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Tuning Journal for Higher Education

Steps for innovation: course units design, classroom experiences, and employability

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University of Deusto
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2016

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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This Issue offers lively insights on innovative efforts, carried out at different stages of Higher Education teaching, learning, and research paths. In our May 2016 Issue, we reported about echoes from micro and macro processes, which occur in the epochal paradigm shift regarding Higher Education, from teacher-centred to student-centred education. Here we report about a new set of micro processes and experiences. In more detail, two contributions concern curriculum and course units' design in the domain of architecture; three deal with teaching and learning experiences within a classroom context; and the last one offers a model approach to employability of students in Agricultural Sciences.

Besides spontaneous submissions, most papers of the present Issue are selected outcomes from two events, i.e. Tuning MEDA Research and Good Practice Sessions, held in Bilbao (Spain) on May 2016, and the Tuning Africa Symposium on Research and Good Practices, held in Accra (Ghana) on October 2016, both focusing on competence-based and student-centred approaches in Higher Education. The two initiatives were first time events in the history of two by now well established Tuning Communities, namely Tuning MEDA (Tuning Middle East and North Africa countries) and Tuning Africa (over 40 participating countries) respectively. The operational concept for both initiatives included several steps, such as: i) a call for proposals (either a Research Article or an Account of Good Practice); ii) a preliminary selection, based on the proposal abstract; iii) a final selection, based on extended papers; iv) a final symposium, presenting the selected Research Articles and Accounts of Good Practice. The authors of these latter papers were invited to submit their works to Tuning Journal for Higher Education (TJHE). The Editors, in agreement with the Tuning Academy, decided to let

the research articles undergo the usual review process of this Journal; while a different review process was envisaged for the Accounts of Good Practice, which will appear in 'Special Issues' of TJHE, additional to its regular Issues. In practice, both events led to quite interesting developments. The participation in the Tuning Africa event was beyond expectations. After the initial Call, the organisers — we acknowledge and thank here in particular Prof. Damtew Teferra, University of KwaZulu-Natal in South Africa — received about 50 initial proposals, either for research articles or accounts, similarly divided between the two strands. The list of approved papers for the final symposium in Accra included 7 research articles and 4 accounts of Good Practice. As a whole, the present Issue hosts two research contributions from the Tuning MEDA event and 3 from the Tuning Africa event.

The first two contributions in this Issue deal with the "modernisation" of taught course units within a degree course. Tuning MEDA contributions show how the Tuning reference points and the related meta-profile concept can impact and change curriculum design in the Architecture subject area in two Middle East Universities, in Syria and Jordan respectively. The backbone of the two papers is similar and it consists in a re-visitation at their respective institutions of selected course units in "Design", an important sub-area of the architectural programmes. The units are the pair of units Basic Design I and II in the Hakky's contribution and a single advanced unit, i.e. Design 5, in the Al Husban et al.'s contribution. Both contributions, which in the background rely on a deeply understood Tuning Methodology, are pieces of "evidence-based research". They exemplify, in a somewhat complementary manner, how people, who are academics in a subject not explicitly related to Educational Sciences, can nevertheless obtain meaningful findings, about how to improve student education in their own specific area, which can represent relevant learning resources for peers.

Hakky's contribution describes and documents results of using the Bloom's taxonomy and the Learning Retention Pyramid within two course units to achieve 5 core competences, showing that the competence based approach allows the students to achieve both the upper levels of Bloom's scale (they were trained to analyse, synthesise, and evaluate) and a high degree of retention. The study was based on a questionnaire and instructor's own evaluation and results indicated that all competences were well recognised by students. Moreover, students declared that the most effective teaching techniques were: lecturing, demonstration, group discussions, and practice by doing. This research showed that it is possible to modify courses in the curriculum at a detailed level without the application of major changes in their core objective so as to match critical competences, as advanced by Tuning MEDA.

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Al Husban et al.'s contribution relies on a very comprehensive approach. In the first part of their article, they intend "to explore, describe, summarize, and understand the holistic view of teaching and learning, program/ curriculum design, generic and specific competences, intended learning outcomes, assessment and constructive alignment." Indeed, relying on the corresponding bibliography, they offer a wide theoretical background for a "holistic" approach to curricular design. As underlined by one of their reviewers, this approach offers a goldmine of ideas and evidence-based reflections on "any course redesign and transformation of any curriculum in architecture, looking to change the traditional educational model for one with emphasis on skills and competences". Moreover, a particularly interesting aspect regards "the idea of eliminating subjectivity in the evaluation process, through the use of various modalities that allow greater interaction and student ownership of their learning process".

The following group of contributions to the present Issue regards innovative teaching learning experiences in the context of a classroom or work-related teaching experience. Two contributions come from the Tuning Africa Symposium quoted above, reporting about how in some Ethiopian universities formative assessment or self-efficacy practice contributes to student-centred learning. The third one comes from Europe, namely from an Italian university, reporting about how work-related experiences can help soft skills achievement.

Weldmeskel et al.'s contribution focuses on the role of student self-regulation on learning. It describes the extent at which quality formative assessment (formative feedback, self-assessment and peer assessment) on lessons of a course involves students in self-regulated learning. The quasi-experimental intervention carried out included pre and post self-regulated learning questionnaire and focus group discussions with the students. Significant differences between intervention group and comparison group were found: students who were taught by the use of quality formative assessment on lessons report more involvement in self-regulating learning and perceive formative assessment as an encouraging step toward making the learning and assessment process more involving and interactive. Authors provide, therefore, recommendations to promote the use of quality formative assessment in order to aim at the improvement of student self-regulation on learning and assessment in university classes.

The contribution by Kinde et al. aims at investigating the practical utility of the theory of self-efficacy in other cultural settings aside from Western countries. In the authors' words, "Students' mathematics self-efficacy is defined as belief of competency in engaging in mathematical problems". In

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practice, the authors exposed 63 first year engineering students, at Jimma University, Ethiopia, to a self-efficacy enhancing "treatment" while they were attending the course unit Applied Mathematics II. The findings are that the "treated" sample show meaningful improvements of performance parameters with respect to a control sample of similar size. This is corroborated by qualitative findings stemming from appropriate Focus Discussion Groups.

Frison et al. frame their contribution within the literature on work-related learning activities. They aim at exploring and identifying considerations able to improve teaching strategies and methods. As the existing literature states, the qualitative research presented in this study — based on content analysis of texts produced by students — shows the strong impact of a work-related experience on the development of generic skills. In particular, the students' reports focused on the emotional, reflective, self-management and teamwork skills. The content analysis highlights an important reference to emotions and feelings, which can be related to the contact with the "real environment", where work takes place. This evidence-based research offers methodological inspiration that can be used to design work-related activities, able to foster the development of generic skills when implemented in an academic course.

The last contribution in the present Issue is from a small African country, Mauritius. The authors of this contribution applied the "Tuning survey methodology", in order to map out "the set of skills, understandings and personal attributes that will increase the job prospects in agriculture of the fresh graduate from the Faculty of Agriculture of the University of Mauritius". The study includes description of the job market situation of the country and of its higher education system. Moreover, their findings are discussed in a worldwide perspective, quoting appropriate references. In the words of one reviewer, "the paper follows very important aspects of Tuning, like: Description of the job market and the role of the universities; Status of working in the field of Agri (undergraduates). It includes [perceptions of] employers, students and graduates/Alumni; it gives a detailed description of existing undergraduate study programmes in Agriculture science; it can be a good example for other parts in Africa to find out about the relevant needs for employability".

As a concluding remark, we would like to point out how, out of six accepted contributions, only three ones (Hakky; Al Husban et al.; Armoogum et al.) are strictly and explicitly Tuning-related contributions. The other ones examine the role of different approaches / methodologies in pursuing 'real' student-centred teaching & learning activities. Moreover, it is interesting to note that even the contributions, which are related to Tuning, introduce issues for cross-fertilisation such as relationship with Bloom's taxonomy,

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learning retention, objectiveness of assessment processes. All this confirms the editorial choice of this Journal to serve "as a platform for students, teachers, policy makers, administrators, and academics … in order to engage in constructive debate on new approaches, methods and tools on teaching, learning and assessment in competence-based and student-centred curricula in higher education". This choice was clear to the founders of the Journal, even though it was then an implicit one. Now, after three years of publication, after a consolidation phase, which has built awareness about this Journal as the voice of the Tuning Communities, we explicitly confirm the "open" platform role of the Journal.

The Editorial Board warmly welcomes submission of articles that fall within the compass of this Journal.

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Articles

Improving Basic Design courses through Competences of Tuning MEDA*

Rafee Hakky**

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Abstract: It is well established that Tuning's development of the concept of competences for the improvement of what is referred to as student-centered approach has proven itself beneficial in developing higher education programs.[1] This paper examines the application of competences suggested by Tuning-MEDA to the benefit of teaching architecture. Two courses were selected from the Architectural Engineering Program at the International University for Science and Technology, Damascus, Syria; namely, Basic Design I and II. Five competences were selected as crucial to be achieved in these two courses: ability to think, perceive and conceive spaces three dimensionally and communicate verbally, in writing, graphically, and/or volumetrically; have critical thinking, analysis and synthesis; knowledge of aesthetics and arts, and understanding their role as key factors in the quality of architectural thinking and design; possess a high level of interpersonal skills; and appreciation of the social and cultural role of architecture. The two courses are evaluated at two levels before being examined in relation to their ability to achieve these competences. They were looked at in connection with Bloom's Taxonomy and found to be able to deliver learning at its upper levels; namely, analysis, synthesis, and evaluation. They were also examined against the typical Learning Retention Pyramid and were found to provide learning opportunities through learning techniques which provide a high level of retention: demonstration, group discussion, and practice by doing. Finally, it was found that the five competences assigned to the courses were very much achievable and indeed through applying them, the two courses were more focused and could achieve their objectives more successfully.

* The author bases this work on Tuning Middle East Project. He wishes to extend his appreciation to all organizers and researchers in Tuning for their support and help in making this paper reality.

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More details are available at the end of this article.

[1] Robert Wagenaar, "Competences and learning Outcomes: a Panacea for Understanding the (New) Role of Higher Education?" *Tuning Journal for Higher Education* 1, no. 2 (May 2014): 279-302.

Keywords: Architectural education; basic design; competences; design courses; design education; architectural design.

I. **Introduction**

Schooling systems in almost all Arab countries, including Syria, are based in general on memorizing more than any other teaching technique. Students have strong ability to retain given information in their minds until they enter exams. Afterwards, most information is lost. This lack of ability to maintain information is a result of a teaching culture that emphasizes memorization for the sake of pouring information on exam papers only to get grades. Information or knowledge then is lost because it does not have any purpose beyond this simple objective; in most cases also, it does not have any relevance to life experiences.

Although this problem is strongly crystallized in the Arab world, it has its resonance in almost all schooling systems to different degrees. Students are given "facts" in school. Therefore, one major objective of Basic Design courses in design schools, including architecture, is to open the minds of new students in these fields to the idea that there is no one "fact" in connection to anything, at least in design. Thus, these courses attempt to help students go beyond the basic level of cognition (knowledge and comprehension), according to Bloom's Taxonomy, to the upper levels (starting from application to evaluation). In other words, these courses aim to encourage and guide students to think on their own building on knowledge gained in the classroom.

II. **The Problem**

The International University for Science and Technology in Damascus, Syria is a young university; its first class graduated in 2009. During its first few years, the two Basic Design courses in the Architectural Engineering Program at the University were taught according to at least two different approaches. One approach was to ask students to design a cube whose side was around 30 cm long using different materials (wood, plastic, metal, etc.). Students were exposed to design elements (point, line, surface, and mass) and to a number of design principles (balance, harmony, hierarchy, etc.). Students' proposals submitted at the end of the courses would theoretically reflect their understanding of the taught principles.

The second approach of teaching the course was to treat it as a regular design course where students would be asked to design a small project and produce basic architectural drawing along with a model. The problem with

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both approaches was that they allow very limited opportunity to systematically help students overcome their inherited drawback in relation to their way of accumulating knowledge and how they can benefit from it.

Both approaches were not successful in addressing two very crucial issues in relation to these critical courses. First, they did not provide the needed body of knowledge expected to be acquired through them. Second, they did not aim to help students change their attitude and approach towards learning to get to higher ranks in the classic Bloom's Taxonomy beyond "application" in the best of cases.

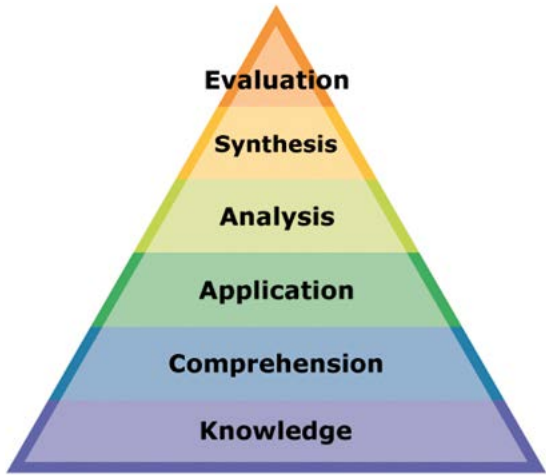

Figure 1

Original version of Bloom's Taxonomy Pyramid

Retrieved 16/4/2016 from: http://www.learnnc.org/lp/pages/4719.

III. **The Proposed Approach**[2]

Any proposed approach to teaching these Basic Design courses was expected to address the drawbacks of earlier approaches. Taking this issue as

[2] The development of these two courses is part of a continuous effort to raise the standards of the Program at IUST in order to make it more capable to confirm with Tuning-MEDA. This effort is a reflection of strong belief that development of any program should be a continuous

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a point of departure, this proposed approach was expected to address the type and quantity of information to be introduced in the course; on the other hand, it was to take a stand on how to help students build their own healthy attitude towards architecture and themselves, and to learn how to reflect their conceptual ideas in physical form. Hence, the approach which the author adopted is based on a number of clear objectives:

a) To teach students design principles and spatial organization methods

b) To give students a chance to practice with these principles and methods to master their use

c) To create learning opportunities for students to go beyond the basic levels of Bloom's Taxonomy to the higher levels

d) To help students build a strong and confident yet sensitive personality[3]

e) To help students improve their presentation techniques at all levels

The two Basic Design courses, One and Two, are dealt with as a one year continuous course starting with the very basics of design elements, through design principles, spatial organization, form relationships, spatial definition and enclosure, ending with approach and paths. The program of the two courses is based on the famous book: *Architecture: Form, Space, and Order* by Francis Ching in its second edition (1996). The book is still considered one of the best works to be used as an introductory to the architectural design field from its formal perspective.

In order to provide students with every possible opportunity to learn, the two courses are designed to benefit from the Learning Pyramid (Adapted from NTL Institute for Applied Behavioral Science). According to the Pyramid, each method of teaching allows a certain average learning retention rate: for example, a student would retain 5% of the information presented to him in a lecture;[4] while on the other hand, he or she would retain 90% of information he or she would teach to colleagues.

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process by any school and not a periodical action. See for instance: Thomas Baker and Howard Smith Jr., "Integrating Accreditation into Strategic Planning," *Community College Journal of Research and practice* vol. 60, no. 3 (February 2007): 21-27

[3] The idea of developing students' personality to become good citizens has become central in higher education. See for instance: Wagenaar, "Competences and learning Outcomes: a Panacea for Understanding the (New) Role of Higher Education?" *Tuning Journal for Higher Education* 1, no. 2 (May 2014): 279-302.

[4] In the case of the architectural design studio, there is no one opinion about the use of lectures. Some value having lectures in studio while others see that lectures should be

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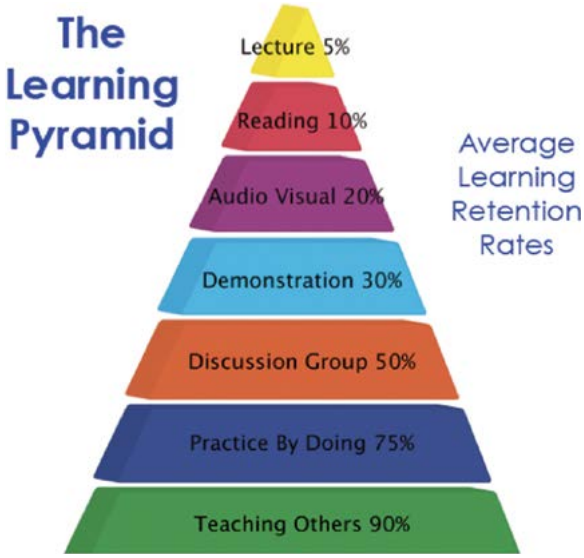

Figure 2

The Learning Pyramid (Adapted from NTL Institute for Applied Behavioral Science)

(Retrieved 16/4/2016 from: http://www.westmuse.org/sites/westmuse.org/files/uploads/2012/03/pyramid.png)

The courses use almost all learning techniques to different degrees, table 1 shows, based on the author's estimation, the use of each learning technique in the two courses.

Three very important techniques are heavily used in teaching the courses; namely, demonstration, discussion group, and practice by doing. The use of these three techniques is inevitable in teaching design. Instructors depend greatly on demonstrating to students by action how certain design issues or problems can be solved. Practice by doing is by far the most used technique in teaching design. Students are instructed to tackle different design problems; through their experiences in trying to resolve the issues involved in the design problem they acquire knowledge. In fact, design studios in all design schools are based on this learning technique.

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completely abandoned for they do not provide a beneficial ground for true learning of design. See for example: Mark Gelernter, "Reconciling Lectures and Studios," *Journal of Architectural Education* 41, no. 2 (1988): 46.

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Table 1

Estimated use of learning techniques in the Basic Design courses

The Learning Technique		Estimated Use of the Technique			
		Not Used	Slightly Used	Used	Heavily Used
Lecture	5%				■
Reading	10%		■		
Audio Visual	20%	■			
Demonstration	30%				■
Group Discussions	50%				■
Practice by Doing	75%				■
Teaching Others	90%		■		

The most beneficial technique according to the Learning Pyramid, which is teaching others, can be seen in the two courses in two ways: first in an indirect way during discussion groups. Usual design studio in the Arab countries is typically based on desk critic where students' projects are critiqued by the instructor individually on the desk of each student. This technique is used all over the world, but it should be supplemented by other techniques. One of those techniques is group discussion which has been seen as very informative. Students learn from each other in many cases more than they learn from formal instructions given by tutors. Discussions among students bring out the best of each one them as they try to prove their points of view. Learning takes place then in a very positive way.

The other way of presenting an opportunity to teach others as a technique of learning is presented through giving students the chance to present a particular issue to the class. Formal presentations require serious preparation and sound understanding of the topic to be presented. Going through such an experience guarantees the retention of information. Another form of teaching others is through the use of students as jurors. Students are divided to small groups, each member of the group presents his or her work and then listens to and discusses with his colleagues his or her work. In such situations, students become very alert and eager to have their logic heard.

It is worth mentioning here that in these two courses, and in fact, in all design courses, it appears that the revised Bloom's Taxonomy is more appropriate. This is because in design, the process of evaluation comes as a

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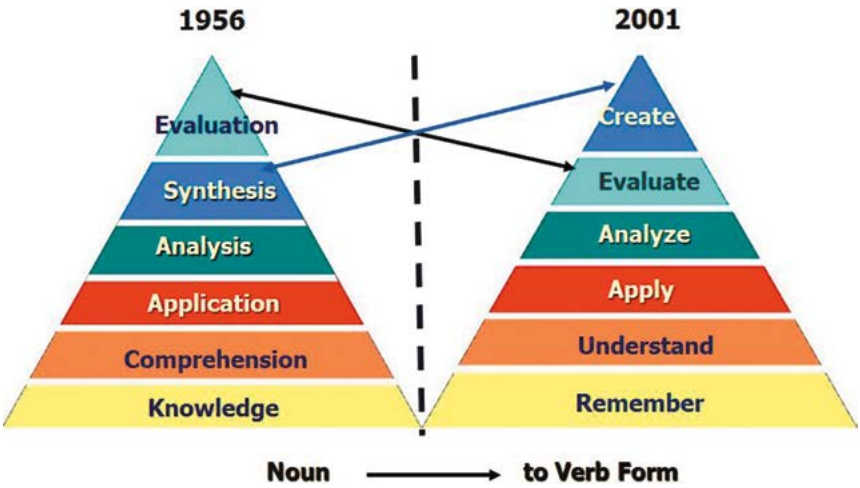

Figure 3

Revised version of Bloom's Taxonomy

Retrieved 10/4/2016 from: http://thesecondprinciple.com/teaching-essentials/beyond-bloom-cognitive-taxonomy-revised/

result of the analysis (of the site, users, program, similar projects, etc.). Evaluation leads to the main objective of the whole process which is to design (create in the terms of the revised Bloom's Taxonomy). Thus, in teaching design, students learn to acquire knowledge which they then comprehend. After comprehension they apply this knowledge without full understanding of reasons. In a later and more advanced stage they master the ability to question (analyze) and then take a stand based on the analysis (evaluate). At this stage, students will have the ability to utilize their evaluations as means to improve their work; at this point they become creative.

IV. **Tuning-MEDA and the Development of Basic Design Courses**[5]

The new approach used in teaching the two Basic Design courses started in 2011. However, it took a number of adjustments and refinements based on

[5] Tuning in its basic objective is not very different from any accreditation system. Its method and process may be different from typical accreditation system, but, like accreditation, its aim is to find a way to evaluate the outcome of an educational program. Thus benefits of any

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accumulated experiences. Tuning-MEDA, which started its work in mid 2013, was an opportunity to evaluate the development of the courses and to examine their validity within a larger scope of the whole curriculum. Tuning-MEDA proposed a list of competences that each student should acquire during his study period in any architectural program in the concerned region (The Middle East and North Africa).[6] Based on the list of competences, a proposal for a revised program for the Architectural Engineering Program at the International University for Science and Technology was developed. The proposal attempts to include all the competences which have been agreed upon as necessary, each in the appropriate courses.

Careful assignment of competences to courses is a very crucial endeavor and should be done with good understanding of the capacity of each course and its content on one side, and the comprehensiveness and integration of all courses to form a cohesive and complete program on the other.[7] Obviously, no course can meet all competences; on the other hand, no course should exist in the program if it does not meet at least one competence. Competences for architectural curriculum were grouped under five main categories: Design abilities, construction and technological abilities, theoretical background and socio-cultural values, professional practice and work ethics, and personal characteristics.

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accreditation system are shared by Tuning; these benefits have been stated by many studies in different fields of education, one of which is Wendy Nicklin's work which stated thirty benefits for accreditation in health care specialties. See: Wendy Nicklin, "The Value and Impact of Health Care Accreditation," *Accreditation Canada*, 2008, 2-4.

[6] Many see Tuning's regional approach needed; as an example, Augusti states: "pan-European system of accreditation of engineering programmes and qualifications will be essential in order for European engineers to be competitive on a global scale. G Augusti, "Transnational Recognition and Accreditation of Engineering Educational Progammes in Europe: Perspectives in a Global Framework," *European Journal of Engineering Education* 31, no. 3 (2006): 249-260. On the other hand, others go against Tuning, believing that there is an urgent need to have one 'global model of engineering accreditation that can be used to assess global professional skills and attributes of engineering graduates.' See: Arun Patil and Gary Codner, "Accreditation of Engineering Education: Review, observations and Proposal for Global Accreditation," *European Journal of Engineering Education* 32, no. 6 (2007): 639-651.

[7] A degree profile based on competences is proven to be useful on many levels; one of which is informing students' ahead of time the expected learning outcomes of a particular course. Among the other benefits of the use of competence based programs is quality control of offered education. See Julia Gonzalez and Maria Yarosh, "Building Degree Profiles. The Tuning Approach," *Tuning Journal for Higher Education* 1, no. 1 (Nov. 2013): 37-69. However, the debate on how to measure a competence is old and can be found in all fields of knowledge, see for instance: Elizabeth Girot, "Assessment of Competence in Clinical Practice — A Review of the Literature," *Nurse Education Today* 13, no. 2 (April 1993): 83-90. The article questions the meaning of competence and how it can be assessed.

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Among the many changes included in the proposal, the Basic Design courses (which became one, in the proposed program, with higher number of credits: 5 credit course in lieu of the two-3 credit courses) are supposed to cover the following competences:

1. Ability to think, perceive and conceive spaces three dimensionally and communicate verbally, in writing, graphically, and/or volumetrically (Design abilities 2)
2. Have critical thinking, analysis and synthesis (Theoretical background and socio-cultural values, 5)
3. Knowledge of aesthetics and arts, and understanding their role as key factors in the quality of architectural thinking and design (Theoretical background and socio-cultural values, 7)
4. Possess a high level of interpersonal skills (Personal characteristics, 4)[8]
5. Appreciation of the social and cultural role of architecture (Theoretical background and socio-cultural values, 1)[9]

It is worth noting that all of these competences are considered important generic competences internationally except the third one because it is very specific to architecture.[10] The fifth competence is included in these two early courses of the Program to emphasize the role of higher education in preparing students to face realities of life and be able to meet society's expectations.[11] More specifically, students should be aware of economic and cultural issues related to the society for which they are designing.

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[8] Interpersonal skills have become essential in all fields including engineering and architecture, see for example Chenicheri Sid Nair, Arun Patil, and Patricie Metrova, "Re-engineering Graduate Skills — A Case Study," *European Journal of Engineering Education* 34, no. 2 (2009): 131-139. Also see: Sanjoy Mazumdar, "Cultural Values in Architectural Education: An Example from India," *Journal of Architectural Education* 46, no. 4 (1993): 230-238.

[9] Some feel that as early as the first studios in architectural programs, efforts should be made not only to inject an awareness of the importance of multi disciplinary work between architecture and other related fields, but also to give such work a space in these early studios. See: Linda Grroat and Sherry Ahrentzen, "Voices for Change in Architectural Education: Seven Facets of Transformation from the Perspectives of Faculty Women," *Journal of Architectural Education* 50, no. 4 (1997): 271-285.

[10] Pablo Benitone and Edurne Bartolome, "Global Generic Competences with Local Ownership: a Comparative Study from the Perspective of graduates in Four World Regions," *Tuning Journal for Higher Education* 1, no. 2, (May 2014): 303-334.

[11] Robert Wagenaar, "Columbus Egg? Qualifications Frameworks, Sectoral Profiles and Degree Programme Profiles in Higher Education," *Tuning Journal for Higher Education* 1, no. 1 (November 2013): 71-103.

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Accordingly, competences related to such issues should be part of any accreditation or evaluation process.[12]

Three points to be considered here: first, the degree of compatibility between the competences and the original courses' descriptions; second, the relation between the competences and Bloom's Taxonomy; and third, the extent these competences were actually met when teaching the two courses.

V. **Courses' Description, Bloom's Taxonomy, and the Competences**

Description of courses goes as follows:

> ***305111 Basic Design (1) (3 Credit Hours; Prerequisite: -)***
> *This first semester studio introduces students to design and the formal attributes of compositions. Throughout the use of the basic shapes and forms, the students are expected to identify abstract forms and relate them to practical functions. Upon completion of the course, students are expected to demonstrate an understanding of fundamental principles and primary elements of design.*
>
> ***305112 Basic Design (2) (3 Credit Hours; Prerequisite: 305111)***
> *This second semester studio introduces students to more contextual and formal complexity in space design. Its main goal is to develop the design mentality among students. The course offers problems that deal with space, measure, structure, sites, etc. Upon completion of the course, the students are expected to demonstrate the ability to transform "design thinking" into an initiation of architectural design and to communicate their ideas in a clear manner.*

The following points can be extracted from the course descriptions as the main issues of the two courses: formal composition, form and function, fundamental principles and primary elements of design, context, design mentality, structure, site, design thinking, communicate ideas. The following table exhibits a matching between these issues and the five competences adopted from Tuning-MEDA.

It appears that issues in the course descriptions are well covered in three competences one way or another. The fourth competence, possess a high level of interpersonal skills, is a general one that should be gained throughout the whole period of education. However, it is highly emphasized in these two courses since they are considered as initiation courses to the field of architecture

[12] See for instance: Marcos Cerqueira, "A literature Review on the Benefits, Challenges and Trends in Accreditation as a Quality Assurance System," 7.

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Table 2

Issues in Basic Design courses covered by Tuning-MEDA competences

Competence	Issues in the course description
Ability to think, perceive and conceive spaces three dimensionally and communicate verbally, in writing, graphically, and/or volumetrically.	Fundamental principles and primary elements of design, context, structure, site, communicate ideas.
Have critical thinking, analysis and synthesis.	Design mentality, design thinking.
Knowledge of aesthetics and arts, and understanding their role as key factors in the quality of architectural thinking and design.	Formal composition, form and function.
Possess a high level of interpersonal skills.	
Appreciation of the social and cultural role of architecture.	

and the mentality of design. This competence is coupled with the second one, having critical thinking, analysis, and synthesis, in order to build the mentality of a designer who is always questioning, analyzing and then creating. Thus, these two competences, the second and fourth, are concerned with the development of the personality of the young designer in terms of his or her intellectuality and behavior. The first and third competences deal with the technical abilities of the designer; this is to say, his or her ability to compose spaces which correspond to the function and setting of the project. Similarly, the fifth competence, appreciation of the social and cultural role of architecture, is crucial to the development of young architects in order to become more aware and responding to their socio-cultural environment, especially with all the complexity of modern day life. Thus, this competence was added with the idea that it will be included in the revised course description.

Moreover, it is of value to note that Bloom's Taxonomy which appears in its original form to be input based logic, has taken a shape that is more output oriented in its revised form. This is evident in the way it states the details of each level. As an example, the revised Taxonomy explains "Remembering" as: "can the student create a new product or point of view?" These statements present output regardless of the input. They aim at what students can do, as opposed to what was offered to them.

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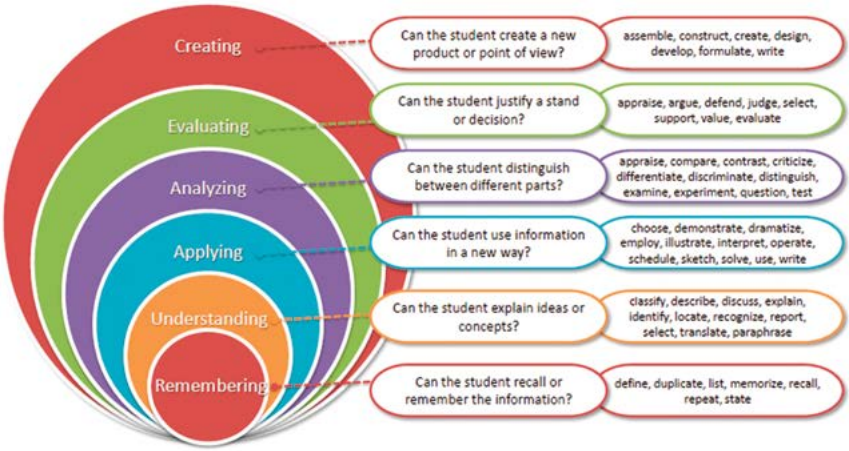

Figure 4

Revised version of Bloom's Taxonomy with detailed explanation of each level

Retrieved 20/8/2016 from http://pcs2ndgrade.pbworks.com/f/1318607148/RBT.PNG

Accordingly, it is possible to see clear matching between Bloom's Taxonomy and the competences aimed by the two Basic Design courses as shown in Table 3. The fourth competence in particular cannot be related directly to any of the six levels of Bloom's Taxonomy since it does not relate to a particular educational task; it is a general competence that talks about the personality of the designer and his or her character. As mentioned earlier, this competence is gained with time and throughout the whole university education of the student.

Table 3

Compatibility between the Competences and Bloom's revised Taxonomy

Competence	Compatible level(s) of Bloom's Revised Taxonomy
Ability to think, perceive and conceive spaces three dimensionally and communicate verbally, in writing, graphically, and/or volumetrically	Understanding Applying
Have critical thinking, analysis and synthesis	Evaluating Creating

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Competence	Compatible level(s) of Bloom's Revised Taxonomy
Knowledge of aesthetics and arts, and understanding their role as key factors in the quality of architectural thinking and design	Remembering Understanding
Possess a high level of interpersonal skills	
Appreciation of the social and cultural role of architecture	Understanding Evaluation

VI. **Competences' achievement: Students' appraisal of Basic Design courses**

It is possible to evaluate the results of teaching the two courses in accordance with the new approach in a number of ways. One of these ways is to evaluate them through comparing projects done by students of earlier years with similar projects done by students who have gone through the new way of teaching the Basic Design courses. Theoretically, projects of the second group should show more comprehension of issues addressed in the two courses and better application of them in later work. Another way of evaluating benefits of the new approach is through personal interviews with students to appraise their maturity in the areas discussed in the two courses.

Although there are many possibilities of evaluation, the implementation of a questionnaire was selected. This is because Tuning emphasizes the role of students in the process of developing competence-based educational programs. Their input is seen to be instrumental in the evaluation of any change or development of curricula.[13] From this perspective, students who studied the courses during the academic year 2014-2015 were asked through a questionnaire to evaluate a number of points related to the way the courses were taught and the benefits of the courses. Forty five students participated in the questionnaire; the results are shown in Table 4.

[13] Alexander Bedny and Liliya Erushkina and Oleg Kuzendov, "Modernising Education Programmes in ICT Based on the Tuning Methodology," *Tuning Journal for Higher Education* 1, no. 2 (May 2014): 387-404. Also see: Karole 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 (November 2013): 127-163.

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Table 4

Areas Basic Design courses were helpful to student's learning

The Basic Design courses

		Did not help me at all	Helped me a little	Helped me well	Helped me a lot
1	Helped my understand the role of the architect in building healthy environment	3	8	17	17
2	Helped me be more able to analyze information	0	10	19	16
3	Helped me be more able to express my ideas and projects	3	10	22	10
4	Helped me learn about basics of design	1	5	15	24
5	Helped me learn about different construction methods	19	17	7	2
6	Helped me better understand client's needs	8	16	15	6
7	Helped me comprehend the profession of architecture and its different dimensions	6	10	18	9
8	Gave me a chance to practically apply whatever I learned of basics of design	5	15	13	12
9	Gave me self confidence as a designer who cares about his/her surroundings	3	11	21	10
10	Helped me improve my English language	11	20	12	2

It is helpful to relate the questions of the questionnaire to the competences expected from the two courses. Table 4 shows these relationships; it is to be noted that the last two benefits in the list (helped me learn about different construction methods, and helped me better understand client's needs) are not related to any particular competence. These two benefits were added because they were discussed many times during the courses but were not

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emphasized. Therefore, degree of benefit expected in relation to them should be low. Table 3 confirms this assumption; the lowest level of benefit is in relation to these two points. The third point which earned low rating in terms of its benefit was "improving English language." This evaluation is also very fair because the course did not work on this point but briefly. All principles and important terms were given in English in addition to Arabic. This was the extent to which the course dealt with the issue of second language, no more.

Table 5

Competences provided by Basic Design courses
and corresponding benefits as per the questionnaire

Competences	Corresponding Benefits from Basic Design courses as per the questionnaire
Ability to think, perceive and conceive spaces three dimensionally and communicate verbally, in writing, graphically, and/or volumetrically.	• Helped me be more able to express my ideas and projects. • Gave me a chance to practically apply whatever I learned of basics of design.
Have critical thinking, analysis and synthesis.	• Helped me be more able to analyze information.
Knowledge of aesthetics and arts, and understanding their role as key factors in the quality of architectural thinking and design.	• Helped me learn about basics of design.
Possess a high level of interpersonal skills.	• Gave me self confidence as a designer who cares about his/her surroundings. • Helped me improve my English language.
Appreciation of the social and cultural role of Architecture.	• Helped my understand the role of the architect in building healthy environment. • Helped me comprehend the profession of architecture and its different dimensions.
	• Helped me learn about different construction methods.
	• Helped me better understand client's needs.

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However, looking at the rest of the points which are more directly related to the competences, it is clear that students feel they have benefited greatly. For instance, the second point (helped me be more able to analyze information), the third point (helped me be more able to express my ideas and projects), the fourth point (helped me learn about basics of design), the eighth point (gave me a chance to practically apply whatever I learned of basics of design), and the ninth point (gave me self confidence as a designer who cares about his/her surroundings) have all very high rating. These results are clearly indicative of the success of the two courses in achieving their intended objectives. Formulating the objectives in clear competences was undoubtedly instrumental in this success.

The other aspect of the search for ways to better benefit students in achieving attempted competences is investigating the appropriate teaching technique. Table 5 concentrates on three competences out of five planned for these courses; namely, ability to think, perceive and conceive spaces three dimensionally and communicate verbally, in writing, graphically, and/or volumetrically; have critical thinking, analysis and synthesis; and possess a high level of interpersonal skills. The first competence is covered in question 1, 2, and 3. The second competence is covered in question 4, while the third is covered in the remaining questions. These remaining questions are directly taken from the sub-competences which were originally discussed in earlier stages of developing the final list of competences and were then grouped under it.[14]

Table 6

Three Competences and corresponding questions from the questionnaire

	Competence	Corresponding Questions
1	Ability to think, perceive and conceive spaces three dimensionally and communicate verbally, in writing, graphically, and/or volumetrically	2. My ability to perceive and imagine spaces 3. My ability to express my design ideas orally and graphically
2	Have critical thinking, analysis and synthesis	4. My ability to think, analyze, and synthesize
3	Possess a high level of interpersonal skills	The rest of the questions

[14] Tuning for the Middle East and North Africa: Architecture, Fourth Report, University of Deusto, 16, 3, 2016.

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These three competences are more tuned with the intention of the courses. The other two competences (knowledge of aesthetics and arts and understanding their role as key factors in the quality of architectural thinking and design, and appreciation of the social and cultural role of Architecture) are introduced in the two studied courses, but are better addressed in later and more advanced courses in the curriculum.

Table 7 exhibits clear distinction of four teaching techniques: lecturing, demonstration, group discussion, and practice by doing. Lecturing in particular shows the highest points; this is expected since materials of the two courses are first presented in lecture form and then addressed in more detail through exercises. These exercises are done individually in general; which make them fit the practice by doing teaching technique. During students work on their exercises and while evaluating their work, the other two teaching techniques, demonstration and group discussions, come to the fore. The courses, like all design courses, depend heavily on the instructor demonstrating to students how certain things are solved or done, and on rigorous group discussions. Students' answers reflect the importance of these techniques.

