduates as unimportant.[46] ,[47]

Some comments regarding this point are in order. Measurement in psychology is extremely relevant as it makes it possible to gather data about abilities, behavioural traits, personality types and other features that allow professionals to quantify human characteristics.[48] However, administering psychometric tools is not the same as designing them. While psychologists in different professional areas usually administer evaluation techniques in the diagnosis process, the design of evaluation tools is not a common practice in psychology — these are generally developed in academic contexts within research processes.

In addition to this, it is worth recalling that in Argentina the psychologist's profile has had a strong clinical character, while psychometrics, statistics and methodology have been less developed.

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[41] Salazar-Mora and Prado-Calderón, "Valoración de competencias específicas del profesional en Psicología desde la Universidad de Costa Rica," 41-63.

[42] Sanchez Vazquez, "La ética y deontología profesional en el proceso de formación académica de los alumnos de la Facultad de Psicología," 109-125.

[43] Tuning América Latina, *Tercera Reunión General*.

[44] Cristina Botella et al., "La utilización de las nuevas tecnologías de la información y la comunicación en psicología clínica," *UOC Papers: revista sobre la societat del coneixement* 4 (2007): 32-40.

[45] Jordi Miró, "Psicoterapia y nuevas tecnologías," *Cuadernos de Medicina Psicosomática y Psiquiatría de Enlace* 81 (2007): 15-20.

[46] Piedad Cabrera et al., "La formación en Psicología desde una perspectiva de competencias. Una contribución para el mejoramiento de la formación universitaria en Chile," *Calidad en la Educación* 33 (2010): 183-223.

[47] Tuning América Latina, *Tercera Reunión General*.

[48] Diana Malo Salavarrieta, "La medición en psicología como herramienta y como reflexión ética en el ejercicio del psicólogo," *Revista Psicogente* 11 (2008): 46-51.

This explains why students do not regard this as a central competence in the profession and a common practice, but rather as a specific field of knowledge and ability related to a particular area.

Regarding the self-perceived degree of achievement of specific competences, it is worth noting that the students surveyed considered that most of the competences are thoroughly developed during their professional training in Psychology.

It is also worth stressing that the competence with the highest self-perceived degree of achievement was the ability to accept the ethical commitment of psychological practice.

It is encouraging to find that students perceive high levels of achievement in ethical competences since these competences are one of the pillars for a responsible professional practice that is committed to society.

In addition, the students regarded the ability to carry out scientific research as one of the competences with the highest degree of achievement. This result is not consistent with the findings reported in other studies, as such ability is generally regarded as an area with a low competence requiring improvement. [49],[50]

On the other hand, it is also relevant to focus on those competences with perceived low levels of achievement. The data gathered in this respect is useful to reflect upon the role of these competences in psychologists' education and open a debate about the need to provide more thorough training in these competences.

One of these competences is the ability to design and develop programmes that promote psychological well-being. This is a competence that is regarded as highly important but with respect to which students and graduates do not feel competent enough. This draws our attention to one of the main shifts in psychology in the past few years: the growing interest in well-being and individual strengths, in a move away from a focus on pathological aspects. The findings obtained from the students' survey point in this direction.

Along these lines, the interest of psychology throughout time has been focused on the negative aspects of the individual, which resulted in a disciplinary framework biased towards pathological aspects. As a

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[49] Andrea Herrera et al., *"Competencias académicas y profesionales del psicólogo," Diversitas* 5.2 (2009): 241-254.

[50] Mauricio González, Ingrid González, and Karol Vicencio, "Descripción del rol autopercibido del psicólogo y sus implicancias en los procesos de formación de pregrado," *Psicoperspectivas* 13.1 (2014): 108-120.

consequence of this approach, there has been little progress in the study of strategies to optimise the individual's resources.[51]

However, this approach has changed over the past few years. A trend has emerged in psychology that addresses positive variables and preventive measures instead of focusing on the traditional negative and pathological aspects.[52]

This shift may be attributed to the introduction of Positive Psychology by Seligman in 1998. The scientific community thus became interested in concepts such as happiness, well-being, optimism and wisdom.[53]

It was at that time that the concept of well-being became prominent in the scientific community, which now regards Psychology not only as the study of pathologies and damage, but also of strengths and virtues. Psychological treatment should not only focus on fixing what is broken but also nurture what is best within ourselves.[54]

The statements above are closely related to the ability to design programmes that promote well-being. It would be particularly helpful to increase efforts so that students and graduates may enhance their degree of achievement in this area.

To conclude, it is important to reflect upon the essential competences that should be included in academic curricula so as to guarantee a minimum, sufficient and relevant training in all professional areas where psychologists may intervene.

This creates the need for a constant assessment of training, its strengths and weaknesses and improvement plans aimed at enhancing the quality of university education.

At present, the only project that evaluates the competences required for the practice of psychology in Latin American is the Tuning Latin America Project. In some countries of the region, however, there have been proposals to establish a list of competences at the national level — such has been the case in Chile and Colombia.

In Argentina, this area has not been adequately studied. For this reason, it is worth emphasising that the findings in this research provide evidence that the competences set out within the framework of the Tuning Latin

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[51] Carmelo Vázquez, "La psicología positiva en perspectiva," *Papeles del psicólogo* 27, no. 1 (2006): 1-2.

[52] María Laura Lupano Perugini and Alejandro Castro Solano, "Psicología positiva: análisis desde su surgimiento." *Ciencias psicológicas* 4, no. 1 (2010): 43-56.

[53] Martin Seligman, "The president's address," *American Psychologist* 54 (1999): 559-532.

[54] Martin Seligman,"Fundamental assumptions," *Psychologist* 16, no. 3 (2003): 126-127.

America Project are regarded as highly relevant by the university students that participated in the survey.

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About the authors

DENISE BENATUIL (dbenatuil@iname.com), PhD in Psychology, is Director of Undergraduate Psychology Studies at Palermo University (Argentina) where she teaches in undergraduate and postgraduate programmes on the following subjects: Internships in Psychology I, II and Practicum. She also teaches at the postgraduate level at the Buenos Aires University (Argentina). She is currently involved in three research projects. The first one is *Professional competences and Psychologist profiles* which is carried out at the Centre for Higher Education Research at Palermo University and in the context of which many publications have been produced in the last years in reference to the competences for psychology training, the evaluation of competencies according to Tuning Latin America Project in advanced undergraduate students and Psychology graduates, acquisition modalities, internship and practicum as relevant components for the acquisition of competences. The second project is *Competences of the Psychologist in different fields of application,* carried out at the Centre for Psychology Research at Palermo University. It focuses on the assessment of professional practices as a device for the acquisition of skills in Psychology students. It also explores the skills needed for the expert development of the clinical psychologist. The third project is entitled *Exploring the Global Well-*

being of Children and Youth. Methodological Challenges and practices of Undertaking Qualitative Research on Well-being from Multinational Perspectives and is hosted by the Centre for Research in Social Science (CICS) at Palermo University.

MARÍA JULIANA LAURITO (mlauri@palermo.edu) holds a Master's in Higher Education (MEs) from Palermo University (Argentina) where she Secretary of Psychology Degree Programme and teaches at the undergraduate level the following subjects: Internships in Psychology I and II. She currently participates in the following research projects: *Professional competences and Psychologist profiles*; *Competences of the Psychologist in different fields of application*, and *Exploring the Global Well-being of Children and Youth. Methodological Challenges and practices of Undertaking Qualitative Research on Well-being from Multinational Perspectives*. Within the framework of the first project, many publications have been produced during the last years in reference to the competences for psychology training, the evaluation of competencies according to Tuning Latin America Project in advanced undergraduate students and Psychology graduates, acquisition modalities, internship and practicum as relevant components for the acquisition of competences. The lead department for the first project is the Centre for Higher Education Research at Palermo University. The second project is hosted by the Centre for Psychology Research at Palermo University. It focuses on the assessment of professional practices as a device for the acquisition of skills in Psychology students. It also explores the skills needed for the expert development of the clinical psychologist. The lead department for the third project is the Centre for Research in Social Science (CICS) at Palermo University.

Students applying their knowledge of material science in problem-solving: implications for competence based-learning at the University of Zimbabwe

Peter Kwaira*

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Abstract: This study involved a class of serving teachers in their second year of a Bachelor of Education degree programme, in which one of the pre-requisite courses covered during first year was '*Principles of Material Science* (PMS). At the time of study, they were studying '*Machine-shop Practice*' (MsP); a course based on the *Design and Technology* (D&T) approach, in terms of teaching and learning. They were required to solve practical-technical problems through hands-on practical activities, supported by relevant ancillary theory. In practice, during such activities, students are expected to demonstrate the ability to apply their knowledge of *Material Science* (MS) in various ways; for example, in the choice of materials for given projects aimed at solving specific problems and in the methods of working such materials. Now given this background, the problem was therefore to determine the extent to which students applied their knowledge of MS in solving selected problems under MsP. Data were gathered through interviews, discussions, observations and document analysis. Findings showed students being able to apply their knowledge of MS effectively during problem-solving under MsP; thereby, qualifying their learning as having been outcome-based in nature.

Keywords: Curriculum change and innovation; design and technology; outcome-based learning; problem-solving; teaching; learning; Technical Education.

I. Introduction and background to the problem

The Department of Technical Education (DoTE) at the University of Zimbabwe (UZ) has been involved in the education, training and professional development of technical subject teachers since 1987. Teachers come to the Department for a Bachelor of Education (B.Ed.) degree after qualifying to

* Peter Antonio Kwaira (Petkwaira@gmail.com), PhD in Science and Technology Education, is Senior Lecturer at the Department of Technical Education, University of Zimbabwe (Zimbabwe). *More details are available at the end of this article.*

teach specific technical subjects from various technical teachers' colleges around the country. Such subjects include; Wood Technology, Metal Technology, Building Technology, Technical Graphics, Agriculture and Home Economics. This study mainly focused on teachers specializing in the first two. As a requirement, teachers usually join the Department after at least two years of teaching experience in schools.

The UZ, through DoTE, introduced the said programme in 1987 at the request of the Government of Zimbabwe, through the Ministry of Education, which had just adopted a new philosophy in the teaching/learning of technical subjects; Design and Technology (D&T). This marked the advent of D&T as a new concept in the curriculum. Since then, D&T has always featured both, as a subject and as an approach in the teaching/learning of technical subjects.

The move by Government to introduce D&T was mainly motivated by the need to keep the curriculum abreast of global trends, regarding Technical Education (TE), with specific reference to *curriculum change and innovation*.[1] Curricula the world over are changing rapidly, and in Zimbabwe as elsewhere, there has been need to relate teacher education and training to the prevailing politico-socio-economic demands of the curriculum, which now includes D&T within the context of TE.

In recent years, TE has made spectacular advances and the societies in which we live, work, and learn have undergone some dramatic changes.[2] During a national conference on the theme, 'Teacher Education for the 21st Century: Issues and strategies' in 2000, the then permanent secretary for the Ministry of Higher and Technology Education in Zimbabwe expressed the need for developing a teacher education system that would be responsive to the prevailing social, political and economic changes in the country.[3] This reinforced the speech by the then Minister of the same ministry, when he officially opened the conference, expressing the need for continued renewal and review of teacher education and training. Delegates were challenged to address the issue of quality, particularly in teacher education and higher education in general ahead of the new socio-politico-economic era of an emerging millennium. The need for a paradigm shift was also

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[1] National Conference on Teacher Education Report (NCTER), *Teacher education for the 21st. century: Issues and strategies* (Harare: Ministry of Education and Culture, Zimbabwe, 2000).

[2] John P. Keeves and Glen S. Aikenhead, "Science curriculum in changing world," in *Improving science education,* ed. B.F. Fraser and H.J. Walberg (Chicago: The National Society for the Study of Education, 1995), 13-45.

[3] National Conference on Teacher Education Report (NCTER), *Teacher education for the 21st. century: Issues and strategies*, 1.

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emphasised, regarding focus on quality of the teaching force as opposed to mere quantity.