Table 7

Effect of teaching techniques on students learning and personal growth (students can choose more than one option)

The most helpful teaching techniques for my development were in connection to:

		Lectures	Readings	Audio-visual	Demonstration	Group discussions	Practice by doing	Teaching others	No development
1	My personality as an architect	20	3	2	12	29	10	6	0
2	My ability to perceive and imagine spaces	26	2	5	18	8	21	3	0
3	My ability to express my design ideas orally and graphically	13	4	1	17	12	17	4	5
4	My ability to think, analyze, and synthesize	15	4	3	12	15	19	1	1
5	My ability to adapt to different situations	8	3	0	5	11	18	1	5

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		Lectures	Readings	Audio-visual	Demonstration	Group discussions	Practice by doing	Teaching others	No development
6	My ability to work autonomously	6	7	4	4	6	23	3	1
7	My ability to take initiatives	5	1	0	11	12	9	9	4
8	My feeling of commitment to work	19	2	0	6	9	17	0	1
9	My feeling of dedication	25	2	0	7	15	7	2	1
10	My ability to be assertive	12	4	1	8	12	11	2	8

These results are exactly compatible with the estimated use of learning techniques presented in Table 1. The results are in general very promising when looked at from the Learning Pyramid perspective. This is because three learning techniques with the highest rate of retention are used: demonstration (30%), group discussion (50%), and practice by doing (75%). It is worth mentioning that in an informal discussion with the new group of students who are taking the two courses in this academic year (2015-2016), they indicated that the most beneficial time for them is when they get involved in group discussions. Teaching others is a technique that is not well introduced yet, but some experimentation with it is in order. One last remark here is related to point 8 and 9 (my feeling of commitment to work and my feeling of dedication), these two issues were discussed in length throughout the two courses during lectures just to build in students a stronger feeling of responsibility; it seems that it worked.

The questionnaire gave positive responses in general. However, there are a number of issues one cannot ignore. Firstly, the number of students who participated in the questionnaire although not small, but it represents only one batch of students. It would definitely be more reflective if more than one batch participated. Thus, repeating the questionnaire for two more years perhaps may bring about new results and/or support existing ones.

Another worthy point to be mentioned is that students who participated in the questionnaire were freshmen; they were not aware of other methods of teaching and thus they had no reference points for comparison. In this regard, a supporting questionnaire targeting faculty who can compare the new

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approach with old ones may be very useful. Nevertheless, informal discussions with teaching assistants who assisted in both new and old ways of approaching these two courses expressed favorable views of the new method.

A third point related to the questionnaire has to do with the major change in teaching approach between high school and the university. Students usually come from a very restrictive and limited teaching system at school to suddenly a much more open and versatile system. Students feel freedom, maturity, responsibility, and excitement at the time they take these two courses at the beginning of their university education. All this change may have given the courses some advantage; and thus, students' evaluation may not be as objective as one would have liked it to be.

Finally, the two courses are practical ones where students "play" with forms and shapes; they get exposed to completely new techniques of interaction with information. They do not just absorb information; they directly employ it in their work. This by itself is very exciting at times, although it can be frustrating too. It is to be noted that all these points do not take away from the value of the questionnaire. Students responded with maturity as it was explained in the discussion of the results. These warning remarks are only to open the door for more detailed evaluation to support the results which were very positive in the initial examination.

VII. **Summary and Conclusions**

This paper documented an experimentation related to applying the competence approach to developing curricula as introduced by Tuning-MEDA based on student-centered approach.[15] The experimentation focused on two basic design courses offered in the first year of the Architectural Engineering Program at the International University for Science and Technology, Damascus, Syria. The two courses were redeveloped to concentrate on three main competences defined by Tuning-MEDA architectural group. These were: ability to think, perceive and conceive spaces three dimensionally and communicate verbally, in writing, graphically, and/or volumetrically; have critical thinking, analysis and synthesis; and

[15] This sort of activity has become standard in higher education for the improvement of education systems which has become increasingly interested in seeing students as the center of the whole process of education. See for instance: Anna Serbati and Alessio Surian, "Developing Reflection on Competence-Based Learning: the Russian Experience with the Tuning Approach," *Tuning Journal for Higher Education* 1, no. 2 (May 2014): 463-481.

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possess a high level of interpersonal skills. Two more competences were also analyzed but to a lesser degree: knowledge of aesthetics and arts, and understanding their role as key factors in the quality of architectural thinking and design; and appreciation of the social and cultural role of architecture.

The study was basically based on a questionnaire along with the instructor's own evaluation of the way the two courses were taught. Results indicated very clearly that all five competences were well recognized by students and that they feel very strongly about their competence to deal with the topics introduced to them during the course. They also feel very strongly that the most effective tools of teaching were: lecturing, demonstration, group discussions, and practice by doing.

It can be concluded that the two courses helped students get beyond the first three levels in Bloom's Taxonomy of learning to reach the upper three levels to different degrees. They were trained to analyze, synthesize, and evaluate. Moreover, students' learning was achieved through learning techniques that guarantee high level of retention. They benefited from chances to learn through demonstration, group discussions, and practice by doing. Most importantly, the five competences adopted from Tuning-MEDA and were aimed for the two courses were achieved to a very acceptable extent.

The experimentation showed that it is possible to modify courses in the curriculum at a detailed level without the application of major changes in their core objective so as to match critical competences advanced by Tuning-MEDA. It can also be concluded that if Tuning-MEDA is used in conjunction with Bloom's Taxonomy and the Learning Pyramid, the three together can enhance the quality of learning in a very noticeable way.

Bibliography

Augusti, Giuliano. "Transnational Recognition and Accreditation of Engineering Educational Programmes in Europe: Perspectives in a Global Framework." *European Journal of Engineering Education* 31, no. 3 (2006): 249-260.

Baker, Thomas, and Howard Smith Jr. "Integrating Accreditation into Strategic Planning." Community College *Journal of Research and Practice* 60, no. 3 (February 2007): 21-27.

Bedny, Alexander, Liliya Erushkina, and Oleg Kuzendov. "Modernising Education Programmes in ICT Based on the Tuning Methodology." *Tuning Journal for Higher Education* 1, no. 2 (May 2014): 387-404.

Beneitone, Pablo, and Edurne Bartolomé. "Global Generic Competences with Local Ownership: a Comparative Study from the Perspective of graduates in Four

Tuning Journal for Higher Education
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World Regions." *Tuning Journal for Higher Education* 1, no. 2 (May 2014): 303-334.

Cerqueira, Marcos., A Literature Review on the Benefits, Challenges and Trends in Accreditation as a Quality Assurance System, p. 7.

Gelernter, Mark. "Reconciling Lectures and Studios." *Journal of Architectural Education* 41, no. 2 (1988): 46.

Girot, Elizabeth. "Assessment of Competence in Clinical Practice — A Review of the Literature." *Nurse Education Today* 13, no. 2 (April 1993): 83-90.

Gonzalez, Julia, and Maria Yarosh, "Building Degree Profiles. The Tuning Approach," *Tuning Journal for Higher Education* 1, no. 1, (Nov. 2013): 37-69.

Groat, Linda, and Sherry B. Ahrentzen. "Voices for Change in Architectural Education: Seven Facets of Transformation from the Perspectives of Faculty Women," *Journal of Architectural Education* 50, no. 4 (1997): 271-285.

Hahn, Karola, 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 (November 2013): 127-163.

http://thesecondprinciple.com/teaching-essentials/beyond-bloom-cognitive-taxonomy-revised/ (Retrieved 10/4/2016).

http://www.westmuse.org/sites/westmuse.org/files/uploads/2012/03/pyramid.png (Retrieved 16/4/2016).

Mazumdar, Sanjoy. "Cultural Values in Architectural Education: An Example from India." *Journal of Architectural Education* 46, no. 4, (1993): 230-238.

Nicklin, Wendy, The Value and Impact of Health Care Accreditation. *Accreditation Canada*, 2008, pp. 2-4.

Patil, Arun, and Gary Codner. "Accreditation of Engineering Education: Review, Observations and Proposal for Global Accreditation." *European Journal of Engineering Education* 32, no. 6 (2007): 639-651.

Serbati, Anna, and Alessio Surian. "Developing Reflection on Competence-Based Learning: the Russian Experience with the Tuning Approach." *Tuning Journal for Higher Education* 1, no. 2 (May 2014): 463-481.

Sid Nair, Chenicheri, Arun Patil, Patricie Metrova. "Re-engineering graduate skills — a case study." *European Journal of Engineering Education* 34, no. 2 (2009): 131-139.

Tuning for the Middle East and North Africa: Architecture. Fourth Report, University of Deusto, 16, 3, 2016.

Wagenaar, Robert. "Columbus Egg? Qualifications Frameworks, Sectoral Profiles and Degree Programme Profiles in Higher Education," *Tuning Journal for Higher Education* 1, no. 1 (November 2013): 71-103.

———. "Competences and learning Outcomes: a Panacea for Understanding the (New) Role of Higher Education?" *Tuning Journal for Higher Education* 1, no. 2 (May 2014): 279-302.

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Implementing the competences-based and student-centered learning approach in Architectural Design Education. The case of the T MEDA Pilot Architectural Program at the Hashemite University (Jordan)

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Abstract: Higher educational systems become increasingly oriented towards the competences-based student-centered learning and outcome approach. Worldwide, these systems are focusing on the students as a whole: focusing on their dimensional, intellectual, professional, psychological, moral, and spiritual. This research was conducted in an attempt to answer the main research question: how can the architectural design courses be designed based on the required competences and how can the teaching, learning activities and assessment methods be structured and aligned in order to allow students to achieve and reach the intended learning outcomes? This research used a case study driven best practice research method to answer the research questions based on the T MEDA pilot architectural program that was implemented at the Hashemite University, Jordan. This research found that it is important for architectural education to adapt the students-centered learning method. Such approach increases the effectiveness of teaching and learning methods, enhances the design studio environment, and focuses on students' engagement to develop their design process and product. Moreover, this research found that using different assessment methods in architectural design courses help students to develop their learning outcomes; and inform teachers about the effectiveness of their teaching process. Furthermore, the involvement of students in assessment produces effective learning and enhances their design motivation.

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More details on the authors are provided at the end of this article.

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However, applying competences-based students-centered learning and outcome approach needs more time and staff to apply. Another problem is that some instructors resist changing to the new methods or approaches because they prefer to use their old and traditional systems. The application for this method at the first time needs intensive recourses, more time, and good cooperation between different instructors and course coordinator. However, within the time this method will be more useful and interesting for the teacher and more effective and formative for students. Finally, the development of architectural academic staff is needed to increase awareness of learning needs of all architectural students. This requires redesigning and aligning their curriculum and courses syllabus according to the requirements of new methods.

Keywords: Competences; meta-profile, intended learning outcome; teaching and learning activities; assessment methods; constructive alignment; students-center learning approach; architectural design.

I. **Introduction**

I.1. *Brief Background*

Higher education represents a crucial factor in innovations and human capital, which is the backbone for economic prosperity and social well-being in the 21st century.[1] Recently, higher educational systems become increasingly oriented towards the competences-based student-centered learning and outcome approach.[2] Over worldwide, these systems are focusing on the students as a whole: focusing on their dimensional, intellectual, professional, psychological, moral, and spiritual.[3] This focusing shift from the emphasis on the educational input to output; from the teacher-center learning to student-centered learning approach, and from focusing on teaching and instruction to focusing on learning.[4],[5]

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[1] Karine Tremblay, Diane Lalancette, and Deborah Roseveare, *Assessment of Higher Education Learning Outcomes: AHELO Feasibility Study Report — Volume 1 — Design and Implementation* (Paris: Organisation for Economic Co-Operation and Development (OECD), 2012).

[2] CoRe, *A Tuning Guide to Formulating Degree Program Profiles: Including Program Competences and Program Learning Outcomes* (Bilbao: University of Deusto, Nuffic / TUNING Association, 2010).

[3] Aurelio Villa Sanches and Manual Poblete Ruiz, *Competence-based Learning: A Proposal for the Assessment of Generic Competences* (Bilbao: University of Deusto, 2008).

[4] CoRe, *A Tuning Guide to Formulating Degree Program Profiles,* 11.

[5] Chris Rust, "The Impact of Assessment on Student Learning: How Can the Research Literature Practically Help to Inform the Development of Departmental Assessment Strategies

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The students-center learning approach is a new way of thinking means the learner engages actively in learning under his/her responsibility and management.[6] This approach requires using generic and specific competences and learning outcomes. It focuses on the requirements of the discipline and society in terms of preparing for citizenship and employability.[7] It focuses also on what students do not what the teacher does.[8] Using this approach requires the instructors to align the following primary elements of a course: competences and learning outcomes, content, teaching and learning activities, and assessments methods.[9]

This paradigm shift requires a change of the traditional academic staffs mind set.[10] Additionally, the development of architectural academic staffs is needed to increase awareness of learning needs of all architectural students. They require redesigning and aligning their curriculum and courses syllabus according to the requirements of new methods. Therefore, this research presents a good practical example in architectural design educational area that links generic and specific competences, Meta profile, learning outcomes, teaching and learning activities, assessment methods, implementing, monitoring, evaluating and improving practice in architectural design education.

I.2. *Research Context*

In the context of architectural engineering, there is a paradigm shift occurring in the engineering curriculum and academic structure from objective-based/input-based education toward outcome-based education.[11] Globally, new paradigm in higher education shifts from delivering lectures and providing students with the means to learn (teacher center learning or

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and Learner-Centred Assessment Practices?," *Active Learning in Higher Education* (SAGE Publications) 145, no. 3 (2002): 145-158.

[6] David J. Nicol and Debra Macfarlane-Deck, "Formative assessment and self-regulated learning: Amodel and seven principles of good feedback practice," *Studies in Higher Education* 31, no. 2 (2006): 199-218.

[7] Tuning, *Introduction to Tuning* (Bilbao: Tuning Academy, 2007).

[8] Duncan D Nulty, *Curriculum Design* (Griffith Institute, Griffith Institute for Higher Education, 2012).

[9] Stefan Popenici and Victoria Millar, *Writing Learning Outcomes: A Practical Guide for Academics* (The University of Melbourne, 2015).

[10] CoRe, *A Tuning Guide to Formulating Degree Program Profiles,* 19.

[11] Tremblay, Lalancette, and Roseveare, Assessment of Higher Education Learning Outcomes, 36.

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instruction paradigm) — towards a "learning paradigm" in which the emphasis is no longer on the means but on the end (student-centered learning or learning paradigm).[12]

This shift started in Europe in June 1999 when 29 European ministries of education decided to establish the European Higher Education Area (EHEA) by 2010 and decided to use the terms of learning outcomes and competences of their educational modules and programs. Now many courtiers are aligning their higher education with the Bologna process to facilitate description of qualifications, mutual recognition of degree, and student mobility.[13]

I.3. *Research Problem and Justification*

Higher education represents a crucial factor in innovations and human capital, which is a backbone of economic prosperity and social well-being in the 21st century.[14] Recently, higher educational systems become increasingly oriented according to the competences-based student-centered learning and outcome approach.[15],[16] Many faculties in Europe and US adopt the new learning philosophy; by contrast, Asia-Pacific reports many difficulties in implementing this effective reform.[17]

A good teaching method is a process to support learning activities and achieve the intended learning outcomes, which academic is using it spontaneously.[18] Some academics teach students without having much formal knowledge of how students learn.[19] Additionally, not many writers apply theory to transform their practice in higher education.[20] Moreover, very

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[12] Ibid., 37.

[13] Ibid., 36.

[14] Ibid., 16.

[15] CoRe, *A Tuning Guide to Formulating Degree Program Profiles,* 25.

[16] Andy Gibbs, Declan Kennedy, and Anthony Vickers,"Learning Outcomes, Degree Profiles, Tuning Project and Competences," *Journal of the European Higher Education Area* 2012, no. 1: 72-88.

[17] Tremblay, Lalancette, and Roseveare, Assessment of Higher Education Learning Outcomes, 37.

[18] John Biggs and Catherine Tang, *Teaching for Quality Learning at University* (Maidenhead: Open University Press/McGraw Hill, 2007).

[19] Heather Fry, Steve Ketteridge, and Stephanie Marshall, "Understanding student learning," in *A Handbook for Teaching and Learning in Higher Education: Enhancing Academic Practice*, ed. Heather Fry, Steve Ketteridge and Stephanie Marshall (New York: Routledge, 2009), 8-26.

[20] Biggs and Tang, *Teaching for Quality Learning at University*.

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few writers engage a reader to personal experience and open our eyes to the wonder approaches in higher education around us.[21]

There is a need for a formal strategy for teaching, learning and assessment in higher education to provide students with high quality of learning experience. This strategy aims to improve the physical learning environment and to develop life-long learning opportunity.[22] Measuring the quality of higher education outcomes is needed to measure the effectiveness of education methods and to enhance the quality of higher education outcomes.[23]

The need for more systematic approach for supporting student learning becomes ever more important.[24] The main principle to the implementing and developing of any learning, teaching, and assessment strategies is ensuring that we design, develop, implement, monitor, and assure that the best learning experience to all students, which support them to achieve the intended learning outcomes.[25]

Assessment and feedback are areas that students are least satisfied with.[26] There has been little research about the assessment choice like offering assessment alternatives.[27] Relatively little research has been done to find out academics' beliefs about assessment and yet this is fundamental if we are serious about making changes in our practice and persuading colleagues to do the same.[28] Therefore, an alternative method of students' assessment is needed to develop an evidence base for development in the field of architectural design assessment.[29]

Assessment has become such a critical problem for architectural education. The architects and instructors do not pay intention to the outcome

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[21] Ibid.

[22] GMIT, *Code of Academic Policy No. 4: Learning, Teaching & Assessment Strategy 2010 - 2015* (Galway-Mayo Institute of Technology, Dublin: Academic Council of GMIT, 2010).

[23] Tremblay, Lalancette, and Roseveare, *Assessment of Higher Education Learning Outcomes,* 32.

[24] David Gosling, "Supporting student learning," in *A Handbook for Teaching and Learning in Higher Education: Enhancing Academic Practice*, ed. Heather Fry, Steve Ketteridge, and Stephanie Marshall, (New York: Routledge, 2009), 113-131.

[25] BC, *Every learning matters: Balton College higher education: Learning. teaching and assessment strategy 2013-2016* (Bolton College, Bolton College, 2013).

[26] Lin Norton, "Assessing student learning," in *A Handbook for Teaching and Learning in Higher Education: Enhancing Academic Practice*, ed. Heather Fry, Steve Ketteridge and Stephanie Marshall (New York: Routledge, 2009), 132-149.

[27] Deborah Craddocka and Haydn Mathiasb, "Assessment options in higher education," *Assessment & Evaluation in Higher Education* 34, no. 2 (2009): 127-140.

[28] Norton, "Assessing student learning," 133.

[29] Craddocka and Mathiasb, "Assessment options in higher education," 136.

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assessment from their own responsibility.[30] The instructors are still control over the formative assessment and feedback. The feedback is still seen as a transition process.[31] There is a need to think about assessment methods in higher education.[32] There is a need for formative assessment system to give students useful feedback about their work.[33] To complement other aspects of learning and teaching, it is necessary to develop peer learning and assessment process.[34]

I.4. *Research Purpose*

The purpose of this research was to review, analyze, and synthesize the different related pieces from the higher education literature to explore, describe, summarize, and understand the holistic view of teaching and learning, program/curriculum design, generic and specific competences, intended learning outcomes, assessment and constructive alignment.

The further purpose was to present good practice research in architectural education based on the T-MEDA pilot program that implemented in the Hashemite University, Jordan. Additional purpose was to provide a model for aligning architectural learning outcomes for design 5 course with teaching and learning activities and assessment methods, which could be used by architectural design educators to design/redesign architectural courses and assist architectural colleagues to implement constructive alignment in their architectural education.

In addition, the intent was to increase the students' engagement level in the architectural learning activity; increase the academic orientation and attention to architectural design education, research, and studies; and eliminate the surface learning approach in architectural education and use deep approach to learning instead.

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[30] James F. Pontuso and Saranna R. Thornton, "Is Outcomes Assessment Hurting Higher education?," *The NEA Higher Education Journal* Fall (2008): 61-70.

[31] Nicol and Macfarlane-Deck, "Formative assessment and self-regulated learning."

[32] Dorothy Spiller, *Assessment matters: Self-assessment and peer assessment* (The University of Waikato, Hamilton, New Zealand: Teaching Development Unit/Wāhanga Whakapakari Ako, 2012).

[33] Peter T. Knight, "Summative assessment in higher education: practices in disarray," *Studies in Higher Education* 27, no. 3 (2002): 275-286.

[34] David Boud, Ruth Cohen, and Jane Sampson, "Peer learning and assessment," *Assessment and Evaluation in Higher Education* 24, no. 4 (2000): 413-426.

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I.5. *Research Questions*

The research questions fall under two categories. The first and second research questions fall under the category of reviewing, analyzing, synthesizing, and exploring the different meaning and the relationships between different terminologies from the current higher education literature. The third, forth, and fifth research questions fall under the category of that which is unknown in the literature. Both of them were explored based on the implementation of the architectural T-MEDA pilot program at the Hashemite University, Jordan as a case study driven best practice method. However, the literature was reviewed and organized according to the research questions. The research questions were:

1. What do we mean by the following terminologies: teaching and learning, program/curriculum design, generic and specific competences, intended learning outcomes, assessment methods, and constructive alignment?
2. What are the relationships between all of the above terminologies?
3. What are the generic/specific competences and Meta-profile that are required for designing the architectural program at the Hashemite University, Jordan?
4. How can we design the course? How can the teaching, learning, and assessment activities in architectural design courses (design 5 as a case study) be best structured, organized, and aligned based on T MEDA project in order to allow students to achieve and reach the intended learning outcomes?
5. How can we implement the self and peer assessment methods in architectural design education?

I.6. *Research Hypothesis*

This research developed two hypotheses. The first hypothesis was that using the competences-based student-centered approach and constructive alignment in architectural design courses increases the effectiveness of teaching and learning methods; enhances its environment, and focuses on students' engagement and their successes. The second hypothesis was that using different assessment methods in architectural design courses helps

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students to develop their learning outcomes and informs teachers about the effectiveness of their teaching.

I.7. *Research Design (Methodology)*

This research used a case study driven best practice research method to answer the third, fourth, and fifth research questions and to report and describe the processes and the results of the T MEDA pilot architectural program that was implemented at the Hashemite University, Jordan: Design 5 course as a case study. This case study method used to analyze HU architectural program, its generic and specific competences, Meta profile, intended learning outcomes, assessment methods, constructive alignment, implementation process and procedures, evaluation for continuous development. By adopting a reflective approach, these issues are discussed and analyzed according to the authors experience in design education. This research adopted case study based approach to provide conceptual model of designing architectural design courses.

The case study is one of several ways of doing social science research.[35] It is a research approach or systematic inquiry into an event or a set of related events that is used to obtain, describe, report, interpret, explain, explore, and generate an in-depth, multi-faceted understanding of a complex issue, event or phenomenon of interest in its natural real-life settings in which it occurred.[36],[37],[38]

The case study is a research strategy often categorized under the qualitative research method[39] that provides tools for the researcher to study a phenomenon within their context.[40] It can inform and report professional practice or evidence-informed decision-making[41].

Many terminologies are used in scientific and professional literature like case study, case review, and case report: case study is evidence base

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[35] Robert K. Yin, *Case Study Research: Design and Methods,* Vol. 5 (SAGE Publications, 2014).

[36] Sarah Crowe, Kathrin Cresswell, Ann Robertson, Guro Huby, Anthony Avery, and Aziz Sheikh, "The case study approach," *BMC Medical Research Methodology* 100, no. 11 (2011): 1-10.

[37] Pamela Baxter and Susan Jack, "Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers," *The Qualitative Report* 13, no. 4 (2008): 544-559.

[38] Yin, *Case Study Research: Design and Methods*.

[39] Donna M. Zucker, *How to Do Case Study Research*. (College of Nursing, University of Massachusetts, Amherst: School of Nursing Faculty Publication Series, 2009).

[40] Baxter and Jack, "Qualitative Case Study Methodology."

[41] Ibid.

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professional applications; case review emphasizes on a critical reappraisal of a case; while case report refers to a summary of a case or to the document reporting a case.[42]

The case study research method is used when the focus of the study is to answer "how", "what", and "why" questions[43] and when the researcher has little control over the variables.[44]

Data in case study research come from documentation, archival records, projects, longitudinal studies, in-depth interviews, direct observations, participant observation and physical artifacts.[45] The use of multiple sources of data (data triangulation) has been advocated as a way of increasing the internal validity.[46]

I.8. *Research Significance*

This research discussed the key concepts and principles of competences, learning and teaching, and assessment. It attempted to explain and measure the architectural design learning outcomes that achieve by students and learners; to develop the assessment strategies in architectural design education as a key part of the effective architectural curriculum development; to develop new and improve existing design students' assessment and feedback mechanisms; and to enhance the quality of teaching and learning through reflective practice.

Additionally this research tries to develop professional academic skills of architectural instructors' as teaching, learning, and assessment; to help the reader to build a practical foundation of knowledge that facilitate integration of the architectural design courses content, assessment, and delivery and how to design the architectural design courses. This research treats with each area separately to help the reader to consider all elements together in easy and systematic way to enhance personal practice.

This research will enhance and improve the validity and reliability of architectural design assessment methods. It will develop and promotes reflective and active learning techniques in design studio; enhance professional practice inside and outside design studio; facilitate innovations; develop quality and engaging environments for all architectural students and

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[42] Zucker, *How to Do Case Study Research*.
[43] Baxter and Jack, "Qualitative Case Study Methodology."
[44] Yin, *Case Study Research: Design and Methods*.
[45] Zucker, *How to Do Case Study Research*.
[46] Crowe et al., "The case study approach."

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staff;[47] eliminate the subjectivity in assessment and increase objectivity; and enhance the quality of higher education outcomes.

II. **Literature Review**

II.1. *What Does Teaching and Learning Mean?*

Education is something you create for yourself in order to receive a career.[48] Teaching can be seen as a process of transmitting the course content to the students through different methods, assessment, projects, lectures, tutorials, and exams.[49] Biggs, as cited in Stefani, 2009, mentioned the critical components of teaching as follow: the curriculum, the teaching methods and strategies, the assessment and evaluation processes, and the education environment.[50]

Learning is seen as a constructive act of the learner,[51] which requires knowledge, skills, and values.[52],[53] Learning is a process whereby students effectively construct their own knowledge and skills[54] from what they do and think.[55] Learning includes understanding materials of subject area, developing subject-specific and general skills, reflecting and thinking strategically.[56]

Learning is a process that involves changing in knowledge, skills, believes, and attitudes[57] and it aims to achieve learning outcomes.[58] The literature

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[47] GMIT, *Code of Academic Policy No. 4: Learning, Teaching & Assessment Strategy 2010 - 2015* (Galway-Mayo Institute of Technology, Dublin: Academic Council of GMIT, 2010).

[48] Ibid.

[49] Biggs and Tang, *Teaching for Quality Learning at University*.

[50] Lorraine Stefani, "Planning teaching and learning: Curriculum design and development," in *A Handbook for Teaching and Learning in Higher Education: Enhancing Academic Practice*, ed. by Heather Fry, Steve Ketteridge, and Stephanie Marshall (New York: Routledge, 2009), 40-57.

[51] Katrien Struyven, Filip Dochy, and Steven Janssens, "Students' perceptions about assessment in higher education: A review," *Assessment & Evaluation in Higher Education* 30, no. 4 (2005): 331-347.

[52] Liesel Knaack, *Enhancing your programs and cources through alighed learning outcomes* (Vancouver Island University, Vancouve: Centre for Innovation and Excellence in Learning, 2015).

[53] Marian McCarthy, "Aligning Learning Outcomes, Learning Activities and Assessment," *Seminario Internacional SCT,* (Pucón: Marian McCarthy, Augest 31, 2011).

[54] Nicol and Macfarlane-Deck, "Formative assessment and self-regulated learning."

[55] Susan A. Ambrose, Michael W. Bridges, Michele DiPietro, Marsha C. Lovett, Marie K. Norman, and RICHARD E. MAYER, *How Learning Works: Seven Research-Based Principles for Smart Teaching* (San Francisco: John Wiley & Sons, Inc., 2010).

[56] Knight, "Summative assessment in higher education: practices in disarray."

[57] Ambrose et al., *How Learning Work*.

[58] Raquel M. Crespo, Jad Najjar, Michael Derntl, Derick Leony, Susanne Neumann, Petra Oberhuemer, Michael Totschnig, Bernd Simon, Israel Gutiérrez, Carlos Delgado Kloos,

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revealed that learning is essentially: constructive, self- regulated, cumulative, goal- oriented, collaborative, situated, and individually different.[59] Learning development is the learners' process to develop their thinking ability, their knowledge, their self awareness and understanding, and become critical thinkers. It also refers to the process that are designed to help them do so.[60]

There are two different approaches to learning. The first is the deep learning approach, which leads from an intention to understand and to active conceptual analysis. In this approach, learner engages in a more active dialogue with the task. The second is the surfaces approach, which the learner tends to complete learning task with little personal engagement.[61],[62]

Student use the deep approach to understand the interested ideas in their studies and they are looking for pattern, principles, and meanings in the text. This approach leads to higher quality learning outcomes[63]. Students in this approach focus on what author means, organize and structure the content, and consider the reading as an important source of learning.[64]

Students use the surface approach to cope with the task requirements with little personal engagements and aim to understand the course materials. Students who using this method do not grasp the overall meanings of studies; have poor quality learning outcomes; and they develop limited understanding of the course materials.[65] Students in this approach focus on the memorizing facts and feel differentiate between evidence and information.[66]

There is no one learning and teaching approach that fits with all students. Different learning strategies can employ to support all learners.[67] Planning of multiple approaches and strategies to learning for each student is a fundamental role and aspect of academic staff.[68] The effective teaching and

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"Aligning Assessment with Learning Outcomes in Outcome-based Education." *EEE Education Engineering* (IEEE EDUCON Education Engineering, 2010), 1-8.

[59] Struyven, Dochy, and Janssens, "Students' perceptions about assessment in higher education."

[60] Gosling, "Supporting student learning."

[61] Struyven, Dochy, and Janssens, "Students' perceptions about assessment in higher education."

[62] Sue Bloxham and Pete Boyd. *Developing Effective Assessment in Higher Education: a practical guide* (England: McGraw-Hill House, 2007).

[63] Ibid., 17.

[64] Nulty, *Curriculum Design*.

[65] Bloxham and Boyd, *Developing Effective Assessment in Higher Education,* 17.

[66] Nulty, *Curriculum Design*.

[67] B&FC, *Learning, teaching, and assessment strategies guide* (Blackpool and The Fylde College, 2013).

[68] Stefani, "Planning teaching and learning: Curriculum design and development."

learning practices are the most important to create high quality experience and critical to learner success. It requires supportive and aspiration environment and use of educational resources to provide students with high quality of learning and teaching; to provide and develop students' skills and enhance their effective employability; improve the students' experience; improve the pedagogy; and to bring successful achievements.[69] Therefore, the learning and teaching activities require students to apply, invent, generate new ideas, and solve the design problems.[70],[71]

II.2. *Program Design or Curriculum Design*

The new agenda for universities is to sell education and to provide for market needs.[72] Students have to pay higher fees to be well taught and will enhance their employment prospects.[73] Therefore, many different terminologies are used to refer to degree program and the unit courses like programs, courses, units, modules or subjects.[74] Program means a set of courses that lead to a certain degree, which encompasses from core curriculum and optional courses to reflect the institution values, goals and missions that provide professional experience and skills for students.[75]

The curriculum is a comprehensive plan for educational program.[76] It provides specific plan for learning and teaching to achieve the intended learning outcomes.[77],[78] It uses to refer to focus on study that containing various designed courses to achieve the required proficiency and qualifications.[79] It is a

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[69] B&FC, *Learning, teaching, and assessment strategies guide*.

[70] Biggs and Tang, *Teaching for Quality Learning at University*.

[71] Gibbs, Kennedy, and Vickers, "Learning Outcomes, Degree Profiles, Tuning Project and Competences."

[72] Biggs and Tang, *Teaching for Quality Learning at University*. 3.

[73] Ibid., 2.

[74] Ibid., xviii.

[75] SAQA, *The National Qualifications Framework: Curriculum Development* (A publication of the South African Qualifications Authority, 2000).

[76] Irma Dolores Núñez y. Bodega, "From curriculum to syllabus design: The different stages to design a program." *MEMORIAS DEL III FORO NACIONAL DE ESTUDIOS EN LENGUAS* 13, no. 3 (2007): 275-290.

[77] Ibid.

[78] Iftikhar Uddin Khwaja, Shahnaz Akhtar, and Abida Mirza, *Module III: Currculum Developmet, Assessment and Evaluation: Professional Competency Enhancement Program for Teachers (PCEPT)* (Islamabad: National Academy of Higher Education (NAHE): Learning Innovation Division and Higher Education Commission (HEC), 2014).

[79] Ibid.

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structure document refers to all aspects of teaching and learning activities, which take place in learning institution.[80]

The curriculum should involve the educational content: what should be learned and how should it be organized.[81] It should encompass the intended learning outcomes, aims and objectives, philosophy, standard setting, teaching and learning methods, value, skills, attitudes, content, the relationships between teachers and learners, assessment methods, evaluation, and how all of these are organized together to provide professional experience.[82],[83],[84] It represents what students should know and be able to do and support teachers in knowing how to achieve these goals.[85]

The curriculum design is purposeful to improve students' learning. It is deliberate goals that involves using an explicit process and identifies what will be done, by whom, and when to attain the intended learning outcomes.[86],[87] It is a complex mechanism that focuses on the skills and competences, which are important for employees and employability.[88] It is a systematic and creative procedure that operates on many levels to provide specific learning knowledge, develop skills, attitudes, values under specific academic program.[89],[90],[91]

II.3. *Generic and Specific Competences*

Competences mean the proven ability to use knowledge and skills in work, professional and personal practice.[92] They have many interchangeable terms like capacity, attribute, ability, capability, and skills that enable

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[80] Bodega, "From curriculum to syllabus design: The different stages to design a program."

[81] Stephen Petrina, *Curriculum and Instruction Design: Advanced Teaching Methods for the Technology Classroom* (University of British Columbia, Canada, 2007).

[82] Ibid.

[83] Bodega, "From curriculum to syllabus design: The different stages to design a program."

[84] SAQA, *The National Qualifications Framework: Curriculum Development*.

[85] Bodega, "From curriculum to syllabus design: The different stages to design a program."

[86] AAAS, *Designs for Science Literacy* (New York: American Association for the Advancement of Science: Oxford University Press, Inc., 2000).

[87] UNISA, *curriculum Policy* (University of South Africa (UNISA), 2010).

[88] Joseph Kessels, and Tjeerd Plomp, "A relational approach to curriculum design." *Verschenen in Journal of Curriculum Studies* 31, no. 6 (1999): 679-709.

[89] Khwaja, Akhtar, and Mirza, *Module III: Currculum Developmet, Assessment and Evaluation*.

[90] Bodega, "From curriculum to syllabus design: The different stages to design a program."

[91] AAAS, *Designs for Science Literacy*.

[92] Crespo et al., "Aligning Assessment with Learning Outcomes in Outcome-based Education."

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learners to think and act in different area of activities (put the knowledge into practice).[93] They are a part of the educational process and they mean to building of the knowledge. They represent dynamic combination between knowledge, understanding, attitude, abilities, roles, and responsibilities.[94] Competences are necessary for today's world[95] to obtain a job, gaining promotion in labor market, and to enhance the employment opportunities.[96]

Competences are the cornerstone in the teaching-learning process.[97] They can be described as reference point to the curriculum design and evaluation. Therefore, the competences are not linked to one course, but they can be developed and evaluated during the total learning process of a study program.[98] The program is structured and specified in terms of generic and specific competence.[99]

Generic competences are common competences that can be identified in different degree programs.[100] Generic competences are multifunctional, multidimensional, transversal, instrumental, interpersonal, and systematic competences that pertaining to each profession. They aim to provide students with scientific technical knowledge and enable them to apply such knowledge in different context.[101] While, specific competences are intimately related to specific knowledge of an area of study.[102]

II.4. *Degree Profile*

The degree profile is a document containing essential information about specific degree program. The profile specifies the subject areas and indicates the special aims and features that distinguish a program form other similar programs. It is described in the terms of the competences and learning

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[93] Tuning, *Introduction to Tuning*.

[94] Sanches and Ruiz, *Competence-based Learning*.

[95] Ibid.

[96] L. Arnau-Sabatés, M.T Marzo, M. Jariot, and J. Sala-Roca, "Learning basic employability competence: a challenge for the active labour insertion of adolescents in residential care in their transition to adulthood," *European Journal of* 17, no. 2 (2013): 252-265.

[97] Sanches and Ruiz, *Competence-based Learning*.

[98] Tuning, *Introduction to Tuning*.

[99] Sanches and Ruiz, *Competence-based Learning*.

[100] Tuning, *Introduction to Tuning*.

[101] Sanches and Ruiz, *Competence-based Learning*.

[102] Tuning, *Introduction to Tuning*.

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outcomes[103] and consists from the merging between generic and specific-subject competences.[104]

II.5. *Intended Learning Outcomes (ILOs)*

Intended learning outcomes (ILOs) means what students should able to know, understand, demonstrate, acquire, perform, and/or feel after the completion the learning process of the course or programme. The ILOs are performance oriented to measure the anticipated students' achievement. They rely and emphasis on the student-centered learning approach and on the learner's ability to do something. They inform the teacher about the content of the teaching (knowledge and skills), teaching strategies and learning activities/tasks; describe what the students should learn; and used to develop assessment tasks and criteria.[105],[106],[107],[108],[109],[110],[111],[112] They are often specific, precise, and measurable.[113]

An intended learning outcome approach has only recently begun to be used in many countries[114] and has an international interest.[115] It is students oriented[116] and considered as an important factor to measure the institution performance.[117] The development, practical use and understanding of learning outcomes is crucial to the success the degree supplement, recognition,

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[103] CoRe, *A Tuning Guide to Formulating Degree Program Profiles,* 20.

[104] Tuning, *Introduction to Tuning*.

[105] UTAS, *Guideline for good assessment prcitces* (University of Tasmania, University of Tasmania Assessment, 2011).

[106] Knaack, *Enhancing your programs and cources through alighed learning outcomes*.

[107] McCarthy, "Aligning Learning Outcomes, Learning Activities and Assessment."

[108] Lori Goff et al., *learning Outcomes Assessment: A Practitioner's Handbook* (Ontario: Higher Education Quality Council of Ontario (HEQCO), 2014).

[109] Stefani, "Planning teaching and learning: Curriculum design and development."

[110] AAAS, *Designs for Science Literacy*.

[111] Popenici and Millar, *Writing Learning Outcomes*.

[112] Steve Y. W. LAM, "Outcome-Based Approach to Teaching, Learning and Assessment in Geomatics Higher Education: the Hong Kong Experience." *Good Educational Practices*, 2009: 1-10.

[113] Knaack, *Enhancing your programs and cources through alighed learning outcomes*.

[114] Gibbs, Kennedy, and Vickers, "Learning Outcomes, Degree Profiles, Tuning Project and Competences."

[115] Goff, et al., *learning Outcomes Assessment*.

[116] Nulty, *Curriculum Design*.

[117] Tremblay, Lalancette, and Roseveare, *Assessment of Higher Education Learning Outcomes*.

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and the degree qualification profile and quality assurance.[118] All educational activities should be related to the intended learning outcomes of the course in order to help students in achieving ILOs at the end of the course.[119]

The intended learning outcomes approach becomes a common language between educators,[120] which covers knowledge, skills, and competences.[121] It brings clarity, precision, and transparency to teaching practice and assessment.[122] Therefore, the ILOs are linked to assessment and evaluation methods along with the teaching and learning strategies[123] as a basis for measuring and reporting students' achievement[124],[125] and describing the expected level that achieved from the intended learning outcomes in order to attain certain grades.[126]

The intended learning outcomes depend upon two factors: the assessment units that are designed to enable the students to demonstrate their understanding. The second is the students' learning process to fulfilling the course outcomes.[127] The learning outcome should be defined before teaching take place.[128] Additionally, the level of understanding of learning and teaching activities should be clearly specified and understood by students from the beginning.[129] These steps are to improve the effectiveness and increase the quality of the program[130],[131] and to create a dynamic equilibrium between teaching strategies, appropriate activities,

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[118] Ibid., 36.

[119] Crespo et al., "Aligning Assessment with Learning Outcomes in Outcome-based Education."

[120] Gibbs, Kennedy, and Vickers, "Learning Outcomes, Degree Profiles, Tuning Project and Competences."

[121] Crespo et al., "Aligning Assessment with Learning Outcomes in Outcome-based Education."

[122] Popenici and Millar, *Writing Learning Outcomes*.

[123] Knaack, *Enhancing your programs and cources through alighed learning outcomes*.

[124] Popenici and Millar, *Writing Learning Outcomes*.

[125] Goff et al., *learning Outcomes Assessment*.

[126] UTAS, *Guideline for good assessment prcitces*.

[127] Richard Hall, "Aligning learning, teaching and assessment using the web: An evaluation of pedagogic approaches." *British Journal of Educational Technology* (Blackwell Publishers Ltd) 33, no. 2 (2002): 149-158.

[128] John Biggs, "Constructive alignment in university teaching." *HERDSA Review of Higher Education*, no. 1 (2014): 5-22.

[129] Clever Ndebele and Cosmas Maphosa, "Exploring the Assessment Terrain in Higher Education: Possibilities and Threats: A Concept Paper." *Journal of Social Science* 35, no. 2 (2013): 149-158.

[130] Goff et al., *learning Outcomes Assessment*.

[131] John B. Biggs, "Aligning teaching for constructing learning." *FOCUS* 16, no. 1 (2008): 1-3.

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and learning outcomes.[132],[133] Clear and realistic learning outcomes provide students with a good guide about what has to be learned, how to teach, and what learning opportunities to provide.[134]

Intended learning outcomes (ILOs) are not curriculum objectives as before.[135] Learning outcomes describe what students are able to do after the completion of the process of learning; while learning objectives are written from the instructors' perspectives in terms of their teaching intentions and focused on what content they attend to achieve different tasks.[136],[137],[138]

There is no limited number of the intended learning outcomes for a subject or a course. It depends on the level of study. However, it is important to have an adequate number to secure adequate information for comprehensive assessment and to provide information for improvement in teaching and course design. It is important to choose a balance number of intended learning outcome to be suitable with your overall aims and the level of study.[139]

In conclusion, Outcomes-based teaching and learning is concerned with more effective teaching and assessment at the course and program level.[140] It depends on constructive alignment and relies on these questions: what the students know and able to demonstrate after teaching new knowledge and to what standard at the course and/or program level? How the learning activity can apply to help them in achieving the outcomes? In addition, how do the instructors assess them to measure their achievements?[141],[142]

II.6. *Assessment*

Assessment is a very complex task[143] and skill-based.[144] It is a set of processes that measure the outcome of students' learning in terms of

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[132] McCarthy, "Aligning Learning Outcomes, Learning Activities and Assessment,"

[133] Hall, "Aligning learning, teaching and assessment using the web."

[134] Ndebele and Maphosa, "Exploring the Assessment Terrain in Higher Education," 152.

[135] Biggs and Tang, *Teaching for Quality Learning at University*.

[136] Popenici and Millar, *Writing Learning Outcomes*.

[137] Knaack, *Enhancing your programs and cources through alighed learning outcomes*.

[138] AAAS, *Designs for Science Literacy*.

[139] Popenici and Millar, *Writing Learning Outcomes*.

[140] Biggs and Tang, *Teaching for Quality Learning at University,* 3.

[141] Ibid.

[142] Goff et al., *Learning Outcomes Assessment*.

[143] Khwaja, Akhtar, and Mirza, *Module III: Currculum Developmet, Assessment and Evaluation*.

[144] Biggs and Tang, *Teaching for Quality Learning at University*.

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knowledge acquired, understanding developed and skills or abilities gained.[145] Assessment is recognized as learning activity that designed to help students to focus on learning.[146] Assessment is part from teaching and learning process aims to measure and monitor to what extent the intended learning outcomes and objectives achieved.[147]

Assessment is a process of ensuring if the students have leaned what they have been taught and what students are able to do or demonstrate.[148],[149] The assessment tasks inform us how these students use their accumulated knowledge academically in their professional practice in appropriate ways.[150],[151] Assessment methods need to be clear from earliest stages of course. It should be fully aligned with all other aspects of course design.[152]

Assessment involves two main pillars: process (how student learn) and subject material (what student learn).[153] Assessment is an integral component of learning and teaching. It includes all process employed by instructors to make judgments about students' achievements over the course of study.[154] This can be achieved: when there is a clear alignment between intended learning outcomes, the students' learning experience, and the assessment tasks; when the students fully understand the assessment process; when there is a clear assessment requirement; and when the assessment tasks designed to assess the capacity to analysis and synthesis design information and concepts.[155]

The nature of particular learning and assessment task determines and influences the students' approach to learning whether deep or surface approach.[156],[157] Appropriate assessments can encourage students to adapt the

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[145] UU, *Assessment Handbook* (Ulster University, 2015).

[146] David Boud, *Assessment 2020: Seven propositions for assessment reform in higher education* (Sydney: Sydney: Australian Learning and Teaching, 2010).

[147] Ndebele, and Maphosa, "Exploring the Assessment Terrain in Higher Education."

[148] AAAS, *Designs for Science Literacy*.

[149] Ndebele, and Maphosa, "Exploring the Assessment Terrain in Higher Education," 152.

[150] Biggs and Tang, *Teaching for Quality Learning at University*.

[151] Gibbs, Kennedy, and Vickers, "Learning Outcomes, Degree Profiles, Tuning Project and Competences."

[152] Boud, *Assessment 2020: Seven propositions for assessment reform in higher education*.

[153] UU, *Assessment Handbook*.

[154] UTAS, *Guideline for good assessment prcitces*.

[155] Ibid., 1.

[156] Ndebele and Maphosa, "Exploring the Assessment Terrain in Higher Education."

[157] Struyven, Dochy, and Janssens, "Students' perceptions about assessment in higher education."

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deep learning approach.[158] It plays a critical role of how students learn and what they choose to learn.[159] It is a tool of learning[160] that involves and identifies clear, valid and appropriate students' learning outcomes.[161] It shapes the students' experience and influences their behavior more than the received teaching.[162] Because the students only learn what they think they will be assessed on, the students want to know what we expect from them, how they will be assessed, and what the mark/level of achievement means; how can we recognize their achievements?[163]

The affective assessment should link directly to the intended learning outcomes and focus upon skills and their transfer.[164],[165] All assessment includes two main aspects: making decisions about the standards of performance expected and then making judgments about the quality of the performance in relation to these standards.[166] The assessment issues are the focus when the colleagues from different schools meet each other.[167] Assessment practices are a complex and join activity between teacher and learner that improve the learner achievements and their capacity to learn how to learn.[168] Therefore, assessment practices should be reviewed in the light of employer perception and of graduates.[169]

The purposes of assessment are to enhance, improve, measure, and evaluate the students' knowledge, and their engagement in learning; enhance the quality of the students' learning achievements[170],[171] through complete designed formal tasks; determine what students' learn; diagnose students'

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[158] Bloxham and Boyd, *Developing Effective Assessment in Higher Education: a practical guide,* 19.

[159] Ndebele and Maphosa, "Exploring the Assessment Terrain in Higher Education."

[160] Sluijsmans D., F. Dochy, and G. Moerkerke, *the use of self-, peer-, and co-assessment in higher education: A review of literature* (Open University of Netherlands, Otec, 1998).

[161] AAAS, *Designs for Science Literacy*.

[162] Bloxham and Boyd, *Developing Effective Assessment in Higher Education: a practical guide*.

[163] Ndebele and Maphosa, "Exploring the Assessment Terrain in Higher Education."

[164] UU, *Assessment Handbook*.

[165] Bloxham and Boyd, *Developing Effective Assessment in Higher Education: a practical guide*.

[166] Spiller, *Assessment matters:Self-assessment and peer assessment*.

[167] Pontuso and Thornton, "Is Outcomes Assessment Hurting Higher education?".

[168] B&FC, *Learning, teaching, and assessment strategies guide*.

[169] Boud, *Assessment 2020: Seven propositions for assessment reform in higher education*.

[170] Sally Brown, "Assessment for learning." *Learning and Teaching in Higher Education*, no. 1 (2004): 81-89.

[171] Boud, *Assessment 2020: Seven propositions for assessment reform in higher education*.

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strengths and weaknesses; give students feedback on their performance and progress.[172]

Additionally, assessment aims to provide quality assurance evidence and encourage students to develop their knowledge, skills, and predispositions to underpin lifelong learning.[173],[174] Additionally, it aims to provide a marks and grades, enable the public to know that the student has got an appropriate level of education and achievements;[175] enable staff to evaluate the effectiveness of their teaching methods;[176] define the next learning goals; and help the students to achieve the intended learning outcomes.[177]

Assessment is driven the learning. It is integral part of teaching and learning strategies.[178] It serves as social and academic purpose that encompasses the gathering of evidence of the students' learning achievements through assignments, tests, projects, and examinations.[179] Assessment tasks help students to achieve learning outcomes and supports learning.[180],[181] It gives students feedback about their work to understand what is good about their work and how they can develop it in future; and about where they have gone wrong and what they need to do to improve.[182],[183] Assessment has significance influence on students' experience in higher education. The improving assessment practices have huge impact on the quality of learning.[184]

If we want to change the way that our students learn and the content of what they learn, the most effective way is to change the way we assess them.[185] (Nicol and Macfarlane-Deck 2006) found that there are many considerable evidence to show that the feedback leads to generate learning and produces significance achievement benefits, knowledge and skills across all education areas.

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[172] Ndebele and Maphosa, "Exploring the Assessment Terrain in Higher Education."

[173] Bloxham and Boyd, *Developing Effective Assessment in Higher Education: a practical guide*.

[174] ASCC, *ASCC alignment and assessment of students learning outcomes (SLOs): Training manual* (California: Accrediting Commission for Community Junior College, 2008).

[175] Norton, "Assessing student learning."

[176] UU, *Assessment Handbook*.

[177] B&FC, *Learning, teaching, and assessment strategies guide*.

[178] Nulty, *Curriculum Design*.

[179] Ndebele and Maphosa, "Exploring the Assessment Terrain in Higher Education."

[180] Norton, "Assessing student learning."

[181] Brown, "Assessment for learning."

[182] Ibid.

[183] Norton, "Assessing student learning."

[184] Boud, *Assessment 2020: Seven propositions for assessment reform in higher education*.

[185] Norton, "Assessing student learning," 134.

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II.6.1. Types of assessment

There are two types of assessment: summative and formative assessment.[186] The summative assessment is a kind of judgment, which contributes to the overall grade of the degree classification that summarizes the student learning at end of program (sum-up of student achievements)[187],[188] to provide achievement certificate.[189] The summative assessment is carried out at the end of a subject or after the conclusion of a major topic.[190] It provides a measure of achievement made in respect of a student's performance in relation to the intended learning outcomes of the module and/or program of study.[191]

While the formative assessment is a kind of purpose that enables students to see how well they are progressing and gives them feedback.[192],[193] Formative feedback is crucial. It needs to be comprehensive, detailed, fair, challenging and supportive, meaningful to individual.[194] The formative assessment and feedback processes help students to become self-learner and control over their own learning. It used to empower students as self-regulated learning.[195]

The main aims of formative assessments are to provide students with feedback on their progress and performance to recognize their achievement[196],[197] and to increase opportunities to improve their work and accelerated learning.[198],[199] Additionally, it aims to identify learning needs and adjust teaching appropriately; to meet divers students' needs; to achieve a greater equity of student outcomes; to hold schools accountable for student achievement; to identify areas for improvement and promote effective evaluation throughout education systems; to meeting the goals of lifelong learning; and to promote high quality of education.[200]

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[186] B&FC, *Learning, teaching, and assessment strategies guide*.
[187] McCarthy, "Aligning Learning Outcomes, Learning Activities and Assessment."
[188] Norton, "Assessing student learning," 137.
[189] Craddocka and Mathiasb, "Assessment options in higher education."
[190] Brown, "Assessment for learning."
[191] UU, *Assessment Handbook*.
[192] Norton, "Assessing student learning," 137.
[193] Craddocka and Mathiasb, "Assessment options in higher education," 133.
[194] Brown, "Assessment for learning."
[195] Nicol and Macfarlane-Deck, "Formative assessment and self-regulated learning."
[196] UU, *Assessment Handbook*.
[197] Knight, "Summative assessment in higher education: practices in disarray."
[198] Ndebele and Maphosa, "Exploring the Assessment Terrain in Higher Education," 153.
[199] Nicol and Macfarlane-Deck, "Formative assessment and self-regulated learning," 129.
[200] CERI, *assessment for learning — the case fgor formative assessment* (OECD/CERI International Conference, 2008).

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II.6.2. Different assessment methods

Assessment needs to take place at the very end of the process.[201] Applying different assessment methods is a good practice to assess different kinds of learning process.[202] These have to be used in order to cope with large number of students, their gender, race, ethnicity, ability, and religion, education, professional background etc.[203] They measure the level of students' achievements from intended learning outcomes. Additionally, they should meet the following principles: validity, fairness, reliability, and rigor.[204]

Self-assessment is process that students evaluate and assesses the quality of their work and learning, judge the degree to which they meet the course intended learning outcomes, and define the strength and weakness in their design work.[205] The students' role in self-assessment is a proactive role. Students are assessing their own work and generating their own feedback.[206]

Self-assessment encourages students to become independent learning; helps them to critique their own; defines the weakness and strengthen on it; becomes responsible for their own education.[207] Self-assessment increases and encourages the students' active participation and engaging actively in the learning process.[208] The students in self-assessment procedure need to know the purpose, the criteria, and process of assessments.[209]

Peer-assessment refers to a process whereby the groups of individuals rate their peers.[210] It means that students provide feedback or grades to other students about the quality of their work.[211] The students learn with and from each other as group focus.[212] Students accept criticism from peers and the language used by peers easier to understand than instructors.[213] Peer assessment is often seen as unfair because students do not trust each other's

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[201] Brown, "Assessment for learning."

[202] Craddocka and Mathiasb, "Assessment options in higher education."

[203] Ndebele and Maphosa, "Exploring the Assessment Terrain in Higher Education," 153.

[204] UU, *Assessment Handbook,* 4-5.

[205] Spiller, *Assessment matters:Self-assessment and peer assessment,* 3.

[206] Nicol and Macfarlane-Deck, "Formative assessment and self-regulated learning."

[207] Ndebele and Maphosa, "Exploring the Assessment Terrain in Higher Education," 153.

[208] Sluijsmans, Dochy, and Moerkerke, *the use of self-, peer-, and co-assessment in higher education*.

[209] Spiller, *Assessment matters:Self-assessment and peer assessment*.

[210] Sluijsmans Dochy and Moerkerke, *the use of self-, peer-, and co-assessment in higher education*.

[211] Spiller, *Assessment matters:Self-assessment and peer assessment*.

[212] Boud, Cohen, and Sampson, "Peer learning and assessment."

[213] Nicol and Macfarlane-Deck, "Formative assessment and self-regulated learning."

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judgments'; worry about favoritisms and friendship influencing marks; feel it is the responsibility of the lecturer and so on.[214]

Students in this method can share understandings of what is required with other students.[215] Peer dialogue enhances the students' sense of self-control over learning.[216] It enhances a greater sense of accountability, responsibility and motivation. It increases the speed of feedback; helps students to develop skills and working together for long life learning such as giving feedback, self-evaluation, negotiation skills, and justifying point of view;[217],[218] improves the quality of their work; develops the students' ability to work cooperatively.[219] Peer learning can contribute to the social and psychological needs of learners. It can encourage students to engage in reflection and exploration of ideas; and it can help students to gain more practice in communications.[220]

Self-assessment and peer assessment plays an important role in learning and teaching methods. The active students' participation in assessment is very important for their future working life.[221] The skill of self and peer-assessment is very important to develop the lifelong learning.[222] The self-assessment, peer-assessment and group assessment encourage the deep learning approach.[223]

II.7. *Constructive Alignment*

Constructive alignment refers not to what the teacher is going to teach, but rather what the outcome of that teaching is intended to be which names the intended learning outcomes.[224] It means creating links or co-ordinates between the course/program learning outcomes, teaching and learning

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[214] Norton, "Assessing student learning," 141.

[215] Ibid., 138.

[216] Nicol and Macfarlane-Deck, "Formative assessment and self-regulated learning."

[217] Bloxham and Boyd, *Developing Effective Assessment in Higher Education: a practical guide,* 23.

[218] Boud, Cohen, and Sampson, "Peer learning and assessment."

[219] Ndebele and Maphosa, "Exploring the Assessment Terrain in Higher Education," 154.

[220] Boud, Cohen, and Sampson, "Peer learning and assessment."

[221] Spiller, *Assessment matters:Self-assessment and peer assessment*.

[222] Sluijsmans, Dochy, and Moerkerke, *the use of self-, peer-, and co-assessment in higher education*.

[223] Brown, "Assessment for learning."

[224] Biggs and Tang, *Teaching for Quality Learning at University*.

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activities, and assessment methods to support students' learning.[225] Constructive refers to how the students structure meaning through different learning activities, while alignment refers to how the teacher create connect between learning activities and assessment tasks to achieve the intended learning outcomes.[226]

The constructive alignment used in different countries for education quality assurance. The benefits of effective constructive alignment are more directed to the students than teachers. Because this method tells the students, not only what they are supposing to be learned, but how and at what standard.[227] In constructive alignment we start with and define the intended learning outcome and align the assessment methods with those outcomes. It means starting with intended learning outcomes of the course and work backwards.[228]

Alignment is a course design methodology emphasizes on the intended learning outcomes.[229] It refers to what extent the learning outcomes statements match with what we teach.[230] It means what teacher does to set up learning environments that supports the appropriate learning activities to achieve the desired learning outcomes. This means that how the teaching methods and assessment tasks are aligned to learning activity assumed in intended learning outcomes.[231],[232] Alignment the elements of learning, teaching and assessment are complement one another to form an integrated whole.[233]

Curriculum/course alignment involves organizing of its aims, goals, content, learning outcomes, teaching and learning strategies, instructors' roles, students' roles, technological affordances, assessment, and evaluation in a coherent structure in order to improve both the coherence

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[225] Gibbs, Kennedy, and Vickers, "Learning Outcomes, Degree Profiles, Tuning Project and Competences."

[226] Biggs and Tang, *Teaching for Quality Learning at University*.

[227] Ibid.

[228] Nulty, *Curriculum Design*.

[229] Bloxham and Boyd, *Developing Effective Assessment in Higher Education*.

[230] Peggy L. Maki, *Assessing for Learning: Building a Sustainable Commitment Across* (2nd. Stylus Publishing and AAHE., 2004).

[231] Ndebele and Maphosa, "Exploring the Assessment Terrain in Higher Education."

[232] Goff et al., *learning Outcomes Assessment: A Practitioner's Handbook*.

[233] Lynn Clouder, "Promotion of reflective learning, teaching and assessment through curriculum design. Occasional Paper No. 10: Connecting Reflective Learning, Teaching and Assessment." In *Connecting Reflective Learning, Teaching and Assessment*, ed by Helen Bulpitt and Mary Deane (London: Higher Education Academy, Health Sciences and Practice Subject, 2012), 8-17.

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of curriculum and student learning and determine the success of any learning environment.[234],[235],[236]

III. **What is the T MEDA Project?**

The Tuning Middle East and North Africa project (T MEDA) funded and supported by the European Commission and organized by Tuning Academy/ University of Deusto, Spain. It is a project by and for universities.[237] T MEDA project aims to implement the Bologna tools in Southern Neighboring Area universities through building of a framework of comparable, compatible and transparent programs of studies.[238] The objectives of this project was to develop Tuning Reference Points in four subject areas (Law, Healthcare and Nursing, Architecture and Tourism) to develop, implement, monitor and improve degree programs and to promote regional and international cooperation between Southern Neighboring Area universities and European universities.[239] The name Tuning was chosen to reflect the idea that the universities do not look for the uniformity or unified, but simply for point of reference convergence and common understanding.[240]

Tuning process aims to make education programs compatible and comparable.[241] The tuning approach respects and promotes the diversity of the degree programs and aims to develop a common language between all stakeholders that involve within process. It aims also to develop the generic and specific competences and intended learning outcomes for different subject areas. Tuning methodologies focus on (re)designing, developing, implementing, evaluating, and enhancing the degree programs with contribution with different stakeholders and partners from Europe, Latin America, Asia, South Africa, etc. additionally, it aims to promote international corporation between universities to develop, implement, monitor, and improve different degree program.[242]

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[234] Popenici and Millar, *Writing Learning Outcomes: A Practical Guide for Academics*.

[235] Thomas C. Reeves, "How do you know they are learning?: the importance of alignment in higher education." *International Journal of Learning Technology* 2, no. 4 (2006): 294-309.

[236] Clouder, "Promotion of reflective learning, teaching and assessment through curriculum design."

[237] T-MEDA, *T MEDA*. 2013. http://tuningmeda.org/.

[238] Ibid.

[239] Ibid.

[240] Tuning, *Introduction to Tuning*.

[241] Sanches and Ruiz, *Competence-based Learning*.

[242] T-MEDA, *T MEDA*. 2013, http://tuningmeda.org/.

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The competences approach changes the concepts from teacher-center approach to student-centered approach, which become a key issue in the Bologna process and the European Credit Transfer System. These processes aim to make programs more comparable, compatible, and transparent, which expressed in terms of competences and learning outcomes.[243]

This project held 5 general meetings. During these meetings and for each subject area, the generic and specific subject competences were discussed, agreed, and listed, The Meta profile were designed, different programs were designed and compared, and the universities that implemented of the T MEDA pilot program were chosen.

In addition, a staff development online course: 'Course design for outcomes based learning in higher education' for each universities that implemented the pilot program had taken by distance mode from May to August 2015. This online course covered the following topics: introduction to the value of reflective practice; competences in course design for higher education; writing learning outcomes; from competences to intended learning outcomes (ILOs): developing competences through sequenced steps; Teaching, learning, and assessment learning outcomes; Alignment of ILOs with teaching, learning and assessment activities; and summing up. The online course directors were Professor Arlene Gilpin and Maria Yarosh from university of Deusto, Spain.

Moreover, workshop was held at the Hashemite University, Jordan on May 17-22, 2015. It covered the following main topics: Introduction: What is Tuning and what does it offer to Higher Education?; how do we make high quality degree programs?; designing a degree program in practice; writing competences and learning outcomes; design of the degree program to be implemented; teaching, learning and assessment in student-centered degree programs.

Based on his participation on T MEDA meetings, online course, and workshop, the first author used the T MEDA competences and Meta profile to redesign and develop architectural degree program and its vision, mission and adjectives; define and develop the intended learning outcomes; and align the teaching and learning methods and activities with assessment tasks for all courses in architectural degree program at the Hashemite University. The first author presented his work many times to the architectural faculty members at HU and the booklet results distributed to them to get feedback. Finally, all the faculty members were sit together and discussed all his work in details, then they modified and agreed his work.

[243] Ibid.

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The next sections will answer question number three: what are the generic/specific competences and Meta-profile that are required to design the architectural program at the Hashemite University, Jordan?

III.1. *T MEDA generic and specific competences of architectural program of the Hashemite University, Jordan*

Competences mean the proven ability to use knowledge and skills in work, professional and personal practice.[244] Generic competences are common competences that can be identified in different degree programs.[245] Generic competences are multifunctional, multidimensional, transversal, instrumental, interpersonal, and systematic competences that pertaining to each profession.[246] Specific competences are intimately related to specific knowledge of an area of study.[247]

III.1.1. Specific competences of architectural degree program of the Hashemite University, Jordan

1. Appreciation of the social and cultural role of Architecture
2. Ability to design buildings and/or urban development projects that blend with the surrounding environment and fully satisfy local human, social and cultural requirements at different levels and complexity
3. Skill in formulating creative and innovative ideas and transforming them into architectural creations and urban planning
4. Knowledge of history and theory of Architecture and related human sciences and engineering
5. Awareness of current architectural ideas and practices at local and global levels
6. Understanding of the ethical issues involved in architectural design and practice

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[244] Crespo, et al., "Aligning Assessment with Learning Outcomes in Outcome-based Education."

[245] Tuning, *Introduction to Tuning*.

[246] Sanches and Ruiz, *Competence-based Learning*.

[247] Tuning, *Introduction to Tuning*.

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7. Awareness that investigation and research are essential components of architectural creations
8. Awareness of the continuous changes of architectural ideas and practices
9. Ability to think, perceive and conceive spaces three dimensionally in different scales
10. Skill in reconciling all the factors involved in architectural design and urban development
11. Mastery of the media and tools used for communicating verbally, in writing and/or volumetrically architectural and urban development ideas and designs
12. Ability to evaluate, enhance and preserve architectural and urban local heritage and recognize the importance of its relation with current architectural developments
13. Ability to work within, or lead constructively interdisciplinary teams
14. Knowledge of aesthetics and arts, and understanding their role as key factors in the quality of architectural thinking and design
15. Capacity to design projects assuring environmental, social, cultural and economic sustainability
16. Ability to conceive and integrate structural, construction, environmental and installation systems to architectural designs
17. Ability to design buildings to accommodate individuals with varying physical abilities
18. Knowledge and ability to apply legal framework, safety regulations and technical codes controlling activities of the profession
19. Capacity to produce comprehensive construction documents
20. Capacity for planning, programming, budgeting and managing architectural projects
21. Awareness of methods of execution practiced in architectural projects
22. Ability to develop site plans and landscape designs
23. Understanding the importance of, and ability to incorporate new and renewable energy sources in building design

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24. Understanding of the basic principles and appropriate application of construction materials including local ones
25. Awareness of the importance of client's role in the design process
26. Ability to analyze and incorporate relevant precedents into architectural design projects

III.1.2. Generic competences of architectural degree program of the Hashemite University

1. Manage time effectively
2. Communicate orally and in writing with different audiences
3. Maintain continuous education
4. Have critical thinking, analysis and synthesis
5. Identify and resolve problems
6. Make logical decisions
7. Work in an interdisciplinary team
8. Lead effectively
9. Work autonomously
10. Maintain quality of work
11. Act ethically with social responsibility
12. Apply knowledge in practical situations
13. Communicate in a second language
14. Be innovative and creative
15. Be flexible and adapt to different situations.
16. Empower others
17. Search for information from a variety a sources
18. Commitment to the protection and preservation of the environment
19. Commitment to human rights
20. Commitment to health and safety procedures
21. Commitment to the preservation of cultural heritage and values
22. Having organizational skills
23. Having sense of dedication
24. Having respect for diversity and multiculturalism
25. Having skills in the use of information and communication technologies
26. Being initiative
27. Being self-motivated
28. Being assertive

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III.2. *Meta profile (degree Profile) of architectural degree program of the Hashemite University, Jordan*

The Meta profile specifies the subject areas and indicates the special aims and features that distinguish this program from the other similar programs. It is described in terms of the competences and learning outcomes[248] and consists from the merging between generic and specific-subject competences.[249]

Architectural program focuses on design studios, courses in design and visualization, building construction and technological aspects, history and theory, urbanism and landscape, and professional practice and work ethics serve as a basis for developing a comprehensive approach to architectural design. Therefore, the Meta profile in architectural program consists from four main pillars: design ability, construction and technological ability, the theoretical background and socio cultural values, and professional practice and work ethics.

III.2.1. Design Ability

The area of design and visualization encompasses required studios, option studios, electives that concentrate on design logic and skills, and courses that support design thinking and representation. The design studio develops the students':

1. Ability to design building, sites, and/or urban development projects in a sustainable manner (socially, culturally, economically, environmentally)
2. Ability to think, perceive and conceive spaces three dimensionally and communicate verbally, in writing, graphically, and/or volumetrically
3. Skills in formulating creative and innovative ideas and transforming them into architectural creations and urban planning
4. Ability to design buildings to accommodate individuals with varying physical abilities
5. Ability to analyze and incorporate relevant precedents into architectural design projects

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[248] CoRe, *A Tuning Guide to Formulating Degree Program Profiles,* 20.

[249] Tuning, *Introduction to Tuning*.

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III.2.2. Construction and technological ability

Construction and technological aspects courses explore, as an integral part of the architectural design process, the physical context; the properties of natural forces; and building structural systems. These courses will develop the students':

1. Ability to conceive and integrate structural, construction, renewable energy systems, and environmental and installation systems to architectural design
2. Capacity to produce comprehensive construction documents
3. Awareness of methods of execution practiced in architectural projects
4. Understanding of the basic principles and appropriate application of construction materials including local ones

III.2.3. The theoretical background and socio cultural values

Courses in history (contemporary) and theory examine attitude concerning the design of building, landscape, and cities that may contribute to a design process responsive to its broadest social and cultural context. Courses in urbanism and landscape address the study of aesthetic, economic, political, and social issues that influence large-scale environments.

These courses will develop the students':

1. Appreciation of the social and cultural role of architecture
2. Knowledge of history and theory of architecture and related human sciences and engineering
3. Awareness of current architectural ideas and practices at the local and global levels,
4. Ability to conduct investigation and research in the process of architectural innovation
5. Critical thinking, analysis and synthesis,
6. Ability to evaluate, enhance, and preserve architectural and urban local heritage and recognize the importance of its relation with current architectural developments

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7. Knowledge of aesthetics and arts, and understanding their role as key factors in the quality of architectural thinking and design

III.2.4. Professional practice and work ethics

In the area of practice, courses are concerned with issues related to the professional context of architecture and its practice and, in particular, with the architect's responsibility for the built environment. Courses in working drawing, contracts and specifications, quantity surveying, professional practice, and training will develop the students':

1. To act ethically pertaining issues related to architectural design and practice
2. Knowledge and ability to apply legal framework, safety regulation and technical codes controlling activities of profession
3. Capacity for planning, programming, budgeting and managing architectural projects
4. Ability to maintain quality of work
5. Ability to protection and preservation of the environment
6. Respect for diversity and multiculturalism
7. Work effectively in a team
8. Work under pressure
9. Manage time effectively
10. Maintain continuous education.

IV. Teaching, Learning, and Assessment activities in Architectural Design Courses (Design 5 as a Case Study) at the Hashemite University Jordan.

The main aim of this section was to answer of the forth and fifth research questions. The forth a research question was: How can we design the course? How can the teaching, learning, and assessment activities in architectural design courses (design 5 as a case study) be best structured, organized, and aligned based on T MEDA project in order to allow students to achieve and

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reach the intended learning outcomes?. The fifth research question was: How can we implement the self and peer assessment methods in architectural design education?

IV.1. *General Description of Architectural Design Courses*

The architectural students are learning by doing and designing project (Design problem based learning or project-based learning approach). The design course depends on the instructors' reflection practice or learning from experience.[250] The design courses are the core courses in architectural engineering education. In each semester, the architectural students should take one design course starting from basic design1, basic design 2, design 1, 2, 3, 4, 5, 6, design thesis, and finally graduation design project. Each student must pass on the prerequisite design course in order to register on the next one (example, each student must pass in design 4 to register in design 5 and so on).

The natures of each architectural design courses are practical ones (6 credit hours). Each student is requested to design architectural projects (functionally, aesthetically, environmentally, and structurally). The instructors select different building types and projects and distribute them among the design courses. The design instructors start from simple design projects in first years to complex projects in the fourth and fifth years. In each design, each student requested to apply his/her understanding of the theory and history courses, construction courses, environmentally and sustainable courses, and professional practical courses in his/her design.

IV.2. *The Architectural Course Design*

As design instructors, we should answer the following questions before design the course. Who are our students? What topics or content do we teach? What kind of skills and knowledge the students should learn? What are the intended learning outcomes for each design phase? What are the assessment criteria and methods for each design phase? How can we assess students' learning? What teaching methods do we use? How can we develop the learning and teaching strategies that enable students to achieve the

[250] Clouder, "Promotion of reflective learning, teaching and assessment through curriculum design."

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intended learning outcomes? What do we need to do to improve students' learning?

IV.3. *The Nature of Design 5 Course at the Architectural Department at the Hashemite University (Case Study)*

This course introduces students to the field and practice of architectural mixed-use and twin-high-rise buildings within the urban context throughout one full semester project. The objective is to provide a foundation for understanding the various dimensions, requirements, limitations, and regulation roles of architectural mixed and twin-high-rise building projects in Jordan. This course employs a professional approach where the students will formulate the brief and requirements of the project as a result of existing architectural and socio-economical analysis of the study area. The project's site will be realistic one located on flat area. The focus will be on programming, conceptual design, design development, final architectural design (aesthetic values as well as functionality and constructability). Additionally, the environmental considerations should be taken into students' consideration when they design project; for example, material selection, life cycle impacts, energy needs, orientation, local specific environmental concerns (if any).

The design process requires understanding and applying building details that include structural, building materials, mechanical, electrical, and sanitation systems as well as architectural details. The nature of this project is framed by theoretical and contextual understanding that focusing on architectural expressional spaces.

IV.4. *Design 5 Course Design Process*

The design 5 course design depends on the Backward Design Model, that means identifying what the instructors do want the students to know, to be able to do, and perhaps even to be as a result of each phase design. This means that starting with intended learning outcomes of the course and work backwards.[251] The course coordinator (first author) plans, prepares, defines, and arranges the course objectives, description, ILOs, Learning activities, teaching techniques, and assessment methods and then all the above distribute

[251] Maki, *Assessing for Learning: Building a Sustainable Commitment Across*.

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into each design phase. The design instructors meet to explain, discuss, add, modify, and agree of the above course design contents and elements.

Course syllabus is then prepared and designed. It is a job specification that refers to the content and subject matter;[252] it includes the course description, ILOs, learning activities, teaching methods and techniques, appropriate assessment methods, and time table for each design phase in full details to give students big pictures in order to arrive to overall grades or marks.[253] The students work load was discussed and information was given to the students. The students' workload is one of the main elements of the course design. It can be interpreted as the number of the working hours that are needed to follow classes. It consists of both from the class contact hours and of the individual time spent to do different learning activities. In design 5, student workload is 32 hour per week.

At the end of each design phase, the course coordinator prepares the design requirements, ILOs, learning activities, teaching techniques, and timetable for the next design phase and explains them to the students. The architectural engineering students should know what expected to know, understand, how to present their work, and/or be able to demonstrate after completion of each design phase within definite time. The design requirements for each design phase should be clearly stated and understood by students. Additionally, the students should know how their work will be assessed and in which method and criteria.

For each design phase, the design instructors show the students three different examples from previous students' work: the first is almost completely meets their requirements. The second is in the moderate level of their expectations, and the final is failed to satisfy with their requirements. The design instructors also explain why each case has got this classification.

Before the final submission of each design phase, the instructors discuss with the students how to present and sell their design requirements and how to negotiate and discuss their design with the jury members (how to communicate their design graphically and verbally). With the final design submission, each student should submit a poster showing his/her design development in each design phase.

The instructors' role is to explain architectural concepts, principles, and design requirements. They present architectural information, develop the assessment criteria based on the ILOs and teaching and learning activities,

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[252] Khwaja, Akhtar, and Mirza, *Module III: Currculum Developmet, Assessment and Evaluation*.

[253] Norton, "Assessing student learning," 136.

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guide the students' design process to achieve the ILOS, and develop students' useful skills and design knowledge in order to get a good job.[254]

IV.5. *Deep Learning Approach*

Deep approach adapted to studying architectural design in order to encourage students to achieve high-quality learning outcomes.[255] This deep approach focuses on understanding of the nature of design problem, analysis/ synthesis, conceptual design, design development, and final design. This process is incorporated into students' existing knowledge to develop and enhance their design skills and abilities. This approach is being associated with students' intrinsic motivation.[256] The intention of the deep approach to learning in architectural design is to understand through an active engagement with the design knowledge.[257]

IV.6. *Intended Learning Outcomes (ILOs) of Design 5 Course*

Based on the course objectives and course design we developed the following intended learning outcomes (ILOs) based on the design process. By the end of this design 5 course, students should be able to:

IV.6.1. Design Ability

a1) Define the nature of project, requirements, factors, regulation roles, and issues that influence the design of architectural mixed use and high-rise mix use building in a complex urban context in world and Jordan.

a2) Breakdown the architectural mixed-use and high-rise buildings projects into manageable inter-relatable partial components; compare different design objectives, and sort them in terms of priorities in the design process.