Historically, technical subjects in Zimbabwe (e.g., Woodwork and Metalwork), have always been taught through the traditional approach, where teachers would present pupils with problem situations and then proceed to provide solutions to those situations. A typical example could be a case where a teacher asks pupils to make a tea-pot stand for their mothers and then proceed to stipulate the material(s), measurements, and the type(s) of joint(s) required to join the various components together.[4] Pupils would then be required to simply follow instructions relating to laid down procedures. The teacher would give knowledge and learners would be recipients expected to retrieve relevant bits and pieces of information as required, especially in examinations. It is such a *banking concept of education* that Paulo Freire has critiqued in his thesis; '*Pedagogy of the Oppressed*'.[5] In '*The Politics of Education, Culture, Power and Liberation*', he (Freire) has maintained his criticism of the metaphor of education as *banking*, elaborately equating the business of education under this metaphor to the act of deposition in which students become the *depositories* while the teacher is the *depositor*.[6] Freire describes how people of conscience can move through different stages to ultimately be able to take action and overcome oppression.[7] To effect major change, at what he calls *critical transformation stage*, people must become active participants in changing their own status through social action, aimed at the larger social order. Here Freire's views of *critical constructivism* are in agreement with those of Vygotsky;[8] Meachum,[9] Donald, Lazarus and Lolwana[10] in their deliberations on *social constructivism*.

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[4] Peter Kwaira, "Problems experienced by teachers in their efforts to implement the Design and Technology approach in the teaching of technical subjects," in *IDATER'98,* ed. Smith, J.S (Department of Design and Technology, Loughborough University, 1998), 224-229.

[5] Paulo Freire, *Pedagogy of the oppressed* (Englewood Cliffs N.J.Prentice Hall, 1972).

[6] Paulo Freire, *The politics of education, culture, Power and liberation* (South Hadley, Mass.: Bergin&Garvey, 1985).

[7] Allan C.Ornstein and Francis P. Hunkins, *Curriculum foundations, principles, and issues* (London: Allyn and Bacon, 2004).

[8] Lev S.Vygotsky, *Thought and language,* ed. Alex Kozulin (Cambridge: The MIT Press, 1986).

[9] Meachum J. Shuaib, "Vygotsky and the blues: Re-reading cultural connections and conceptual development," *Theory into Practice* 40 (2001): 190-197.

[10] Reuven Lazarowtz and Pinchas Tamir, "Research on using laboratory in science instruction," in *A handbook of research in science teaching and learning*, ed. D. Gabel (New York: Macmillan), 94-128.

Freire also advocates for dialogue or match between students and teachers, and for sensitivity to change.[11] From a much earlier debate, Freire refers to what he terms; a curriculum of '*Human phenomenon — Problematic situations — and Background awareness*', which he claims has the potential to transform the world.[12] Accordingly, the curriculum focuses on community, national and world problems; and has to be based on core or inter-disciplinary approaches. Seigfried;[13] Pinar[14] and Marsh and Willis,[15] being reconceptualists and critical theorists, see the thrust of such a curriculum being the development of individual self-actualization and freedom through cognitive and intellectual activities, which would in turn liberate people from the restrictions, limitations and negative controls of society. These theorists are primarily concerned about people and curriculum experience rather than the curriculum planned. They suggest educators shift their attention from *curriculum development* to *curriculum understanding*. This indicates a progressive shift from knowledge to activity, theory to practice and reflections to actions in a situation, where the curriculum attempts to create new conditions and environments for the benefit of humanity.[16] This implies practice and activity becoming more meaningful when guided/informed by knowledge and theory, thereby suggesting a close relationship between these factors. One can draw parallels between Paulo Freire's ideas and the main ideals founded in D&T, especially on the issue of translating theory into practice. 'Parallels and relationships' in this case do not imply Freire's ideas and the ideals of D&T being exactly the same! The key word is 'similarity', where if one was to argue for, and agree with the fact that Paulo Freire, in his thesis 'Pedagogy of the Oppressed' puts forward a proposition to promote 'Education for Liberation' (liberation of the mind regarding independent thinking and decision making), s/he would find traits of such education in D&T. In this regard, Freire's ideas closely relate to the ideals of D&T when the problem-solver is expected to make independent decisions during problem-solving. Therefore, going by Freire's contention relating to the essence of D&T, such a person would be regarded

[11] Paulo Freire, *Pedagogy of the oppressed* (New York: Continuum, 1990).

[12] Paulo Freire, *Pedagogy of the oppressed* (New York: Herder & Herder, 1970), 75-108.

[13] Haddock C.Seigfried, *Pragmatism and Feminism* (Chicago: University of Chicago Press, 1996).

[14] William F. Pinar, "Farewell and celebrate," in *Contemporary curriculum discourses*, ed. William F. Pinar (New York: Peter Lang, 1999), 489.

[15] Colin J. Marsh and George Willis, *Curriculum: Alternative approaches, ongoing issues* (Columbus, Ohio: Merrill, 2003).

[16] Allan C. Ornstein and Francis P. Hunkins, *Curriculum foundations, principles, and issues* (London: Allyn and Bacon, 2004).

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as being free/liberated in terms of thinking and decision-making. Problem-solving involves one being creative in combining established and known rules/principles into new elements to solve a given problem.[17] The main argument appears to be a call for education that empowers learners to play an active role on matters to do with their lives/welfare. Melnick advances similar thoughts in relation to the role of virtual schools, given the changing face of education with the advent of the 21st century:

> Virtual schools should hold out the possibility of the global classroom, democratization of knowledge, student-driven learning, and robust, authentic curriculum that is constantly being improved upon by each successive group of learners.[18]

In agreement with critical theorists like Freire and Melnick, are post-modernists like: Slattery;[19] Peters,[20] and Neville,[21] holding the view that there is not one way to interpret the curriculum. Post-modernists are constructivistic in viewing the world as emergent, fluid, chaotic, open, interactive and on-going.[22] This is contrary to the modernist view of a grand narrative for phenomena. According to Gagnier,[23] post-modernists challenge and question the grand claims proclaimed by modernists about key concepts such as justice, validity, reliability and truth. Likewise, they query the rigidity usually suggested by concepts such as curriculum, instruction, pedagogy, education, schooling, student and teacher.

A common criticism of D&T in Zimbabwean today has been the fact that it does not play an integral role in the instructional process.[24] Apart from failing to teach the subject effectively, most teachers appear to use D&T as an approach on an extremely limited scale. While several factors seem to contribute to this problem, teacher education apparently appears to be at the

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[17] Mills R. Gagne, *The condition of learning* (New York: Holt, Rinehart and Winston, 1987).

[18] Blake Melnick, "Virtual Schools: The changing face of education — Learning with technology," *The English Journal: The world of literature* 91, no. 5 (2002): 85-88.

[19] Patrick Slattery, *Curriculum development in the postmodern era* (New York: Garland Publishing, Inc., 1995), 118.

[20] Michael Peters, *Education and the postmodern condition* (Westport, Conn.: Bergin and Garvey, 1995).

[21] Robert C. Neville, *The high road around modernism* (Albany: State University of New York Press, 1992).

[22] David Harvey, *The Condition of Post-Modernity* (Oxford: Basil Blackwell, 1992).

[23] Regenia Gagnier, "Feminist postmodernism: The end of theory?," in *Theoretical perspectives on sexual differences*, ed. Deborar L. Rhode (New Haven, Conn.: Yale University Press, 1990).

[24] National Conference on Teacher Education Report (NCTER), *Teacher education for the 21st. century: Issues and strategies*, 2.

core; mainly because teachers have the crucial responsibility for developing or preparing the learning environment, choosing or designing instructional strategies and deciding what instructional materials or teaching aids to use.[25] If teachers do not have the necessary knowledge and skills to integrate D&T into the curriculum as part of the instructional process, they cannot be expected to do so. Glenn and Carrier[26] came to this conclusion on teachers who were expected to integrate computer technology into their teaching, but were experiencing difficulties. It was only after they had gone through an in-service programme designed to give them the necessary orientation that there were signs of progress.

At the above mentioned conference on teacher education, several resolutions and suggestions were made in view of a three-fold challenge in the professional development of technical subject teachers, where there was a critical need to;

- increase scientific knowledge in order to approach/teach technical subjects from a scientific perspective.
- enhance the competence of teachers in solving practical D&T problems where practical skills are guided by scientific knowledge and/or principles.
- increase understanding of how to teach pupils to solve technical problems in D&T by putting theoretical knowledge into practical application.

Such a paradigm shift called for life-long professional development, opposed to the 'one-off' programmes in most conventional colleges today.

For the purpose of this study, the following pedagogical ideas were drawn from the aims and objectives of the 2002 version of the 'A' Level D&T syllabus developed by the Zimbabwe Schools Examination Council (ZIMSEC) in collaboration with the Cambridge International Examinations (CIE):

- Problem posing, as opposed to the traditional approach where learners were presented with solutions to problems.
- Learners and teachers brain storming over possible solutions to practical problems.

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[25] Terry W. Moore, *Philosophy of education — An introduction* (London: Routledge and Kegan Paul, 1982).

[26] Allen D. Glenn and Carol A. Carrier, "Teacher education and computer training: An assessment (Beyond the computer revolution)," *Peabody Journal of Education* 64, no. 1 (1986): 67-80.

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- Learners working in groups and collaborating in the business of learning.
- Teaching and learning being learner-centred.
- Learners contributing towards assessment of their work through self-assessment.
- Learners being able to record their ideas in design folios during problem-solving.
- Learners experimenting with various materials.
- Promotion of subject integration between MS and other subjects in the curriculum.
- Technical subjects becoming more and more scientific in orientation within the context of D&T.

It is indeed some of these ideas that guided this study. After their 2-year B.Ed. degree programme, the teachers involved were expected to go back to their schools around the country and implement what they would have learnt. This implied several connotations in relation to the issue of outcome and/or competence-based learning. Teachers being able to apply their newly acquired knowledge and skills in their teaching practice meant a lot, in terms achievement for the whole education system! Out of several possibilities, the main focus of study was on the need to have students (serving teachers) actively demonstrating and reflecting on their understanding of specific concepts within particular subject areas. In this case, one of the pre-requisite courses they had done in their first year was 'Principles of Material Science (PMS). At the time of study, the teachers were in their second year studying Machine-shop Practice (MsP), where they were expected to solve practical problems through hands-on activities. They were also expected to demonstrate the ability to apply their knowledge of Material Science (MS) in such activities. Now given this background, the problem was therefore to determine the extent to which they actually applied their knowledge of MS in solving selected problems under MsP.

II. **The theoretical framework and related perspectives**

From a theoretical perspective, the following issues were pertinent: The essence of curriculum change and innovation; Linking theory and practice in problem-solving within the context of D&T, and Current debate on issues relating to outcome-based learning.

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II.1. *The essence of curriculum change and innovation*

Curriculum change and innovation has to do with the question of 'relevance'.[27] It is usually necessitated by the need to make the curriculum relevant to a particular context. According to Cornbleth,[28] calls for reform signify dissatisfaction, impatience and optimism; thereby, confirming the belief that people are rarely content with things as they are. Naturally people always expect greater quantity and quality than whatever presently exists.[29] On education and schooling, this explains the relentless search for excellence, where the curriculum has remained under the spot-light, challenged to keep abreast of unpredictable events in society.[30]

Since different politico-socio-economic situations exist in different countries, educational problems tend to be relative, depending on the particular needs of individual societies.[31] This brings in the issue of 'curriculum relevance', where English[32] views the curriculum in terms of ideological (or philosophical-scientific), technical (or design), and operational (or managerial) issues.

To argue that curriculum should be relevant or useful does not mean much unless we know whom it should be useful to, what purpose it should be useful for, and in whose judgement it should be useful.[33] Accordingly, activities do not possess or lack relevance in the abstract. They possess or lack relevance to particular people, for particular purposes, and in particular circumstances. In this case, society and the individual are of particular interest.

Curriculum content largely depends on the nature of society.[34] Hence, any society sophisticated enough to have an idea of education is most likely

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[27] Alex C. Bowers and David J. Flinders, *Responsive teaching* (New York: Teachers' College Press Columbia University, 1990).

[28] Catherine Cornbleth, "Ritual and rationality in teacher education reform," *Educational Researcher* 15, no. 4 (1986): 5.

[29] Cornbleth, "Ritual and rationality," 5-14.

[30] Michael W. Apple, "The politics of official knowledge in the United States," *Journal of Curriculum Studies* 22, no. 4 (1990): 377-383.

[31] Herbert Kohl, *Towards educational change and economic justice* (Phi Delta: Kappan, 1991), 678-681.

[32] Fenwick W. English, "Contemporary curriculum circumstances," in *Fundamental curriculum designs*, ed. FenwickW. English (Michigan: University of Michigan, 1983), 1-17.

[33] Robin Barrow, *Giving teaching back to teachers: A critical introduction to curriculum theory* (Sussex: Wheatheaf Books, 1984).

[34] Jon Wiles, *Curriculum essentials: A resource for educators* (New York: Pearson Education, Inc., 2005).

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to regard some knowledge and skills as worthy of passing on to the next generation. What is judged as valuable depends on several factors where, among many, Kelly[35] gives; different epistemological styles, different cultures, and different stages of development. Moore[36] also refers to a position held by some sociologists of education who, following a Marxist persuasion, maintain that any educational curriculum reflects an interest.