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[254] Sherria L. Hoskins and Stephen E. Newstead, "Encouraging Students motivation," in *A Handbook for Teaching and Learning in Higher Education: Enhancing Academic Practice*, ed. by Heather Fry, Steve Ketteridge and Stephanie Marshall, 27-39. (New York: Routledge, 2009).

[255] Spiller, *Assessment matters:Self-assessment and peer assessment*.

[256] Hoskins and Newstead, "Encouraging Students motivation."

[257] Norton, "Assessing student learning," 135.

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a3) Classify and explain the related topics to mixed-use and high-rise building design developments projects and then list the principles of design concerning large-scale projects.

a4) Select, review, describe, analyze, and critique similar design precedents by choosing and analyzing of 3 different case studies (local, regional, and international).

a5) Converse, question and analyze the topics of the mixed-use and high-rise building design project. For 3 case studies, analyze their sites and environmental context, analyze existing spatial concepts and schematic design; analyze the functional design, analyze the horizontal and vertical circulation, analyze the masses and the relationships between in and outside spaces, analyze three-dimensional design with images, analyze the elevations and openings, and generate of architectural design programs,…

a6) Recognize and analyze the design site forces, context, spatial urban structure, building codes, environmental context (natural, man-made and human).

a7) Acquire experience by dealing with urban context: documentation, analyzing, and understanding its evolution.

a8) Adapt critical thinking design processes by using inductive, deductive and abductive (process of inference to the best explanation) reasoning; and using analysis synthesis design cycle to structure the design knowledge and create the conceptual design and models.

a9) Develop graphical thinking and communication skills in interpreting the design concept into spatial experience as it relates to urban design.

a10) Elaborate the conceptual intellectual design that addresses issues and opportunities at the urban scale, and critically synthesis urban site conditions toward the development of innovative spatial experience.

a11) Apply basic organizational, spatial, structural, environmental consideration, and constructional principles to the conception and development of interior and exterior spaces, building elements, and components to create 3 different conceptual spatial design and models.

a12) Combine all previous knowledge to improve the design.

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a13) Chose one design concept and develop it to more architectural details, design the structural system, solve different circulation systems (Vehicles, users circulation — indoor and outdoor), deal with internal designs, deal with Indoor/outdoor spatial compositions and relationships, chose the construction materials…

a14) Evolve the developed design into final architectural design projects by using an appropriate range of media (final plans, elevations, sections, models, 3D perspectives, design booklet).

a15) Sell and present the design orally and graphically by using appropriate representational media and design-based software, different communicational skills, architectural vocabulary and related terminology.

IV.6.2. Construction and Technological Ability

b1) Apply construction elements and building materials into architectural design process.

b2) Deal with structural issues.

b3) Apply building code requirements in design projects.

b4) Develop a sound knowledge and understanding of construction technology and environmental sustainability and an awareness of the related specialisms of structural and environmental engineering and their role in coherent integrated designs.

IV.6.3. Theoretical Background and Socio-Cultural Value

c1) Employ basic methods of data collection and analysis to inform all aspects of the programming and design process.

c2) Identify and list principles of design of architectural mixed-use and high-rise buildings projects in accordance with relevant technical disciplines.

c3) Define strategies for problem solving, conceptual development and poetic expression at all levels of the design process of a building complex.

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c4) Defines the urban spaces and their relations to buildings.

c5) Outline principles of preparation and presentation of complex design projects in a variety of contexts and scales.

c6) Identify different architectural functions and circulation patterns.

c7) Identify appropriate forms and structure systems for different architectural functions.

c8) Identify different site boundaries and all environmental contexts (natural, man-made and human).

c9) Identify the principles of climatic considerations, and energy consumption and efficiency in a certain design.

c10) Identify the processes of spatial change in the built and natural environments; patterns and problems of cities; and positive & negative impacts of urbanization.

c11) Apply professional expertise and skills to the benefit of society as a whole.

c12) Develop an understanding of the historical, theoretical and societal contexts of architecture and their role in providing the specific identity and significance of architecture as a design and research discipline.

IV.6.4. Professional Practice and Work Ethics

d1) Develop team work co-operative skills.

d2) Communicate effectively orally and graphically.

d3) Develop interpersonal skills and effective self-management.

d4) Effectively manage tasks and resources within constrained time.

d5) Employ appropriate architectural communication and representational media, including computer technology, to convey essential formal elements at each stage of the programming and design process.

d6) Work under pressure.

d7) Practices the neatness and aesthetics in design and approach.

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d8) Respect all alternative solutions; changes in original plan of the project, differences in style, culture, experience and treat others with respect.

d9) Contribute positively to the aesthetic, architecture and urban identity, and cultural life of the community.

IV.7. *Design Process*

Throughout the authors' practical and teaching experiences, the architectural design process is a cyclic process that applies the following phase:

a) Analysis design phase: Understanding the nature of project, analysis the site, analysis of 3 different similar case studies, and creating design program. This phase helps students to understand the project and site.

b) Synthesis stage and conceptual design phase: the main aim of this phase is to create different design concepts. This phase helps students to apply their critical thinking and helps them to be flexible and fluency of their thoughts. The flexible and fluency of thoughts are the major elements of creativity.

c) Evaluation Phase and initial development: each student required to evaluate and choose one design concept and develop it initially to architectural plans and mass models.

d) Development phase: the main aim of this phase is to develop the initial architectural plans and masses to more architectural, structural, mechanical details.

e) Final Design Phase: the main aim of this phase is to present the students' 2d drawings, 3d drawings, architectural and structural details, and models as final design product.

IV.8. *Assessment Methods*

Feedback is one of the most important aspects of supporting students' learning.[258] It can be seen as a message to the students about what is right and wrong, good or bad, and strengths and weaknesses. Students use this information to make subsequent improvements.[259]

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[258] Gosling,"Supporting student learning."

[259] Nicol and Macfarlane-Deck, "Formative assessment and self-regulated learning."

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In design studio, the students pay more attention to the feedback, understand it, and act on it for future improvements.[260] Good feedback practice helps to clarify what good performance; offers high quality information to the students about their own design learning; supports the students' motivational believe and self-esteem; provide teacher with the necessary information about their methods and process of teaching.[261]

The purpose of assessment is to make judgments about how design meets appropriate quality. It frames how students learn and what they achieve.[262] Validity of assessment refers to whether assessment measures what its intended to measure: knowledge, understanding, skills, contents, information, behavior, etc. To achieve the validity of assessment, the outcomes should be clearly stated and appropriate assessment method should be selected and used. It used to ensure that the students are marked fairly.[263] Additionally, reliability is concerned with grading within the same provided criteria.[264]

Assessment methods should be clear from earliest stages of course. It should be transparency and explained in details to the students. It should be fully aligned with all other aspects of course design[265] to give students feedback in order to develop their work.[266] In design 5, the instructors follow different assessment methods for each design phase: self-assessment method, peer-review assessment method, instructors' assessment, internal and external jury assessment method.

The following sections will answer the fifth research question: How can we implement the self and peer assessment methods in architectural design? (The researchers' practical methods)

IV.8.1. Self-Assessment Method of design 5 course

In self-assessment method, the researchers prepare the assessment criteria for each design phase based on ILOs, design requirements, learning activities, and teaching techniques. Intensive conversation and negotiation with students about the design phase requirements and the intended learning

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[260] Bloxham and Boyd, *Developing Effective Assessment in Higher Education,* 21.
[261] Nicol and Macfarlane-Deck, "Formative assessment and self-regulated learning."
[262] Boud, *Assessment 2020: Seven propositions for assessment reform in higher education*.
[263] Ndebele and Maphosa, "Exploring the Assessment Terrain in Higher Education,"152.
[264] Ibid.
[265] Boud, *Assessment 2020: Seven propositions for assessment reform in higher education*.
[266] Craddocka and Mathiasb, "Assessment options in higher education," 136.

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outcomes of each phase is needed before any practice of self-assessment.[267] The students must know these criteria before the design phase start to meet the instructors' expectations.

On the self-assessment method, each student should evaluate and assess his/her work based on the assessment criteria. Additionally, the instructors show the strengthen and weakness in each student's work; define what are the missing and mistakes in each work; make suggestion to improve each work; and review the assessment criteria with each student as a checklist.

The self-assessment helps the students to make judgment about their design progress, motivate them for further learning, encourage them to focus on the process of learning, accommodate diversity of learning experience and background, enhance the quality of learning, and prepare student to solve problem in creative ways.[268]

IV.8.2. Small Group Teaching Methods and Peer-Assessment of design 5 course

Small group teaching method is a form of peer, collaborative or cooperative learning to help students to meet the variety of intended learning outcomes.[269] It refers to assessment of students by other students within a group. This method encourages peer learning and peer support; enhance the collaborative learning; encourage students to learn from themselves; provide opportunities for students to clarify and refine their understanding of the concepts through discussion and rehearsal with peers;[270] and equip students with the self-confidence and facilitate group cohesion.[271] It requires deep understanding of course content.[272] There is strong evidence from architectural design students that they enjoy and benefit a lot from this method.[273]

In design 5 design studio, small group teaching method used (group discussion) to teach student how to think, engage, and share their own and other design learning. This method requires wide knowledge and details of

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[267] Spiller, *Assessment matters:Self-assessment and peer assessment*.

[268] Ibid.

[269] Boud, Cohen, and Sampson, "Peer learning and assessment."

[270] Ndebele and Maphosa, "Exploring the Assessment Terrain in Higher Education."

[271] Sandra Griffiths, "Teaching and learning in small groups," in *A Handbook for Teaching and Learning in Higher Education: Enhancing Academic Practice*, ed. by Heather Fry, Steve Ketteridge and Stephanie Marshall, 72-84. (New York: Routledge, 2009).

[272] Boud, Cohen, and Sampson, "Peer learning and assessment."

[273] Griffiths, "Teaching and learning in small groups."

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design subject. The group teaching method is a critical mechanism to develop key skills, improve self-confidence, develop the teamwork and interpersonal communication, and develop their design ideas.[274]

Throughout different design phases, the design instructors encourage students to share and discuss their design ideas and its developments with the other students and get feedback from them. The instructors divide students into groups of 5-8 students. In each class, new groups reformulate with completely new members. Each student in-group presents his/her design work in front of group members and he/she gets critique and feedback from each group member. Later on, the instructors join the group and discuss and critique each student's work in front of all group and ask each group member to critique the design concentrate on the strengthen and weakness design issues. In Peer-review assessment method, each group member requires assessing the other students' design work based on the same assessment criteria that provided by instructors. The authors know from their own experience and from other researchers that the students learn from the discussion among themselves more than learning from their instructors.

Peer discussions offer students with different alternative and strategies to solve the design problems and construct new meanings through negotiations.[275] It can encourage collaborative learning; exchange the knowledge between students; develop the students' skills; get a wider range of design ideas about their work to promote development and improvement; encourage student to clarify, review, modify their design work, help them on how to sell their design ideas through scientific negotiations, and gain confidence and become more competent.[276] Peer mentoring schemes can operate well if students are motivated to support or help other student. It can create an ethos between students themselves and encourage participation and interaction among themselves.[277]

IV.8.3. Jury Assessment of design 5 course

In jury assessment, the instructors invite some professors from the same department as internal jury and some professors from different Jordanian universities/architectural department as external jury. Additionally, the

[274] Ibid.
[275] Nicol and Macfarlane-Deck, "Formative assessment and self-regulated learning."
[276] Spiller, *Assessment matters:Self-assessment and peer assessment*.
[277] Gosling, "Supporting student learning."

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instructors invite architects from architectural practical field who have architectural offices in different Jordanian cities. Each jury committee consists from 4 jury members: 2 from educational field and 2 from practical field. The aims of the design jury are to discuss critique, modify, suggest change, and then assess each student's work. Each jury member requires assessing each student's work based on the same assessment criteria that provided from instructors. The average of grades of the four-jury member and instructors' assessment will be the final grade for each design phase. This assessment method aims to eliminate the subjectivity and increase the objectivity of design assessment.

IV.9. *Constructive Alignment for Design 5 Course*

The instructors use the constructive alignment methods to align the main four elements of the course: course content; intended leaning outcome; teaching and learning activities; and assessments methods. The main aims to use constructive alignment are to explain the purpose of everything that the instructors do or ask students to do and to make the course structure clear to the students (for more details see table 1).

IV.10. *Evaluation of the Course Design Process, Teaching, Learning and Assessment Activities*

What do we want to do to improve students' learning?. Course evaluating is a way to understand the effect of our teaching on students' learning.[278] The purpose of evaluation is to monitor of our teaching performance methods to pinpoint our achievements; to find if the instructors are doing ok; to define the strengths and weakness in their teaching methods; and to compare our teaching methods with other colleagues' methods.[279] The course evaluation encompass the course structure and design; teaching learning strategies; assessment methods and tasks; academic regulations; and interrelationships between them.[280]

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[278] Dai Hounsell, "Evaluating courses and teaching," in *A Handbook for Teaching and Learning in Higher Education: Enhancing Academic Practice*, ed. by Heather Fry, Steve Ketteridge and Stephanie Marshall (New York: Routledge, 2009), 189-212.

[279] Hounsell, "Evaluating courses and teaching," 198-199.

[280] Ibid., 200.

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Table 1

Design course and alignment process (Researchers, 2015)

Design phase	The purpose and design requirements	ILOs	Learning activities	Learning and Teaching methods	Assessment methods
Analysis phase (Group work)	• Understanding the nature of design problem • Critique the similar design precedents • Site analysis	a1, a2, a3, a4, a5, a6, a7, b2, b4, c1, c2, c3, c4, c5, c6, c7, c8, c9, c10, c12, d1, d2, d3, d4, d5, d6	• Searching, Data collecting, and understanding • Case studies searching, collecting, selecting, and analyzing. • Site analysis	• Site visit, • Case study critique • Workshop • Oral group presentation • Lectures • In-class discussion (individual and groups) • Individual and group critique.	• Self-assessment, • Peer review assessment, • Instructors critique assessment, • Internal jury assessment • External jury assessment
Synthesis and conceptual phase (Individual)	Different design concepts creation	a8, a9, a10, a11, c2, c3, c4, c5, c8, c9, c12, d2, d3, d4, d5, d6, d7, d8, d9.	• Individual thinking / concept creation. • Each student should create three different design concepts. • The students should develop their thinking flexibility and fluency (essential elements of creativity). • Each student should develop his/her graphical communication skills to sell design concepts.	• Conceptual analysis and spatial drawings, • Spatial models • Spatial sections, • Freehand and graphical communications • Oral individual presentation • Lectures • In-class discussion (individual and groups) • Individual and group critique.	• Self-assessment, • Peer review assessment, • Instructors critique assessment, • Internal jury assessment • External jury assessment

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Design phase	The purpose and design requirements	ILOs	Learning activities	Learning and Teaching methods	Assessment methods
Development phase	Develop the concept to the initial architectural drawings	a11, a12, a13, b3, c4, c5, c8, c10, d2, d3, d4, d5, d6, d7, d8, d9	• Design concept development. • Choose one design concept and develop it into initial architectural drawings and solutions (Functionally, structurally, aesthetically, environmentally, …)	• Initial Architectural drawings: Plans, Elevations, Sections, • Initial Internal and external perspectives, • Initial Structural systems, • Initial Environmental solutions, • Study models, • Computer programs	• Self-assessment, • Peer review assessment, • Instructors critique assessment, • Internal jury assessment • External jury assessment
Development phase	Develop the intial architectural drawing to more architectural details	a11, a12, a13, b1, b2, c6, c7, c11, d2, d3, d4, d5, d6, d7, d8, d9	Develop the previous work into more architectural details and solutions (Functionally, structurally, aesthetically, environmentally, …)	• Architectural drawings: Plans, Elevations, Sections, • Internal and external perspectives, • Structural systems, • Environmental solutions, • Study models, • Computer programs	• Self-assessment, • Peer review assessment, • Instructors critique assessment, • Internal jury assessment • External jury assessment
Final design phase	Sell and present final design work	a14, a15, c11, d2, d3, d4, d5, d6, d7, d8, d9	• Final presentation and oral defense. The students use different computer programs to present design work graphically. • Student should create detailed model to illustrate his/her graphical drawings.	• FINAL Architectural drawings: Plans, Elevations, Sections, • FINAL Internal and external perspectives, • FINAL Structural systems, • Environmental solutions, • Final design model, • Use different Computer programs	• Self-assessment, • Peer review assessment, • Instructors critique assessment, • Internal jury assessment • External jury assessment

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The design 5 instructors developed the learning and teaching activities, methods and techniques over the past 4 years. After the assessment of each phase finished, the design instructors sit together and discuss, evaluate, and compare the results and students' ILOs achievements of each design phase with the same phase of previous years. Additionally, by the end of semester we ask students to fill the evaluation sheet about the course and ask them to give suggestion how to develop our learning activities, teaching techniques, and assessments methods for next year.

Moreover, different collected feedback used to evaluate the course: feedback from students and response the issue they raise; feedback from teaching colleagues and professional peers; and self-generated feedback.[281] Questionnaire to the students; focus group and informal discussion with students for each design stage; face book group; instructors' notes; sitting and discussion session between instructors; internal and external jury feedback (direct observation); course evaluation from university were used continuous development and improvement of the design 5 learning and teaching approaches.

IV.11. *Results*

This good practice research, in the domain of competences-base student-centereded approach in architectural design, used the T MEDA competences and Meta Profile to design the design 5 course. The course design depends on the Backward Design Model,[282],[283] which means starting with intended learning outcomes and working backwards to define the course descriptions and objectives, learning activities, teaching methods and techniques, and assessment methods. The ILOs were distributed over the design phases; the design requirements of each design phase were agreed and defined; the learning activities, teaching methods, and assessment methods were determined; and finally the course syllabus was designed and aligned between all the above elements. After the course design was implemented, different feedback was collected to evaluate, develop, and improve the course design. Table 1 shows the course design and alignment process.

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[281] Ibid., 201.

[282] Jack C. Richards, "Curriculum Approaches in Language Teaching: Forward, Central, and Backward Design." *RELC Journal* 44, no. 1 (2013): 5-33.

[283] Bruce E. Fox and John J. Doherty, "Design to Learn, Learn to Design: Using backward design for information literacy instruction." *Communications in Information Literacy* 5, no. 2 (2012): 144-155.

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IV.12. *HU Students Perspectives on the Competencies-based Learning Approach*

The students were very satisfied with the competences-based learning approach. Reham stated, "*the new approach leads to new and different experience of the design learning approach. It enables me to develop and structure my own design knowledge and learning in order to meet the intended learning outcomes and instructors' expectations*". Anas stated, "*This approach gives me a great sense of responsibility for my design learning and forces me to develop my master design skills in order to move to more professional design skills*".

Bayan stated, "*This is a great method to prepare me for future professional role. It raises the competition among students. It is clear and valuable method but it needs more working hours*". Rawabi stated, "*This method supports the interactive participation and negotiations on design studio. It enables me to understand the intended learning outcomes and engages on the assessment criteria*". Amal stated, "*This method encourages my personal design learning opportunities. It allows me to measure and evaluate my design progress and achievements*".

Raneem stated, "*This method improves my design knowledge because I know what I should to do from the beginning. This approach opens my mind to new design strategies*". Hamza stated, "*this method develops the ways of analysis, synthesis, thinking, creation, and evaluation and it enhances the sense that I am a real architect*".

V. **Conclusion**

Recently, higher educational systems become increasingly oriented towards the competences-based student-centered learning and outcome approach.[284],[285] There are many faculties in Europe and US adopt the new learning philosophy, by contrast, Asia-Pacific reports many difficulties in implementing this effective reform.[286] Therefore, the purpose of this research was to review, analyze, and synthesis the different related pieces from the higher education literature to explore, describe, and understand the holistic

[284] CoRe, *A Tuning Guide to Formulating Degree Program Profiles,* 25.

[285] Gibbs, Kennedy, and Vickers, "Learning Outcomes, Degree Profiles, Tuning Project and Competences."

[286] Tremblay, Lalancette, and Roseveare, *Assessment of Higher Education Learning Outcomes*, 37.

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view of teaching and learning, program/curriculum design, generic and specific competences, intended learning outcomes, assessment and constructive alignment.

The present study was conducted in an attempt to answer the main research question: how can the architectural design courses be designed based on the required competences and how can the teaching, learning activities and assessment methods be structured and aligned in order to allow students to achieve and reach the intended learning outcomes?. This research used a case study driven best practice research method to answer the research questions based on the T MEDA pilot architectural program that implemented at the Hashemite University, Jordan.

Successful learning and teaching depends on the effectiveness of design courses/program in terms of specific and generic competences, program Meta profile, intended learning outcomes, learning and teaching activities, and assessment methods.[287] All terms are interdependent to form the system of the course and send the same message.[288] Designing the curriculum focuses on defining the conclusion before construction the plot. This means that when the instructor designs the course, he/she should start with defining the required outcomes that are to be achieved and then determine what must be taught.[289] Teaching, learning, and assessment are to be a core activity to share, apply, test, and create knowledge.[290] Teaching and learning should be enhanced by well planned and implemented formative assessment strategies properly aligned to intend learning outcomes and learning activities.[291]

This research found that it is important for architectural education to adapt the students-center learning method: the focus of efforts shifted from the design instructor to the students. The architectural department at the Hashemite University are willing to implement this effective reform of its teaching methods without that more difficulties. Additionally this research found that using the competences-based student-centered approach and constructive alignment in architectural design courses increases the effectiveness of teaching and learning methods enhances the design studio environment, and focuses on students' engagement in their design process.

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[287] Nulty, *Curriculum Design*.

[288] Ibid.

[289] Connie Vitale, "Foundations of university learning and teaching: A reflection on the curriculum alignment." *e-Journal of Business Education & Scholarship of Teaching* 4, no. 2 (2010): 52-64.

[290] GMIT, *Code of Academic Policy No. 4*.

[291] Ndebele, and Maphosa, "Exploring the Assessment Terrain in Higher Education."

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Moreover, this research found that using different assessment methods in architectural design courses helps students to develop their learning outcomes; and informs teachers about the effectiveness of their teaching. The instructors and professors are required to develop and use different assessment methods and link them with the intended learning outcomes to give students feedback in order to develop their work.[292] Additionally, the students should know the purpose of assessment, the intended learning outcomes of each design phase, the degree of quality and performance of their design, and the criteria of the judgment and evaluation before the assessment take place.

Furthermore, the involvement of students in assessment produces effective learning and enhances their design motivation. Self and peer assessment plays important role in learning and teaching methods. They encourage students to become independent learners; increase their self-esteem and develop the negotiation skills, and help them to engage actively in learning process. Therefore, different design assessment methods are the affective way to measure fairly the students learning outcomes. These methods increase the objectivity and decrease the subjectivity of design assessment.

Assessment of architectural design students' work is a significant component of effective teaching and learning.[293] The purposes of design assessments are to guide and help students to develop their design learning outcomes; inform the students about their progress and estimate their performance; and inform instructors about the effectiveness of their teaching. (Cabrera, Colbeck and Terernzini 2001) found that learning outcomes positively associated with instructor interaction and feedback, collaborative learning, and clarity and organization.[294]

However, applying competences-based student-centered learning and outcome approach needs more time and staff to apply. Another problem is that some instructors resist changing to the new methods or approaches because they prefer to use their old and traditional systems. This paradigm shift requires a change of the traditional academic staffs` mind set.[295]

The application for this method at the first time needs intensive recourses, more time, and good cooperation between different instructors and subject coordinators. However, within the time this method will be more useful and

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[292] Craddocka and Mathiasb, "Assessment options in higher education."

[293] Ndebele and Maphosa, "Exploring the Assessment Terrain in Higher Education."

[294] Alberto F. Cabrera, Carol L. Colbeck, and Patrick T. Terernzini, "Developing performance indicators for assessing classroom teaching practices and student learning: The case of engineering." *Research in Higher Education* 42, no. 3 (2001): 327-352.

[295] CoRe, *A Tuning Guide to Formulating Degree Program Profiles,* 19.

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interesting for the teacher and more effective and formative for the students. Finally, the development of architectural academic staff is needed to increase awareness of learning needs of all architectural students. They require redesigning and aligning their curriculum and courses syllabus according to the requirements of new methods.

Bibliography

AAAS. *Designs for Science Literacy*. New York: American Association for the Advancement of Science: Oxford University Press, Inc., 2000.

Ambrose, Susan A., Michael W. Bridges, Michele DiPietro, Marsha C. Lovett, Marie K. Norman, and RICHARD E. MAYER. *How Learning Works: Seven Research-Based Principles for Smart Teaching*. San Francisco: John Wiley & Sons, Inc., 2010.

Arnau-Sabatés, L., M.T Marzo, M. Jariot, and J. Sala-Roca. "Learning basic employability competence: a challenge for the active labour insertion of adolescents in residential care in their transition to adulthood." *European Journal of Social Work* 17, no. 2 (2013): 252-265.

ASCC. *ASCC alignment and assessment of students learning outcomes (SLOs): Training manual*. California, California: Accrediting Commission for Community Junior College, 2008.

B&FC. *Learning, teaching, and assessment strategies guide*. Blackpool and The Fylde College, 2013.

Baxter, Pamela, and Susan Jack. "Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers." *The Qualitative Report* 13, no. 4 (2008): 544-559.

BC. *Every learning matters: Balton College higher education: Learning. teaching and assessment strategy 2013-2016*. Bolton College, Bolton College, 2013.

Biggs, John B. "Aligning teaching for constructing learning." *FOCUS* 16, no. 1 (2008): 1-3.

Biggs, John. "Constructive alignment in university teaching." *HERDSA Review of Higher Education*, no. 1 (2014): 5-22.

Biggs, John, and Catherine Tang. *Teaching for Quality Learning at University*. 3rd. Maidenhead: Open University Press/McGraw Hill, 2007.

Bloxham, Sue, and Pete Boyd. *Developing Effective Assessment in Higher Education: a practical guide*. England: McGraw-Hill House, 2007.

Bodega, Irma Dolores Núñez y. "From curriculum to syllabus design: The different stages to design a program." *MEMORIAS DEL III FORO NACIONAL DE ESTUDIOS EN LENGUAS* 13, no. 3 (2007): 275-290.

Boud, David. *Assessment 2020: Seven propositions for assessment reform in higher education*. Sydney: Sydney: Australian Learning and Teaching, 2010.

Boud, David, Ruth Cohen, and Jane Sampson. "Peer learning and assessment." *Assessment and Evaluation in Higher Education* 24, no. 4 (2000): 413-426.

 ISSN: 2340-8170 • ISSN-e: 2386-3137. Volume 4, Issue No. 1, November 2016, 43-98
doi: http://dx.doi.org/10.18543/tjhe-4(1)-2016pp43-98 • http://www.tuningjournal.org/

Brown, Sally. "Assessment for learning." *Learning and Teaching in Higher Education*, no. 1 (2004): 81-89.

Cabrera, Alberto F., Carol L. Colbeck, and Patrick T. Terernzini. "Developing performance indicators for assessing classroom teaching practices and student learning: The case of engineering." *Research in Higher Education* 42, no. 3 (2001): 327-352.

CERI. *Assessment for learning — the case fgor formative assessment*. OECD/CERI International Conference, 2008.

Clouder, Lynn. "Promotion of reflective learning, teaching and assessment through curriculum design. Occasional Paper No. 10: Connecting Reflective Learning, Teaching and Assessment." In *Connecting Reflective Learning, Teaching and Assessment*, edited by Helen Bulpitt and Mary Deane, 8-17. London: Higher Education Academy, Health Sciences and Practice Subject, 2012.

CoRe. *A Tuning Guide to Formulating Degree Program Profiles: Including Program Competences and Program Learning Outcomes*. Bilbao: University of Deusto, Nuffic / TUNING Association, 2010.

Craddocka, Deborah, and Haydn Mathiasb. "Assessment options in higher education." *Assessment & Evaluation in Higher Education* (Taylor & Francis) 34, no. 2 (2009): 127-140.

Crespo, R. M., Najjar, J., Derntl, M., Leony, D., Neumann, S., Oberhuemer, P., Totschnig, M., Simon, B., Gutierrez, I., & Delgado Kloos, C. "Aligning Assessment with Learning Outcomes in Outcome-based Education." *EEE Education Engineering* (IEEE EDUCON Education Engineering), 2010: 1-8.

Crowe, Sarah, Kathrin Cresswell, Ann Robertson, Guro Huby, Anthony Avery, and Aziz Sheikh. "The case study approach." *BMC Medical Research Methodology* 100, no. 11 (2011): 1-10.

Fox, Bruce E., and John J. Doherty. "Design to Learn, Learn to Design: Using backward design for information literacy instruction." *Communications in Information Literacy* 5, no. 2 (2012): 144-155.

Fry, Heather, Steve Ketteridge, and Stephanie Marshall. "Understanding student learning." In *A Handbook for Teaching and Learning in Higher Education: Enhancing Academic Practice*, edited by Heather Fry, Steve Ketteridge and Stephanie Marshall, 8-26. New York: Routledge, 2009.

Gibbs, Andy, Declan Kennedy, and Anthony Vickers. "Learning Outcomes, Degree Profiles, Tuning Project and Competences." *Journal of the European Higher Education Area*, 2012: 72-88.

GMIT. *Code of Academic Policy No. 4: Learning, Teaching & Assessment Strategy 2010 - 2015*. Galway-Mayo Institute of Technology, Dublin: Academic Council of GMIT, 2010.

Goff, Lori, et al. L*earning Outcomes Assessment: A Practitioner's Handbook*. Ontario: Higher Education Quality Council of Ontario (HEQCO), 2014.

Gosling, David. "Supporting student learning." In *A Handbook for Teaching and Learning in Higher Education: Enhancing Academic Practice*, edited by

Tuning Journal for Higher Education
© University of Deusto. ISSN: 2340-8170 • ISSN-e: 2386-3137. Volume 4, Issue No. 1, November 2016, 43-98
doi: http://dx.doi.org/10.18543/tjhe-4(1)-2016pp43-98 • http://www.tuningjournal.org/

Heather Fry, Steve Ketteridge and Stephanie Marshall, 113-131. New York: Routledge, 2009.

Griffiths, Sandra. "Teaching and learning in small groups." In *A Handbook for Teaching and Learning in Higher Education: Enhancing Academic Practice*, edited by Heather Fry, Steve Ketteridge and Stephanie Marshall, 72-84. New York: Routledge, 2009.

Hall, Richard. "Aligning learning, teaching and assessment using the web: An evaluation of pedagogic approaches." *British Journal of Educational Technology* (Blackwell Publishers Ltd) 33, no. 2 (2002): 149-158.

Hoskins, Sherria L., and Stephen E. Newstead. "Encouraging Students motivation." In *A Handbook for Teaching and Learning in Higher Education: Enhancing Academic Practice*, edited by Heather Fry, Steve Ketteridge and Stephanie Marshall, 27-39. New York: Routledge, 2009.

Hounsell, Dai. "Evaluating courses and teaching." In *A Handbook for Teaching and Learning in Higher Education: Enhancing Academic Practice*, edited by Heather Fry, Steve Ketteridge and Stephanie Marshall, 198-212. New York: Routledge, 2009.

Kessels, Joseph, and Tjeerd Plomp. "A relational approach to curriculum design." *Verschenen in Journal of Curriculum Studies* 31, no. 6 (1999): 679-709.

Khwaja, Iftikhar Uddin, Shahnaz Akhtar, and Abida Mirza. *Module III: Currculum Developmet, Assessment and Evaluation: Professional Competency Enhancement Program for Teachers (PCEPT)*. Islamabad: National Academy of Higher Education (NAHE): Learning Innovation Division and Higher Education Commission (HEC), 2014.

Knaack, Liesel. *Enhancing your programs and cources through alighed learning outcomes*. Vancouver Island University, Vancouve: Centre for Innovation and Excellence in Learning, 2015.

Knight, Peter T. "Summative assessment in higher education: practices in disarray." *Studies in Higher Education* 27, no. 3 (2002): 275-286.

LAM, Steve Y. W. "Outcome-Based Approach to Teaching, Learning and Assessment in Geomatics Higher Education: the Hong Kong Experience." *Good Educational Practices*, 2009: 1-10.

Maki, Peggy L. *Assessing for Learning: Building a Sustainable Commitment Across*. 2nd. Stylus Publishing and AAHE., 2004.

McCarthy, Marian. "Aligning Learning Outcomes, Learning Activities and Assessment." *Seminario Internacional SCT,*. Pucón: Marian McCarthy, Augest 31, 2011.

Ndebele, Clever, and Cosmas Maphosa. "Exploring the Assessment Terrain in Higher Education: Possibilities and Threats: A Concept Paper." *Journal of Social Science* 35, no. 2 (2013): 149-158.

Nicol, David J., and Debra Macfarlane-Deck. "Formative assessment and self-regulated learning: Amodel and seven principles of good feedback practice." *Studies in Higher Education* 31, no. 2 (2006): 199-218.

© University of Deusto. ISSN: 2340-8170 • ISSN-e: 2386-3137. Volume 4, Issue No. 1, November 2016, 43-98
doi: http://dx.doi.org/10.18543/tjhe-4(1)-2016pp43-98 • http://www.tuningjournal.org/

Norton, Lin. "Assessing student learning." In *A Handbook for Teaching and Learning in Higher Education: Enhancing Academic Practice*, edited by Heather Fry, Steve Ketteridge and Stephanie Marshall, 132-149. New York: Routledge, 2009.

Nulty, Duncan D. *Curriculum Design*. Griffith Institute, Griffith Institute for Higher Education, 2012.

Petrina, Stephen. *Curriculum and Instruction Design: Advanced Teaching Methods for the Technology Classroom*. University of British Columbia, Canada, 2007.

Pontuso, James F., and Saranna R. Thornton. "Is Outcomes Assessment Hurting Higher education?" *The NEA Higher Education Journal* Fall (2008): 61-70.

Popenici, Stefan, and Victoria Millar. *Writing Learning Outcomes: A Practical Guide for Academics*. The University of Melbourne, 2015.

Reeves, Thomas C. "How do you know they are learning?: the importance of alignment in higher education." *International Journal of Learning Technology* 2, no. 4 (2006): 294-309.

Richards, Jack C. "Curriculum Approaches in Language Teaching: Forward, Central, and Backward Design." *RELC Journal* 44, no. 1 (2013): 5-33.

Rust, Chris. "The Impact of Assessment on Student Learning: How Can the Research Literature Practically Help to Inform the Development of Departmental Assessment Strategies and Learner-Centred Assessment Practices?" *Active Learning in Higher Education* (SAGE Publications) 145, no. 3 (2002): 145-158.

Sanches, Aurelio Villa, and Manual Poblete Ruiz. *Competence-based Learning: A Proposal for the Assessment of Generic Competences*. Bilbao: University of Deusto, 2008.

SAQA. *The National Qualifications Framework: Curriculum Development*. A publication of the South African Qualifications Authority, 2000.

Sluijsmans, D., F. Dochy, and G. Moerkerke. *The use of self-, peer-, and co-assessment in higher education: A review of literature*. Open University of Netherlands, Otec, 1998.

Spiller, Dorothy. *Assessment matters: Self-assessment and peer assessment*. The University of Waikato, Hamilton, New Zealand: Teaching Development Unit/ Wāhanga Whakapakari Ako, 2012.

Stefani, Lorraine. "Planning teaching and learning: Curriculum design and development." In *A Handbook for Teaching and Learning in Higher Education: Enhancing Academic Practice*, edited by Heather Fry, Steve Ketteridge and Stephanie Marshall, 40-57. New York: Routledge, 2009.

Struyven, Katrien, Filip Dochy, and Steven Janssens. "Students' perceptions about assessment in higher education: A review." *Assessment & Evaluation in Higher Education* 30, no. 4 (2005): 331-347.

T-MEDA. *T MEDA*. 2013. http://tuningmeda.org/.

Tremblay, Karine, Diane Lalancette, and Deborah Roseveare. *Assessment of Higher Education Learning Outcomes: AHELO Feasibility Study Report — Volume 1 — Design and Implementation*. Organisation for Economic Co-Operation and Development (OECD), 2012.

Tuning Journal for Higher Education
© University of Deusto. ISSN: 2340-8170 • ISSN-e: 2386-3137. Volume 4, Issue No. 1, November 2016, 43-98
doi: http://dx.doi.org/10.18543/tjhe-4(1)-2016pp43-98 • http://www.tuningjournal.org/

Tuning. *Introduction to Tuning*. Bilbao: Tuning Academy, 2007.

UNISA. *Curriculum Policy*. University of South Africa (UNISA), 2010.

UTAS. *Guideline for good assessment practices*. University of Tasmania, University of Tasmania Assessment, 2011.

UU. *Assessment Handbook*. Ulster University, 2015.

Vitale, Connie. "Foundations of university learning and teaching: A reflection on the curriculum alignment." *e-Journal of Business Education & Scholarship of Teaching* 4, no. 2 (2010): 52-64.

Yin, Robert K. *Case Study Research: Design and Methods*. Vol. 5. SAGE Publications, 2014.

Zucker, Donna M. *How to Do Case Study Research*. College of Nursing, University of Massachusetts, Amherst: School of Nursing Faculty Publication Series, 2009.

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The impact of formative assessment on self-regulating learning in university classrooms*

Fisseha Mikre Weldmeskel and Dreyer Johann Michael**

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Abstract: This study describes the extent of which the use of quality formative assessment on lessons of a course involves the students as self-regulated learners. There is an increased interest among educational researchers to observe improvement of student self-regulation on learning. The predominant use of summative assessment remains a challenge to helping students develop self-regulation skills in learning and assessment. Quality formative assessment includes formative feedback, self-assessment and peer assessment. The study followed a partially mixed sequential research design and applied a quasi-experimental intervention that lasted for six weeks where six educators applied quality formative assessment on lessons of a general psychology course for intervention group students (N=191). The quantitative data were collected by self-regulated learning questionnaire before and after the use of quality formative assessment on lessons. The qualitative data were collected by focus group discussions with the students. The students' perceptions on self-regulating learning were compared between the intervention (N=191) and the comparison (N=187) group of students. The quantitative analysis used t-test and biserial correlation and proved the presence of statistically significant difference between the two groups in perceiving the self-regulation of learning. Moreover, effect size estimate (Cohen's d) was used to provide a strong validation on the variation between the two groups for the measure of self-regulating learning. Recommendations were made to promote the use of quality

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formative assessment aiming at the improvement of student self-regulation on learning and assessment in university classes.