Apart from society, the 'individual learner' is also considered under the issue of 'curriculum relevance'. Whatever context, the learner is *key* to the success of any curriculum.[37] Society might endeavour to achieve certain ideals but, if the learner's interests are not accommodated, not much might be achieved! Garforth[38] goes further to point out that, politicians, policy makers, school administrators and teachers might agree on what they might consider to be a wonderful curriculum, only to find the wrong students showing up! Garforth appears to agree with Kilpatrick's[39] work, focusing on the 'child-centred curriculum', which according to Ginsburg, belongs to the doctrine of 'child-social-purpose', based on the 'activity-centred curriculum'.

Perhaps, Kilpatrick's work could best be explained by the more recent debate raised by Berlak and Berlak,[40] focusing on three main dilemmas from among several, regarding the choice of knowledge patterns in a curriculum: (a) knowledge as given versus knowledge as problematic, (b) public knowledge versus personal knowledge, and (c) knowledge as molecular versus knowledge as holistic. Given the profile of controversies and contradictions implied in these areas, the direction one takes depends on one's line of thinking, resulting in a particular outlook of the curriculum in a particular context. McNeil[41] draws similarities between Kilpatrick's work

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[35] Victor A.Kelly, *Curriculum context: A comparative approach* (London: Happer and Row Publishers, 1980).

[36] Moore, *Philosophy of education*.

[37] Peter Kwaira, "A study to determine the extent to which the Design and Technology approach is being relevant to the teaching of technical subjects in Zimbabwe," in *Proceedings of the eighth annual meeting of the Southern African Association for Research in Mathematics and Science Education*, ed. Sechaba Mahlomaholo (Port Elizabeth: University of Port Elizabeth, 2000), 239.

[38] Kwaira, "A study to determine the extent to which the Design and Technology approach is being relevant to the teaching of technical subjects in Zimbabwe," 239-246.

[39] Heard W. Kilpatrick, *Foundation of education* (New York: Macmillan, 1926), 212.

[40] Ann Berlak and Harold Berlak, "Towards a non-hierarchical approach to inquiry and leadership," *Curriculum Inquiry* 13, no. 3 (1983): 267-294.

[41] John McNeil, *Curriculum: A comprehensive introduction* (Glenview III: Scott Foreman, 1990).

and that of Dewey.[42] However, the main difference between these two architects/philosophers of education is that while Kilpatrick focuses on the role of the child in an educational enterprise, Dewey focuses more on the teacher's role. For Kilpatrick, the child has to learn to search; investigate, compare, think why and in the end, make his/her own decision as required in a given situation. According to the thinking in this study, this is exactly what D&T is all about!

Barrow[43] identifies four causes of irrelevance in education and consequently, four levels on which relevance may be achieved: what is taught, how it is taught, learners' feelings and the learners' concerns. In practically all societies, rapid change is occurring in roles and relationships, economic conditions, mores and values, religious and political beliefs, relations between nations, and ways of everyday life.[44] These and other changes implicitly and explicitly challenge us to re-think the curriculum.[45] In most cases profound changes are needed in school curricula and in government policies to meet the challenge, hence the need for reform(s) in education, both 'radical' and 'gradual'.[46] In Zimbabwe, the latter, also known as 'continuous/rolling' reforms are currently the main focus in view of the need to have the education system in line with the prevailing politico-socio-economic conditions.

The need for such continuous revision of the curriculum is actually related to the rapid and erratic shifts, qualitatively and quantitatively, in the 'social demand' for education as well as in the 'economic demand' for educated people.[47] Hence, it is affirmed, if 'rolling reform' is to have any meaning or impact, it must be possible to identify, and to some extent predict, such shifts.[48] In most countries today, the majority of citizens must be prepared to change occupations once or twice during their working lives, or to undergo a so thorough re-training that it becomes equivalent to a complete

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[42] John Dewey, "Individuality and experience," in *Art and Education*, ed. John Dewey (Marion, Pa.: Barnes Foundation, 1929), 180.

[43] Barrow, *Giving teaching back to teachers*, 2.

[44] Moore, *Philosophy of education*, 2.

[45] Wayland Bowser, "Reforming design education," *Journal of Architectural Education* 37, no. 2 (1983): 12-14.

[46] Jonas R. Zvobgo, *Transforming education: The Zimbabwean experience* (Harare: The College Press, 1986).

[47] National Conference on Teacher Education Report (NCTER), *Teacher education for the 21st. century: Issues and strategies*, 3.

[48] National Commission for Excellence in Teacher Education (NCETE), *A call for change in teachers education* (Washington, DC: American Association of Colleges in Teacher Education, 1985).

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change of occupation. There is also constant development and change in subjects and materials used in education. All these developments affect the context in which the work of the school is performed.[49] It is becoming less important for schools to spend time teaching about facts that probably will soon become obsolete. By implication, in D&T, the practical skills we teach have to be relevant; otherwise they would not be applicable in problem-solving. Where technological advances occur, for example in industry, what we teach in schools particularly practical skills would accordingly need to keep abreast of events in the world of work. Barrow[50] warns of the danger of 'inert ideas', and argues that education founded upon such ideas is not only useless; it is harmful.

II.2. *Linking theory and practice in problem-solving within the context of D&T*

Important lessons were in this case drawn from Science and Technology (S&T), regarding current practices and issues in practical work. According to Mafumiko and Ottevanger,[51] there is a strong conviction among teachers and researchers that hands-on activities have the potential to develop various student abilities in Science and related subjects like D&T. However, several investigations have recently proved that in many classrooms and laboratories there are serious discrepancies between the lofty goals expressed in the rhetoric of S&T education and the kinds of activities in which students engage.[52] Mafumiko and Ottevanger[53] agree with Ware[54] when they argue that in some schools, especially in developing countries, there is no laboratory work at all. In others, there is hands-on practical work, but students follow a list of step-by-step instructions like technicians trying to reproduce expected results and struggling to get the right answers without question. This also

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[49] Carlson J. Powell and Ronald D. Anderson, "Changing teachers' practice: Curriculum materials and science education reform in the USA," *Studies in science education* 37 (2002): 107-136.

[50] Barrow, *Giving teaching back to teachers*, 2.

[51] Fidelis Mafumiko and Wout Ottevanger, "Micro-scale experiments in improving practical chemistry in Tanzania secondary science education," in *Science education research and teacher development in Tanzania,* ed. Osaki K et al. (Amsterdam: VrijeUniversiteit Amsterdam — International Cooperation Centre, 2002), 121-134.

[52] Sylvia Ware, *Secondary school science in developing countries* (Washington, DC: The World Bank, 1992).

[53] Mafumiko and Ottevanger, *Science education research*, 121-134.

[54] Sylvia Ware, *Secondary school science*, 1.

explains the criticisms levelled against the traditional approach to the teaching/learning of technical subjects, where a lot of practical work goes on with pupils/students following laid down procedures, using recommended materials and tools, for example. Unfortunately, this is a negation of creativity and emancipatory principles, where learners are expected to make independent decisions in problem-solving as propounded by Paulo Freire in his 'Pedagogy of the Oppressed'.[55]

The issue is not simply the teaching/learning of skills, but rather about the nature of skills one would be aiming at promoting. If our aim is to promote the ideals of D&T, then we would worry about rationality, where one engages in informed decision making. This is what differentiates human beings from animals.[56] While there have been cases of some animals performing certain tasks better than human beings, one would still not declare them rational, from a philosophical perspective; thereby suggesting a distinction between *instinct* and *rationality*.[57] On teaching/learning, what we would like to see is not just the mere promotion of practical skills, but the development of skills being accompanied by critical thinking and informed/rational decision making.

However, Bradley[58] presents evidence on cases where teachers do not attempt to do practical work with pupils even when there are adequate facilities and resources. In such cases, the blame is levelled on lack of proper teacher preparation and professional development programmes with regard to practical work at both, pre-service and in-service levels. Having learnt this much from S&T, one could then see why in this study the intention was to link the two courses; MS and MsP. Such a relationship was necessitated by the need to put theoretical knowledge (MS) into practical application under MsP while at the same time being aware of one of the main areas of foci spelt out earlier in this study; 'enhance the competence of teachers in solving practical D&T problems where practical skills are guided by scientific principles'.

II.3. *Current debate on issues relating to outcome-based learning*

While we can debate and differ as to the specific purpose of education, not many of us will disagree that education is purposeful. We create curricula

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[55] Ornstein and Hunkins, *Curriculum foundations, principles, and issues*, 2.

[56] Barrow, *Giving teaching back to teachers*, 2.

[57] Stanley R. Peters, *The philosophy of science* (London: Oxford University Press, 1973).

[58] John D.Bradley, "Science education at the RADMASTE Centre: The role of the university in development," in *Science and environment education: Views from developing countries*, ed. S. Ware (Washington: The World Bank,1999), 41-150.

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of various designs for both general and specific intentions. Indeed, those who develop curricula and teach it have some intent in mind. Discussing the aims and goals of education, Ornstein and Hunkins[59] also maintain that education is enacted for a reason; emergent and random. It is an intentional activity created to allow students to attain specific understandings, skills and attitudes that would enable them to participate meaningfully in their world; current and future.[60]

The fact that some intents in education are geared towards the immediate while others are geared towards the long term justifies and explains the place for objectives and aims in education. Respectively, objectives are for the immediate and aims are for the long term.[61] For example, while we may precisely indicate that after studying a unit covering a particular technical skill, a student would produce an artefact demonstrating an understanding of the behaviour of materials under specific conditions, the implication is that in future, the individual would apply such a skill in ways as yet unknown/unspecified. Moreover, as educationists we hope/assume, what the student does with this skill will demonstrate wise application of knowledge for personal and social benefit.[62]

In times of rapid change such as we have today, in practically every country, society expects schools to help citizens adjust and this has implications for curriculum development as observed by Cornbleth[63] in her discussion of '*Curriculum in Context*'. She argues that curriculum construction is an on-going social activity, shaped by various factors within and beyond the classroom, accomplished interactively and primarily by teachers and students. The curriculum becomes highly constructivistic in nature as explained by Oxford[64] in a phenomenon she terms *shape-shifting*; implying the quick adjustment of functions in situations of rapid change. In a related discussion, Oxford[65] refers to the concept of *social constructivism*, where development is guided by social events/trends. Perhaps, this is why in most cases society has often compelled schools to modify their programmes in order for learners to function more effectively. Usually, this has called for a revisit of the *aims of education* in order for those aims and their objectives

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[59] Ornstein and Hunkins, *Curriculum foundations, principles, and issues*, 3.

[60] Catherine Cornbleth, *Curriculum in context* (New York: The Falmer Press, 1990).

[61] David Pratt, *Curriculum planning* (New York: Harcourt Brace College Publishers, 1994).

[62] Pratt, *Curriculum planning*.

[63] Cornbleth, *Curriculum in context*.

[64] Richardson L. Oxford, "Constructivism: Shape-shifting, substance, and teacher education applications," *Peabody Journal of Education*, 72, no. 1 (1997): 35.

[65] Oxford, "Constructivism," 35-66.

to remain relevant and appropriate in given contexts.[66] For example, in a problem-solving situation, aims are the starting point for an ideal or inspirational vision of the good. In this respect, aims reflect value-laden judgements that help to guide the educational process. This is why the intention in this study was to determine the extent to which teachers were actually applying their knowledge of MS in problem-solving under MsP. As educators, we are challenged to interpret the aims of education in relation to those of society. For this study, the general aims of teacher education in Zimbabwe were the main focus. Several lessons were drawn from Doll[67] who summarizes and interprets the following dimensions of what American aims of education should address:

(a) The *intellectual/cognitive* — Aims focusing on acquisition/ comprehension of knowledge, problem-solving skills, and various levels of thinking

(b) The *social-personal or affective* — Involving person-to-society, person-to-person, and person-to-self interactions

(c) The *productive* — Aiming at allowing/enabling the individual to function in the home, on the job, and in society

According to Sowell[68] these goals furnish answers to the following question: "What destination do you have in mind for learners as far as a particular curriculum or subject is concerned?" In this case, the destination intended for the concerned teachers was for them to end up being able to teach MS effectively in schools through the D&T approach.

However, while goals suggest intended destinations, they do not specifically denote particular learning. Rather, goals address certain characteristics of the learner on attainment of the stated goals.[69] For example, a curriculum that aims at developing learners into resourceful citizens, would most likely try to ensure that learners are skilled in the art of critical thinking, are responsible and have the capacity to work with people from all walks of life. Effectively the point is, when discussing or recommending goals in their generality, we do not pick on specific items for learning, but we highlight the

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[66] Chris Kyriacou, *Effective teaching in schools* (New York: Simon&Schuster Education, 1994).

[67] Ronald C. Doll, *Curriculum improvement: Decision making and process* (Boston: Allyn and Bacon, 1996).

[68] Evelyn J. Sowell, *Curriculum: An integrative introduction* (Upper Saddle River, NJ: Merrill-Prentice Hall, 1996).

[69] George J. Posner, *Analysing the curriculum* (New York: McGraw-Hill, 1992).

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qualities or characteristics that we expect in someone after learning several relative items, depending on the demands of a given context.[70]

Having dealt with the issue of educational goals from a general perspective, it is now perhaps appropriate to relate the issue more closely to the purpose of this study. Ornstein and Hunkins[71] maintain:

> When speaking of goals, we are addressing curriculum goals or desired outcomes for students as a result of experiencing the curriculum. We are not addressing how teachers would instruct students to achieve these goals, although it is realized that instruction is related to the curriculum and that particular methods of instruction are selected mindful of the demands of certain contents and also the demands of students and their ability and interests.

A close study of this argument shows several threads in common with the principles and ideas assumed to have been employed in the design, development, implementation and evaluation of the two course outlines at the core of this study. Most of these are clearly located within the aims and objectives. What seems to be coming out clearly here is that the distinction between aims and goals of education is one of generality, where aims deal with the general process of education, such as 'developing problem-solving abilities' or 'creating technological literacy.' According to Harris et.al.,[72] no specific program or course in a particular school will attain all the aims that there might be. Several aspects of curriculum are likely to address them; thereby suggesting aims only becoming goals when they become more specific in relation to a particular school system and to a specific subject area. For example, in relation to this study, the broad aims from the said B.Ed. degree programme could only become manageable when they led to goals; in turn reduced to objectives within the limits of the course-outlines.

In Zimbabwe, we are currently going through a period that is characterized by rapid and continuous change. Most of these events and changes have been closely related to the serious political and economic challenges currently prevailing. Therefore, one sees the relevance and validity of Dewey's[73] argument, maintaining that the ends to which we strive are not really ends,

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[70] Posner, *Analysing the curriculum*, 1.

[71] Ornstein and Hunkins, *Curriculum foundations, principles, and issues*, 4.

[72] Peter Harris et al., "Competency-based medical education: Implication for undergraduate programmes: For the International CBME Collaborators," in *School of Public Health and Community medicine*, ed. Medicine Faculty (Sydney: University of New South Wales, 2010).

[73] Reginald D. Archambault, *John Dewey on education: Selected writings*, ed. Reginald D. Archambault (New York: Random House, 1964) 74.

but way-points on a continuous journey. According to this observation, education is a journey where our intentions, however phrased, must inform the learner that the attainment of a way-point enables him/her to proceed or advance to the next. Taking from this assertion, this is why, even after MS, teachers were still expected to reflect upon it during MsP.

III. **Research questions**

The main research question addressed in this study went as follows: '*To what extent are students (serving teachers) able to apply their knowledge of Material Science when solving practical problems under Machine-shop Practice?*'

This question was then unpacked through the following sub-questions:

- To what extent are the two courses, MS and MsP reflective of each other?
- What aspects of MS do students find being applicable to their activities in MsP?
- To what extent are students able to reflect on their knowledge of specific concepts in MS when solving practical problems? AND,
- In what activities is one able to identify specific cases of students applying their knowledge of MS in solving given practical problems?

IV. **Methodology**

This study involved 23 serving teachers (16 males and 7 females), enrolled in a B.Ed. degree program with the Department of Technical Education at the University of Zimbabwe. These were qualified teachers drawn from schools all over the country.

Data gathered through interviews, observations and document analysis of course outlines and design folios were mainly analysed qualitatively, with the aid of specially designed schedules and checklists. In addition, observations of workshop activities were also supported by photographs and video filming. Most observations were made during both, class and workshop activities.

On the other hand, the document analysis of design folios was done specifically focusing on one particular project, involving the design and

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development of a toy encompassing variously mechanisms. From a common design brief (Going as follows: *Using various materials, design and make a toy that you could use to teach about the application of at least three mechanisms*), students were expected to come up with a variety of designs. Completion of project was then followed by the document analysis folios, with the aid of a specially crafted schedule based on a skeleton of the following key items:

STAGE 1: Problem situation for design
STAGE 2: Design brief and specifications
STAGE 3: Investigation and market research
STAGE 4: Possible solutions
STAGE 5: Chosen solution
STAGE 6: Realization (Path analysis and routing)
STAGE 7: Evaluation

These stages were vivid sections in folios, thereby resulting in the analysis being a straight-forward exercise. The idea of treating every folio as an *individual case* was adapted from the usual applications in areas as disparate as those outlined by Robson;[74] psychiatry, administration, anatomy, anthropology, clinical medicine, counselling, criminology, military studies and social work. In case studies, a *case/site* refers to the specific/particular situation, individual, group, organization or whatever it is that we might be interested in.[75]

In this study, strategies for dealing with cases in other disciplines provided useful lessons, suggesting solutions to problems with case study methodologies, including the thorny issue of generalizing from individual cases. During the design of this study, such lessons proved useful in planning for what Robson[76] has refers to as 'rigorous case studies' like those conducted here, given the need to evaluate the work in the 23 design folios.

According to the 'Zimbabwe Education Blueprint 2015-2022: Curriculum Framework for Primary and Secondary Education', a 'design folio' is a document comprising the above outlined stages, arranged into 7 sections in a collection of A3 or A2 sheets of cartridge paper written/drawn on one side and bound together into a folder. It is actually a diary of what students record during their design and problem-solving activities. This definition of design

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[74] Colin Robson, *Real world research: A resource for social scientists and practitioner-researchers* (Oxford, UK: Blackwell Publishers, 1993).

[75] Quinn M. Patton, *Qualitative research and evaluation methods* (London: Sage Publications — International and Professional Publisher, 2002).

[76] Robson, *Real world research*, 1.

folio appears very much in line with Garratt's[77] description of the same, referring to a collect of sheets of cartridge paper in form of a journal/logbook. In this study, this was then the document that students were expected to compile for their design projects, thereby allowing them to keep track of their thoughts, ideas and activities. Such a record allowed them the flexibility to revisit their ideas whenever necessary; typical of the design process.

Given the quantity of materials in the 23 design folios that were to be evaluated and analyzed, there was need to device a tool that would enable one to capture all relevant/appropriate data for analysis. This is where the instrument in Figure 4.1 was used. The idea was to focus on the notes, sketches and records in every section of a given folio and identify any aspects in form of ideas, arguments and decision making processes influenced by perceptions, understanding and knowledge of MS. A typical example could be a case where one would be trying to choose a particular material from among many, for a specific application in problem-solving. Figure 5.4 shows details on how this instrument was then used.

Folios ↓	Stage 1 (Section 1)	Stage 2 (Section 2)	Stage 3 (Section 3)	Stage 4 (Section 4)	Stage 5 (Section 5)	Stage 6 (Section 6)	Stage 7 (Section 7)	Total Scores
1								
2								
↓								
23								

Figure 4.1

Skeleton of the tool used to evaluate and analyse data from the 23 folios

Stages 1-7 in Figure 4.1 are actually the 7 stages of the design process, translating into the 7 sections of the design folio, which then became the basis for scrutiny of the folios, going as follows; Problem situation for design, Design brief and specifications, Investigation and market research, Possible solutions, the Chosen solution, Realization (Path analysis and routing) and Evaluation.

[77] Regenia Gagnier, "Feminist postmodernism: The end of theory?," in *Theoretical perspectives on sexual differences*, ed. Deborar L. Rhode (New Haven, Conn.: Yale University Press, 1990).

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Essentially, the flexibility suggested by the folio as already indicated implies the problem-solving activities within D&T being an on-going process; thereby qualifying as one of the key activities in Developmental Research (DR). DR is often initiated for complex, innovative tasks where very few validated principles are available to structure and support design and development activities.[78] It is about making practical and scientific contributions, involving empirical testing of prototypes in a cyclic fashion, which is a typical feature of problem-solving in D&T. Since the seven sections of the design folio are drawn from the design process, it is important to note that the 'Evaluation' at the seventh stage does not mean end of processes, but rather the beginning of another round of investigations through further research for the sake of improvement in a given context.

V. **Results and findings**

The results and findings of this study were presented in line with the four secondary research questions, resulting in the following:

- Material Science and Machine-shop Practice being reflective of each other
- Aspects of Material Science applicable to activities in Machine-shop Practice
- Students reflecting on their knowledge of Material Science during problem solving
- Evidence of students applying their knowledge of MS in problem solving

V.1. *Material Science and Machine-shop Practice being reflective of each other*

Findings here were in answer to the question: '*To what extent are the two courses, MS and MsP reflective of each other?*' This question was addressed in two ways; Document/Content analysis of the two course outline, and interviews/discussions with students.

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[78] Jan Van den Akker, "Principles and methods of development research," in *Design approaches and tools in education and training*, ed. Jan van den Akker et al. (Dordrecht: Springer Science+Business Media, 1999), 1-14.

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Analysis of course outlines was mainly centred on the general aims (purpose), where the former went: *'The main purpose of this course is to give you (prospective D&T teachers) a strong theoretical background that would enable you to teach MS at 'A' Level. Although this course is mainly theoretical, an effort will be made to include simple illustrations, demonstrations and laboratory activities, wherever possible. You will be expected to apply what you learn in this course when you go for your MsP.*' AND, the latter: '*This course generally aims at affording you the opportunity to apply the theoretical knowledge acquired in various pre-requisite subjects; MS being the most outstanding. Specifically, you are expected apply such knowledge in solving practical problems encountered in various workshop situations. The same knowledge is also expected to help you making decisions/ choices, regarding what materials to use in specific problem situations, depending on the nature of problem). Solutions to problems in this case would involve the design and development of gadgets to meet specific practical/technical needs.*'

An examination of these two profiles (aims) shows a close relationship between the two courses. This was also confirmed by students during group/ class focused discussions/interviews involving all the 23 participants. The following questions were presented and debated openly with all participants airing their views from various angles:

1. Would you say there is any relationship between the Materials Science you did last year and the Machine-shop Practice course you are currently doing?
2. If 'yes' to '1', in what way? AND; If 'no, why do you say so?
3. Either way in '2', may you please give examples?
4. Given your activities in Machine-shop Practice, where exactly would you say, there has been evidence of you having applied your knowledge of Material Science?

With all proceedings captured on audio tape, the following are just a sample of transcripts from some of the outstanding views shared:

- ***Student 1***: I think MS that we did last semester is very relevant in the MsP that we are doing now, because you find--e-e--, we are now able to---we have vast knowledge of materials that are available for us as designers and we are now being able to implement them in our designs.
- ***Student 2***: Yes, yes, yes. Even on the cutting list of materials on the--of the toy project, I actually put the materials which I learnt in my Material Science, of which, it shows that I am actually applying what I learnt from my Material Science course.

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- ***Student 3***: In MS, we dwelt much on materials that are used in engineering, right. And, in MSP we are now using those different types of materials---materials that we learnt in Material Science to manufacture small artefacts in our practical projects. Currently, we---we are manufacturing a simple auto-mata toy, a toy that has got different mechanisms.

- ***Student 4***: Yes, relationship is there, especially where you have to relate materials to design. When selecting materials for prototype, on basis of what we learnt in MS.

- ***Student 5***: Ya-a,---.There is relationship. We---we learnt about characteristics of materials and, we're applying that---in our designing course.

In fact, as they expressed their views, most students actually showed illustrations in their design folios to consolidate their arguments. Since they were expected to go and teach MS and MsP back in their schools, deliberations during these discussions are most likely to have created a lot of confidence in them. Sharing ideas through brain-storming is highly regarded in D&T, where learners learn to listen to each other and accept each other's ideas and opinions. This also helped to dispel the culture of selfishness and individualism, where people are sometimes reluctant to share ideas. It is such values that these participants were expected to cultivate in their pupils back in schools, while at the same time assisting colleagues to do the same with their classes.

V.2. *Aspects of Material Science applicable to activities in Machine-shop Practice*

Findings here were in answer to the question: '*What aspects of MS do students find being applicable to their activities in MsP?*'

Scrutiny of the MS course outline showed the following broad families of materials being pertinent and applicable to MsP: The Metallic; Polymeric and Ceramic.