Keywords: Self-regulated learning; quality formative assessment; feedback; self-assessment; peer assessment; constructivist learning.

I. **Background of the study**

I.1. *Introduction*

This study examined the contribution of a quality formative assessment used on lessons of a course in involving the students as self-regulated learners in a "General Psychology" course at three west Ethiopian universities. Quality formative assessment denotes the delivery of formative feedback by educators, peer-assessment and self-assessment, which contribute to the improvement and the self-regulation on learning. Self-regulation of learning refers to the students' perceptions on self-regulating learning before and after an instructional intervention in which quality formative assessment was used on lessons of the course.

At present, Ethiopia considers education and training as an instrument of development and poverty alleviation. To realise this, the country set educational objectives which reflect the needs of the society.[1] In relation to university education, one of the specific objectives incorporated in the policy states: "satisfy the country's need for skilled human power by providing training in the various skills and at different levels."[2] In line with this, the country is rapidly expanding higher education, and student enrollment is also increasing. Moreover, there is a national concern and dedication to improve the quality and relevance of university education. The need for competence based education and the active role of the student are also key issues emphasised on the policy. However, assessment practices on course delivery in university classes often lack the student active involvement in self-regulating learning. Students at universities have not been fully engaged in assessment practices, which can enhance self-regulated learning skills.[3] On the other hand, the contributions of formative feedback, peer assessment, and self-assessment to the country's university

[1] Ministry of Education (MOE), *Education and Training Policy 1994* (Addis Ababa: MOE, 1994), 7-8.

[2] MOE, *Education and Training Policy 1994*, 9.

[3] Higher Education Relevance and Quality Agency (HERQA), "Jimma University institutional quality audit report 2008" (Addis Ababa: HERQA, 2008).

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education had not been well studied and documented. This study integrated quality formative assessment on the lessons of a course and found out the ways by which the student perception on self-regulation learning was enhanced.

I.2. *Conceptual model*

Conceptually, the constructivist learning paradigm was fundamental to inform this study, since the study examined the contribution of quality formative assessment to the improvement of self-regulated learning. Active student involvement and competence based learning are the major assumptions of constructivist learning. Students make sense of new knowledge by mapping it to their existing knowledge and they see instruction not only as the transmission of knowledge but also as intervention in an ongoing knowledge construction process. Moreover, there is an opportunity for the students to actively involve as self-and peer-assessors of their learning. The provision of effective feedback also contributes to self-regulate learning. As a result, educators consider formative assessment as an essential curriculum component that contributes to student self-regulation in learning. Hence, the following statement explains the logic for the conceptual alignment of this study with constructivist learning paradigm. A quality formative assessment that is integrated with instruction, involving the students as self-assessors, peer assessors, when accompanied with feedback improves student self-regulation on learning. Hence, this study raises an important research question that states, "To what extent can the use of quality formative assessment involve students with self-regulating learning as perceived and reported by themselves?

II. **Literature review and empirical evidence**

II.1. *Literature review*

Self-regulated learning can be taken as one outcome of using quality formative assessment in instruction. Over the last twenty years, the ways researchers conceptualise learning and assessing at the higher education context have been changing.[4] Researchers tend to propose different approaches

[4] David J. Nicol and Debra M. Dick, "Formative assessment and self-regulated learning: a model and seven principles of good feedback practice," *Studies in Higher Education* 31, no. 2 (2006): 201.

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to learning and assessing, which can help in the improvement of student learning and self-regulation. One proposed approach that forms the basis for "student-centered learning" is self-regulation on learning. The need to expand the understanding on the role of students' in learning, as well as the practicable tactics of scaffolding self-regulated learning skills and assessment is well recognised.[5] Although self-regulation has received little attention in the literature of formative assessment, researchers perceive self-regulation as a set of metacognitive, motivational and behavioural tactics which benefit the student to control and manage learning outcomes actively.[6]

Conceptually, self-regulated learning is a method by which a student actively participates in setting learning objectives and then attempt to monitor, regulate and control his/her cognition, motivation, and behaviour to achieve the objectives.[7] Self-regulated learning is a self-directed activity by which a student transforms his/her mental abilities into academic skills and shows the initiative in the learning activity.[8] Formative assessment plays a key role to increase self-awareness and self-regulation skills. For example, formative assessment guides the student's judgment about what is important to learn, and influence the perceptions on competence.[9] Self-regulation involves interplay between commitment, control, and confidence. It addresses the way students monitor, direct, and regulate actions toward the learning objectives. It implies autonomy, self-control, self-direction, and self-discipline. Such regulation involves "self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals" and can lead to seeking, accepting, and accommodating feedback information.[10] Self-regulated

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[5] Heidi L. Andrade, "Students as the definitive source of formative assessment: Academic self-assessment and the self-regulation of learning," in *NERA Conference Proceedings 2010,* Paper 25, ed. Northeastern Educational Research Association (NERA) (Rocky Hill: University of Connectut, 2010), accessed January, 2013. http://digitalcommons.uconn.edu/nera_2010/25/.

[6] Paul R. Pintrich, "*The role of goal orientation in self-regulated learning,"* in *Handbook of self-regulation,* ed. Boekaerts M., Pintrich, PR and Zeidner, M. *(*San Diego, CA: Academic, 2000), 454.

[7] Pintrich, "*The role of goal orientation in self-regulated learning*," 456.

[8] Barry J. Zimmerman, "Becoming a self-regulated student: An overview," *Theory into Practice* 41, no. 2 (2002): 65.

[9] Lorrie Shepard. "Formative assessment: Caveat emptor: The Future of Assessment: Shaping Teaching and Learning" (paper presented at ETS Invitational conference, New York, October 10-11, 2005).

[10] John Hattie and Helen Temperley, "The power of feedback," *Review of Educational Research* 77, no. 1 (2007): 93-94.

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learning focuses on the management of learning by students. While students self-regulate learning, they take part to set achievement targets, stick to study schedules, and maintain the motivation and effort to achieve the targets. The self-regulation on learning is a key outcome in the implementation of quality formative assessment that contributes to learning improvement. Self-regulation is particularly salient in the higher education context because of the (often-implicit) expectations on student independence in learning.[11] In self-regulation, learning can result from self-generated thoughts and behaviours that are systematically oriented towards the attainment of learning targets.[12] The student's role here is significantly important. The proactive role of the student in generating and using feedback that enhances learning is also well-acknowledged.[13] Educators at higher education can empower students as self-regulated learners by the continuous use of quality formative assessment and feedback. Educators also tend to attribute many of the individual differences in learning to the level of students' self-regulation skills. Self-regulated learning requires different skills. These are:

> *…(a)setting specific proximal goals for oneself, (b) adopting powerful strategies for attaining the goals, (c) monitoring one's performance selectively for signs of progress, (d) restructuring one's physical and social context to make it compatible with one's goals, (e) managing one's time use efficiently, (f) self-evaluating one's methods,(g) attributing causation to results, and (h) adapting future methods.*[14]

Thus, it is proposed that the use of quality formative assessment "helps students to develop the mentioned self-regulated learning skills."[15] In essence, then, self-regulated learning and effective feedback lead to improved learning gains.[16] Students who self-regulate their learning are more effective in learning their subjects.[17] These students show persistence, resourcefulness, confidence and high achievement. When students set superior goals proactively, monitor learning intentionally, use strategies effectively, and

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[11] Keithia Wilson and Alf Lizzo, "A just in time intervention to support the academic efficacy of at risk first year students" (FYE Pacific Rim Conference: Griffith University, 2008), accessed June, 2011, https://www.griffith.edu.au/__data/assets/pdf_file/0005/224762/.

[12] Charity H. Johansson and Peter Felton, *Transforming Students: Fulfilling the Promise of Higher Education* (John Hopkins Press, 2014), 12.

[13] Nicol and Dick, "Formative assessment and self-regulated learning," 199.

[14] Zimmerman, "Becoming a self-regulated student," 66.

[15] Zimmerman, "Becoming a self-regulated students," 66.

[16] Nicol and Dick, "Formative assessment and self-regulated learning," 210.

[17] Zimmerman, "Becoming a self-regulated students," 66.

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respond to feedback adaptively, they not only attain mastery but also sustain their motivation and efforts in learning.[18]

Quality formative assessment involving formative feedback, self and peer assessment enhances student self-regulation on learning. However, existing research demonstrates that self- and peer assessment are not common assessment practices.[19] The perception of students on formative assessment and self-regulation of learning influences its use and effectiveness. The research literature recognises perception as a major challenge to the use of formative assessment that enhances self-regulated learning in the classroom context. The perception of the student is important, mainly because in the implementation of quality formative assessment, the student assumes an increased responsibility to regulate and self-reflect on his/her own learning and assessment.

II.2. *Empirical evidence*

The literature with respect to empirical evidence clarified the contribution of formative assessment to the self-regulation of learning. In fact, the effect of innovative assessment practices on students' learning experience at higher education is a neglected research topic.[20] From the empirical literature, it was learned that students value improvement-oriented assessment methods. There are also evidences which support the positive influence of formative assessment to improve self-regulation and academic performance. Moreover, some of the research evidences show significant differences with respect to average effect sizes in the students' self-regulation perception scores between an intervention and comparison groups, when formative assessment was used on lessons. The empirical evidences confirm the advantage of immediate and corrective feedback provision to contribute for student self-regulation on learning. Furthermore, research findings substantiate the significance of self-assessment to bring about critical reflection and the development of autonomous and self-regulated learning skills. In some of the studies reviewed, students perceived peer assessment positively, despite complaints on its unfairness and lack of accuracy. Hence, the question in this

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[18] Barry J. Zimmerman, "From Cognitive Modeling to Self-Regulation: A Social Cognitive Career Path," *Educational Psychologist* 48, no. 3 (2013): 137.

[19] Andrade, "Students as the definitive source of formative assessment," 5.

[20] Sheena Bevitt, "Assessment innovation student experience: A new assessment challenge and call for a multi- perspective approach to assessment research," *Assessment and Evaluation in Higher Education* 40, no. 1 (2015): 103.

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study is, how do students differ in their perceptions towards self-regulating learning when educators use quality formative assessment on lessons of a university course.

III. **Research Design and Methods**

III.1. *Research design*

This study situated itself within the pragmatic paradigm of studying the relationship of research variables. This is because the research question set, call for objective data from self-regulated learning perception questionnaire as well as subjective data on the personal experiences of students obtained by focus group discussions. The pragmatic paradigm requires the mixing of quantitative and qualitative methodologies. The quantitative methodology is useful because the study followed empirical methods of data collection, analysis and interpretation of research variables with quantitative characteristics through quasi-experimental procedures, which lasted two weeks for the pilot study and four weeks for the main study. The qualitative methodology is also useful to look into the complexity of research participants' perceptions.

As mentioned earlier, the objective of this study was to examine the extent of which the use of quality formative assessment on lessons of a course involves the students as self-regulated learners. Therefore, it was necessary to collect data from the group, who experienced the effect of the use of quality formative assessment. To achieve the objective, the study followed a mixed method research design. Mixed method is a research design that integrates quantitative and qualitative data either concurrently or sequentially at one or more stages of the research process.[21] This design of research is advantageous because it uses the strengths of both methods, and their combined use provides an expanded understanding of the research variables.[22] A mixed-methods approach is also useful since it compensates the weakness of one by the strength of the other. In the present study, to supplement the quantitative data, qualitative data was collected based on a

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[21] John W. Creswell, Vicki L. Plano Clark, Michelle L. Gutmann, and William E. Hanson, "Advanced Mixed Methods Research Designs," in *Handbook of mixed methods in social and behavioral research*, ed. Abbas Tashakkori and Charles Teddlie (Thousand Oaks, CA: Sage, 2003), 235.

[22] John Creswell, *Research design: A qualitative, quantitative and mixed- method approaches*, 3rd ed. (London: Sage Publication inc, 2009), 206.

sequential explanatory strategy. Specifically, the study followed a mixed method research design of the type partially mixed sequential dominant status in which a main quantitative study was sequentially followed by a qualitative study.[23] This type of mixed method design is useful when researchers intend to conduct the study by giving emphasis to the quantitative methodology. Partially-mixed sequential design is used when there is an intention to examine a large sample first to test the relationship of research variables and then to investigate in more depth with a few cases in the qualitative phase.[24] In this approach, the collection and analysis of qualitative data usually follows and supplements the collection and analysis of quantitative data.[25] In the present study, the researchers, first collected and analysed the quantitative data, collected and analysed the qualitative data, and then mixed the two in the interpretation and discussion phases of the study.[26]

III.2. *Sampling and data collection procedures*

In selecting the sample respondents for this study, the researchers used simple random sampling technique to identify students of intact classes for the quasi-experimental procedure. For instance, the selection of three universities which took part in the study was made by the lottery-draw method. From each of the universities included in the study, two entire classes of students who were enrolled for "General Psychology" course in the academic year 2013/14 were randomly selected for inclusion in the intervention group. Two other classes taking a similar course to that of the intervention group were also identified as comparison groups to supply the quantitative data for the study. Therefore, the number of students who participated in the study was 464 including both the intervention and the comparison groups, of which only 378 (81.46%) filled out the self-regulated learning perception questionnaire completely. The sample size (n= 378) is representative of the student population (N = 6500) enrolled for "General Psychology" course at the six Universities. The collection of data for this study was carried out in two steps. The first step was the

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[23] Nancy Leech and Anthony Onwuegbuzie, "An array of qualitative data analysis tools: A call for data analysis triangulation," *School Psychology Quarterly* 22, no. 4 (2007): 570.

[24] Creswell et al., "Advanced mixed methods research designs," 171.

[25] Creswell, *Research design: A qualitative, quantitative and mixed- method approaches*, 211.

[26] Creswell et al., "Advanced mixed methods research designs," 178.

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collection of baseline data before the quasi-experimental intervention. The baseline data included determining the students' perceptions on the practices of quality formative assessment and finding out whether this enhanced their self-regulation on learning. During the second step, data were collected by means of questionnaire re-administration, and focus group discussions.

III.3. *Data analysis*

The quantitative data outputs comprised both descriptive and inferential statistics. Descriptive statistics were used to present the participants' perception scores on the self-regulation of learning resulting from the use of quality formative assessment. The inferential statistics such as t-test, biserial correlation, and effect size estimate were used to determine the presence of statistically significant and valid variation between the students in the intervention and in the comparison groups on the measure of self-regulated learning perception. In fact, before this, analysis of the baseline data was done to establish the precondition for applying the quasi-experimental procedure in the form of instructions using quality formative assessment on lessons taught for the intervention group students.

On the other hand, qualitative data analysis is practicable for answering "why" and "how questions" in research. For example, "How do students perceive self-regulating learning in the instructional process of a university courses? Since, it is mostly concerned with the complex nature of human behaviour in a social context, qualitative data can be analysed in different ways.[27] The specific method of qualitative data analysis followed in this study was the constant comparison method, for its relevance and simplicity when applied to several types of data such as Focus Group Discussions (FGDs).[28] This method of qualitative data analysis is useful to identify the underlying themes emerging from the research data set. The researchers read through all the data before applying the constant comparison method. After that, the data were organised into smaller chunks. Afterwards, every chunk of data was given a label with a describing code. After all the data had been coded, the codes were grouped in terms of similarity and themes

[27] Keith Punch, *Introduction to social research: Quantitative and qualitative approaches*, 2nd ed. (New Delhi: Sage, 2005), 5.

[28] Leech and Onwuegbuzie, "An array of qualitative data analysis tools: A call for data analysis triangulation," 586.

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were distinguished based on each grouping.[29] Finally, the themes were used for interpretation based on how they relate to the research question raised in the study.

IV. **Results and Discussion**

IV.1. *Results*

The active role of students has implication for learning improvement. This can be made possible by stimulating self-regulated learning. Self-regulated learning involves the students' metacognitive, behavioural and motivational tactics to attend their learning progress actively. In this study, a thirteen (13) items questionnaire (see annex 1), with internal reliability coefficient of 0.92 to show the homogeneity of items in the scale was used to measure the students' perception in self-regulating learning on a general psychology course before and after the instructional intervention conducted with the intervention group. The assessment scale was from 1 (= *always not true*) to 4 (=*always true*). For the base-line data (i.e. before the lessons took place), the average overall (i.e. summed over all 13 items) score of perception on self-regulating learning was 32.73 with a standard deviation of 4.31 for the comparison group and 32.09 with a standard deviation of 3.89 for the intervention group respectively.

Table 1

Base-line data on the perception of self-regulating learning

Group	Mean score	SD
Comparison	32.73	4.31
Intervention	32.09	3.89

These mean ratings are half-way on the scale measure, between 26 (i.e. 13 items x 2, corresponding to all ticks being "*mostly not true"*) and 39 (i.e. 13 items x 3, corresponding to all ticks being "*mostly true"*). Thus, it can be said, according to the perceptions of the students there was little or no

[29] Leech and Onwuegbuzie, "An array of qualitative data analysis tools: A call for data analysis triangulation," 591.

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enhancement to the self-regulation of learning on the lessons of the general psychology course before the use of quality formative assessment. The Levene's test (see table 2) for equality of variances on the perceptions of self-regulating learning showed no statistically significant difference between the two groups ($P = 0.65 > 0.05$, $df = 1$ & 376). This can be taken as a satisfactory pre-condition for the quasi-experimental procedure, where quality formative assessment was integrated with instruction and used on the lessons taught for the intervention group.

Table 2

Levene's test for equality of variances on the perceptions of self-regulating learning

Variable	Group	Mean	SD	df	F- ratio Table value	F- ratio observed	Level of signifi-cance
Self-regulated learning, perception	Comparison	32.73	4.31	1 & 376	3.84	0.65	0.05
	Intervention	32.09	3.89				

After the use of quality formative assessment on lessons, the thirteen items-questionnaires that elicited the students' perceptions on self-regulating learning was re-administered to both groups. As shown in table 3 and figure 1, a change in the mean perception of self-regulating learning was reported for both groups. For instance, the mean perception on self-regulating learning for the comparison group students (N=187) was 34.14 with a standard deviation of 5.11 and the mean perception on self-regulating learning for the intervention group students (N =191) was 41.04 with a standard deviation of 3.94. According to this data, there was an increment in the mean perception scores equal to 6.90.

Table 3

Mean perception scores increments

Group	Pretest mean	Posttest mean	Pretest SD	Posttest SD
Comparison	32.73	34.14	4.31	5.11
Intervention	32.09	41.04	3.89	3.94

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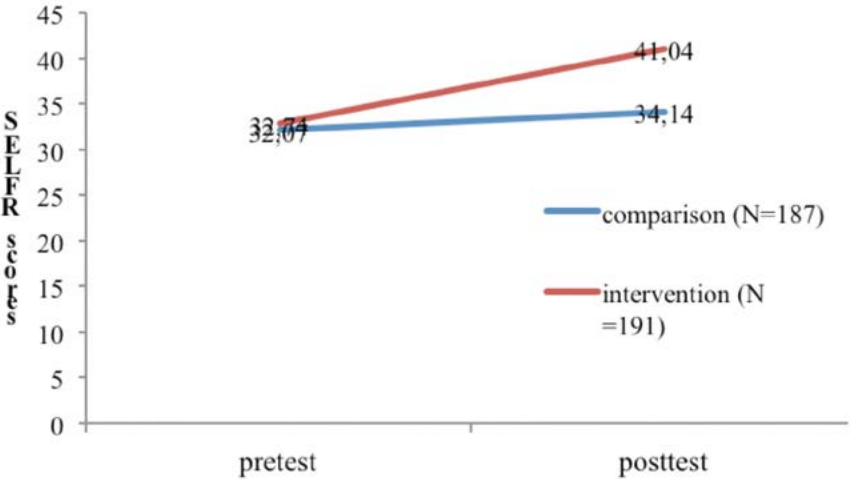

Figure 1

Comparisons of self-regulation mean scores

The independent samples mean difference test (t-test) that assumed unequal variances between the two groups — as the Levene test had shown — revealed a statistically significant difference *(t = 14.72, df = 376, α. < 0.00)* between the intervention and the comparison group, where the intervention group perceived self-regulating learning as improved after the use of quality formative assessment (see table 4 below). The critical t-value (at df=376) is 3.29 that means the observed t-value (14.72) is considerably higher than the critical value. The difference on the perceptions of self-regulated learning is attributed to the use of quality formative assessment on lessons of the course.

Table 4

Perception of self-regulating learning (post intervention)

Group	Mean scores	SD	Mean differ.	T-value (Table value = 1.96)	df	Assumption	Sig. (p =. 05)	Remark
Compa.	34.14	5.11	6.9	14.72	376	Unequal variances	.000	There is statistically significant difference.
Interv.	41.04	3.94						

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On the other hand, the biserial correlation coefficient was computed between the self-regulated learning perception score as a continuous variable and the students' placement in either the comparison or the intervention group as dichotomous variable. The t-test only shows variation between the two groups. It does not completely assure whether the use of formative assessment brings the students' involvement in self-regulating learning. Thus, the biserial correlation was used to check whether there was a relationship between placement in the intervention group where formative assessment was used and the involvement of the students in self-regulating learning. Therefore, the observed biserial correlation (rb) was found to be considerably higher than the critical correlation coefficient at the specified degrees of freedom (rb = 0.61 with degrees of freedom = 376), where the expected correlation coefficient (the cut off value) at alpha = 0.05 is 0.19 or less. This shows the presence of a statistically significant relationship between placements in the intervention group where quality formative assessment was used on lessons and the students' perceptions on self-regulating learning. Furthermore, effect size for the students' perception difference on self-regulating learning was estimated using the raw scores mean difference, and the standardised mean difference methods. The raw score mean difference between the two groups on perceiving the self-regulation of learning was 6.90 score points. The effect size estimate on standardised mean difference was 0.77, which means, according to the convention about estimates of effect size from quasi-experimental intervention, that this is judged close to a higher effect.[30]

Similarly, focus group discussant students also confirmed the contributions of quality formative assessment to the quality of learning and to have positive effects on the self-regulation of learning as well as changing the students' attitudes to be more positive and active towards learning and assessment. The uses of self and peer assessment were advantageous because they were motivating to promote the active attention and involvement of the students in learning and assessing. According to the opinion of the focus group discussants, self-assessment facilitated for independent learning. They also reported peer assessment to stimulate student motivation and competition. In this study, therefore, the instructional intervention that integrated the use of quality formative assessment produced a positive effect on the students' perception of self-regulating learning. As the finding in this study revealed, the use of quality formative assessment on lessons significantly changed the students' perception on self-regulating learning. For instance, self-assessment

[30] Jacob Cohen, Statistical power analysis for the behavioural sciences (New York: Routledge Academic, 1988), 6.

raises students' self-regulation skills and stimulates them to achieve better.[31] In the present study, more than half of the students reported to perceive self-assessment as motivating and helpful for the self-regulation of learning. This result is similar to a study where students reported that they are motivated, able to self-regulate their learning, and learn in different ways as a result of self-assessment activities on lessons.[32] The association among the active involvement of students in self-assessment, motivation, self-regulation of learning and marked improvement in achievement was also noted.[33] Autonomous learning and reflective thinking are important learning goals in the context of higher education.[34] Self-assessment produces responsible and autonomous students who can self-regulate learning.[35] The students who took part in the FGDs also reported the usefulness of the self-assessment practice to help for independence, autonomy and acquisition of self-regulated learning skills. Peer assessment not only improves the quality of learning but also empowers students. The usefulness of peer assessment lies on the chance of greater involvement it gives to students to self-regulate learning. A student may gain insight into his/her own learning and performance when assessing other student's work. Peer assessment enables students to self-assess their own learning better.[36],[37] Students in this study also witnessed peer assessment as a useful activity to contribute for implicit motivation, competition and self-regulation on learning.

IV.2. *Discussion*

Self-regulation is central to "student-centred learning," and it is a significant feature of learning. It is predictive of improved academic outcomes

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[31] Parvis Birjandi and Nasrin H. Tamjid, "The role of self-assessment in promoting Iranian EFL students' motivation," *English Language Teaching* 3, no. 3 (2010): 217.

[32] Kay Sambell and Liz McDowell, "The construction of the hidden curriculum: message s and meaning in the assessment of student learning," Assessment and Evaluation in Higher Education 23, no. 4 (1998): 398.

[33] Andrade, "Students as the definitive source of formative assessment: Academic self-assessment and the self-regulation of learning," 4.

[34] Sambell and McDowell, "The construction of the hidden curriculum: messages and meaning in the assessment of student learning," 399.

[35] Zimmerman, "Becoming a self-regulated students," 68.

[36] Ngar Lui and Careless David, "Peer feedback: The learning element of peer assessment," *Teaching in Higher Education* 11, no. 3 (2006): 281.

[37] Jing Yan Lu and Nancy Law, "Online peer assessments: effects of cognitive and affective feedback," *Instructional Science* 40, no. 2 (2012): 261.

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and motivation, enhanced involvement in the learning process and subsequent successful performance.[38] Students can play a significant role in self-regulating learning and assessment.[39] Self-regulation is conceptualised as a set of metacognition, behaviour and motivational tactics that the student applies to manage his/her learning outcomes actively.[40] Self-regulation then refers to self-generated thoughts, feelings and behaviours that are directed towards achieving the intended learning objectives.[41] Students who have the skills to self-regulate learning focus on how they activate, alter and sustain specific learning activities. In a situation where such essential qualities of learning are absent, coaching students to develop self-regulated learning skills is especially relevant.[42]

The use of quality formative assessment on lessons can play a key role in the development of self-regulated learning skills. Student self-regulation has salience in the context of higher education because of the need for relative independence of the student.[43] Research evidence shows the usefulness of self-regulated learning skills for enhancing student motivation and achievement.[44] Thus, researchers suggest that educators at higher education should use formative assessment and feedback to enhance student self-regulation and independence in learning and assessing. A self-regulated student displays superior achievement gains and personal efficacy.[45] Students who self-regulate their learning are characterised by personal initiation, perseverance and adaptive skills.[46] They are also capable of monitoring, directing and regulating actions towards the learning objectives.[47] It is also understood that the effective use of quality formative assessment paves the way for motivation and self-regulation to learning and assessment. In the present study, the students who

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[38] Ian Clark, "Formative assessment: Policy, perspectives and practice," *Florida Journal of Educational Administration and Policy* 4, no. 2 (2011): 170.

[39] Andrade, "Students as the definitive source of formative assessment: Academic self-assessment and the self-regulation of learning," 9.

[40] Pintrich, "The role of goal orientation in self-regulated learning," 454.

[41] Zimmerman, "Becoming a self-regulated students," 65.

[42] Zimmerman, "Becoming a self-regulated students," 70.

[43] Wilson and Lizzo, "A just in time intervention to support the academic efficacy of at risk first year students," 2.

[44] Barry J. Zimmerman, "Developing Self-Fulfilling Cycles of Academic Regulation: An Analysis of Exemplary Instructional Models," in Self-Regulated Learning, ed. Schunk, DH & Zimmerman, BJ (New York: Guilford, 1998),8.

[45] Zimmerman, "Becoming a self-regulated students," 66.

[46] Zimmerman, "*Developing Self-Fulfilling Cycles of Academic Regulation: An Analysis of Exemplary Instructional Models*," 14.

[47] Hattie and Temperley,"The power of feedback," 47.

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were taught by the use of quality formative assessment reported a better involvement in self-regulating their learning and also outperformed the comparison group by the post-test achievement score. Thus, effective use of quality formative assessment improves the involvement of students in learning and also achievement in tests. A similar study showed that students who self-regulate their learning are those who achieve significantly higher grades than those who achieved lower grades.[48] In the present study, the students in the intervention group reported an improved involvement and experience in self-regulating learning. The greater and significant variation in the perception of self-regulation between the students might be attributable to the quality formative assessment that was used on lessons. Furthermore, in an attempt to self-regulate learning and assessment, students direct their thoughts and behaviours towards achieving the set learning goals.[49] As a result of self-regulated learning, the students' motivation and effort to achieve high scores in tests increases. This was clearly seen in the present study. The students who were placed in the intervention group outperformed the students who were placed in the comparison group on the posttest achievement score.

V. **Conclusion and Recommendations**

The mean perception score on self-regulating learning for the intervention and comparison group students varied significantly. The result confirms that the students who were taught by the use of quality formative assessment on lessons report more involvement in self-regulating learning than those who were not taught by the use of quality formative assessment. Thus, the use of quality formative assessment contributes to the enhancement on the students' level of involvement and experience in self-regulating learning. As a result of this, inference can be made on the presence of a strong and statistically significant relationship between the students' placement in the intervention group where the teaching of the course integrated quality formative assessment and their perceptions in self-regulating learning with a magnitude of near to high effect size. As learned from the views of the students who took part in the focus group discussions, there was a positive perception for using quality formative assessment on lessons.

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[48] Paul Pintrich and Elsabeth De Groot, "Motivational and self-regulated learning components of classroom academic performance," *Journal of Educational Psychology* 82, no. 1 (1990): 36.

[49] Johansson and Felton, *Transforming Students*, 13.

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The students perceived formative assessment as encouraging with respect to making the learning and assessment process more involving and interactive. They also pointed out the promising effect and the usefulness of formative assessment to the students' motivation and active participation in learning. The focus group discussant students also revealed the benefits of each form of quality formative assessment to promote self-regulated learning skills. For instance, formative feedback encouraged active learning to occur, self-assessment facilitated relative independence and autonomy for the students and peer assessment enhanced the students' motivation, responsibility and competition on learning. Nevertheless, despite their optimistic perceptions on the advantages of quality formative assessment, the students expressed their concerns because of the amount of time consumed by the assessment activities against the coverage of course content. Even so, in general terms, they favour the use of quality formative assessment on the teaching learning process.

Hence, the findings of this study confirmed the salient contributions on the use of quality formative assessment for student self-regulation on learning. The use of quality formative assessment helps students to self-regulate their learning and assessment activities. Therefore, department heads, course team leaders, quality assurance officers, educators and students at universities should collaborate and work towards the promotion and use of quality formative assessment on lessons of university courses because quality formative assessment can have salient contributions to improve the student self-regulation on learning and the students' learning and assessment skills. Moreover, continuous professional development trainings which will be organized for university educators shall focus in supporting teachers develop the skills on how to design and implement instructions by integrating quality formative assessment. Furthermore, university educators use quality formative assessment on lessons and prepare the students with self-regulated learning skills so that the students' active involvement in learning and assessing can be improved.

Bibliography

Andrade, Heidi. "Students as the definitive source of formative assessment: Academic self-assessment and the self-regulation of learning." In NERA Conference Proceedings 2010. Paper 25, edited by Northeastern Educational Research Association (NERA) (Rocky Hill: University of Connectut, 2010. Accessed January, 2013. http://digitalcommons.uconn.edu/nera_2010/25/.

Bevitt, Sheena. "Assessment innovation student experience: A new assessment challenge and call for a multi-perspective approach to assessment research." *Assessment and Evaluation in Higher Education* 40, no. 1 (2015):103-119.

Birjandi Parvis and Tamjid Nasrin. "The role of self-assessment in promoting Iranian EFL students' motivation." *English Language Teaching* 3, no. 3 (2010): 211-220.

Clark, Ian. "Formative assessment: Policy, perspectives and practice." *Florida Journal of Educational Administration and Policy* 4, no. 2 (2011):158-180.

Cohen, Jacob. *Statistical power analysis for the behavioural sciences*. New York: Routledge Academic, 1988.

Creswell, John W., Vicki L. Plano Clark, Michelle L. Gutmann, and William E. Hanson. "Advanced Mixed Methods Research Designs." In *Handbook of mixed methods in social and behavioral research*, edited by Abbas Tashakkori and Charles Teddlie, 209-239. Thousand Oaks, CA: Sage, 2003.

Creswell, John. *Research design: A qualitative, quantitative and mixed- method approaches*. 3rd ed. London: Sage Publication inc, 2009.

Hattie, J., and Helen Timperley. "The power of feedback." *Review of Educational Research* 77, no. 1 (2007): 81-112.

Johansson, Charity H., and Peter Felton. *Transforming Students: Fulfilling the Promise of Higher Education*. John Hopkins Press, 2014.

Leech, Nancy, and Anthony Onwuegbuzie. "An array of qualitative data analysis tools: A call for data analysis triangulation." *School Psychology Quarterly* 22, no. 4 (2007): 557-584.

Lu Jing Y and Law Nancy, "Online peer assessments: effects of cognitive and affective feedback." Instructional *Science* 40, no. 2 (2012):257-275.

Lui, Ngar, and David Careless. "Peer feedback: The learning element of peer assessment." *Teaching in Higher Education* 11, no. 3 (2006): 279-290.

Nicol, David J, and Debra M. Dick. "Formative assessment and self-regulated learning: a model and seven principles of good feedback practice." *Studies in Higher Education* 31, no. 2 (2006):199-218.

Pintrich and De Groot, "Motivational and self-regulated learning components of classroom academic performance." *Journal of Educational Psychology* 82, no. 1 (1990):33-40.

Pintrich, Paul. "*The role of goal orientation in self-regulated learning*." In *Handbook of self-regulation, 452-502,* edited by Boekaerts M. Pintrich PR and M. Zeidner. San Diego: CA Academic, 2000.

Punch, Keith. *Introduction to social research: Quantitative and qualitative approaches*. 2nd ed. New Delhi: Sage, 2005.

Sambell, Kay, and McDowell Liz. "The construction of the hidden curriculum: messages and meaning in the assessment of student learning." *Assessment and Evaluation in Higher Education* 23, no. 4 (1998):391-402.

Shepard, Lorrie. "Formative assessment: Caveat emptor. The Future of Assessment: Shaping Teaching and Learning." Paper presented at ETS Invitational conference, New York, October 10-11, 2005.

Tuning Journal for Higher Education
© University of Deusto. ISSN: 2340-8170 • ISSN-e: 2386-3137. Volume 4, Issue No. 1, November 2016, 99-118
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Wilson, Keithia, and Lizzo Alf. "*A just in time intervention to support the academic efficacy of at risk first year students*." FYE Pacific Rim Conference: Griffith University, 2008.

Zimmerman, Barry. "Developing Self-Fulfilling Cycles of Academic Regulation: An Analysis of Exemplary Instructional Models." In *Self-regulated learning: From teaching to self-reflective practice*, edited by DH Schunk and BJ Zimmerman, 1-19. New York: Guilford, 1998.

———. "From Cognitive Modelling to Self-Regulation: A Social Cognitive Career Path." *Educational Psychologist* 48, no. 3 (2013): 135-147.

———. "Becoming a self-regulated student: An overview." *Theory into Practice* 41, no. 2 (2002): 64-70.

Annex

Title: Self-regulated learning perception measure

Instruction: For each of the following items, focus on the use of quality formative assessment that promoted your self-regulated learning and assessment. Make a circle to indicate your choice. The meaning of the numbers/choices is shown in the table below.

Keys:	1 = always not true,	2 = mostly not true,
	3 = mostly true,	4 = always true

No.	In the general psychology course…	1	2	3	4
1	Your self-regulated learning was enhanced by formative assessment	1	2	3	4
2	Lesson objectives were communicated to you	1	2	3	4
3	You were engaged in assessing the progress of your learning	1	2	3	4
4	You had greater control over your own learning	1	2	3	4
5	You managed your learning outcomes actively	1	2	3	4
6	You had a chance to set learning goals	1	2	3	4
7	You had an opportunity to focus your actions on the learning goals	1	2	3	4
8	Your confidence has increased because of your control over the learning	1	2	3	4

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No.	In the general psychology course…	1	2	3	4
9	You received feedback that improved your learning	1	2	3	4
10	Your motivation to learn was increased because you had greater control over your own learning	1	2	3	4
11	Because of the formative assessment used, you understood your strengths and weaknesses	1	2	3	4
12	You gave yourself feedback to reflect on the correctness of your actions	1	2	3	4
13	You interpreted the feedback actively given to you by the educator and your peers	1	2	3	4

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Improving students' self-efficacy and academic performance in Applied Mathematics through innovative classroom-based strategy at Jimma University, Ethiopia

Kinde Getachew and Asfawossen Birhane*

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Abstract: Research on area of self efficacy theory is scarce in African context though several scholars propose the need for investigating the practical utility of the theory in other cultural settings aside from Western countries. We have tested the theory of self-efficacy in Ethiopian context and showed how an innovative classroom based strategy (promoting students' mastery experience, exposing students to role model, persuading students the importance of effort and creating favorable attitude towards a subject) influenced self-efficacy belief and academic achievements of students in applied mathematics II employing explanatory sequential mixed methods design. We found statistically significant difference between the experimental group and the control group on mean academic performance of applied math II ($t = 2.75$, $df = 121$, $p = .007$). The magnitude of the mean difference ($MD = 5.77$) between the two groups was medium ($\eta^2 = .4978$). There was no statistically significant mean difference in the experimental group and the control group on mean score of self-efficacy belief in mathematics ($t = .626$, $df = 85$, $p = .553$) though the experimental group scored higher than the control group. We validated the self efficacy theory in Ethiopian context and also provided insight how mathematics instructors could use the innovative classroom based strategy. Further study on the applicability and generalization of the intervention package in other contexts is warranted.

Keywords: Self-efficacy; sources of self-efficacy belief; self-efficacy enhancement strategies; mathematics self-efficacy and achievements.