Generally, all these materials shared a common ground under the following aspects: Chemical and physical properties; General classification of materials; The crystal structure in materials; Atoms in materials; The periodic table; Crystals and grains; The unit cell; Phase transformations in materials; Effects of the addition of other elements on the structure of pure materials; Effects of stress on materials; Effects of temperature change on materials; Methods of joining materials and Processing methods in general.

In MsP, activities are guided by broad categories placing content into two divisions; '*Practical application of knowledge*' and '*Ancillary theory*

guiding practice'. It was therefore during group discussions that students were able to clarify on how they viewed and related these two categories.

With the aid of a check-list, it was possible to have students participating in the development of the impressions in Table 5.2. There were aspects and areas they found strictly belonging to ancillary/allied theory and those where the two categories were combined (putting theory and practical application together). Eventually after a long discussion, where participants shared ideas, what now features in Table 5.2 was widely agreed upon. There was also a high likelihood of participants taking this as a template to guide them in their teaching back in schools.

Table 5.2

Categorizing MS content accordingly under MsP

Content items in the 'MS' Course Outline	Category in MsP Course Outline	
	Ancillary Theory	Practical Application
1. ENGINEERING MATERIALS IN GENERAL		
(a) Three families of engineering materials	√	
(b) Bonding forces in different materials	√	
2. METALLIC STRUCTURES		
(a) Metal atoms	√	
(b) The periodic table	√	
(c) The unit cell	√	
(d) Phase transformation in metals	√	
(e) Effects of other element on the structure of pure metals	√	√
3. EFFECTS OF STRESS AND TEMPERATURE ON METALS		
(a) Plastic strain, permanent deformation and slip	√	√
(b) Cold work or work hardening	√	√
(c) Effects of elevated temperatures on work hardened structures	√	√
(d) Selection of annealing temperatures	√	√
(e) Effects of grain size on properties	√	

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Content items in the 'MS' Course Outline	Category in MsP Course Outline	
	Ancillary Theory	Practical Application
4. ENGINEERING ALLOYS (Non-ferrous)		
(a) Aluminum alloys	√	
(b) Magnesium alloys	√	
(c) Copper alloys	√	
(d) Nickel alloys	√	
(e) Titanium alloys	√	
(f) Zinc alloys	√	
5. STEEL, CAST IRON, DUCTILE IRON and MALLEABLE		
(a) The iron-iron carbide diagram and its phases	√	
(b) Plain carbon and low alloy steel (equilibrium structures)	√	
(c) Hypoeutectoid and hypereutectoid steels	√	
(d) Hardenability of steel	√	
(e) Stainless steels	√	
(f) White iron, gray iron, ductile iron and malleable iron	√	
(g) Working with iron-based materials	√	√
6. COMPOSITE MATERIALS; Including Concrete and Wood		
(a) Synthetic composites	√	
(b) Concrete and its components	√	
(c) Properties of concrete	√	
(d) Special concretes	√	
(e) Wood as an engineering material	√	
(f) Wood macrostructure	√	
(g) Wood microstructure	√	
(h) Properties of wood	√	
(i) Asphalt as an engineering material	√	
(j) Processing of composite materials	√	√

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Content items in the 'MS' Course Outline	Category in MsP Course Outline	
	Ancillary Theory	Practical Application
7. PLASTICS		
(a) The concept of polymerization	√	
(b) Polymerization types	√	
(c) Processing of plastics	√	√

V.3. *Students reflecting on their knowledge of Material Science during problem solving*

Here the findings were in answer to the question: *'To what extent are students able to reflect on their knowledge of specific concepts in MS when solving practical problems?'*

Students were observed working individually and in groups. Individually they would study given design briefs in order to understand given problems. Thereafter, they would consult their MS notes, as well as visiting the library to access information on designs, materials and relevant technologies for the problems at stake.

In groups, they would do more or less the same thing (consulting their notes and searching for information), except that this time the process would involve brain-storming and sharing ideas in discussions. Besides individual work and group activities, they would also consult their lecturers wherever necessary, depending on the situation. Experiments and trials with/of various materials and mechanism were a common feature in workshops/laboratories.

V.4. *Evidence of students applying their knowledge of MS in problem solving*

Findings here were in view of the following question: '*In what activities is one able to identify specific cases of students applying their knowledge of MS in solving given practical problems?*'

Although students had convincingly claimed to be applying their knowledge of MS in problem-solving under MsP, there was still need for verification of those claims through tangible evidence. Observations during class and workshop activities had also helped to substantiate some

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of the claims. However, there was still need to go further, checking for more evidence.

Students had been seen working, sharing ideas in groups and brainstorming over the use of materials and the relevant pieces of technology in problem-solving. What was then left was to go through their folios and find out how they reported their activities and explained themselves. This justified the content analysis of these documents. The validity and reliability of the information obtained from such sources as folios; being not so salient, was based on the fact that it was likely to be reasonably original and authentic. Students had recorded issues and events as they encountered or experienced them naturally in their daily workshop activities since these folios were actually journals for such a purpose.

After compiling notes from the 23 design folios, culminating in a 39-page document, the next step was to make sense out of the notes. This involved going through all notes, issues, phenomena and specific points at which one could have evidence of students having applied their knowledge of MS in solving practical problems during MsP.

Although information from the folios was summarized to only focus on relevant details, an effort was made to try and have it as much as possible, 'word for word' in all cases.

Since data collection from folios had been guided by the seven stages of the design process as already indicated, it was found logical to follow the same stages during data analysis. It was therefore within these stages, going by the sections in the folio that one searched for evidence of statements containing reasoning, choices and decision-making implying traits of perceptions and understandings appropriately supported by knowledge of MS.

The 39-page document comprising notes from the folios was closely studied according to the criteria in Table 5.4.1, where numbers **1**-**7** represented the said stages of the design process, effectively translating into respective sections of the folio. Statements (i) to (vi) are not really about issues totally independent of each other. They are simply about one checking for evidence of students having applied their knowledge of MS in solving practical/technical problems under MsP. In many ways, the application of knowledge in this case also reflected a lot on one's perceptions and understanding in relation to given phenomena. However, experience showed that although the main purpose of analysis was to locate and identify evidence of the application of MS in folios, sense of focus tended to differ across the seven sections. Therefore, statements (i) to (vi) in Table 5.4.1 helped to differentiate sense of focus across respective sections from **1**-**7**. For example, while in sections **1** and **2**, the idea was to check on the clarity of statements relating the 'Problem

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situation for design', 'Design brief and specifications', in sections **3**, **4**, **5**, **6** and **7** students were expected to make informed decisions, explanations and arguments relating to the selection and justification of possible solutions, materials and tools/equipment in given contexts. It was within these parameters that the application of MS was to be demonstrated.

Table 5.4.1

Matrix representing criteria for identifying and locating traits of MS in the design folios

Statements	Code	1	2	3	4	5	6	7
i) Clarity of relevant details as informed by knowledge of MS	Det-Cla	X	X			X		
ii) Clues implying application of MS in specific statements	Ap-Clu		X	X	X	X		
iii) Evidence of choices and decision making being guided by knowledge of MS	Ch&D-m			X	X	X	X	X
iv) Appropriate use of MS knowledge in explanations/descriptions of processes & procedures	Pro-Exp		X			X	X	
v) Evidence of Material Science in highlighting and focusing on relevant issues	MS-Iss					X	X	X
vi) Evidence of appropriate use or application of materials in design or problem solving	Mat-App						X	X

Key for Codes: (i)**Det-Cla**=Detail Clarity (ii)**Ap-Clu**=Application clues (iii)**Ch&D-m**=Choices& decisions-making (iv)**Pro-Exp**=Process explanation (v)**MS-Iss**=Material Science issues (vi)**Mat-App**=Material application.

For the sake of clarity, the codes indicated from (i) to (vi) in Table 5.4.1 were marked throughout the hard copy of the said 39-page document containing notes from the folios. In each case, there was need to identify this evidence by means of such markings, and Figure 5.4 shows a summary of how this evidence was then transformed and reduced into a tabular record where every tick means a trait of MS according to the criteria in Table 5.4.1. These patterns were an important indication of the extent to which students had applied their knowledge of MS in solving practical problems at various levels during MsP. This was also a way of corroborating what they had claimed during interviews and discussions regarding their application of MS in MsP.

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Although all the 23 folios had evidence of one form or another as outlined in Figure 5.4, the issue was to determine the extent to which the knowledge of MS was applied at various levels within the various folios. This was not easy and several approaches were tried. Evidence was there within the data, but how to make sense out of the data remained a problem. It was only after several trials that a reasonable approach emerged comprising two routes. While one route involved following the profiles in individual folios (representing individual students) across all sections (1-7), the other was about following sections, from Folio 1 to Folio 23 (see Figure 5.4 for sense of orientation). However, there was need to summarize and have an over-view of this information in order to make sense and meaning out of it. It was also necessary to establish a system of interpreting the data and in view of the two routes highlighted above, the idea was to come up with ways that could be used to put the data in specific units for the purpose of interpretation. This resulted in two scales designed according to the nature of data at hand. In both cases, the scale was based on the range of scores in Figure 5.4.

Folios	Sec. 1	Sec. 2	3	4	5	6	7	Total Scores
1		√√				√√√√√	√√√√√√	**13**
2		√√√√√	√√√√√√√		√	√√√√√	√√√√√√√√√	**28**
3		√√√	√		√√	√√√√	√√√√√√√	**17**
4		√√√√	√√√		√√	√√√√	√√√	**16**
5		√√√			√√√√√	√√√√√	√√√√√	**18**
6		√√√√√		√	√	√√√√	√√√√√√√	**18**
7		√√√√			√√√	√√√	√√√√	**14**
8		√	√√			√√√√√√	√√√√√√√	**16**
9		√	√√√√√		√√√√	√√√√√	√√√	**18**
10			√√√√√	√	√√√√√√	√√√	√√√√√√	**21**
11		√√√√√√√	√	√	√√√√√√√	√√√√	√√√√	**24**
12		√√√√√	√√√√	√√√√		√√√√√√√	√√√√√	**25**
13	√	√√	√√√√√√√√√		√√√√√	√√√	√√√	**24**
14		√√	√√√√√√√√√		√√√	√√√	√√√	**20**
15		√√√√	√√√√			√√√√√	√√√	**16**

Folios	Sec. 1	Sec. 2	3	4	5	6	7	Total Scores
16					√	√√√√√	√√√	**10**
17	√	√			√	√√√√	√√	**10**
18		√√√√	√√√√√√√√√		√√√√	√√√√√√√	√√√√√√	**33**
19		√√√√	√√		√	√√√√√√√	√	**16**
20		√√√	√√√√√√	√√√√√	√√√√	√√√√√√√	√√√√	**34**
21		√√			√	√√√√√√√	√√√	**15**
22		√√√			√	√√√√√√√	√√√√	**17**
23		√√√√	√√√√√√√		√√√√√	√√√√	√√√√√	**29**
Totals	**2**	**69**	**78**	**13**	**59**	**123**	**107**	

Figure 5.4

An excerpt showing how scores were entered for folios 1-23

Every tick stands for an indication (clue/evidence) of MS having been applied.

After determining the sense of both sets of scores, it was then possible to group/categorize them into the following levels in ascending order: Very Low; Low; Moderate; High and Very High. This was the sense in which the results and findings in Figure 5.4 could be interpreted in tables 5.4.2 and 5.4.3. For the sake of clarity, rows 1-23 in Figure 5.4 stand for the number of folios analysed while columns 1-7 stand for the stages in the design process, translating to the seven sections of the design folio.

Table 5.4.2

Results and findings according to the first scale (Going by folio profile)

Score Range	Level	No. of Folios
1-9	Very Low	0
10-14	Low	4
15-20	Moderate	11
21-24	High	3
25-& above	Very High	5

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The results and findings in Table 5.4.2 show that, in one way or another, all teachers applied their knowledge of MS in solving practical problem during activities in MsP. The only difference was the extent and level of that application, depending on individuals.

Table 5.4.3

Results and findings according to the second scale (Going by sections)

Score Range	Level	Folios Section(s)
1-10	Very Low	1
11-40	Low	4
41-70	Moderate	2&5
71-100	High	3
101-& above	Very High	6&7

Table 5.4.3 shows that the application of MS during MsP, as reflected in the folios varied in intensity, depended on various sections. While there was more evidence of application in some sections (e.g.6&7), there was much less in others (e.g.1&4).

Having achieved an overview of the picture emerging from tables 5.4.2 and 5.4.3, one could sum up the general observations and say that there was adequate/satisfactory evidence of teachers really applying their knowledge of MS during MsP, despite differences in intensity of application. All bits and pieces of evidence, leading to the results and findings presented here have mainly served to confirm and qualify most claims made by teachers during interviews and discussions.

VI. **Discussion of conclusions and their implications**

Conclusions were drawn in line with the research questions, going as follows:

- MS and MsP courses were found reflective of each other.
- Several aspects of MS were found applicable during problem-solving under MsP.
- Students did reflect on their knowledge MS during problem-solving under MsP.

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- Generally there was adequate evidence of students applying their knowledge of MS during problem-solving activities under MsP.
- Having students being able to apply their knowledge of MS as they solved specific practical problems under MsP had several implications on the issue of outcome/competence-based learning at the University of Zimbabwe.

The fact that the two courses; MS and MsP were found closely related and reflective of each other proved to be very useful in promoting subject integration between them. It also helped to prove the relevance of each course to the common purpose of skills development within the context of outcome/competency-based learning. Linking and relating the two courses conceptually and practically in the manner reflected in this study has several implications on the issue of assessment and accreditation, where efficiency is promoted by cross-checking and triangulating assessment mechanisms for the development of realistic learning outcomes between the two courses. Competency-based learning, being a relatively new phenomenon at the University of Zimbabwe, there is a high potential of this study providing important lessons to other sections of the University, particularly in the Faculty of Education. Currently, developments in competency-based teacher education (CBTE) present both; possibilities and challenges. Besides the need to be clear on the specification of learning strategies or formats, there is still need to provide a clear description of intended learning outcomes (ILOs).

According to Smith and Dollase,[79] the outcome/competency-based learning approach has the potential to yield authentic curricula for various fields. In this case, such a potential is also likely to be felt in teacher education, where the challenge has been to have teachers coping up with rapid changes in education, particularly now (2017) when our system has undergone a rigorous review process at all levels, in view of the Zimbabwe Agenda for Sustainable Socio-Economic Transformation (ZIMASSET). According to Government, the success of this policy development squarely depends on the strength of the education system at all levels.[80]

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[79] Stephen R. Smith and Richard Dollase, "Outcome based education: Part 2 — Planning, implementing and evaluating a competency-based curriculum," *Med.Teach* 21, no. 1 (1999): 15-22.

[80] Government of Zimbabwe, *Zimbabwe Agenda for Sustainable Socio-Economic Zimbabwe Agenda for Sustainable Socio-Economic Transformation (ZimAsset); Towards an Empowered Society and a Growing Economy — October 2013-December 2018* (Harare: Government printers, 2013).

Observations by Harris et al.[81] have provided adequate evidence proving that outcome- or competency-based learning frameworks and systems are designed to move/go beyond routine curricular renewal. Unfortunately, in Zimbabwean, there still appears to be a lack of a consistent language surrounding these frameworks, along with an underlying lack of conceptual clarity. To a large extent, this has been a major obstacle to the advancement of outcome- or competence based learning at various levels. One bone of contention in the discussion of any outcome/competency-based teacher education curriculum model is the notion of separate and independent competencies, given that competencies or capabilities reside in integrated professional performance. At least for this study, this notion has to an extent been broken by the promotion of a form of subject integration between MS and MsP. The conviction in this study was to contribute to a system that would help prepare students for lifelong learning by increasing their involvement in decisions-making about their own learning; thereby tracking their own progress. This was based on the belief that outcome/competency-based learning provides a focus on reflective and developmental activities, which Candy and associates[82] have placed at the very core of all learning activities, in keeping with one of the requirements of higher education; fostering the development and transformation of students. Such transformation involves the provision of tools to assist student in continuing to learn.[83] A clearly articulated framework of practical, real-world objectives provides a rare opportunity for students to develop a clear pathway toward relevant competencies. In most cases this has been a departure from many previous curricula that have relied on a stratification of experiences; rarely building upon one another and remaining fragmented without a comprehensive framework.

However, despite all these advantages, outcome/competency-based Learning models have always raised several issues and problems in the areas of design, assessment, and systemic factors, all of which have also impacted upon teachers and learners.[84] Effectively, these are areas still in need of further research.

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[81] Harris et al., "Competency-based medical education," 1.

[82] Philip C. Candy et al., "Developing lifelong learners through undergraduate education," in *National Board of Employment, Education and Training Commissioned Report No. 28*, ed. Philip C. Candy et al (Canberra — ACT: Australian Government Publishing Service, 1994).

[83] Susan Toohey, *Designing courses for higher education* (Buckingham, UK: Society for Research into Higher Education, 1999).

[84] Harris et al., "Competency-based medical education," 2.

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About the author

PETER ANTONIO KWAIRA (Petkwaira@gmail.com), PhD in Science and Technology Education, has been with the University of Zimbabwe, in Zimbabwe, since 1989. He is currently a Senior Lecturer in the Department of Technical Education, teaching; Principles of Design, Principles of Material Science, History and Philosophy of Technical Education, Entrepreneurship and Project Management, Applied Physics and Research Method to both Bachelor and Masters' degree levels. His area of specialization is Technical Education, where his research interests are mainly in the areas of Design and Technology Education, Teacher Education, Curriculum Design and Development, Product Design and Development, Distance Education, Sustainable Development, Food Production and Processing, and Community Development.

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Developing Generic Competences in Life Sciences: the untold story of the Makerere University College of Health Sciences in Uganda

Lazarus Nabaho*

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Abstract: Ordinarily, higher education should transform the student. Transformation refers to the development of high order subject and generic competences as a consequence of the university experience. The current discourse on generic competences, especially in the African context, focuses largely on the end (generic competences to be developed) rather than the means or process (how to develop the generic competences). Relatedly, the discussion on the subject treats generic competences as general and does not give insights into whether the priority attached to generic competences varies across disciplines. It is against this backdrop that the paper set out to identity the generic competences which are aligned with dental surgery and nursing education at Makerere University in Uganda. The paper further delved into the strategies for developing generic competences among medical students. Data for the paper was collected from dental surgery and nursing academics using interviews. The resultant data was analysed using thematic analysis. The findings revealed that problem solving, lifelong learning and interpersonal competences are aligned with life sciences. The utilitarian nature of life sciences, the rapidly changing mode of diseases and the attendant treatment options, and the highly social nature of the life sciences explicate this apparent alignment. The findings further revealed that the university employs three approaches to develop generic competences: problem-based learning, conducting generic course units, and role modelling. Therefore, it can be inferred that the generic competences to be developed on a particular academic discipline and the approaches used to develop them are a curriculum issue.

Keywords: Generic competences; higher education; life sciences; strategies; academics.

I. Introduction

Arguably, transformation of students from "adolescents with school-type knowledge into adults ready to enter society and the labour market at the

* Lazarus Nabaho (lnabaho@umi.ac.ug), PhD in Educational Management, is a Senior Lecturer at Uganda Management Institute (Uganda). *More details are available at the end of this article.*

highest level of competences available" [1]presupposes a fundamental purpose of higher education.[2] In the quality discourse, transformation is among the dominant notions of quality in higher education and scholars such as Harvey and Knight[3] regard it as the "meta-quality concept." Apologists of the transformative view of quality opine that alternative notions of quality in higher education- exceptional, value for money, consistency/perfection and fitness for purpose-are possible, though not very good, operationalisations of the transformative process rather than ends in themselves. Within the transformative perspective, quality higher education is defined and measured by the degree to which the institution has provided the student with a meaningful education experience by imparting discipline-specific knowledge as well as generic attributes and values.[4]

Generic competences, like other quality-related concepts, defy a single definition. Nevertheless, Barrie [5] defines generic competences as "the skills, knowledge and abilities of university graduates, beyond disciplinary content knowledge, which are applicable in a range of contexts" and are acquired as a result of completing any undergraduate degree. The connotation generic suggests that the competences are necessary regardless of the field of study or the academic discipline. Generic competences are also known by a plethora of synonyms such as soft skills, key skills, common skills, essential skills, employability skills, necessary skills, transversal skills, social skills, 21st century skills, and transferable skills. It is widely believed that generic competences are essential for both the world of work (employability) and other aspects of life and epitomise graduates as global citizens and effective members of modern day society who can act as agents of the social good.[6]

Globally, the notion of generic competences has gained traction in higher education and higher education institutions are currently preoccupied with developing them and demonstrating that their graduates have acquired them. The unprecedented global interest in generic competences was fuelled by the desire to bridge the gap between the world of education and the world of

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[1] Don F. Westerheijden, Bjorn Stensaker, and Maria Joao Rosa, introduction to *Quality Assurance in Higher Education. Trends in Regulation, Translation and Transformation*, ed. Don F. Westerheijden, Bjorn Stensaker, and Maria Joao Rosa (Dordrecht: Springer, 2007), 7.

[2] Lee Harvey and Peter Knight, *Transforming higher education* (Buckingham, UK: SRHE and Open University Press, 1996), 14.

[3] Ibid., 14.

[4] Tim Pitman, "Reinterpreting higher education quality in response to policies of mass education: the Australian experience," *Quality in Higher Education* 20, no. 3 (2014): 360.

[5] Simon C. Barrie, "A research-based approach to generic graduate attributes policy," *Higher Education Research & Development* 23, no. 3 (2004): 262.

[6] Ibid.

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work. Stakeholders in higher education often hypothesise that bridging the gap between the two complementary worlds, albeit at times with different perspectives of the purpose(s) of higher education, would facilitate a smooth transition of graduates from university education to the world of work in particular and society in general.

Since the late 2011, the African Higher Education Harmonisation and Tuning Project — an initiative of the African Union in partnership with the European Union that seeks to establish an Africa Higher Education Space — has been preoccupied with delineating context-specific generic competences. It should be remembered that the idea of an African higher education space was initially envisioned by the Arusha Convention of 1981. The phenomenal success of the Bologna Process in Europe, as evidenced by the creation of the European Higher Education Area, has ostensibly reignited the motivation to harmonise higher education in Africa. The African Higher Education Harmonisation and Tuning Project, through a highly consultative process, identified eighteen generic competences and these have been reported by Hahn and Teferra.[7] Hahn and Teferra[8] laud the Project for developing "…an improved understanding of graduate's competences that are relevant to a variety of scopes, prominently to the labour market" and that can inform measures to close the gap between higher education and the continent's needs. The drive by universities to develop generic competences can address the incessant complaints by the employers that higher education graduates are often ill-prepared for the workplace. The perceived mismatch between the competences required by the employers and the competences of the graduates has, in part, precipitated the rampant graduate unemployment in African countries.

On a positive note, the commitment by the African Union to promote generic competences in higher education marks a radical departure from the traditional purpose of higher education of promoting "knowledge, truth and reason"[9] to "more functional notions of the relationship between higher education and society." [10] Undoubtedly, this shift in the direction of a

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[7] Karola Hahn and Damtew Teferra, "Tuning as Instrument of Systematic Higher Education Reform and Quality Enhancement: The African Experience," *Tuning Journal for Higher Education* 1, no. 1(2013): 142-43, accessed May 2, 2016, http://www.tuningjournal.org/article/view/23/10.

[8] Ibid., 155.

[9] Ronald Barnett, *Beyond All Reason: Living with Ideology in the University* (Buckingham (UK: SRHE & Open University Press, 2003), 2.

[10] Vanessa Brown, "How University Academics Respond to the Introduction of New Quality Assurance Policies in South African Higher Education" (PhD thesis., University of Pretoria, 2010), 69.

utilitarian mind-set is an explicit, though belated, recognition of higher education as an instrument of socio-economic development. This recognition positions higher education as a powerful tool to enable Africa leapfrog mounting development challenges, *inter alia*, low economic growth, poverty and low competitiveness of the economy.

Despite the accolades above, the African Higher Education Harmonisation and Tuning initiative examines generic competences from a general perspective and does not identify competences which are aligned with particular academic disciplines. Furthermore, the Project does not delve into why certain competences should be prioritised in particular academic programmes. Finally, within the Project, there is a dearth of studies on how higher education institutions develop generic competences. It would therefore not be an overstatement to infer that the Project has placed unparalleled emphasis on **what** (what generic competences fit the African context and should therefore be developed?) compared to **how** (how best can the generic competences be developed?) or a combination of both. As a result, the discourse on generic competences has largely focused on the end (competences) rather than the means (approaches) and this resonates with extant literature. Calma, for example, posits that less attention has been paid to how students develop generic skills[11] despite developing generic competences being the biggest challenge facing institutions of higher learning.[12] Finally, much of the literature on generic skills is theoretical and offers policy recommendations and prescriptive advice.[13]

It is against this backdrop that the paper answers the following research question: What generic competences are aligned with life sciences at undergraduate level at the Makerere University College of Health Sciences and how does the College develop these competences? The paper comprises four main sections. The first section is the introduction and is followed by the methods section. Section 3.0 presents the results. The final section discusses the findings, makes propositions, and points to the direction for further research.