I. Introduction: Background

In education context students are expected to invest effort, participate and show perseverance in their learning. However, lack of interest and

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confidence, low motivation and disengagement are common among students. Such behaviors could be explained by the theory of self-efficacy.[1] Self-efficacy beliefs determine students academic functioning through cognitive, motivational, affective, and decisional making processes. The cognitive process refers to students thinking in self-enhancing or self-debilitating ways; the motivational aspects includes the motivation students have for their learning and persistence in the face of challenges; the affective domain incorporates emotional aspects of students; and the decision making includes the choices students make in a course of their education.[2]

Students' mathematics self-efficacy is defined as belief of competency in engaging in mathematical problems.[3] Several scholars indicate students' beliefs in mathematics as an important element in determining their behavior to a large extent[4]. Students with a higher self-efficacy belief display adaptive behavior such as investing the necessary effort, participating eagerly in their learning, recovering from failure more quickly, engaging in challenging learning experiences, discarding quickly a faulty strategy, anticipating higher goals, showing perseverance in the face of difficulty, having motivation to learn, employing different learning strategies, attributing their success to effort and failure to inappropriate strategy than students with low self-efficacy belief.[5],[6],[7],[8]

Various research works also demonstrate the relationship between student's self-efficacy belief in mathematics and academic achievement in mathematics.

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[1] Del Siegle and Betsy McCoach, "Increasing Student Mathematics Self-Efficacy through Teacher," *Journal of Advanced Academics* Training 18, no. 2 (2007): 278, doi: 10.4219/jaa-2007-353.

[2] Albert Bandura, "Social Cognitive Theory in Cultural Context," *Applied Psychology: An International Review* 51, no. 2 (2002): 270, doi: 10.1111/1464-0597.00092.

[3] Diana K. May, "Mathematics Self-Efficacy and Anxiety Questionnaire" (PhD Dissertation University Of Georgia, (2009), 1, https://getd.libs.uga.edu/pdfs/may_diana_k_200908_phd.pdf.

[4] Alan Schoenfeld, "Learning to think mathematically: Problem Solving, Metacognition, and Sense-making in Mathematics," in *Handbook of Handbook for Research on Mathematics Teaching and Learning*, ed. D. Grouws, (New York: MacMillan, 1992), 359.

[5] Albert Bandura, "Perceived Self-Efficacy in Cognitive Development and Functioning, Educational Psychologist," *Educational Psychologist* 28, no. 2 (1993): 144, doi 10.1207/s15326985ep2802_3.

[6] Albert Bandura, "Social Cognitive Theory," in *Annals of Child Development*, ed. R. Vasta, Vol.6. Six theories of child development (Greenwich: CT: JAI Press, 1989), 47.

[7] Alison Sewell and Alison St George, "Developing Efficacy Beliefs in the Classroom," *Journal of Educational Enquiry* 1, no. 2 (2000): 59, file:///C:/Users/user/Downloads/576-2358-1-PB%20(6).pdf.

[8] Ahmed Elhassan Hamid Hassan, Abdulaziz Alasmari and Eldood Yousif Eldood Ahmed, "Influences of Self-Efficacy as Predictors of Academic Achievement. A Case Study of Special Education Students- University of Jazan," I*nternational Journal of Education and Research* 3, no. 3 (2015): 283, ISSN: 2201-6333 (Print) ISSN: 2201-6740 (Online) www.ijern.com.

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The findings reveal students' self-efficacy belief in mathematics influence academic achievement directly or indirectly by raising students' persistence.[9] Thus, educators need to think of strategies that could enhance student's self-efficacy belief and academic achievement in mathematics. In line with this, a number of researchers suggest self-efficacy theory as a comprehensive model for mathematics teachers for enhancing students' self-efficacy belief and academic achievements through designing appropriate instructional strategies complement with the traditional method of teaching mathematics.[10],[11]

II. **Statement of the problem**

Despite an increasing number of publications on self-efficacy beliefs and academic performance in math in Western countries over the past decades, researches conducted in the tenet of self-efficacy are bounded by several limitations. Scarce research in African context is one of the limitations though several scholars propose the need for investigating the practical utility of the theory in other cultural settings.[12],[13],[14]

In addition, there is little empirical evidence that show how college mathematics instructors enhance students' mathematics self-efficacy in a classroom[15],[16] though studies carried out in Western countries suggest instructional strategies involving mastery experiences raise students' mathematics self-efficacy.[17],[18]

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[9] Frank Pajares and David Miller, "Role of Self-Efficacy and Self-Concept Beliefs in Mathematical Problem Solving: A Path Analys," *Journal of Educational Psychology* 86, no. 2 (1994): 200, http://www.cimm.ucr.ac.cr/.

[10] Ellen, U.L., and Frank Pajares, "Sources of Self-Efficacy in Mathematics: A Validation Study," *Contemporary Educational Psychology* 34, no. 1 (2009): 100, doi:10.1016/j.cedpsych.2008.09.002.

[11] Amy L. Zeldin, Shari L. Britner, and Frank Pajares, "A Comparative Study of the Self-Efficacy of Successful Men and Women in Mathematics, Science and Technology Careers," *Journal of Research in Science Teaching* 45, no. 9 (2008): 1054, doi 10.1002/tea.20195.

[12] Tuntufye S. Mwamwenda, "Self-Efficacy and Performance in Mathematics at An African University,"*The Journal of Independent Teaching and Learning* 4 (2009): 25, http://www.iie.ac.za/.

[13] Siegle and McCoach, "Increasing Student Mathematics Self-Efficacy," 278.

[14] Usher and Pajares, "Sources of Self-Efficacy in Mathematics," 100.

[15] Mica A. Hutchison, Deborah K. Follman, Melissa Sumpter, and George M. Bodner, "Factors Influencing the Self-Efficacy Beliefs of First-Year Engineering Students," *Journal of Engineering Education* 95, no. 1 (2006): 40, doi: 10.1002/j.2168-9830.2006.tb00876.x.

[16] May, "Mathematics Self-Efficacy and Anxiety Questionnaire," 59.

[17] Usher and Pajares, "Sources of Self-Efficacy in Mathematics," 100.

[18] Zeldin, Britner and Pajares, "A Comparative Study," 1054.

 ISSN: 2340-8170 • ISSN-e: 2386-3137. Volume 4, Issue No. 1, November 2016, 119-143
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On top of that a research work conducted in Ethiopian Universities discloses frustration and low confidence in mathematics among students due to poor background in math, discouragement from instructors when students make mistake, failure to explain concepts adequately as instructors are merely interested to cover chapters, limited time for class activity and poor feedback provision.[19] Similarly, a study conducted in secondary school students shows significant numbers of students perceive mathematics as a difficult subject to learn and this perception in turn deters students to learn mathematics.[20] In spite of such problems, there is no single study that gives insight to policy makers and mathematics instructors on how to modify students' sense of self-efficacy belief in a classroom setting and how students' performance could be improved.

In line with the aforementioned gaps, we test the theory of self-efficacy in Ethiopian context and show how the classroom based intervention strategy (promoting mastery experience, exposing students to role model, persuading students the importance of effort and creating favorable attitude towards a subject) influence self-efficacy belief and academic achievements of students in applied math employing explanatory sequential mixed methods design. By doing so, we validate the theory of self efficacy in Ethiopian context in particular, and in Africa in general; and also provide mathematics instructors a viable approach of integrating the intervention strategy with the usual way of instruction. In sum, the study has both theoretical and practical significances. Consequently, we address the following hypothesis.

- H_1: Students who will receive the treatment (self efficacy enhancement strategy) will score higher on self-efficacy belief in applied math II than students who will not receive the treatment (H_1: $\mu_{\text{self-efficacy score for the experimental group}} \geq \mu_{\text{self-efficacy score for the control group}}$).
- $H_{1:}$ Students who will expose to the treatment (self efficacy enhancement strategy) will score higher in applied math II academic performance than students who will not expose to the treatment (H_1: $\mu_{\text{academic achievements for the experimental group}} \geq \mu_{\text{academic achievements for the control group}}$).

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[19] Asfawossen B. and Kinde G, "Gender, Self-Efficacy Belief, Sources of Self-Efficacy Associated to Academic Achievements in Applied Mathematics: The Case of First Year Engineering Students of South Western Universities Of Ethiopia," *International Journal of Current Research* 8 no. 05 (2016): 30398, http://www.journalcra.com/.

[20] Tesfaye Jale Geche, "Learning Styles and Strategies of Ethiopian Secondary School Students in Learning Mathematics" (Master Thesis, University of South Africa, 2009), 80, http://hdl.handle.net/10500/3125.

Tuning Journal for Higher Education
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III. **Theoretical framework**

III.1. *Self-efficacy theory*

In an attempt to study and influence students' academic engagement, one could not think a better theory than Bandura's theory of self-efficacy as it is a well tested theory, suggests ways of improving educational practices and scores of researchers have also shown the effectiveness of the various intervention programs based on the theory.[21],[22],[23] The theory clearly articulates the constructs of self-efficacy and also posits how self-efficacy could be formed and modified in a classroom level. According to self efficacy theory, students' self-efficacy is developed as students interpret their exposure with respect to mastery experiences, vicarious experiences, verbal persuasion and physiological and emotional arousal.[24],[25]

Performance/mastery accomplishment is the experience students perceived from a specific activity in the past; and successful performance of the activity enhances a sense of self-efficacy while unsuccessful accomplishments wakened the formation of self-efficacy belief.[26],[27] Performance experience is the very important aspect of self-efficacy belief and contributes a lot for students' self-efficacy belief and academic achievements. If students have a history of good performance in a certain subject, then they will develop belief that they will be a good performer in that particular subject in the future.[28],[29] Performance experiences could be enhanced in the classroom by breaking complex behavior to small achievable goals; establishing small goals; making an individual's effort and recording progress with a calendar.[30]

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[21] Artino Anthony, "Academic Self-Efficacy: From Educational Theory to Instructional Practice," *Journal of Perspectives on Medical Education* 1, no. 2 (2012): 81, doi: 10.1007/s40037-012-0012-5.

[22] Ellen L. Usher and Frank Pajares, "Sources of Academic and Self-Regulatory Efficacy Beliefs of Entering Middle School Students," *Contemporary Educational Psychology 31, (2006):* 125, doi:10.1016/j.cedpsych.2005.03.002.

[23] Mart van Dinther, Filip Dochy and Mien Segers, "Factors affecting students' self-efficacy in higher education," *Educational Research Review* 6, no. 2 (2011): 104, doi:10.1016/j.edurev.2010.10.003.

[24] Zeldin, Britner, and Pajares, "A Comparative Study," 1037.

[25] Barry J. Zimmerman, "Self-Efficacy: An Essential Motive to Learn," *Contemporary Educational Psychology* 25 (2000): 88, doi:10.1006/ceps.1999.1016.

[26] Zeldin, Britner, and Pajares, "A Comparative Study," 1037.

[27] Zimmerman, "Self-Efficacy: An Essential Motive to Learn," 88.

[28] Usher and Pajares, "Sources of Self-Efficacy in Mathematics," 100.

[29] Zeldin, Britner and Pajares, "A Comparative," 1037.

[30] Siegle and McCoach, "Increasing Student Mathematics Self-Efficacy," 284.

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The other source of self-efficacy belief is vicarious experiences. Vicarious experiences serve as an important function as a role model in which observing a student succeeded or failed in a particular subject could likely alter other students' self-efficacy beliefs in that particular subject.[31] Usher and Pajares state that if students observe a classmate succeed in a challenging mathematics problem, for example, they would be likely convinced that they could also master the challenging task.[32]

Verbal persuasion which includes encouragement from parents, teachers, and peers is one sources of self-efficacy-belief; and the physiological arousal that includes anxiety, stress, fatigue, and mood is also other sources of self-efficacy-belief. Encouragement from parents, teachers, and peers whom students trust can boost students' confidence in their academic capabilities; and also promoting students' positive emotional state and reducing negative emotional experiences strengthens self-efficacy.[33] However, various research works have shown that these two sources of self-efficacy belief contribute the least to self-efficacy belief formation.[34]

III.2. *Intervention packages*

Various research works have shown that teachers could cultivate and promote students' self-efficacy and academic achievements based on four sources of self-efficacy belief.[35],[36],[37],[38] In the process of modifying students' sense of self-efficacy belief and academic achievements, instructors could integrate the usual method of instruction with self efficacy enhancement strategy.[39] Brewer writes as follow how to integrate an innovative pedagogy with the existing traditional instruction:

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[31] Zeldin, Britner and Pajares, "A Comparative Study of the Self- Efficacy," 1037.

[32] Usher and Pajares, "Sources of Self-Efficacy in Mathematics," 89.

[33] Ibid., 90.

[34] Zeldin, Britner and Pajares, "A Comparative Study of the Self- Efficacy," 1037.

[35] Usher and Pajares, "Sources of Self-Efficacy in Mathematics," 100.

[36] Siegle and McCoach, "Increasing Student Mathematics Self-Efficacy," 280.

[37] C.W.Loo and J.L.F. Choy, "Sources of Self-Efficacy Influencing Academic Performance of Engineering Students," *American Journal of Educational Research* 1, no. 3 (2013): *91* DOI:10.12691/education-1.

[38] Meera K.P. and Jumana M. K "Self-Efficacy and Academic Performance In English" *Imperial Journal of Interdisciplinary Research*, 2, no. 2 (2016): 83. ISSN: 2454-1362, http://www.onlinejournal.in

[39] Zeldin, Britner, and Pajares, "A Comparative Study of the Self-Efficacy," 1054.

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> The traditional framework of most college algebra classes includes lectures provided by the instructor and homework completed by the student. If effective pedagogical changes made that fit within this traditional lecture-based framework then it is more likely that these changes will be accepted and consistently used by the collegiate mathematics education community.[40]

Consequently, we develop an innovative classroom based strategy that could enhance students' self efficacy belief and academic achievements in mathematics. It is innovative because we align the self-efficacy enhancement strategy with lecturing and implement the intervention regularly during instruction. The innovative classroom based strategy is basically adapted from Bandura's theory of self-efficacy and existing literatures.[41] There are lots of practical and theoretical evidences that show the effectiveness of the innovative classroom based strategy in influencing students' self-efficacy belief and academic achievements in mathematics.[42],[43]

We hypothesize that a combination of the innovative classroom based strategy with the traditional instruction is likely to have an influence in students' academic achievements and self-efficacy belief in math II as depicted in figure 1.

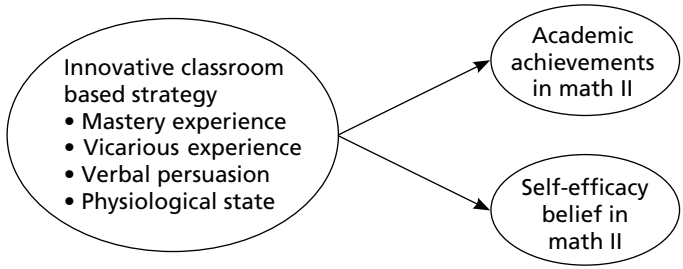

Figure 1

Schematic diagram of the innovative classroom based strategy and proposed influence on students' academic achievements and self-efficacy belief in math II

[40] David, Shane Brewer, "The Effects of Online Homework on Achievement and Self-efficacy of College Algebra Students" (Dissertations Thesis, Utah State University, 2009), 2, Paper 407, http://digitalcommons.usu.edu/etd/407.

[41] Siegle and McCoach, "Increasing Student Mathematics Self-Efficacy," 283.

[42] Usher and Pajares, "Sources of Academic and Self-Regulatory Efficacy Beliefs,'' 140.

[43] Siegle and McCoach, "Increasing Student Mathematics Self-Efficacy," 306.

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Instructors implement the innovative classroom based strategy along with the daily traditional instruction in mathematics. The elements of the innovative classroom based strategy are depicted in table 1.

Table 1

Elements of the innovative classroom based strategy

Strategies	When to implement
Strategy 1: Mastery experience	
Starting the lesson with a review	beginning of lesson
Posting the daily lesson objective or shared them with the student	beginning of lesson
Reviewing and checking objectives achieved	at the end of the lesson
Asking students to record each day on a calendar something new they learned	at the end of the lesson
Reinforcing students (could be privately or in group) on the objectives they had mastered	always, during or after lesson
Writing a specific feedback on assignment, class work	always, during or after lesson
Prompting students who perform poorly to attribute their failures to lack of effort	always, during or after lesson
Completing accomplishment plan by setting up small goals and proceed to difficult ones	always, during or after lesson
Helping students to record goals achieved for the accomplishment plan	always, during or after lesson
Reviewing student's accomplishment plan	all the time
Strategy 2: Vicarious experiences	
Peer modeling	beginning of the intervention
Strategy 3: Verbal persuasion	
Encouraging students' performance or ability to perform	all the time
Orienting students continuously they could master applied II with an effort	all the time
Strategy 4: Emotional arousal	
Comforting students during exercise, exam, telling them the type of exam	Whenever there is exercise, test

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IV. **Methodology**

IV.1. *Design of the intervention phase*

An explanatory sequential mixed methods design was used as indicated in figure 2. First, a quasi-experimental design was used followed by a qualitative method. The quasi-experimental design was chosen because it was not possible to randomly assign students to either the treatment or the control group as the group (classroom) was already formed.[44] Researchers in the area of self-efficacy suggest that a quantitative study should be complemented by qualitative inquiry to get additional information.[45] Thus, we conducted FGDs with some students of experimental group at the conclusion of the intervention to document their experience in applied math II before the intervention, change in self-efficacy, academic achievements, positive and negative aspect of the intervention. The study was conducted over four week periods in the second semester of 2015/16 academic year, in 123 (90 males, 33 females) first year engineering students, Institute of Technology, Jimma University, Ethiopia.

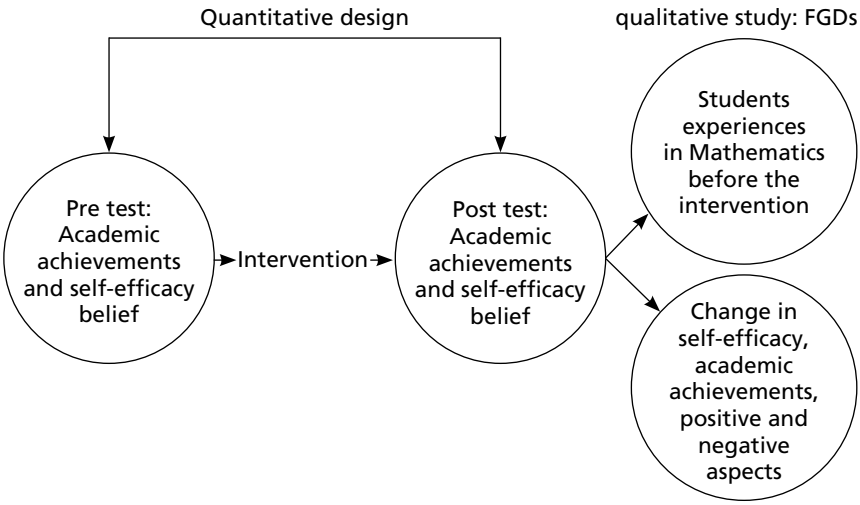

Figure 2

Explanatory sequential mixed methods design

[44] John W. Creswell, *Educational Research: Planning, Conducting, and Evaluatin Quantitative and Qualitative Research* (Boston: Pearson,2012), 309.

[45] Zeldin, Britner, and Pajares, "A Comparative Study of the Self-Efficacy," 1037.

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IV.2. *Instruments*

Self-efficacy belief: A scale on self-efficacy measure was used to measure students' level of self-efficacy belief in mathematics before and after the experiment. The self-efficacy scale contains 14 items which was adapted to suit mathematics self-efficacy for college students. Students rate each item on a five point scale (1-Never; 2-Seldom; 3-Sometimes; 4-Often; 5-Usually). As an example, *'I feel confident to ask questions in my applied mathematics class', 'I believe I can do well on applied mathematics test' and 'I believe I can understand the content in applied mathematics course'* were some of the items included in the self-efficacy scale.[46] The psychometric qualities of the self-efficacy were checked taking 25 first year material engineering students from Jimma University, Technology Institute. The Chronbach alpha (α level) inter item reliability estimate was .961.

Mathematics Achievement II: Mathematics achievement was operationalized as a numerical grade students received on mid and final exams of applied math II. The academic achievement tests were developed in relation with the course outline of applied mathematics II by the classroom teacher. Students' score in the mid exam was served as a pretest and the final exam was served as a post test. The psychometric quality, especially the content validity of the exams, was checked.

Intervention Package: An intervention package was adapted, piloted and used for the study. The intervention package was tried out in first year material engineering students. We learnt from the pilot test the intervention packages could be implemented in a classroom with some preparation. Some strategies were excluded from the final intervention. For instance, peer modeling by senior students was excluded as it was difficult to arrange.

FGDs: Students' experiences in mathematics before and after the intervention and possible changes in self-efficacy and academic achievements as result of the intervention, positive and negative aspect of the intervention were probed.

IV.3. *Procedures*

First, among applied mathematics course instructors who were offering the applied mathematics II in the 2015/16 in Jimma University, Institute of Technology, one instructor was selected. The criteria for the selection was

[46] May, "Mathematics Self-Efficacy and Anxiety Questionnaire," 72.

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teaching at least two sections as they serve as the control and experimental groups, had some training on method of teaching and experienced in teaching applied mathematics II. Students of one department were assigned in a control group while students of the other department were assigned in the experimental group randomly.

Then, orientation to the selected instructor was given for about an hour by the investigators on how to go about the whole experiment. Specifically, detailed orientation was given with the help of an intervention guideline. The orientation was focused on how to do each component of the intervention packages, when to do the various components and also how to effectively engage students in the some component of the strategy. Moreover, the instructor was told to register the strengths, weaknesses, unusual or unexpected circumstances during the intervention and write any comments of the experiment on the prepared guidelines throughout the intervention phase. Each day the instructor recorded the self-efficacy strategies implemented during the instruction in a checklist. The instructor also oriented how to engage students effectively in mathematics instruction with the help of student accomplishment plan and a calendar. The orientation was focused on how students should use the plan and the calendar in applied math II.

At the onset of the experiment, students were given a brief description of the procedure and asked whether they were willing to participate and no one refused. Then, a pre test was conducted and compared to see whether the experimental and control group were equivalents on their level of mathematics self-efficacy scores and on their midterm exam achievements on applied math II. With this the researchers checked the equivalence of the two groups on self-efficacy measure and academic achievements scores at the onset.

There were 63 students in the experimental group and 60 students in the control group. Students in the experimental group were taught applied math II with instructional strategies containing self-efficacy intervention management for about 4 weeks (3 hours per week) by the classroom teacher while students in the control group were taught with the usual instruction. The actual implementation of the mastery, vicarious, verbal and emotional experiences were 86%, 100%, 93% and 86% as depicted in table 2, respectively.

Then, a self-efficacy scale similar to the pre test and a final exam on applied mathematics II were administered for the experimental and control groups at the conclusion of the intervention. Finally, experimental group's self-efficacy and academic achievement scores in applied math II were compared to the control group. Moreover, FGD with students was conducted to secure additional information on changes of self-efficacy belief, academic achievements and the whole process of the intervention.

Table 2

Actual performance of the intervention packages

Strategies	Week 1		Week 2		Week 3		Week 4	Achieved (%)
	1st class	2nd class	1st class	2nd class	1st class	2nd class	1st class	
Strategy 1 (Mastery experiences)								
Starting the lesson with a review	x	x	x	x	x	x	x	100%
Posting the daily lesson objective	x	x	x	x	x	x	x	100%
Reviewing and checking objectives	x	x	x	x	x	x	x	100%
Asking students to record each day on a calendar something new they learned	x	x	x	x	x	x	x	100%
Reinforcing students (could be privately or in group)		x	x			x	x	71%
Writing a specific feedback on assignment, class work	x	x		x	x		x	71%
Prompting students who perform poorly to attribute their failures to lack of effort	x	x	x		x	x	x	86%
Completing accomplishment plan	x	x	x	x	x	x	x	100%
Helping students to record goals achieved					x	x	x	29%
Reviewing student's accomplishment plan	x	x	x	x	x	x	x	100%
Strategy 2 (Vicarious experiences)								
Peer modelling	x							100%

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Strategies	Week 1		Week 2		Week 3		Week 4	Achieved (%)
	1st class	2nd class	1st class	2nd class	1st class	2nd class	1st class	
Strategy 3 (Verbal persuasion)								
Encouraging pertaining to students' performance	x	x	x	x	x	x	x	100%
Orienting students continuously that they could master applied II with an effort		x	x	x	x	x	x	86%
Strategy 4 (Emotional arousal)								
Comforting students during exercise, exam	x		x	x	x	x	x	86%

IV.4. *Analysis*

IV.4.1. Quantitative Analysis

Mean and independent t test were used to check differences on mathematics self-efficacy and academic achievement scores of applied Mathematics II between the control and experimental groups before and after the intervention. A two tail t test with .05 α level was used.

IV.4.2. Qualitative analysis

Qualitative data analysis was conducted by transcribing and coding key data elements. Then, codes were merged to thematic areas.

IV.5. *Ethical Considerations*

Permission was obtained from each participant. The aim of the study was explained to the respondents and confidentiality was assured using code instead of names throughout the research.

V. **Results**

60(48 males, 12 females) and 63(42 males, 21 females) students participated in the control and experimental group, respectively. The mean age of the participants was 19.47 with a standard deviation of 1.28.

V.1. *Difference on self-efficacy scores between the experimental and control groups before the intervention*

The mean score on self-efficacy belief in mathematics for the experimental group was 3.62 with a standard deviation of .81 while the mean score on self-efficacy belief in mathematics for the control group was 3.58 with a standard deviation of .77.We run independent t test to check the observed differences on measure of self-efficacy belief in mathematics between the control and experimental group were statistically significant. The Shapiro-Wilk test indicated that the assumption of normality was met for the experimental (statistic = .978, df = 47, p = .508) and the control (statistic = .984, df = 43, p = .813) groups. The independent sample t test indicated there was no statistically significant mean differences in the two groups on mean scores of self-efficacy belief in mathematics (t = .252, df = 88, p = .802).

Table 3

Mean scores on self-efficacy beliefs in mathematics between the experimental and control groups before the intervention

Groups	$\bar{X}$	SD	df	t	P
Experimental group	3.62	.811	85	.252	.802
Control group	3.58	.773			

V.2. *Differences on self-efficacy scores between the experimental and control groups after the intervention*

The mean scores on self-efficacy belief in mathematics for the experimental group was 3.67 with a standard deviation of .663 while the mean score for self-efficacy belief in mathematics for the control group was 3.57 with a standard deviation of .773. We conducted independent t test to check the observed differences on measure of self-efficacy belief in mathematics between the experimental and control groups were statistically

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significant. The Shapiro-Wilk test indicated that the assumption of normality was met for the experimental (statistic = .967, df = 44, p = .234) and the control (statistic = .984, df = 43, p = .813) groups. Though the experimental group scored higher than the control group on measure of self-efficacy belief in mathematics, the independent sample t test indicated there was no statistically significant mean differences between the experimental and the control groups (t = .626, df = 85, p = .553).

Thus we failed to reject H_o as students who received the treatment in experimental group did not exhibit a statistically significant mean difference on measure of self-efficacy beliefs in mathematics compared to students who were assigned in the control group (H_0: μ self-efficacy score for the experimental group = μ self-efficacy score for the control group).

Table 4

Mean score on self-efficacy belief in mathematics between the experimental and control groups after the intervention

Groups	$\bar{X}$	SD	df	t	P
Experimental group	3.67	.663	85	.626	.533
Control group	3.57	.773			

V.3. *Differences on academic achievements in applied math II between the experimental and control groups before the intervention*

The mean scores on academic performance in applied mathematics II for students of the experimental and control groups were computed before the intervention to check their equivalence. The mean academic performance (Mean = 13.06, Std. dev. = 6.485) of students in the experimental group was higher than the mean academic performance (Mean = 12.00, Std. dev. = 6.344) of the control group. We run independent t test to check the observed differences on mid academic performance of applied math II between the experimental and the control groups were statistically significant. The Shapiro-Wilk test indicated that the assumption of normality was met for the experimental (statistic = .090, df = 63, p = .200) and the control (statistic = .986, df = 60, p = .061) groups. The independent sample t test indicated there was not a statistically significant differences on mean scores of mid academic performances of applied math II (t = .905, df = 121, p = .336) between the experimental and the control groups. Prior to the intervention both groups of students had similar academic performances in applied mathematics II.

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Table 5

Mean scores on academic performances in applied mathematics II for the experimental and control groups before the intervention

Groups	$\bar{X}$	SD	df	t	P
Experimental group	13.06	6.485	121	.905	.336
Control group	12.00	6.345			

V.4. *Differences on academic achievements in applied math II between the experimental and control groups after the intervention*

The mean academic performance (Mean = 23.96, Std. dev. = 10.08) of students in the experimental group was higher than the mean academic performance (Mean = 18.19, Std. dev. = 13.06) of students who were assigned in the control group. The Shapiro-Wilk test indicated the assumption of normality was met for the experimental (statistic = .985, df = 63, p = .658) and the control (statistic = .964, df = 60, p = .132) groups on mean academic performance of applied math II. Then, we run independent t test to check the observed differences on mean academic performance of applied math II between the experimental and the control groups were statistically significant. The independent sample t test indicated there was statistically significant differences between the experimental and the control groups on mean academic performances of applied math II($t = 2.75$, df = 121, p = .007). The magnitude of the mean difference (MD = 5.77) between the two groups was medium ($\eta^2 = .4978$).

Thus, we rejected H_0 as students in the experimental group had a statistically significant mean differences in academic achievements in applied mathematics II compared to students who were assigned in the control group (H_0: μ academic performance for the experimental group = μ academic performance for the control group).

Table 6

Mean scores on academic performances in applied mathematics II for the experimental and control groups after the intervention

Groups	$\bar{X}$	SD	df	t	P
Experimental group	23.96	10.08	121	2.75	.007
Control group	18.19	13.06			

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The pre-test and pos-test mean scores on academic achievements in applied math II for the experimental and control groups were graphed as follow. As shown in the figure, the progress of the experiment and the control groups follow a different pattern. In this regard, it could be concluded that exposing students to the innovative classroom based strategy resulted in different effects of academic performances in applied mathematics II. More specifically, the experimental group had higher gains in terms of academic performance in applied mathematics II at the post test than the control group even though they were nearly equal at the pre test. This situation is illustrated in the graph below.

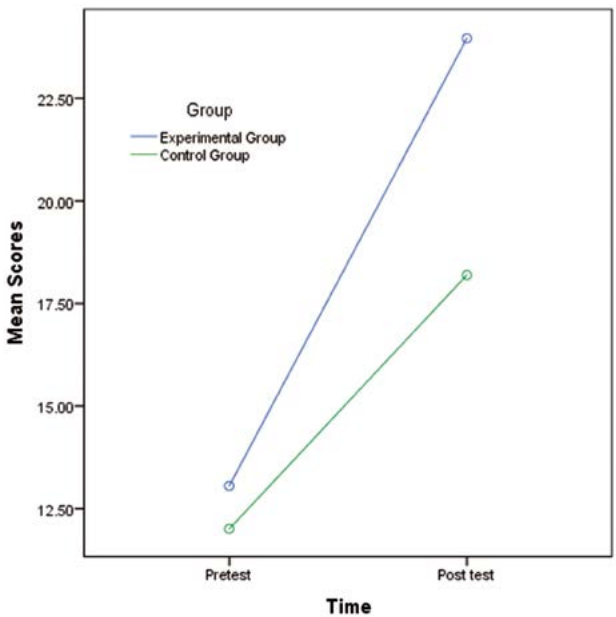

Figure 3

Pre test and pos test mean scores in academic achievement in applied math II for the experimental and control groups

V.5. *Refection of the classroom instructor*

The classroom instructor mentioned several improvements among students as a result of the intervention. The instructor mentioned different

things which were categorised under five themes: persistence, cooperation, content mastery, self regulation and efficacy belief. As indicated below, students have shown significant improvement on exerting effort, cooperating among each other, mastering of the content taught, utilising time effectively and self-efficacy belief in maths.

Table 7

Refection of the classroom instructor on the intervention

Theme	Element
Persistence/ Effort	• Working hard in the class • Attending class actively • Almost all students trying to solve a given problem • Participating actively • Increasing effort
Cooperation	• Helping each other while doing exercise • Trying to learn from each other
Content mastery	• Answering the question correctly • Attaining the daily objective • Doing the exercise correctly • Almost all understood the topic
Self regulation	• Utilizing the plan
Efficacy belief	• Developing the sense of 'I can do'

The classroom instructor pointed out some weaknesses of the intervention packages. He mentioned some challenges from student sides like not recording the daily work on accomplishment plan, refusing to receive help by peer and also there were some resistance to work in small groups at the beginning of the experiment. The classroom instructor also added that the intervention was too much to be completed with the given period. Eventually, students were acquainted with the intervention and as result most of the problems existed at the beginning of the experiment were less apparent towards the final session of the intervention, the classroom instructor said.

V.6. *Qualitative findings*

Focus Group Discussion (FGD) was carried with students of the experimental group. Various questions were presented for them as described below.

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The FGD discussants were presented with questions about their experiences in Mathematics. *The discussants said that they thought mathematics was a difficult subject. Some students also added that people around them told that math is a difficult subject to learn and also some of the discussants said that they love mathematics very much.*

Then the discussants were asked about whether their self-efficacy in math has increased, decreased, or remained unchanged as a result of the intervention. *Almost all of the discussants said that their confidence in math had improved. They added that they got confused initially; and as they went through the intervention they came to understand the procedure of the intervention. As one female student suggested students' accomplishment plan was very helpful for planning their time as per the activities covered in the class. In general, they said the intervention was important and should be extended to math I.*

Then the discussants were also asked about whether their academic achievements have increased, decreased, or remained unchanged as a result of the intervention. *Almost all the discussants said that their academic achievement had increased. They also added that the intervention was important in influencing their academic achievements as there were discussion with peer which immediately opens the door to clarify difficult contents and also timely feedback from the instructor was helpful to correct mistakes on time.*

Then the discussants were also asked about the positive aspects of the intervention. *The discussants said that the intervention was important to help one another and made them active. Moreover, one female student said that 'the accomplishment plan helped her a lot in attending the course attentively and budgeting her time appropriately'. They also said that they knew in detail what contents and objectives will be covered and also realized their strength and weaknesses on daily basis through the feedback given.*

The discussants were also asked about the negative aspects of the intervention and things that need improvement in the future. *The discussants said that it would have been better to start the intervention when the course had begun. And also it should be extended to applied math I.*

Finally the discussants were invited to forward suggestions and comments about the intervention. *The discussants said that the intervention should be continued as it is important to learn applied math effectively. And also they added that it should be extended to other departments in order to minimize number of students who get failed grade in applied math courses.*

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VI. **Discussions**

In this research, we attempted to modify the students' self-efficacy belief and academic achievements in applied math II through innovative classroom based strategy. To this end, students who received the treatment showed a significant improvement in their academic achievements consistent with the suggestions of some researchers[47],[48],[49] but inconsistent with other researcher.[50]

The most likely explanation for the improvement in students' academic achievements in the experimental group may be the result of the exposure to innovative classroom based strategy. Specifically, modeling, attribution feedback, positive emotional experiences, mastery experiences and goal setting whom students in the experimental group encountered could be responsible for differences in academic achievements. Attribution feedback given by teachers could change students' persistence, perseverance and perception in a way that mathematics could be mastered with effort and possibly this belief could result in improvement in academic achievements.[51] Similarly, the goals setting could have a substantial impact on monitoring progress and achievement; reiterating lesson objectives could help students to organize their learning and evaluate their progress and in turn enhance students' academic achievements.[52]

Contrary to our findings, some researchers did not find statistically significant differences between the experimental and control groups in academic achievements. The possible reasons for inconsistent findings might be the short span of the intervention to effect academic achievements differences or the differences on the content or domain of the intervention.[53]

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[47] Edgar Bresó, Wilmar B. Schaufeli, and Marisa Salanova,"Can a Self-Efficacy-Based Intervention Decrease Burnout, Increase Engagement, and Enhance Performance? A Quasi-Experimental Study,'' The international *Journal of Higher Education Research* 61, no. 4 (2010): 351, doi:10.1016/j.edurev.2010.10.003.

[48] Blake, M. E., Masten W. G., Henley, T. B. and Ball S. E., "Sources and Influence of Mathematics Self-Efficacy in Jamaican College Students," *Caribbean Journal of Psychology* 7, no. (2015): 40, Online ISSN 0799-2831.

[49] Naomi, B.A, "The relationship between self-efficacy and reading proficiency of first-year students: An exploratory Study," *Reading & Writing* 6, no. 1 (2015): 7, http://dx.doi.org/10.4102/ rw.v6i1.522015.

[50] Siegle and McCoach, "Increasing Student Mathematics Self-Efficacy through," 299.

[51] Zeldin, Britner and Pajares, "A Comparative Study," 1055.

[52] Siegle and McCoach, "Increasing Student Mathematics Self-Efficacy," 283.

[53] Ibid., 299.

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On the other hand, there were no statistically significant mean differences between the experimental and the control groups on mean score of self-efficacy belief though students in experimental group scored higher on measure of self-efficacy belief in applied math II compared to students who were assigned in the control group. This finding was inconsistent with the findings of other researchers.[54],[55] Majority of the interventions done with the tenet of self efficacy theory across several domains have shown the potential of the intervention strategy to influence students' self-efficacy.[56]

The possible explanation for the insignificant differences between the experimental and the control groups on mean score of self-efficacy beliefs on applied math II could lie on the duration of the intervention and the contents of the intervention packages. The intervention could have brought the desired change had it been implemented for a longer duration. In this research, the intervention was carried out for about four weeks due to limited resources. As a result, the intervention might not be able to bring the desired result. In this regard, the implementer of the intervention packages commented '*Had I started this on time, it would have been more fruitful*'. The other explanation could be students' failure to notice and report self-efficacy belief improvements as their attention could only be on mastering the academic tasks.[57]

VII. **Implications**

The objective of the study was to find out how an innovative classroom based strategy influences students' self-efficacy belief and academic achievements in applied math II.

The innovative classroom based strategy designed for the intervention group was effective in influencing students' academic achievement in applied math II. This finding could have a practical significance for classroom instruction. If instructors use the instructional strategies regularly such as reviewing of past lesson, communicating daily objectives, checking objectives achieved on daily basis, monitoring student progress, reinforcing student on objectives they had mastered, communicating feedback on assignment and class works, persuading students who perform poorly to

[54] Usher and Pajares, "Sources of Self-Efficacy in Mathematics," 100.
[55] Zeldin, Britner, and Pajares, "A Comparative Study," 1054.
[56] Dinther, Dochy, and Segers,"Factors affecting students' self-efficacy," 104.
[57] Siegle and McCoach, "Increasing Student Mathematics Self-Efficacy," 305.