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[11] Angelito Calma, "Fixing holes where the rain gets in: Problem areas in the development of generic skills in business," *Journal of International Education in Business* 6, no. 1 (2013): 36.

[12] Yassin Sulaiman et al., "Implementation of Generic Skills in the Curriculum" (paper presented at the EDU-COM International Conference, Perth, Australia, November 19-21, 2008).

[13] Vathsala Wickramasinghe and Lasatha Perera, "Graduates', university lecturers' and employers' perceptions towards employability skills," *Education + Training* 52, no. 3 (2010): 227, accessed June 3, 2016, doi/full/10.1108/00400911011037355.

II. **Methods**

Before presenting the methods, it is appropriate to sketch the context of Makerere University in general and the College of Health Sciences (CHS) in particular. Makerere University-the oldest public university in Uganda and in East Africa- was established in 1922 as a technical college.[14] The University consists of ten colleges including the CHS. The CHS was established in 1924 and is the oldest medical training university unit in East Africa. Currently, the college comprises four schools: medicine, health sciences, public health, and biomedical Sciences. The next layer is the academic units or departments. Administratively, the college is headed by a principal who is assisted by a deputy principal. The dean is the administrative head of the school while departments are headed by chairs or heads of department.

The study adopted a case study design. The choice of the design was informed by two principal considerations. First, the research question necessitated a case study design. Yin[15] argues that a case study is justifiable when questions of **how** and **why** are to be answered. This study answers a **how** question. Finally, the study aimed to "optimise understanding of the case rather than to generalise beyond it."[16] This is consistent with Yin[17] who postulates that "case studies are generalisable to theoretical propositions and not to populations or universes."

For a study of this nature, the respondents may include, *inter alia*, academics and employers. However, academics were preferred as a source of information. Two reasons explicate the declination to include employers in the study. First, the reach question — what generic competences are aligned with life sciences at undergraduate level at the Makerere University College of Health Sciences and how does the College develop these competences? — is inclined towards what is obtaining in the college and the stakeholders at the student-academic interface are therefore better placed to provide factual and reliable information. Secondly, the tracer studies by the National Council for Higher Education and the CHS have made a significant contribution by identifying generic competences for medical education from the perspective of employers.

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[14] Makerere University, *Makerere University Self-Assessment Report* (Kampala: Makerere University, 2013).

[15] RobertYin K, *Case Study Research: Design and Methods* (Thousand Oaks, CA: Sage, 2003).

[16] Robert E. Stake, *The Art of Case Study Research* (Thousand Oaks, CA: Sage, 1995), 86.

[17] Yin, *Case Study Research*, 10.

Purposive sampling was deemed an appropriate sampling technique for the inquiry. Merriam[18] opines that "purposive sampling in based on the assumption that the investigator wants to discover, understand, and gain insight and therefore must select a sample from which the most can be learnt." The School of Health Sciences was purposively selected and the nursing and dentistry departments were also selected using the same technique. Similarly, nursing and dentistry degree programmes were selected. The aim was to have respondents from a hard-applied discipline (dental surgery) and a soft-applied discipline (nursing). Two academics who teach on each of the selected academic programmes were purposively selected to participate in the study.

The following criteria were used to select academics from each of the departments: a full-time member of staff; a minimum of three years in the university service; and having coordinated or currently coordinating a course. This brought the total number of academics from whom data was collected to four (three female and one male). The academics comprised one senior lecturer and departmental chair, two lecturers and one assistant lecturer. In terms of academic achievement, one respondent possessed a doctoral degree; three respondents possessed master's degree in clinical disciplines while one had just embarked on a master's degree. The small number of participants in the study ought to be understood against the tradition in which the research is anchored. The study is anchored in the qualitative tradition. This tradition considers the quality of respondents to be more important than the number of respondents. Similarly, the tradition regards the depth of interviews to be more important than the number of interviewees.

Data for the study was collected in July 2014 using interviews and the following data collection questions were put to the respondents: (a) what generic competences do you consider important for nursing and dental education and why? (b) how do you develop these competences in students? Each interview session lasted 45 to 60 minutes and was recorded. Consistent with the qualitative tradition, data were analysed simultaneously with data collection. Data analysis adopted Creswell's[19] six steps of qualitative data analysis, namely (1) organise and prepare the data for analysis, (2) read through the data to obtain a general sense of the information and to reflect on

[18] Sharan Merriam B, *Qualitative research and case study applications in education* (San Francisco: Jossey-Bass, 1998), 61.

[19] John W. Creswell, *Research Design. Qualitative, Quantitative and Mixed Methods Approaches*, 2nd ed. (London: Thousand Oaks: Sage Publications, 2003), 191.

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the overall meaning, (3) begin detailed analysis with a coding process, (4) use the coding process to generate a description of the categories or themes, (5) advance how the description and relationship of themes were represented in the qualitative narrative, and (6) make an interpretation or find meaning with the data. Organisation of data for analysis involved transcribing each interview. Each interview transcript was read to get a feeling for academics' wording. Second, coding was done, and two codes emerged from the data: "competences" and "strategies." Finally, themes were generated from the codes. To ensure confidentiality, the teaching department is used to identify the respondents in the report with LDD representing "Lecturer Department of Dental Dentistry Department" and LDN signifying "Lecturer Department of Nursing" followed by the order in which the interviews were conducted.

III. **Results: Generic Competences and the approach to developing them**

The findings are presented in two sections. The first section presents the generic competences which are aligned with dental surgery and nursing education while the subsequent section presents the strategies that the Makerere University College of Health Sciences uses to develop generic competences.

III.1. *Generic Competences for Dental Surgery and Nursing Programmes*

Nursing and dental surgery lecturers singled out three generic competences which should be integral of dental and nursing education at undergraduate level: problem-solving, lifelong learning, and interpersonal competences. These competences are examined below:

III.1.1. Problem-solving

Problem-solving was perceived to be a mandatory competence for healthcare professionals regardless of the field of specialisation. The priority that the respondents accorded to problem-solving cannot be divorced from the functional nature of dentistry and nursing. Generally, dental surgeons and nurses deploy problem-solving abilities to find answers for patients' problems. The respondents opined that life sciences are basically about solving health problems of clients and dental surgery and nursing students

should, by implication, be prepared to solve contemporary health problems. A dental surgery lecturer attested to this imperative: "For us [health workers], life is about solving problems [related to health]…I mean our work is about solving problems" (LDD-2). Though respondents did not allude to decision-making as a generic competence, it can be argued that decision making is part and parcel of problem-solving. Essentially, problem-solving is a decision-making approach that comprises identifying the cause of a problem (diagnosis) and developing ways to remove or correct the cause. Similarly, much as critical thinking did not feature in responses of health academics, it is implied in problem-solving since it is through critical thinking that problems are normally solved.

III.1.2. Lifelong learning

Participants in the study regarded change as the only constant in the health field. This perception was based on the notion that the mode of diseases and treatment are always changing and healthcare professionals ought to keep abreast with the rapidly shifting trends in their respective fields of study. It was on the basis of this premise that the participants in the study identified lifelong learning (learning to learn) as an essential competence for students and graduates of health disciplines. Promotion of lifelong learning hinges on the idea that health practitioners are not immune from learning upon completion of their degree programmes and aims at guarding against the temptation to offer old or out-dated solutions to current problems. A nursing lecturer unequivocally illustrated this as follows:

> …the mode of diseases change, the treatments change; everything changes, the way things are done changes. There are certain things I was taught when I first came here [at Makerere University] as a student nurse which have changed completely. So, if you don't continue to search for knowledge, then you can be out of practice (LND-1).

This suggests that the university experience should cultivate in students a culture of learning, unlearning and relearning so as to prevent obsolescence of knowledge and competences.

III.1.3. Interpersonal attributes

The findings on this competence suggest that dental surgeons and nurses operate in a highly social and complex environment since they unavoidably

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interface with other healthcare professionals, patients and their caregivers. The social nature of nursing and dental surgery necessitates possession of sound interpersonal abilities among the practitioners. The relevance of this competence in healthcare delivery is aptly summarised in the following dilemma that was put forward by a nursing lecturer:

> If you are a nurse on the [medical] ward and you do not have [good] interpersonal skills, how will you deal with the doctor, deal with the lab attendant, how would you deal with the radiologist and then you must also deal with the dietician because your patient must eat specific foods? (LND-1).

The excerpt suggests that the needs of clients are better met through effective inter-professional collaboration and use of multi-disciplinary teams. Communication, an essential aspect of interpersonal skills, was apparent in the data. To emphasise the centrality of oral communication, a nursing lecturer said: "And when for example you are assessing a patient, there is no way you are going to talk about assessing somebody without talking about communication and people skills" (LDN-1). In as much as dental surgery lecturers were not explicit on interpersonal skills, they implicitly pointed to particular attributes when asked about how the College of Health Sciences develops generic competences. Leadership featured strongly in their responses. Coincidentally, two competences (lifelong learning and problem solving) are apparent in the Makerere University Strategic Plan (2008/2009-2017/2018):

> The strategic focus for the next ten years is to produce a graduate who will not only command traditional academic and subject specific skills but will also possess generalist [sic] skills such as problem solving, reflective abilities, willingness to learn and a predisposition to lifelong learning.[20]

III.2. *Strategies for developing Generic Competences*

The College of Health Sciences at Makerere University employs a multidimensional approach to develop generic competences in students, namely using problem-based learning, offering generic or "non-core" courses, and modelling the competences by lecturers.

[20] Makerere University, *Strategic Plan* (Kampala: Makerere University, 2008).

III.2.1. Problem-Based Learning (PBL)

The findings on this strategy point to a nexus between the perceived purpose of life sciences (solving health problems) and the approach to developing discipline-specific and generic competences (problem-based learning). Since 2003, the College of Health Sciences has been using problem-based learning (PBL), a branch of student-centred learning, to develop subject and generic competences. Problem-based learning, as the name suggests, is an approach to teaching and learning under which "topics that constitute the curriculum are converted into medical problems which students engage with to construct their own knowledge" (LDN-2). Based on a curriculum-related medical problem, teams of ten students under the guidance of the lecturer, generate learning objectives from the problem, and search for information from various sources such as internet, textbooks, and journals to achieve the objectives. Procedurally, the students present their findings on learning objectives in tutorials.

Generally, PBL is intended to "encourage learners to own their own learning" (LDD-2) and to produce self-directed learners. In other words, PBL shifts the teacher from the centre of learning and firmly places the learner at the centre of the learning process. This was illustrated by a dental surgery lecturer: "…with problem based learning…the teacher is no longer at the centre; everything [that] you do revolves around the student" (LDD-1). The role of the teacher therefore shifts from content transmission to facilitating the learning process through converting topics into medical problems, and giving guidance to learners during tutorial sessions. Therefore, it would be naïve to infer that student-centred learning diminishes the role of the lecturer. Ideally, placing the onus on students to look for the information to achieve the learning objectives or outcomes empowers students and equips them with problem solving and lifelong learning competences. The respondents alluded to these competences in the previous section. The findings demonstrate that PBL is beneficial to both the learners and the teacher in terms of the volume of information generated and development of generic competences. Concerning the volume of information, a dental surgery lecturer said: "They [students] come up with so much information and you get to learn from them yourself" (LDD-1).

On the other hand, lecturers attested to the development of generic competences among the students because of employing problem-based learning, including but not limited to problem-solving, research, teamwork, and interpersonal competences. In relation to critical thinking, a nursing lecturer said: "Problem- based learning encourages students to think outside

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the box" (LDN-2). Relatedly, asked about how the college develops generic competences, a nursing lecturer said: "the student-centred learning, the problem based learning, which we are using now,…is inculcating these virtues [or generic competences] in… students [right] from year one because we put them in groups, they select a leader who will be able to control the group as they discuss and this (leadership role) is rotational [among the 10 students] (LDN-1). Finally, a dental surgery lecturer gave a vivid narrative of how PBL contributes to the development of generic competences, that nuances our understanding of PBL and that encompasses a range of generic competences:

> When it comes to lifelong learning, of course problem-based learning is done in tutorial style where students are given [health] problems. So, the students get an objective from that [problem] and they go out and look for the information [to achieve the objective]. So if you give a student problems and challenges and they are supposed to get answers to (sic) them, that means that even when they go for clinical work and find challenges, then you are forced if you don't know [the answer] to go and look for information. And when it comes to teamwork, they [students] are normally learning in sets of 10 for a tutorial at any one time. So, they learn from each other, they learn [how] to discuss [issues]. We have around six [degree] programmes [in the College of Health Sciences]. So, students from different programmes are learning together. I am a dental surgeon but I am learning together with someone [who] is doing [human] medicine. Even when they leave the university, they realise the importance of other professions and then that teamwork aspect comes in. So, you see the curriculum itself was built in such a way that it brings out that (sic) [generic competences] (LDD-1).

This excerpt demonstrates that generic competences can be embedded in the disciplinary curriculum and lends credence to the idea that generic competences are a curriculum issue.

The College of Health Sciences is a success story in the implementation of problem-based learning. The success of the pedagogical approach hinges on:

i. Adequate resources: adequate human and material resources must be in place if problem-based learning is to succeed because it is labour-intensive. A dental surgery lecturer emphasised this aspect by asking the following question:

> Problem-based learning needs lots of staff. Without staff, then how do you guide the students?…At the tutorial level, you need staff…who are committed and then you need content experts because outside the classroom environment these students should go to content experts to discuss with them what they have learnt [and] what they have read (LDD-1).

Besides human resources, PBL requires learning resources: "It (problem-based learning) needs resources in terms of the internet, [and] text books where the students can get the information" (LDD-2). Finally, the pedagogical approach requires adequate space.

ii. Committed students: a dental surgery lecturer said: "And it (problem-based learning) also needs students who are committed and do not only want to receive [knowledge from the teacher] but are willing to go out and [search] for information" (LDD-1). Therefore, the success depends on, *inter alia*, re-orienting the mind-set of the learners from being recipients of knowledge from the teacher to constructors of their own knowledge.

iii. Support by teaching staff: this support is necessary because PBL necessitates changing the teaching approach from the traditional lecture method to student-centred learning. Despite the introduction of the instructional strategy in the college, a nursing lecturer opined that some lecturers still want to "Teach the way they were taught [at university]" (LDN-2). This statement underscores the fact that student-centred learning in general and problem-based learning in particular are bound to face resistance from academics: "I know it is not a very easy shift [from teacher-centred approach to student-centred learning]. When they first brought it to the College [of Health Sciences], we (lecturers) resisted it. Some [lecturers] are still in denial and resisting it. Another group [of lecturers] adopted it" (LDD-1). The existence of change agents explicates the successful adoption of PBL in the college: "We have had champions who have embraced change; once you have champions, the rest [of lecturers] can pick up" (LDD-2). Therefore, change agents can help the university to navigate obstacles to implementing a pedagogical reform.

Within the domain of problem-based learning, students prepare write-ups which equally focus on health problems. Generally, under write-ups, students are required to observe a patient, document what has been observed, and compare what has been observed with extant literature. Through this self-discovery or constructivist approach, students are able to identify health problems and their symptoms, conditions, causes and remedies.

In conclusion, problem-based learning can be likened to hitting two birds with the same stone because it leads to the development of both subject-specific and generic competences. However, with problem-based learning, generic competences are not taught but are a spill over from subject course

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units. This may deny students the theoretical foundation or underpinning of the competences and calls a supplementary approach to developing them such as running management course units.

III.2.2. Conducting general courses

The College runs general course units to develop generic competences. The excerpts below attest to this approach: "…our curriculum has communication skills; we have management, which includes teamwork [as a topic] and so on. So all those things (generic competences) are incorporated" (LDN-1). This approach was echoed by a dental surgery lecturer: "The College [of Health Sciences] actually put…learning items in the curriculum. When it comes to communication skills, we actually have a course unit on that" (LDD-1).

III.2.3. Role modelling

The findings on role modelling, as a strategy for developing generic competences, resurrect the desirability of exhibiting professionalism on the part of the university educator. This necessitates lecturers to teach by example and to conduct their lives in an exemplary manner. Their personal lives should be beyond reproach because they have a significant influence, either negatively or positively, on the learners in general and the development of generic competences in particular. A nursing lecturer explained:

Since this (nursing) is a people sort of profession, you must teach by example. You must be a role model. I think that is very important. So if we are talking about time keeping, you are there on time and they see you. Then the learners get accustomed that this is how things are done (LDN-1).

The excerpt demonstrates that role modelling by the teacher has an immense potential to develop generic competences in students and particularly time management and integrity.

IV. **Discussion**

This study has identified generic competences which should constitute the graduate profile for dental surgery and nursing education: problem-solving, lifelong learning and interpersonal competences. These competences

resonate with some of the 18 generic competences for African higher education that were reported by Hahn and Teferra.[21]

Two competences for African higher education (leadership, management and team work; and communication and interpersonal competences) have been clustered into interpersonal competence in this study. Lifelong learning appears in this study and among the 18 competences for African higher education under the African Higher Education Harmonisation and Tuning Project.

On the other hand, two competences (objective decision-making and practical cost effective problem solving; and ability for conceptual thinking, analysis and synthesis) have been nested into problem-solving. Therefore, five of the competences in the Project resonate with the competences in this study. However, there are variations between the competences from this study and some of the competences that higher education institutions in the African higher space should develop. The following competences appear in the Project Report but do not feature in this study: commitment to UBUNTU (respect for the well-being and dignity of others); ability to communicate effectively in official/national and local languages; and flexibility, adaptability and ability to respond to new situations. Other competences are: environmental and economic consciousness; ability to work in an intra and intercultural and/or international context; ability to work independently; ability to evaluate, review and enhance quality; self-confidence; and commitment to preserve African identify and cultural heritage. There are two plausible explanations for this variation. First, the African Higher Education Harmonisation and Tuning Project is a continental initiative and respondents could have looked at the competences from continental and international perspectives. Secondly, the broad scope of Project could have given rise to the wide range of competences.

The findings suggest that a particular disciplinary field may have generic competences that are aligned with it. This partly explicates why not all the competences in the African Higher Education Harmonisation and Tuning Project were mentioned by the participants in this study. This is a pointer to the fact that while it may be desirable to promote similar generic competences across disciplines, curriculum developers and quality assurance schemes should not lose sight of peculiarities of academic disciplines. It also leads to an inference that while generic competences are general to all undergraduate programmes, each programme can have programme specific generic competences. Programme specific generic competences should be those that

[21] Hahn and Teferra, "*Tuning as Instrument*," 142-43.

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are deemed important to the disciplinary field and that the employers consider as most important when selecting graduates for entry-level jobs. This is consistent with Wickramasinghe[22] who found out that there are differences in the priority given for the employability skills by employers and lecturers in the Australian context. The programme specificity should not imply that other generic competences are insignificant but that they should not be promoted in equal measure.

According to lecturers, problem-based learning has potency to develop generic competences and had indeed developed them in students. This finding corroborates Kiguli-Malwadde, Businge and Mubuuke[23] who established, from the perspective of medical students, that problem-based learning was instrumental in developing the following generic competences among them: teamwork, interpersonal skills, time management, leadership skills, communication, conflict resolution, problem solving and critical thinking among students. The success of problem-based learning in developing generic competences cannot be detached from the tutorial approach that the College of Health Sciences employs. Tutorials have been found to lead to the development of generic competences. Specifically, tutorials are credited for enhancing intellectual, analytical, and communication skills, as well as creative reflection owing to their reflective nature.[24]

It should be noted that the College employs a dual approach to develop generic competences: embedding the competences in the curriculum and conducting standalone generic course units. The embedded approach for developing generic competences has enthusiasts and critics. The enthusiasts opine that the "embedded approaches to skills acquisition gives employability skills the same status as [subject] knowledge and obliges all lecturers to address them" while the critics of the approach — and at the same time proponents of standalone course units — argue that separate units "ensure that the skills are covered and have competent teachers to teach them."[25] Despite the above contestation, the university appears to have towed a middle of the road position.

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[22] Wickramasinghe and Perera, "Graduates', university lecturers' and employers' perceptions."

[23] Elsie Kiguli-Malwadde, Businge Francis, and Gonzaga Mubuuke Aloysius, "Attitudes and perceptions of students and teachers about problem based learning in the radiography curriculum at Makerere University, Uganda," *European Journal of Radiography* 1 (2010).

[24] Mwangi Ndirangu and Udoto Morris O., "Quality of learning facilities and learning environment: challenges for teaching and learning in Kenya's public universities," *Quality Assurance in Higher Education* 19, no. 3 (2011): 220.

[25] Lee Harvey, "New Realities: The Relationship between Higher Education and Employment," *Tertiary Education and Management* 6 (2000): 11.

In view of the findings, the following propositions are made for Makerere University in particular and the African Higher Education Harmonisation and Tuning initiative in general. First, because generic competences are a curriculum issue, they should be embedded throughout the curriculum at undergraduate level in view of the evidence that generic competences can be learnt best if embedded in the disciplinary curriculum.[26] This particular proposition has implications for curriculum development. The pedagogical approaches for dental surgery and nursing education should be informed by the generic competences which are to be developed among the learners. Similarly, curriculum designers should pay adequate attention to generic competences during the process of developing learning outcomes for discipline-specific courses. The above notwithstanding, it is prudent to emphasise a dual approach to developing generic competences. The dual approach calls for an infusion of generic competences in the disciplinary curriculum and offering generic course units. The convergence in the generic competences for dental surgery and nursing also suggests that similar generic course units for both programmes may be applicable. The second proposition is that universities should, in addition to embedding generic competences in the subject curriculum, embed the competences in student assessment. Thirdly, generic competences should be part and parcel of discipline-specific teaching and learning and academics should foster their development during the students' university experience. Furthermore, generic competences should be elevated to a quality assurance issue in higher education. This necessitates that the accreditation schemes, at national, regional and continental level, make it mandatory for universities to, *inter alia*, develop robust quality assurance mechanisms to ensure that generic competences are taught, assessed and reported. Finally, universities should shift from mapping out the generic competences to demonstrating greater evidence of the attainment of the competences.

A noteworthy limitation of this study, the ontological orientation in which it is anchored notwithstanding, is the small sample. Despite the limitation above, the overly interpretivist study contributes to the discourse on developing generic competences in higher education in two ways. First, the study extends scholarship on generic competences from **what** competences should be developed to **how** the competences should be developed. The approaches to developing generic competences that are employed in health sciences at Makerere University can be transferred to other disciplines in

[26] Clair Hughes and Simon Barrie, "Influences on the assessment of graduate attributes in higher education," *Assessment & Evaluation in Higher Education* 35, no. 3 (2010), accessed June 7, 2016, doi/abs/10.1080/02602930903221485.

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general and applied fields which involve solving problems such as engineering in particular. Secondly, the study identified the preconditions for the success of student-centred learning and particularly problem-based learning. The lessons from this case study can be transferred to other higher education institutions with a view to maximising student learning.

The study nuances our understanding of how generic competences can be developed through the curriculum at undergraduate level. Arguably, the discourse on the development of generic competences is incomplete without insights on how to assess them. It is therefore recommended that future studies should investigate how universities assess generic competences. This is consistent with Calma[27] who argues, "If universities are determined to develop generic skills, specific assessments must be designed to evaluate them". Finally, it is also recommended that the study is replicated in another public university that offers similar academic programmes in order to ascertain whether there are variations in the priority attached to particular generic competences across academic institutions.

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About the author

LAZARUS NABAHO (lnabaho@umi.ac.ug) is a Senior Lecturer at Uganda Management Institute, Uganda. He holds a PhD in Educational Management of Makerere University, Uganda. Nabaho has a track record of publishing articles, book chapters and preparing policy briefs. His research areas include quality management in higher education, teaching and learning, education policy, education reforms, performance management, governance in higher education, and decentralisation and local governance.

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Ladislas Bizimana
Managing Editor, TJHE
Journals Manager
Publications Service
DEIKER-OTRI - Knowledge Transfer Office
University of Deusto
Avenida de las Universidades, 24
48007 Bilbao, SPAIN
Tel: (+34) 944 139 003 (ext. 3048)
Email: ladislas.bizimana@deusto.es
tuningjournal@deusto.es

TJHE
Ethical Guidelines for Publication

TJHE Ethical Guidelines for Publication

FINAL VERSION (MARCH 2015)

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Date: 16 March 2015

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University of Deusto
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Tel: (+34) 944 139 003 (ext. 3048)
Email: ladislas.bizimana@deusto.es
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Avenida de las Universidades, 24
48007 Bilbao, SPAIN
Tel: (+34) 944 139 467 (direct)
Tel: (+34) 944 139 003 (ext. 3147)
E-mail: dita@deusto.es

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University of Groningen
Oude Kijik in't Jatstraat, 26
9712 EK Groningen, THE NETHERLANDS
Tel: (+31) 503 636 059
E-mail: tuningacademy@rug.nl

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