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attribute their failures to lack of effort and encouraging them to try harder on daily basis, then students' academic performance will be enhanced.

VIII. **Future directions and limitations**

The innovative classroom based strategy designed for promoting students' self-efficacy belief and academic achievements in applied math II at a classroom could be taken as an important innovative pedagogy. However, the applicability and generalization of the intervention package should be tested in other departments of the Technology Institute at Jimma University and other Universities with rigorous design, longer duration and improved intervention packages based on the weaknesses suggested by the implementer.

Since we observed statistically significant mean differences on academic achievements between the experimental and the control groups, the findings could have practical significance in teaching applied math. We strongly recommend that workshops and seminars should be organized at Jimma University, Technology Institute, to train instructors on how to implement the innovative classroom based strategy.

Future research works should be conducted to investigate whether students' self-efficacy belief and academic achievements in math respond better to one source of self-efficacy intervention strategy than to the other and how the four sources of self-efficacy belief interact to influence self-efficacy belief and academic achievements in math. Moreover, a research work is needed with follow up component to ascertain whether the improvement shown in academic achievement in our study is sustained or not.

Though the study came up with important findings, it has some limitations and the findings of the study should be interpreted cautiously. One of the limitations of this study could be diffusion of treatment. Students in the experimental group may share some of the tasks of the intervention to the control group which could undoubtedly affect the internal validity of the research. Similarly, we used two existing classes of students and assign one as the experimental group and the other as a control group randomly. Such assignment may introduce threat to internal validity. Moreover, the intervention which was done in classroom setting under strict supervision of the instructor may limit the external validity of the research and conducting the intervention only in two departments could also limit the generalization of the study to other settings.[58]

[58] Creswell, *Educational Research,* 304.

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Bibliography

Anthony, Artiny. "Academic Self-Efficacy: From Educational Theory to Instructional Practice." *Journal of Perspectives on Medical Education* 1, no. 2 (2012):76-85. doi:10.1007/s40037-012-0012-5.

Bandura, Albert. "Social Cognitive Theory in Cultural Context." *Applied Psychology: An International Review* 51, no. 2 (2002): 269-290. doi: 10.1111/1464-0597.0009.

———. "Perceived Self-Efficacy in Cognitive Development and Functioning, Educational Psychologist." *Educational Psychologist* 28, no. 2 (1993): 117-148. doi: 10.1207/s15326985ep2802_3.

———. "Social Cognitive Theory."*In Annals of Child Development, edited by R. Vasta, Vol.6. Six theories of child development*. 1-60. Greenwich: CT: JAI Press, 1989:1-60.

Boakye, N.A. "The relationship between self-efficacy and reading proficiency of first-year students: An exploratory study", *Reading & Writing* 6 no. 1 (2015): 1-9. http://dx.doi.org/10.4102/ rw.v6i1.522015.

Brewer, David Shane. "The Effects of Online Homework on Achievement and Self-efficacy of College Algebra Students." Dissertations Thesis, Utah State University, 2009. Paper 407. http://digitalcommons.usu.edu/etd/407.

Creswell, J. W. *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*. Boston: Pearson, 2012.

Dinther, Mart van, Dochy Filip, and Segers Mien. "Factors Affecting Students' Self-Efficacy in Higher Education." *Educational Research Review* 6, no. 2 (2011): 95-108. doi:10.1016/j.edurev.2010.10.003.

Edgar, Bresó, Wilmar B. Schaufeli, and Marisa Salanova. "Can a Self-Efficacy-Based Intervention Decrease Burnout, Increase Engagement, and Enhance Performance? A Quasi-Experimental Study." *The International Journal of Higher Education Research* 61, no. 4 (2011): 339-355. doi:10.1007/s10734-010-9334-6.

Gebresilasse, A. and Abebe, K. "Gender, Self-Efficacy Belief, Sources of Self-Efficacy Associated to Academic Achievements in Applied Mathematics: The Case of First Year Engineering Students of South Western Universities of Ethiopia." *International Journal of Current Research* 8, no. 05 (2016): 30393-30400. http://www.journalcra.com/.

Geche Tesfaye, Jale."Learning Styles and Strategies of Ethiopian Secondary School Students in Learning Mathematics." Master Thesis, University of South Africa, 2009. http://hdl.handle.net/10500/3125.

Hassan Ahmed Elhassan Hamid, Alasmari Abdulaziz, and Ahmed,Eldood Yousif Eldood "Influences of Self-Efficacy as Predictors of Academic Achievement. A Case Study of Special Education Students- University of Jazan," I*nternational Journal of Education and Research* 3 no. 3 (2015): 275-284.

Hutchison M, A., Follman D. K., Sumpter M. G., and Bodner, G M. "Factors Influencing the Self-Efficacy Beliefs of First-Year Engineering Students." *Journal*

of Engineering Education 95, no. 1 (2006): 39-47. doi: 10.1002/j.2168-9830.2006.tb00876.x.

Loo, C., and Choy, J., "Sources of Self-Efficacy Influencing Academic, Performance of Engineering Students," *American Journal of Educational Research 1*, no. 3 (2013): 86-92. DOI:10.12691/education

Marion E. Blake, William G. Masten, Tracy B. Henley, Steven E. Ball, "Sources and Influence of Mathematics Self-Efficacy in Jamaican College Students" *Caribbean Journal of Psychology* 7, no. (2015): 24-42, Online ISSN 0799-2831

May, Diana, K., "Mathematics Self-Efficacy and Anxiety Questionnaire." PhD Dissertation University of Georgia, 2009. https://getd.libs.uga.edu/pdfs/may_diana_k_200908_phd.pdf.

Meera and Jumana "Self-Efficacy And Academic Performance In English" *Imperial Journal of Interdisciplinary Research*, 2, no. 2 (2016): 79-83, ISSN: 2454-1362, http://www.onlinejournal.in

Mwamwenda T. S. "Self-Efficacy and Performance in Mathematics at An African University." *The Journal of Independent Teaching and Learning* 4 (2009): 23-28. Long Island University, Global College, Durban, http://www.iie.ac.za/.

Pajares, Frank and Miller M. David. "Role of Self-Efficacy and Self-Concept Beliefs in Mathematical Problem Solving: A Path Analysis." *Journal of Educational Psychology* 86, no. 2 (1994):193- 203. http://www.cimm.ucr.ac.cr/.

Siegle, D., and McCoach, D. B. "Increasing Student Mathematics Self-Efficacy through Teacher." *Journal of Advanced Academics* Training 18, no. 2 (2007): 278-312. doi: 10.4219/jaa-2007-353.

Schoenfeld, A. H. "Learning to think mathematically: Problem solving, Metacognition, and Sense-making in Mathematics." In *Handbook for Research on Mathematics Teaching and Learning*, edited by D. Grouws, 334-370.New York: MacMillan, 1992.

Sewell, Alison, and St George Alison. "Developing efficacy beliefs in the classroom." *Journal of Educational Enquiry* 1, no. 2 (2000): 58-71.

Usher, Ellen L., and Pajares Frank."Sources of Self-efficacy in Mathematics: A Validation Study." *Contemporary Educational Psychology* 34, no. 1 (2009): 89-91. doi:10.1016/j.cedpsych.2008.09.002.

Usher, E. L., and Pajares, F. "Sources of Academic and Self-Regulatory Efficacy Beliefs of Entering Middle School Students." *Contemporary Educational Psychology* 31 (2006): 125-141. doi:10.1016/j.cedpsych.2005.03.002.

Zeldin, A. L., Britner S. L., and Pajares, F. "A Comparative Study of the Self-Efficacy of Successful Men and Women in Mathematics, Science And Technology Careers." *Journal of Research in Science and Teaching* 45, no. 9 (2008): 1036-1058. doi: 10.1002/tea.20195.

Zimmerman B. J. "Self-Efficacy: An Essential Motive to Learn." *Contemporary Educational Psychology* 25 (2000): 82-91. doi:10.1006/ceps.1999.1016.

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Work-related teaching and learning methods to foster generic skills in Higher Education. An Italian experience

Daniela Frison, Concetta Tino, Jonathan W. Tyner, and Monica Fedeli*

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Abstract: Within the framework of modernisation of higher education systems in Europe, universities are invited to go beyond a knowledge-based perspective focused on disciplinary approaches and to be more concentrated on encouraging generic skills to deal with today's complex and unpredictable career paths. The literature about Work-Related Learning and Work-Integrated Learning offers evidence to research regarding contributions of work-related experiences to the development of generic skills. The first part of the article presents a literature review carried out following the matching among three main keywords: work-related learning, generic skills, and higher education. Resources focused on the integration/ teaching of generic skills in formal curriculum or in co-curriculum work-related activities and they were collected in order to explore the link between work-related learning in higher education and the development of generic skills. The focus is to identify valuable considerations to improve teaching strategies and methods. The second part presents an Italian work-related experience developed within the course of "Organizational Intervention Research Methods," which involved 22 master's degree students. The work-related assignment will be described in addition to the content analysis process of the 22 collected texts and the findings about the development of generic skills.

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Keywords: work-related learning; generic skills; higher education; teaching and learning methods; university-business cooperation.

I. **Introduction**

Within the framework of modernisation of the European Higher Education system, universities are invited to go beyond a knowledge-based perspective focused on disciplinary approaches, and to encourage generic skills and creative learning outcomes such as complex thinking, social skills, participatory learning, and personal shaping of knowledge.[1] Furthermore, curricula should be developed through partnerships among teaching staff, students, graduates, and labour market actors in order to drawing on effective teaching and learning methods which could mend the gap between study and work.[2] European documents[3] suggest strategies and approaches such as dialogue and cooperation with companies and organizations, in order to expose teachers and learners to real life situations, challenges, and cases and offer students the opportunity to acquire relevant skills that enhance their employability.[4]

The focus on university-business dialogue and cooperation with the world of work,[5] in addition to teaching and learning methods, links the academic setting with a "real" environment, an authentic professional work setting that allows students to observe actual work occurring in a workplace. This "real" environment refers to what is mentioned in North American literature as *Work-Related Learning*[6] and in Australian literature as *Work-*

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[1] European Commission, *Modernisation of Higher Education, Report on Improving the quality of teaching and learning in Europe's higher education institutions* (Luxembourg: Publications Office of the European Union 2013), accessed July 22, 2016, http://ec.europa.eu/dgs/education_culture/repository/education/library/reports/modernisation_en.pdf.

[2] European Commission, *Modernisation of Higher Education*.

[3] Commission of the European Communities, *A new partnership for the modernisation of universities: the EU Forum for University Business Dialogue*, (2009), accessed July 22, 2016, http://ec.europa.eu/transparency/regdoc/recherche.cfm?C=it; European Commission, *Supporting growth and jobs — an agenda for the modernisation of Europe's higher education systems*, (2011), accessed July 22, 2016, http://ec.europa.eu/education/library/policy/modernisation_en.pdf; Technopolis, *Education in the Knowledge Triangle*, (2012), accessed July 22, 2016, http://www.mondragon.edu/en/international/files/OF%2035%201613%20Draft%20final%20report%20and%20case%20studies%20121025-1.pdf.

[4] European Commission, *Modernisation of Higher Education*.

[5] Commission of the European Communities, *A new partnership*.

[6] John M. Dirkx, "Work-Related Learning in the United States: Past Practices, Paradigm Shifts, and Policies of Partnerships," in *The Sage Handbook of Workplace Learning* (2011): 293-306.

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Integrated Learning.[7] Indeed, the two terms both concern the integration between educational experience (such as formal course) and practical one (such as work) in order to create meaningful benefits for students, organizations, and other stakeholders.

II. **Definition of terms**

A literature review based on 18 conceptual (7) and empirical (11) articles selected among 40 European, US, and Australian resources guided the research group to clarify terms, theoretical orientations, and practical implications about work-related teaching and learning methods to improve generic skills.[8] The articles have been selected according to the matching among three main key words: work-related (or integrated) learning, generic (or soft) skills, and higher education. Using these criteria, resources were collected on the integration/teaching of generic skills in formal curriculum or in co-curriculum work-related activities in order to explore the link between work-related learning in higher education and the development of generic skills as well as to identify valuable considerations to improve teaching strategies and methods in the formal setting. In this way, the research group has excluded papers related to workplace or work-based learning, more focused on informal and non-formal learning and on activities outside the academic setting which are carried out into the workplace (internship, service learning, etc.). Suitable literature was identified using Google Scholar and relevant databases were searched by using the AIRE (Integrated Access to Electronic Resources) Portal of the Padua University in order to retrieve electronic resources from the University Library System.

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[7] Indra Abeysekera, "Issues relating to designing a Work-Integrated Learning (WIL) program in an undergraduate accounting degree program and its implications for the curriculum," *Asia-Pacific Journal of Cooperative Education* 7, no. 1 (2006): 7-15; Lesley Cooper, Janice Orrell, and Margaret Bowden, *Work integrated learning: A guide to effective practice* (Routledge, 2010); Phil Gardner and Kenneth R. Bartkus, "What's in a name? A reference guide to work-education experiences," *Asia-Pacific Journal of Cooperative Education* 15, no. 1 (2014): 37-54.

[8] Daniela Frison, "Esperienza e apprendimento: verso una didattica work-related", in *Coinvolgere per apprendere. Metodi e tecniche partecipative per la formazione* ed. Fedeli Monica, Grion Valentina and Frison Daniela (Lecce: Pensa Multimedia, 2016); Daniela Frison, Monica Fedeli, and Edward W. Taylor, "Work-Related Learning: a survey on Teaching and Learning Methods in the Italian Higher Education System," *ICERI 2015 Proceedings* (2015): 8393-8401.

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First, the collected resources provide different definitions in order to clarify the term *Work-Related Learning* (WRL). For example, Coll and colleagues[9] define *Work-Integrated Learning* (WIL), more used in the Australian context, as "an educational strategy in which students undergo conventional academic learning within an educational institution and combine this with some time spent in a workplace relevant to their program of study and career aims". Beyond this focus, McLennan & Keating[10] underline that WIL is a teaching and learning approach that, "has the potential to provide a rich, active and contextualized learning experience for students which contributes to their engagement in learning". Around these aims, Gardner and Bartkus have mapped a variety of alternative names that have been developed to refer to the integration between formal context and workplace:[11] *Cooperative and Work-Integrated Education* includes community/service focus (service learning, cooperative education, and community-based learning)[12]; *Career and Technical Education*, more used in US and Canada, identifies instruction aims heading at developing core workplace competences and specific skills in different occupational areas[13] and finally *Experiential Education* takes students into the community.[14]

Furthermore, in the North American context, Dirkx[15] extensively defines Work-Related Learning as learning which occurs "in educational preparation programs apart from the workplace, in formal and informal learning within the workplace, and in continuing education and professional development programs offered outside of the workplace".

As anticipated, under this wider definition, the research group has focused its attention specifically on the academic setting and work-related strategies such as approaches and methods that are integrated into the curriculum.

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[9] Richard K. Coll et al., "Putting the 'integrated' in work-integrated learning," *World Association of Co-operative Education Asia Pacific 2008 Conference: Work Integrated Learning (WIL): Transforming Futures, Practice… Pedagogy… Partnerships*, (2008): 112.

[10] Belinda McLennan and Shay Keating, "Work-integrated learning (WIL) in Australian universities: The challenges of mainstreaming WIL," *ALTC NAGCAS National Symposium*, (2008): 4.

[11] Gardner and Bartkus, "What's in a name?".

[12] Richard K. Coll and Karsten E. Zegwaard, "Perceptions of desirable graduate competencies for science and technology new graduates," *Research in Science & Technological Education* 24, no. 1 (2006): 29-58.

[13] John L. Scott and Michelle Sarkees-Wircenski, *Overview of Vocational and Applied Technology Education* (Homewood Illinois: American Technical Publishers, 2004).

[14] Janet Eyler, "The power of experiential education," *Liberal Education* 95, no. 4 (2009).

[15] Dirkx, "Work-Related Learning," 294.

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Starting from this analysis orientation, a specific focus has been devoted to the link between WRL (or WIL) and generic skills. Indeed, the development of generic skills is recognized among the main goals of WRL/WIL experiences.[16] In their research, Freudenberg, Brimble, and Cameron propose a Professional Development Program (PDP) in order to encourage knowledge and skill areas as "social interaction (networking), self-management (time-management, personal planning), learning and adaptability, problem-solving, conceptualize and analyse, work in teams, speak to an audience (to prepare a presentation), search for information (read databases, surf the net), write essays (or a CV, a letter of presentation), and the ability to identify and define professional goals (understand the different roles and the needs of the organizations)".[17] Also Coll and colleagues highlight that a key purpose of WIL is to provide graduates with a skill set coherent with the request of potential employers.[18] Despite this emphasized focus on the link between work-related activities and the improvement of generic skills, literature on the topic underlines the difficulty for Higher Education systems to provide students with workplace skills, especially the generic ones.[19]

Concerning generic skills, De Villiers[20] underlines that it is not easy to define these skills because the definition and concept differs across discipline,

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[16] Atchison Mary et al., *Work integrated learning paper* (Melbourne: RMIT University, 2002); Coll, "Putting the 'integrated' in work-integrated learning"; Crebert Gay et al., "Developing generic skills at university, during work placement and in employment: graduates' perceptions," *Higher Education Research & Development* 23, no. 2 (2004): 147-165; Evelyn Shyamala Devadason, Thirunaukarasu Subramaniam, and Esther Gnanamalar Sarojini Daniel, "Final year undergraduates' perceptions of the integration of soft skills in the formal curriculum: a survey of Malaysian public universities," *Asia Pacific Education Review* 11, no. 3 (2010): 321-348; Brett Freudenberg, Mark Brimble, and Craig Cameron, "WIL and generic skill development: The development of business students' generic skills through work-integrated learning," *Asia-Pacific Journal of cooperative education* 12, no. 2 (2011): 79-93; Nava Subramaniam and Brett Freudenberg, "Preparing accounting students for success in the professional environment: Enhancing self-efficacy through a work integrated learning programme," *Asia-Pacific journal of cooperative education* 8, no. 1 (2007): 77-92.

[17] Freudenberg, Brimble, and Cameron, "WIL and generic skill development," 173.

[18] Coll et al., "Putting the 'integrated' in work-integrated learning."

[19] Noel Burchell, Dave Hodges, and L. Rainsbury, "What competencies do business graduates require? Perspectives of New Zealand stakeholders," *Journal of Cooperative Education* 35, no. 2-3 (2000): 11-20; Coll et al., "Putting the 'integrated' in work-integrated learning;" Coll and Zegwaard, "Perceptions of desirable graduate competencies."

[20] Rouxelle De Villiers, "The incorporation of soft skills into accounting curricula: preparing accounting graduates for their unpredictable futures," *Meditari Accountancy Research* 18, no. 2 (2010): 1-22.

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context, and sometimes country. Bennet and colleagues[21] define them as skills which "support any discipline (generic), and which can be transferred to a range of contexts, in higher education or the workplace". Generic skills are also defined as "those transferable skills which are essential for employability at some level for most"[22] and, as Bridgstock[23] affirms, these skills have also been defined as core skills, key competencies, transferable skills, or underpinning skills.

Several empirical researchers were aimed at collecting the employers' point of view[24] concerning both the definition and the different traits of generic skills or the students' workplace experiences.[25] Less empirical studies have been carried out in order to explore the integration of generic skills in the higher education setting. Concerning this issue, the research group mapped resources related to the development of generic skills by means of work-placement programs,[26] activities integrated into the curriculum,[27] and specific teaching and learning methods[28] across different

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[21] Neville Bennett, Elisabeth Dunne, and Clive Carré, "Patterns of core and generic skill provision in higher education," *Higher education* 37, no. 1 (1999): 71-93.

[22] Peter Kearns, *Generic Skills for the New Economy. Review of Research* (Leabrook: National Centre for Vocational Education Research, 2001).

[23] Ruth Bridgstock, "The graduate attributes we've overlooked: Enhancing graduate employability through career management skills," *Higher Education Research & Development* 28, no. 1 (2009): 31-44.

[24] Bridgstock, "The graduate attributes we've overlooked;" Melvin R. Weber et al., "An exploratory study identifying soft skill competencies in entry-level managers," *Tourism and hospitality Research* 9, no. 4 (2009): 353-361.

[25] Coll et al., "Putting the 'integrated' in work-integrated learning;" Sally Sambrook, "Factors influencing the context and process of work-related learning: Synthesizing findings from two research projects," *Human Resource Development International* 8, no. 1 (2005): 101-119.

[26] Crebert, "Developing generic skills at university."

[27] Devadason, Subramaniam, and Daniel, "Final year undergraduates' perceptions;" De Villiers, "The incorporation of soft skills into accounting curricula;" Ian Drummond, Iain Nixon, and John Wiltshire, "Personal transferable skills in higher education: The problems of implementing good practice," *Quality assurance in education* 6, no. 1 (1998): 19-27; Freudenberg, Brimble and Cameron, "WIL and generic skill development;" Roselina Shakir, "Soft skills at the Malaysian institutes of higher learning," *Asia Pacific Education Review* 10, no. 3 (2009): 309-315.

[28] James Cannan, "Practice based learning: exploring current models used for real world learning at a "dual sector tertiary institution," *WACE Asia Pacific Conference E-Proceedings* (2008); Coll et al., "Putting the 'integrated' in work-integrated learning"; Devadason, Subramaniam and Daniel, "Final year undergraduates' perceptions;" Freudenberg, Brimble and Cameron, "WIL and generic skill development;" Scott Lee, "A comparison of student perceptions of learning in their co-op and internship experiences and the classroom environment: A study of hospitality management students" (Diss., University of Central Florida Orlando,

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disciplinary sectors. For example, Dummond, Nixon, and Wiltshir[29] describe embedded or integrated development strategies where skills are "developed within the curriculum (randomly interspersed, core modules, mapped skills with no progression, mapped skills with progression, or project-based development)", whilst Devadason, Subramaniam, and Daniel[30] describe as "development of soft skills based on formal teaching and learning activities". Otherwise, generic skills could be improved by means of parallel (or stand-alone) development "in freestanding modules, which are not integrated into the curriculum".[31] These are also defined as "bolt-on" courses, such as "public speaking" or "critical thinking"[32] or co-curriculum programs that are especially conceived to improve generic skills.

Therefore, in this contribution the integration of generic skills in the curriculum becomes the joining link between WRL in the formal curriculum and teaching and learning activities.

Within this framework of WRL/WIL, the explored literature offers a wide variety of models and categorizations of generic (often mentioned as soft) skills in higher education programs. De Villiers[33] identifies two conceptual domains of necessary skills that are specific for business graduates and professionals at all levels: 1) technical skills and 2) the emotional intelligence. These skills include negotiation, diversity sensitivity, social complexity, social judgement, networking, flexibility and adaptability.

In the Malaysian higher education system, the generic skills include: communication skills in English, critical thinking and problem-solving, team-work, lifelong learning and information management, entrepreneurial skills, moral and professional ethics, and leadership.[34]

Other generic skills categorizations are included in wider models related to graduates' attributes and work-readiness. This is the case of the conceptual model of graduate attributes for employability developed by Bridgstock[35] and referring to: career management skills composed by self-management skills and career building skills, discipline-specific skills, originated in

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Florida, 2006); Chynette Nealy, "Integrating soft skills through active learning in the management classroom," *Journal of College Teaching & Learning (TLC)* 2, no. 4 (2011): 1-6.

[29] Drummond, Nixon, and Wiltshire, "Personal transferable skills in higher education," 21.

[30] Devadason, Subramaniam, and Daniel, "Final year undergraduates' perceptions," 325.

[31] Drummond, Nixon, and Wiltshire, "Personal transferable skills in higher education," 21.

[32] Devadason, Subramaniam, and Daniel, "Final year undergraduates' perceptions."

[33] De Villiers, "The incorporation of soft skills into accounting curricula."

[34] Devadason, Subramaniam, and Daniel, "Final year undergraduates' perceptions;" Shakir, "Soft skills at the Malaysian institutes of higher learning."

[35] Bridgstock, "The graduate attributes we've overlooked."

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specific domains, disciplines or subject matter areas, generic skills, and underpinning traits and dispositions. Within this approach, Litchfield and Nettleton[36] propose a set of key graduate attribute descriptors including: global perspective, communication capacity, ability to work well in a team, ability to apply knowledge, and creative problem-solving and critical thinking skills.

Despite the richness of models and definitions, there is consistent lack of literature, methods, and instructional approaches for faculty to foster connections between higher education and the world of work in order to encourage generic skills and "work-readiness". Few methodological advices are available on how to develop work-related strategies in class and to promote connections between course contents and the related professions or support activities in cooperation with organizations in order to improve generic skills.

This study proposes a work-related activity specially designed to give students the opportunity to spend time in a "real" professional environment that is relevant to their study program and career aims by completing a particular assignment related to course contents. According to the literature mentioned earlier, the development of generic skills is recognized as one of the main goals of WRL activities, the research questions guiding the study was the following: 1) do students who are involved in the WR assignment recognize and reflect on the development of generic skills as an outcome for the WRL experience? And 2) according to the students' perspective, what are the generic skills encouraged by the specific WR proposed assignment?

III. **Methods**

The work-related assignment was designed and carried out during the Academic Year 2014/2015 within the course of "Organizational Intervention-Research Methods" (master study program in Lifelong and Continuing Education, University of Padua) in accordance with a company placed in the Italian Veneto territory.

22 Italian students (1 M and 21 F) attending the first year of the master program were involved in the study. The work-related (WR) assignment asked students to identify, in pairs (11 couples), the main values of the organizational culture of a company, starting from the observation of its

[36] Litchfield and Nettleton, "Work-ready wiki."

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spaces. As Merriam and Tisdell[37] underline, the observation of the physical setting focuses on these aspects: "what is the physical environment like? What is the context? What kinds of behaviours is the setting designed for? How is space allocated? What objects, resources, technologies are in the setting?". The hypothesis which guided the assignment was the following: the arrangement of spaces and the way of using them within a company are relevant indicators of the organizational values which inspire the behaviours of its actors and its organizational culture.[38] Collaboratively, teachers and organizational representatives (belonging to the Human Resources Department) arranged a 4 hours business visit in order to allow students to move within the company, observing inside and outside, architecture and interiors, through the means of a provided observation grid to carry out a structured observation of the physical environment.[39]

At the end of the company-visit experience, the 11 pairs of students were asked to complete two different tasks:

1. Working in pairs, they wrote a report concerning the observed organizational culture. The report was addressed to the Human Resources Department of the company. The pairs were invited to add, at the end of the report, an explanation about the strategy followed to manage the observation assignment from a methodological point of view (How? Alone or with the support of the colleague? Sharing with the colleague the observation strategy from the beginning or only at the end? Observing without the grid and using the grid at the end or using it from the beginning of the observation?).

2. At the end of the first in pairs section, each student wrote an individual text, based on her/his own personal reflections about the work-related experience. This individual reflection encouraged students to think about strengths, difficulties, challenges, and feelings related to the WR assignment and to focus on the personal management of the activity, once more from a methodological point of view.

This paper focuses on the content analysis of the pair and individual texts, submitted online by the students through the University Content Management System.

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[37] Sharan B. Merriam and Elizabeth J. Tisdell, *Qualitative research: A guide to design and implementation*(John Wiley & Sons, 2015), 141.

[38] Aberto Munari, "L'osservazione sistematica e strutturata della gestione degli spazi di un'organizzazione" (Unpublished manuscript, University of Padova, Italy, 2013).

[39] Munari, "L'osservazione sistematica e strutturata."

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IV. **Data Analysis and Findings**

The 22 collected individual texts and the 11 pair texts were analysed employing qualitative data analysis and the research software Atlas.ti 7.0. Texts were uploaded into the software as primary documents (PDocs) made up of two different Hermeneutic Units (HUs), a sort of containers of PDocs, quotations and codes. The first HU gathered 22 individual texts and the second one 11 collaborative reflective parts. The coding process was carried out through the assignment of pre-codes and codes to the texts and, further, through the aggregation in code families. The pre-codes were useful to identify the following categories, the codes, and the codes families, and to aggregate codes that could best explain and represent the investigated dimensions.

Through this process, the first HU generated 23 codes, from 103 total quotations focusing on generic skills referred by students in their personal texts. The codes were aggregated into the 7 following codes families referring to the literature analysis.

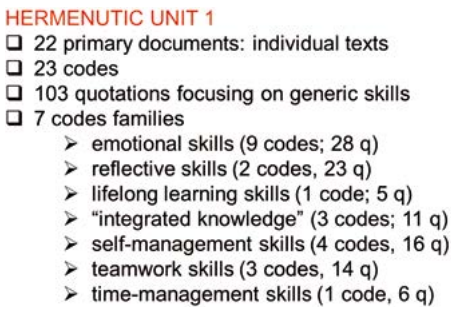

Figure 1

Hermeneutic Unit 1: code families, codes, quotations

First, we identified a category of generic skills referred to emotional intelligence mentioned by De Villiers.[40] We defined this first category as emotional skills (9 codes; 28 quotations), which referred to feelings and emotions related to the WR experience and its management by pairs of students. The students clearly exhibited emotions and the strategies in order

[40] De Villiers, "The incorporation of soft skills into accounting curricula."

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to help accommodate their needs while effectively carry out the assignment. According to the students' reflections, the WR activity was rich of emotions: positive ones (14 quotations), including excitement, astonishment to visit the organization, and curiosity, and negative ones (14 quotations), including anxiety and uncertainty. Students referred of an initial feeling of embarrassment and disorientation (8 quotations), worry, and anxiety (3 quotations), they mentioned also their effort to deal with this frustration, supported by the positive welcome of the company, the curiosity toward a new experience and the feeling to have the "opportunity" to observe a real environment.

A second category of skills is related to reflective skills[41] (2 codes, 23 quotations) which refers to reflections on the observation exercise (11 quotations) and on the learning experience in itself (12 quotations). For example, "I have reached a more aware, situated and internalized learning compared with theoretical learning", a student underlined. Another student highlighted, "we had the chance to enrich and improve our skills, without remaining closed in our own system of beliefs or usual patterns". Concerning the observation exercise, it emerged that the WR activity allowed students to reflect on the role of the observer and to go deeper in this process. The content analysis highlighted important references to emotions and feelings related to the interaction with a "real environment". Students seemed to overcome feeling of unfamiliarity and became comfortable with the organizational setting: anxiety and worry prevailed at the beginning of the experience. However, the reports referred that the students were able to pass this emotional obstacle by focusing on their own positive attitudes such as humility and curiosity. Some of the students expressed gratitude for being in a real work context as well as observing a real work setting during worktime.

A third category of generic skills is related to self-management skills[42] (4 codes, 16 quotations). In their reports, students underlined that the WR experiences encouraged self-management skills in terms of find strategies in order to be well informed about the company before their visit (4 quotations), organizing a way to gather data (7 quotations), identifying the best strategy to carry out the assignment (3 quotations), and, finally, being careful to not disturb the routine work (2 quotations). For example, one student specified

[41] Chris Eames and Beverley Bell, "Using sociocultural views of learning to investigate the enculturation of students into the scientific community through work placements," *Canadian Journal of Math, Science & Technology Education* 5, no. 1 (2005): 153-169.

[42] Freudenberg, Brimble, and Cameron, "WIL and generic skill development."

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his/her observation strategy: "I decided to photograph spaces and furniture, to focus on some details, but to continue to write down what most impressed me". Another student regarding his/her personal strategy stated "I decided to primarily take notes of my personal impression". A third student explained "I avoided interfering on what I observed, I just took pictures and notes, to respect people in the space". Indeed, students addressed a marked respect to the employees, focused on their daily work and made conscious decisions to intentionally not interfere with the routine of employees. This code was deeply associated with the code: strategy to gathered data. Overall, students adapted their data collection methods in order to be mindful and not disturb the "company life".

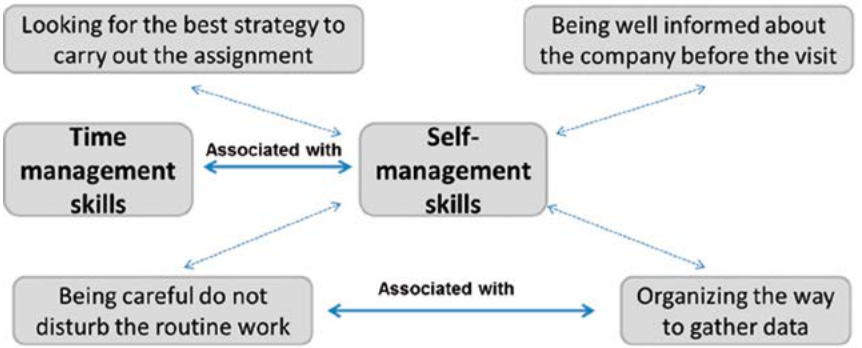

Figure 2
Code family "Self-management skills" and linked codes

A fourth code family referred to teamwork skills (3 codes, 14 quotations), another skill set underlined among the generic skills fostered by WRL activities. Students expressed different ways to manage the work in pairs referring to cooperation between the pair work (4 quotations), team decision making referring to the chosen strategy about how to observe, what and when (7 quotations), and sharing of information and observed elements useful to carry out the observation assignment (3 quotations). One student mentioned collaborating with a colleague in order to identify gaps in observations by stating, "during the observation we compared our work in order to integrate observed elements lost by one of us".

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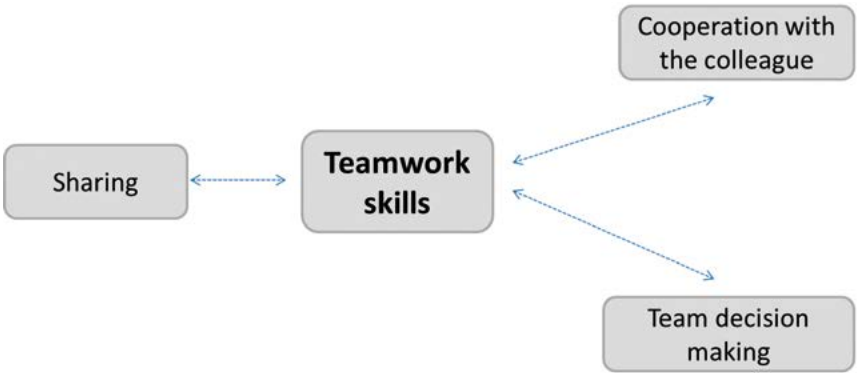

Figure 3
Code family "Teamwork skills" and linked codes

A fifth category of generic skills is "integrated knowledge" (3 codes; 11 quotations), which referred to the integration among theory and practice (7 quotations), and past and present learning (1 quotations). Students described the WR experience as a way to transfer theoretical contents in a professional context (3 quotations). A student expressed that, "it was, for me, a guided experience to learn and collect information from the setting, useful to become an educator". Another student mentioned, "I realized that having a critical ability of observation is an important skill for an educator". The content analysis underlined an association between the focus on the transferability of theoretical content in the workplace and the integration theory-practice.

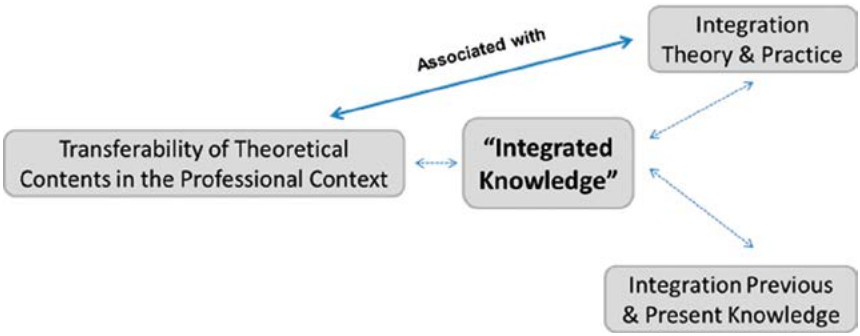

Figure 4
Code family "Integrated Knowledge" and linked codes

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The earlier mentioned self-management skills are strongly associated with a sixth skills family recognized by literature, the time-management skills[43] (1 code, 6 quotations), sometimes included within the self-management skills category, but also recognized independently. Since students addressed specific reflections to time-management skills, the research team decided to include them in a specific category. Students emphasized their efforts to handle time management constraints in order to complete their task and optimize, as much as possible, the time spent in the organizational environment. For instance, one student stated, "we optimized the timework and contributed to the written work in a productive way".

The last category referred to the lifelong learning skills (1 code; 5 quotations) concerning the willingness to learn.[44] Students described their attitude toward the WR activity highlighting their willingness to immerse themselves into the learning experience and to learn from it. One student stated: "I positioned myself in front of the people of the company like a person who needs to learn a lot of things and I actively listened to them".

In order to expand the analysis, we also took into account the 11 reports, written by each student pair, that focuses on the strategy to manage the observation assignment. This second HU generated 9 codes, from 91 total quotations devoted to generic skills referred by the student pairs.

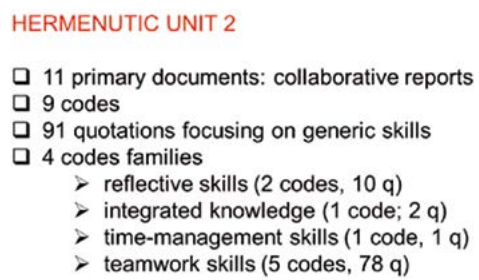

Figure 5

Hermeneutic Unit 2: code families, codes, quotations

Only four generic skill sets (code families) were mentioned by students in the collaborative part, the most part evidently related to teamwork skills.

[43] Coll and Zegwaard, "Perceptions of desirable graduate competencies."

[44] Devadason, Subramaniam, and Daniel, "Final year undergraduates' perceptions"; Shakir, "Soft skills at the Malaysian institutes of higher learning."

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First, the most mentioned skill set referred to teamwork skills (5 codes, 78 quotations). This collaborative section is strongly devoted to the strategy to work together in order to carry out the assignment in an effective way. In addition to the codes mentioned above (cooperation, team decision making and sharing), a new code appeared, that referred to the comparison (4 quotations) between the different observation strategies and data collection techniques that were chosen by the two members of the work-pair. In fact, the students compared their personal strategy in order to develop an effective way to collect data and carry out the observation exercise. It is interesting to mention that in the previous Hermeneutic Unit, the strategy to collect data was a personal choice and decision. On the other hand, in this second unit the code "organizing the way to gather data" referred to a joint decision between pairs of students and was included in the self-management skills family. Furthermore, the content analysis underlined a strongly association between the three codes: comparison, team decision making and, indeed, organizing the way to gather data.

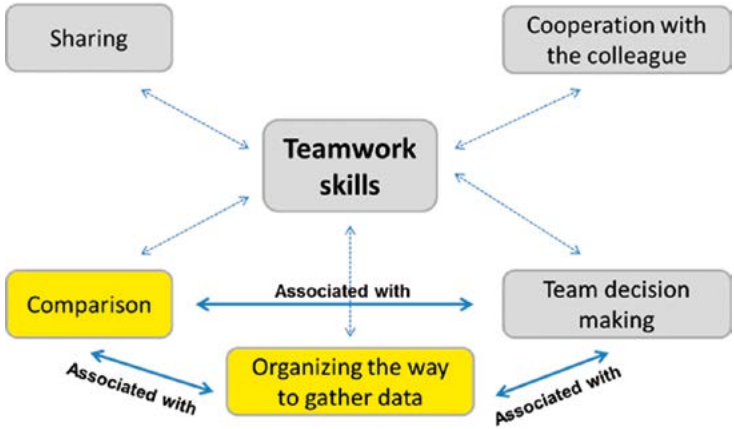

Figure 6

Code family "Teamwork skills" and linked codes

Second, students mentioned reflective skills (2 codes, 10 quotations). Once again, the students' reflections focused on the observation exercise (8 quotations) as well as on the learning experiences (2 quotations) as mentioned before concerning the individual texts.

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Third, students referred to what we early identified as "integrated knowledge" (1 code, 2 quotations). In this part of the report, students underlined the connection among theory and practice, but the reference to this "integration" is less evident in this part of the assignment. Furthermore, the code "integration between past and present learning", identified in the personal reflection, does not appear in this section.

Fourth, time management skills (1 code, 1 quotation) is the last identified family referring to the difficulty to deal with time constraints, but in this second Hermeneutic Unit, this code appears just once. It seems that time is perceived much more as a personal constraint rather than a pair constraint shared between student pairs.

V. **Theoretical Considerations and Recommendations for Practice**

As mentioned above, literature highlights the development of generic skills as one of the main results of WRL strategies and activities. The strong references to generic skills stated by the students involved in the presented WR assignment seems to agree with the literature analysis. Above all, students referred to the emotional, reflective, self-management, and teamwork skills. The content analysis highlights an important reference to emotions and feelings related to the contact with the "real environment".

Reflection emerged as a crucial skill that enables students to identify strengths, difficulties, and challenges of the WR assignment and to face with them. Reflection is central in order to connect theory and practice, understand the links between present and previous knowledge, that students made explicit in their individual texts (for example they mentioned theories and authors studied in previous courses). Self-management and teamwork skills set are as many represented in the content analysis.

The assignment was meant both as individual student and a pair student task. This required students, on one hand, to identify a personal work strategy and observation strategy while on the other hand, share and negotiate a collaborative way of working in order to produce a report that can be delivered to the company. The skill sets for students to work independently and collaborative focused on generic skills development including skills such as self-management and teamwork. However, it would be interesting to see if students develop these same generic skills without being exposed to the same crucial experience of interacting with a real company environment and real customers. In other words, does the experience gained by students working together in a collaborative observation process, where they interact

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with a real work environment with real customers and expectations to deliver a real output, foster the development of generic skills including, but not limited to, self-management and teamwork?

This study offers methodological considerations that can be used to design work-related activities that would foster the development of generic skills when implemented in an academic course.

First, adding a dimension of reality and concreteness to an assignment helps teachers to amplify the outcomes of the learning experience. Even if time spent in the professional context by the students is limited (here, we refer to a unique business visit), in this study the mentioned generic skills are the same usually reported by students involved in an internship or work-placement experience.

Second, to interact with a real customer (not only a real problem, as it occurs in problem-based learning assignment for example, but also a real customer to whom the reports were addressed) amplifies student engagement in this assignment exercise. The consequences of the work experience were not just a negative or positive grade. The consequences refer to the personal "reputation" of students in the professional network. A limitation in this assignment was the lack of opportunity for students to return the reports to company's representatives and receive face to face feedback. In other words, the students' outputs were sent to the Human Resources manager but students did not have the opportunity to receive personal feedback face to face after presenting their reports.

Third, a crucial role for students was being engaged in reflection. It would be possible to only ask students the results of the observation process (the values of the organizational culture "observed using the spaces observation grid) without a reflection on the process. In this study, it is evident that the references to generic skills emerge in the collaborative and individual reflective sections, not in the core part of the assignment referred to the observation of the physical company's setting and focused on the observation output.

Fifth, the arrangement of a work-related assignment asks teachers to take care of the partnership with organizations. Without a clear "contract" which defines tasks and responsibilities of the three implicated subjects — university/instructors, students, and organizations — the WR activities risk to fail without achieving formative objectives, neither for the academic side, nor for the organization.[45]

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[45] Frison, "Esperienza e apprendimento;" Frison, Fedeli and Taylor, "Work-Related Learning."

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Sixth, a crucial aspect of WR strategies is support. Students have to be supported and encouraged by both parties involved, the university and organization. Therefore, every WR activity must offer time and space of support, a sort of "help" service which welcomes administrative and organizational problems, offering a "learning guide" to the students to deal with critical situations. Reflective spaces and tools, monitoring meeting, and peer-tutoring meeting have this aim.[46] In this specific case, an online tutor supported students starting from the business visit day, to the final delivery of the output, facilitating the collaborative assignment process.

In the end, assessment and integration are two crucial aspects of WR strategies, and they must be considered within the curriculum. These dimensions open to new questions. For instance, how can teachers assess WR experiences? If not teachers, then who assesses these experiences? Should the university, the organization, or perhaps both collaborative assess WR experiences? Nevertheless, WRL is known to rely on the university for new assessment strategies more oriented to assess skills and competences rather than knowledge.[47]

VI. **Further Steps and Conclusions**

This study offers just a first exploration on how to encourage WR activities in order to foster generic skills and it highlights the crucial role of the company in carrying out of the assignment.

A further analysis is in progress, concerning the reflections offered by a new group of students involved in a similar observation exercise during the academic year 2015/2016. A new element was added: the Human Resources manager of the company (a new one, different from that one of the academic year 2014/2015) analysed the students' reports and provided in-depth feedback in person, during the final lesson. Furthermore, the students' analysis of the organizational values was shared within the company and communicated to the ownership. The collected data are going to be analysed and compared.

Furthermore, it would be interesting to compare the same assignment carried out without a "real" customer and a "real" workplace (for example

[46] Cooper, Orrell, and Bowden, "Work integrated learning;" Frison, Fedeli and Taylor, "Work-Related Learning;" Litchfield, Frawley, and Nettleton, "Work-ready wiki."

[47] Cooper, Orrell, and Bowden, *Work integrated learning*; Gardner and Bartkus, "What's in a name?".

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the observation of the academic spaces or other public space) in order to analyse if emotional, self-management, and teamwork skills are emphasized differently than in cases with a "real" customer and workplace.

In the end, this data will be valued to arrange a specific professional development path on work-related strategies in higher education, to encourage the proposal of work-related activities and assignments in classrooms, and to enhance teachers' recognition and appreciation for the centrality of generic skills during the academic experience.

Bibliography

Abeysekera, Indra. "Issues relating to designing a Work-Integrated Learning (WIL) program in an undergraduate accounting degree program and its implications for the curriculum." *Asia-Pacific Journal of Cooperative Education* 7, no. 1 (2006): 7-15.

Atchison, Mary, Sarah Pollock, Ern Reeders, and Janine Rizzetti. *Work integrated learning paper*. Melbourne: RMIT University (2002).

Bennett, Neville, Elisabeth Dunne, and Clive Carré. "Patterns of core and generic skill provision in higher education." *Higher education* 37, no. 1 (1999): 71-93.

Bridgstock, Ruth. "The graduate attributes we've overlooked: Enhancing graduate employability through career management skills." *Higher Education Research & Development* 28, no. 1 (2009): 31-44.

Burchell, Noel, Dave Hodges, and L. Rainsbury. "What competencies do business graduates require? Perspectives of New Zealand stakeholders." *Journal of Cooperative Education* 35, no. 2-3 (2000): 11-20.

Cannan, James. "Practice based learning: exploring current models used for real world learning at a "dual sector tertiary institution"." *WACE Asia Pacific Conference E-Proceedings* (2008): 91-97.

Commission of the European Communities. *A new partnership for the modernisation of universities: the EU Forum for University Business Dialogue,* 2009. Accessed July 22, 2016. http://ec.europa.eu/transparency/regdoc/recherche.cfm?C=it.

Coll, Richard K., Chris Eames, Levinia Paku, Mark Lay, Diana Ayling, Dave Hodges, Shiu Ram, Ravi Bhat, Jenny Fleming, Lesley Ferkins, Cindy Wiersma, and Andrew Martin. "Putting the 'integrated' in work-integrated learning." In *World Association of Co-operative Education Asia Pacific 2008 Conference: Work Integrated Learning (WIL): Transforming Futures, Practice…Pedagogy…Partnerships* (2008): 101-107.

Coll, Richard K., and Karsten E. Zegwaard. "Perceptions of desirable graduate competencies for science and technology new graduates." *Research in Science & Technological Education* 24, no. 1 (2006): 29-58.

Cooper, Lesley, Janice Orrell, and Margaret Bowden. *Work integrated learning: A guide to effective practice*. Routledge, 2010.

 ISSN: 2340-8170 • ISSN-e: 2386-3137. Volume 4, Issue No. 1, November 2016, 145-167
doi: http://dx.doi.org/10.18543/tjhe-4(1)-2016pp145-167 • http://www.tuningjournal.org/

Crebert, Gay, Merrelyn Bates, Barry Bell, Carol-Joy Patrick, and Vanda Cragnolini. "Developing generic skills at university, during work placement and in employment: graduates' perceptions." *Higher Education Research & Development* 23, no. 2 (2004): 147-165. http://dx.doi.org/10.1080/0729436042000206636

Devadason, Evelyn Shyamala, Thirunaukarasu Subramaniam, and Esther Gnanamalar Sarojini Daniel. "Final year undergraduates' perceptions of the integration of soft skills in the formal curriculum: a survey of Malaysian public universities." *Asia Pacific Education Review* 11, no. 3 (2010): 321-348.

De Villiers, Rouxelle. "The incorporation of soft skills into accounting curricula: preparing accounting graduates for their unpredictable futures." *Meditari Accountancy Research* 18, no. 2 (2010): 1-22.

Dirkx, John M. "Work-Related Learning in the United States: Past Practices, Paradigm Shifts, and Policies of Partnerships." *The Sage Handbook of Workplace Learning* (2011): 293-306.

Drummond, Ian, Iain Nixon, and John Wiltshire. "Personal transferable skills in higher education: The problems of implementing good practice." *Quality assurance in education* 6, no. 1 (1998): 19-27.

Eames, Chris, and Beverley Bell. "Using sociocultural views of learning to investigate the enculturation of students into the scientific community through work placements." *Canadian Journal of Math, Science & Technology Education* 5, no. 1 (2005): 153-169.

Eyler, Janet. "The power of experiential education." *Liberal Education* 95, no. 4 (2009): 24-31.

European Commission. *Supporting growth and jobs — an agenda for the modernisation of Europe's higher education systems,* 2011. Accessed July 22, 2016. http://ec.europa.eu/education/library/policy/modernisation_en.pdf.

———. *Modernisation of Higher Education. Report on Improving the quality of teaching and learning in Europe's higher education institutions*. Luxembourg: Publications Office of the European Union, 2013. Accessed July 22, 2016. http://ec.europa.eu/education/library/reports/modernisation_en.pdf.

Freudenberg, Brett, Mark Brimble, and Craig Cameron. "It's All about 'I': Implementing 'Integration' into a WIL Program." *eProceedings of the WACE Asia Pacific Conference*, 2009. Accessed July 22, 2016. http://acen.edu.au/resources/docs/WACE_ACEN_Asia_Pacific_Conference_2008_E-Proceedings-1.pdf#page=170.

———. "Where there is a WIL there is a way." *Higher Education Research & Development* 29, no. 5 (2010): 575-588.

———. "WIL and generic skill development: The development of business students' generic skills through work-integrated learning." *Asia-Pacific Journal of cooperative education* 12, no. 2 (2011): 79-93.

Frison, Daniela. "Esperienza e apprendimento: verso una didattica work-related". In *Coinvolgere per apprendere. Metodi e tecniche partecipative per la formazione,* edited by Monica Fedeli, Valentina Grion, and Daniela Frison, 259-288. Lecce: Pensa Multimedia, 2016.

Tuning Journal for Higher Education
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doi: http://dx.doi.org/10.18543/tjhe-4(1)-2016pp145-167 • http://www.tuningjournal.org/

Frison, Daniela, Monica Fedeli, and Edward W. Taylor. "Work-Related Learning: a survey on Teaching and Learning Methods in the Italian Higher Education System." *ICERI 2015 Proceedings*, (2015): 8393-8401.

Gardner, Phil, and Kenneth R. Bartkus. "What's in a name? A reference guide to work-education experiences." *Asia-Pacific Journal of Cooperative Education* 15, no. 1 (2014): 37-54.

Kearns, Peter. *Generic Skills for the New Economy. Review of Research*. Leabrook: National Centre for Vocational Education Research, 2001.

Lee, Scott. "A comparison of student perceptions of learning in their co-op and internship experiences and the classroom environment: A study of hospitality management students". Diss., University of Central Florida Orlando, Florida, 2006.

Litchfield, Andrew, and Nettleton Skye. "Work-ready wiki: Supporting the learning and teaching of professional graduate attributes." *Hello! Where are you in the landscape of educational technology? Proceedings of Ascilite Melbourne* (2008): 552-561.

Mayer, Eric. *Putting general education to work: The key competencies report*. Canberra: Australian Education Council and Ministers for Vocational Education, Employment and Training, 1992.

McLennan, Belinda, and Shay Keating. "Work-integrated learning (WIL) in Australian universities: The challenges of mainstreaming WIL." *ALTC NAGCAS National Symposium*, 2008. Accessed July 22, 2016. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.530.4443&rep=rep1&type=pdf

Merriam, Sharan B., and Elizabeth J. Tisdell. *Qualitative research: A guide to design and implementation*. John Wiley & Sons, 2015.

Munari, Aberto. "L'osservazione sistematica e strutturata della gestione degli spazi di un'organizzazione". Unpublished manuscript, University of Padova, Italy, 2013.

Nealy, Chynette. "Integrating soft skills through active learning in the management classroom." *Journal of College Teaching & Learning (TLC)* 2, no. 4 (2011): 1-6.

Sambrook, Sally. "Factors influencing the context and process of work-related learning: Synthesizing findings from two research projects." *Human Resource Development International* 8, no. 1 (2005): 101-119.

Scott, John L., and Michelle Sarkees-Wircenski. *Overview of Vocational and Applied Technology Education*. Homewood Illinois: American Technical Publishers, 2004.

Shakir, Roselina. "Soft skills at the Malaysian institutes of higher learning." *Asia Pacific Education Review* 10, no. 3 (2009): 309-315.

Subramaniam, Nava, and Brett Freudenberg. "Preparing accounting students for success in the professional environment: Enhancing self-efficacy through a work integrated learning programme." *Asia-Pacific journal of cooperative education* 8, no. 1 (2007): 77-92.

Technopolis. *Education in the Knowledge Triangle*, 2012. Accessed July 22, 2016. http://www.mondragon.edu/en/international/files/OF%2035%201613%20Draft%20final%20report%20and%20case%20studies%20121025-1.pdf.

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Weber, Melvin R., Dori A. Finley, Alleah Crawford, and David Rivera, Jr. "An exploratory study identifying soft skill competencies in entry-level managers." *Tourism and hospitality Research* 9, no. 4 (2009): 353-361.

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The need to enhance the employability competences (knowledge, skills, autonomy, and attitudes) of undergraduates in Agriculture. Evidence from students' perceptions and employers' expectations

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Abstract: The Faculty of Agriculture (FoA) (University of Mauritius) is the only tertiary Education Institution in the country providing graduate training in Agriculture with an annual enrolment of about 100-125 students. Although the relative contribution of the Agricultural sector to the economy has declined over the past decade — share to GDP: 3.0% in 2014 as compared to 6.4% in 2004[1] the introduction of new schemes in support of Bio- Farming, food processing and value-addition will attract new entrepreneurs to Agriculture. This transformation in the Agriculture sector will create new job opportunities, but has to leverage on skilled human capital. Graduates with good employability skills are of strategic importance to the FoA, in line with the government's vision to develop a knowledge-based economy. This study aimed at mapping out the set of skills, understandings and personal attributes that will increase the job prospects of the fresh graduate from FoA in Agriculture. The main research question centred on the perceptions of employers, alumni and students of the FoA, concerning the most relevant competences for the Subject Area (key general and key subject specific competences), understandings and personal attributes, which enhance

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[1] "Digest of Agricultural Statistics Mauritius," Ministry of Finance and Economic Development, http://statsmauritius.govmu.org/English/StatsbySubj/Documents/Digest/Digest%20of%20Agricultural%20Statistics%202014.pdf.

the employability of graduates in Agriculture. Using semi-structured interviews, the study explored and triangulated the perceptions from four key stakeholders' perspectives, namely: a range of employers, Industry Placement Supervisors, alumni of the FoA and current students. Both quantitative and qualitative insights of the perceptions on the employability skills of FoA undergraduates were obtained from a wide range of employers from the private and public sector. An analysis of data from the interviews and responses was carried out using SPSS. The key attributes that were valued by the key stakeholders have been used to inform the '*Employability Skills Subject Area Framework*', and the '*Curriculum Mapping'*, proposed for the degree of BSc (Hons) Agriscience and Technology of the FoA.

Keywords: undergraduate; agriculture; employability; generic and subject specific competences (knowledge, skills and autonomy and responsibility); curriculum mapping.

This work was carried out at the Faculty of Agriculture of the University of Mauritius, Mauritius. The authors would like to thank all the different employers in the Mauritian agricultural sector for their time and collaboration, as well as all the students (current and alumni) and staff who participated in the surveys.

I. **Introduction**

Education, worldwide, has known a lot of innovation, modernisation and has greatly evolved since time immemorial. All countries around the world have understood the importance of education for the development of a country, for the improvement of their Gross Domestic Product (GDP) and for value-addition to their own labour force. With the occurrence of competition for meritocracy in workplace, more and more students around the world are going for tertiary education. Thus, there has been a tremendous increase in the number of students leaving university with a degree, and with the emergence of these graduates, additional pressure is added on the government and the states to employ them. Recent studies by the World Bank show that the global employment rate has increased from 43% in 2005 to 63% in 2007. Even though unemployment scaled down by 7 points (around 9% in 2007), it remained nonetheless at a pre-occupying level towards the end of 2007: it still concerns about 29% of university graduates three years and a half after their graduation[2]

[2] World Bank, "Education, Quality and Economic Growth" (2007). http://siteresources.worldbank.org/EDUCATION/Resources/278200-1099079877269/547664-1099079934475/Edu_Quality_Economic_Growth.pdf.

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and almost 74 million people in the 15 to 24 age group unemployed around the world, translating into a 12.4 per cent unemployment rate for this subset.

I.1. *Rationale for the study*

The OECD[3] identifies four main ways in which tertiary education contributes to the social and economic development of a country. Firstly, value-addition to human capital through teaching; secondly, the use of research and the development of knowledge to build knowledge bases; thirdly, fostering interactions with knowledge users to disseminate and use knowledge; and fourthly, the maintenance of knowledge through inter-generational storage and the transmission of knowledge thereon. With increasing globalised competition for jobs and promotion of lifelong learning opportunities, it is important that Tertiary Education Institutions (TEIs) establish a closer link between learning opportunities and the employability skills and competences required in the workplace. Employability of a student leaving University with a degree should be a key preoccupation of TEIs the more so as the tertiary education sector is becoming a highly competitive one with students having the possibility to choose from the wide array of institutions both within a country and internationally. The advent of e-learning facilities offers even more opportunities for students to modulate their tertiary education according to their needs and preferences. It is therefore important that TEIs update the employability skills that are being transferred to students through their programmes of studies to be in line with the demand of the job market.

Therefore the general aim of this study is to assess the need of TEIs to enhance the employability skills of undergraduate students in the field of Agriculture based on what current and past students perceive to be important and the expectations of the current and potential employers. Degree programmes in Agriculture are designed to develop the competences required of graduates who will be involved in the management of agricultural enterprises, research and advisory work. Graduates from Agricultural degrees are expected to acquire a thorough understanding of crop and animal production techniques and of the underpinning scientific, economic and business principles for the production of safe food in a sustainable manner. Graduates in Agriculture will be able to identify and solve technological

[3] OECD, "Tertiary Education for the Knowledge Society: OECD Thematic Review of Tertiary Education: Synthesis Report" (2008), accessed August 11, 2016, http:// oecd-conference-teks.iscte.pt/downloads/OECD_overview.pdf.

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problems encountered in typical production systems, to evaluate new technologies and apply them to commercial practice, to manage an agribusiness, to respond to public concerns for safe food production practices and to evaluate the consequences of agriculture on the environment.

I.2. *The context of the study*

This study was conducted in the Republic of Mauritius, and most specifically on the main island Mauritius, a small island state located in the Indian Ocean and East of Madagascar with a current population of around 1.2 million inhabitants in December 2015.[4] The following sections provide a brief description of the job market in Mauritius as well as the role of Tertiary Education Institutions in providing graduates for the job market.

I.2.1. The job market in Mauritius

Mauritius became independent in 1968 and since then, the unemployment rate of the Mauritian population has been quite low, the highest rate of unemployment (19.70%) being recorded in 1983.[5] However, with the economic boom that was initiated with the tourism and textile industry, the unemployment rate declined to 2.70% in the 1990s.

Mauritius has been recently described as the emerging country of the Indian Ocean with the brightest future. Mauritius being a developing country has an unemployment rate of 7.8%, that is, about 16280 inhabitants are unemployed.[6] In order to decrease this unemployment rate, the Mauritian government has adopted the "YEP project" (Youth Employment Program). Hence in 2013, about 4000 youths were attributed a job in the private and the public sector as well. In addition, the Ministry of Finance aims at setting up a training program entitled "Service-focused employment preparation" that

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[4] "Digest of Agricultural Statistics Mauritius," Ministry of Finance and Economic Development, http://statsmauritius.govmu.org/English/StatsbySubj/Documents/Digest/Digest%20of%20Agricultural%20Statistics%202014.pdf.

[5] Central Statistics Office (Mauritius), "Mauritius in Figures," Ministry of Finance and Economic Development, http://statsmauritius.govmu.org/English/Publications/Documents/MIF/mif09.pdf

[6] "Statistics Mauritius", Ministry of Finance and Economic Development 2015, http://statsmauritius.govmu.org/English/StatsbySubj/Documents/Digest/Digest%20of%20Agricultural%20Statistics%202014.pdf.

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would improve the "soft skills" of unemployed youth to enable them to be more effective at work.

The Mauritian Agricultural sector represents 19% of employment of the country's population. The other sectors of the population are employed in the EPZ sector (33.9%), 12.6% in the manufacturing sector, 16.5% works in the tourism industry and 8.3% works in the financial services.[7]

I.2.2. The training role of Tertiary Education Institutions for the job market in Mauritius

The tertiary education landscape in Mauritius has witnessed major changes since its independence in 1968, when only the University of Mauritius was offering tertiary education. Today, there are 68 Tertiary Education Institutions operating in Mauritius. There are 10 publicly-funded Tertiary Education Institutions, including 4 universities and 6 institutions. Each has its own specificity, and offers programmes in diverse fields of study, ranging from Certificate to PhD level. In addition, 58 private tertiary institutions are registered locally and provide tertiary education. The awarding bodies of the private tertiary institutions are mostly based overseas. However, the University of Mauritius is the only Tertiary Education Institution in Mauritius offering undergraduate and postgraduate courses in Agriculture. The Faculty of Agriculture is the foundation Faculty of the University of Mauritius. It was originally founded as the College of Agriculture of the Ministry of Agriculture in 1914. In 2014, the Faculty has celebrated a century of teaching and training in the agricultural and food sectors in Mauritius.

At the end of 2013, 42,000 Mauritian students were enrolled in a study programme at tertiary level, out of which 55% were female students. The distribution of those students across different fields of study[8] were Education (8%), Humanities and Arts (5.4%), Social Sciences, Business and Law (54.9%), Sciences (11.9%); Engineering, Manufacturing and Construction (7.5%), Agriculture (0.9%), Health and Welfare (4.8%), Services (5.2%) and Others (1.4%). It is to be noted that students' enrolment in the field of Agriculture is quite low and has been on a constant decline over the years with an increasing preference for social sciences, business and law.

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[7] Pierre Dinan, "The agricultural sector in Mauritius: Economic aspects-Past, present and future." Presented at the Symposium on Agriculture in Mauritius: Evolution and Prospects on 29th October 2003, Mauritius Chamber of Agriculture, www.mchagric.org/images/pdf/p_dinan.pdf

[8] UNESCO, "The 2015 Global Monitoring Report – Education for All 2000-2015: Achievements and Challenges," http://unesdoc.unesco.org/images/0023/002322/232205e.pdf.

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I.2.2.1. Linking the Faculty of Agriculture to the Mauritian agricultural sector

The Faculty of Agriculture (University of Mauritius) is committed to the advancement of Teaching and Learning in the areas of Agriculture and food. The Faculty has engaged in the development of a comprehensive portfolio of new programmes of studies at Certificate, Diploma, BSc and PhD level during the period 2006-2015, including food science and technology, food safety and quality, agricultural science and technology, bio-farming, natural resource management, aquaculture, agribusiness, agricultural extension, land and water management, landscape management, biotechnology, microbiology, applied biochemistry, bioinformatics etc. The portfolio of new programmes reflects emerging areas in Agriculture and food in Mauritius, and illustrates how the Faculty has responded to the needs of students and of prospective employers.

I.3. *The aims of the study*

The aims of this study are three-fold. First the study aims at analysing and determining the employment status of undergraduates in the field of Agriculture. Second, the aim is to evaluate the contribution of a long-standing programme of studies to the undergraduates' personal knowledge, skills and attributes. Third, the aim is to define further training needs of undergraduates in the field of Agriculture.

The main research questions of the present study are:

- What are the perceptions of employers, alumni and students of the FoA, concerning the skills, understandings and personal attributes, which enhance the employability of undergraduates in Agriculture?
- What are the gaps in perceptions of professional competencies between key stakeholders?
- How can the FoA use the perceptions to provide formal learning opportunities to enhance employability skills of FoA students?

II. **Method**

II.1. *Literature review*

A review of some of the most relevant publications on employability, employability skills and competence-based learning was carried out in order be able to answer the research questions of this present study.

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The use of the Tuning methodology helps to identify the relevant generic and subject specific competences of graduates in Agriculture and their inter-relations, and contributes to elaborate a meta-profile for the subject. The Tuning methodology contributes to the design of a degree that is relevant to the specific needs of the Republic of Mauritius, the region, and the society at large.

A synthesis of the most important points and concepts are given in the following sections.

II.1.1. Graduate employability and employability skills

Lees[9] provided a very interesting comparison between employment and employability. According to her, employment refers to an individual having a job but employability refers to the capacity of an individual to maintain and progress in his/her job and in the job market in general.

According to Hillage and Pollard,[10] employability refers to the capacity of an individual to first secure initial employment, to be able to keep this employment, and to be eventually able to obtain another employment if required. These authors further add that each individual has employable assets namely knowledge, skills and attitudes. The way the individual uses his/her assets in his search for employment and the context of the job market will impact on his/her employability. Over the last 15 years there has been increasing research interest on graduate employability producing a number of studies (e.g. Atkins;[11] Brown;[12] Archer;[13] Rothwell;[14] Stwine and Alves;[15]

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[9] Dawn Lees, "Graduate Employability — Literature Review," LTSN Generic Centre. University of Exeter (2002), http://www.palatine.ac.uk/files/emp/1233.pdf.

[10] Jim Hillage and Emma Pollard, "Employability: developing a framework for policy analysis," *Research Brief* No. 85 (London: Department for Education and Employment, 1998).

[11] M J Atkins, "Oven-ready and self-basting: taking stock of employability skills," *Teaching in Higher Education* 4(2) (1999): 267-280. doi:10.1080/1356251990040208.

[12] Phillip Brown, Anthony Hesketh, and Sara William, "Employability in a knowledge-driven economy," *Journal of Education and Work* 16(2) (2003):107-126.

[13] Will Archer, and Jess Davison, "*Graduate employability. What do employers think and want,*"(The Council for Industry and Higher Education, UK,2008).

[14] Andrew Rothwell, Steven Jewell, and Marie Hardie, "Self-perceived employability: investigating the responses of post-graduate students," *Journal of Vocational Behavior* 75 (2009): 152-161.

[15] Elinor E Stwine and Mariana G Alves, "Higher Education and employability of graduates: will Bologna make a difference?" *European Educational Research Journal* 9, no. 1 (2010): 32-44.

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Hodzic[16]) with a list of skills and attributes that promote graduate employability namely core skills; key skills; common skills; transferable skills; essential skills; functional skills; skills for life; generic skills and enterprise skills.[17] Employability[18] of a graduate has been defined as "the propensity of the graduate to exhibit *attributes* that employers anticipate will be *necessary* for the *future* effective functioning of their organisation." It is important, as pointed out by the National Institute of Adult Continuing Education (NIACE),[19] not to lay emphasis on the responsibility of the individual to be 'employable'. Indeed, NIACE puts forward that employability is a shared 'social construct' between the individuals who have to be responsible for their choices and decisions made and the enterprises who have to provide the adequate work environment and culture (including values, attitudes and behaviours) to promote the employability of their workforce. Rothwell[20] proposed a student self-perceived employability matrix whereby the student can assess his/her self-perception of his/her employability in relation to interrelated parameters namely his/her self-belief (confidence in his/her skills and abilities, his/her engagement with his/her studies and academic performance, his/her awareness about opportunities in the labour market; his/her own ambitions); his/her university (the student's perception of the strength of the university brand); his/her field of study (the reputation his/her university has in his/her field of study; the status and credibility of his/her field of study; and the state of the external labour market (the student's perception of the state of the external labour market; the demand of the external labour market for his/her field of study).

Graduate employability skills, on the other hand, has been clearly defined[21] by CBI/Pearson as a set of skills that comprise of a positive attitude to work; self-management; team working; business and customer awareness;

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[16] Sabina Hodzic, "Increasing PhD students' employability by focusing on the academic entrepreneurship. The analysis of entrepreneurial competences," *Tuning Journal for Higher* Education 3, no. 2 (2016): 347-387.

[17] Kevin Lowden, Stuart Hall, Dely Elliott, and Jon Lewin, "Employers' perceptions of the employability skills of new graduates"(Research commissioned by the Edge Foundation, SRCE Centre, University of Glasgow, 2011).

[18] Lee Harvey, "New realities: the relationship between higher education and employment," *Tertiary Education and Management* 6 (2000): 3-17.

[19] NIACE, http://archive.niace.org.uk/Organisation/advocacy/Archive/Cbipaper.htm.

[20] Andrew Rothwell, Jewell Steven and Marie Hardie, "Self-perceived employability: investigating the responses of post-graduate students," *Journal of Vocational Behavior* 75 (2009): 152-161.

[21] CBI/Pearson, "Learning to grow: what employers need from education and skills" (Education and Skills Survey, 2012), www.cbi.org.uk.

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problem solving; analysis skills; basic numeracy skills; application of information technology; knowledge about their chosen job/career; international cultural awareness; and foreign language skills. From the survey carried out[22] by CBI/Pearson in 2012 on the needs of UK employers from education and skills, it was clear that there were a number of shortcomings identified by the employers such as poor team working; limited career awareness, poor business and customer awareness amongst others. It was put forward by the authors of the report that the shortcomings identified in terms of employability skills can best be overcome through a partnership approach involving the students, the TEIs and the employers.

II.1.2. *Competences, Learning Objectives and Learning Outcomes*

It is not within the scope of the present study to provide an exhaustive review of the concept of competence and associated terminologies such as learning objectives and outcomes. However, we wish, in this paper, to base our use of these terminologies on the definitions developed by Tuning given that the Tuning initiatives, namely developing a common communication language amongst stakeholders such as academic staff, students, graduates, employers and professional organisations; and involving those stakeholders in the process of curriculum design and quality enhancement,[23] fit well within the objectives of this present study.

Hence, we use the following definitions of Tuning as proposed by Wagenaar:[24]

- Competences are understood as "*a dynamic representation of demonstrated knowledge, understanding/insight/comprehension, (subject specific and generic) intellectual, practical and interpersonal skills and (ethical) values.*" Competences are owned by the learner, and acquired through the study of successive modules in a course and assessed continuously.
- A learning outcome is referred to as a "statement of what a learner is expected to know, understand and be able to demonstrate after completion of a process of learning."

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[22] Ibid.

[23] Robert Wagenaar, 'Competences and learning outcomes: a panacea for understanding the (new) role of Higher Education," *Tuning Journal for Higher Education* 1, no. 2 (2014): 279-302 (2014).

[24] Ibid.

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- A learning objective refers to the material to be covered by the teaching staff and is therefore based on the transfer of knowledge from the academic staff to the learner.

II.1.2.1. Competence-based learning

The Faculty of Agriculture of the University of Mauritius has been selected to participate in the TUNING Africa Project, a joint Africa-EU Strategy Tuning project, after a successful application involving 96 universities in Africa. TUNING-Africa is a collaborative process, involving academics working with potential employers and other stakeholders in curriculum development to enhance student competences. The project aims at improving staff capacity to design and develop curricula, working towards the design of a set of reference points for generic competences expected of graduates in Agriculture. The Faculty is confident that the collaborative partnership with institutions in the EU and Africa will enhance opportunities to work towards acquiring or developing further the specialist knowledge, general intellectual skills and capacities, personal qualities and attitudes expected of our graduates in Agriculture and food.

II.2. *Sample and procedure*

The secondary and primary data that have been used to inform this present study have come from multiple sources. Hence secondary data was gathered from the registration profile of students in their first year; from previous tracer studies carried out at FoA; from the reports submitted by on-site supervisors of students on industrial placement; and from the current curriculum framework for the course BSc (Hons) Agriscience and Technology. The primary data was gathered from current students at the Faculty of Agriculture of the University of Mauritius; from alumni of FoA; from employers; and from technical staff employed in FoA laboratories. The details of this data collection are explained in the following section.

II.2.1. Secondary Data Collection

Given that FoA has over 100 years of experience in Higher Education teaching and research in the agricultural sector, we decided for this present study to limit the secondary data collection to a definite period, that is, from

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2000 to 2015 for several reasons namely ease of access to the data as older data were not accessible in a computerised format; curricula at FoA have evolved over the years to respond to the demand from both the public and private sectors in Mauritius and in line with the development of new economic sectors for the country.

First of all the students' admission office of the UoM was contacted to obtain a list of students who have registered for agricultural undergraduate degrees at FoA over the period 2000 to 2015. The aim was to be able to generate a profile of the students based on indicators such as their high school final results and their gender. This profile would be useful to see how A-level students have acquired value over their three year undergraduate study period and the types of employment that they are currently in today.

Secondly the tracer study carried out at FoA for the period 2003-2010 was analysed with respect to its findings and the impact of the latter on curriculum development at FoA.

Thirdly, the reports submitted by on-site supervisors of students on industrial placement were analysed specially in relation to the comments of the supervisors on the performance of the students at the work place.

Fourthly the current curriculum framework used for the BSc (Hons) Agriscience and Technology course was analysed with respect to its modules and module content. The analysis dealt with the learning outcomes, practical skills and other activities that are currently being taught to undergraduate students in Agriculture.

II.2.2. Primary Data Collection

A series of four quantitative surveys were conducted over the period from November 2015 to February 2016 to gather primary data from different sources namely current students at the Faculty of Agriculture of the University of Mauritius; from alumni of FoA; from employers; and from technical staff employed in FoA laboratories. The survey questionnaires (Annexes C, D, E & F) gathered information about the competences acquired by FoA undergraduates, their qualities and limitations in the professional environment and improvements thereon.

II.2.3. Sampling

At the Faculty of Agriculture, there were 5 batches of BSc (Hons) Agriscience and Technology being run in 2015 with about 180 students

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enrolled in this course. Regarding this population size, a sample of 80 students was taken, whereby about 20 students were chosen per course year, (1st year, 2nd year and 3rd year students). 35 past students of FoA were chosen randomly from a list of alumni.

A sample of 16 of the main employers who employ the graduates of the FoA was selected.

A total of 18 technical staff of FoA were selected from all the laboratories of the Faculty namely zoology, botany, microbiology, food science, soil, animal science, biotechnology, biochemistry, tissue culture and at the University Farm.

II.2.4. *Data analysis*

The analysis of the data and information gathered was done using various softwares and online softwares. All primary data was fed into the Software package for statistical analysis (SPSS) program. Using the SPPS, various parameters were determined and analysed. 'Google Forms' were used to analyse data online, and past University students were sent mail containing the link for the questionnaire survey. Graphs and other statistical figures were obtained from this online software. Qualitative data found in the surveys, questionnaires and other reports were analysed and then regrouped into categories and themes where each theme explained what the data were in relation with each specific theme.

A gap analysis refers to approaches that quantify the separation from the present state to an objective.[25] A comparison between the results obtained from the employers' point of view and from the alumni point of view about the missing learning competences as well as the competences and skills required for the employability of students graduating from the FoA was made.

II.2.4.1. Analysis of past tracer study at FoA

In June 2010, a survey was carried out with graduates to evaluate the training provided by the Faculty of Agriculture and to obtain a feedback on

[25] John Murray, "A Gap Analysis Process to improve IT management" in The gap Analysis Process; Practical Example; Process Goals and Hurdles; Process Mechanics (2000). Auerbach Publications. CRC Press LLC. http://www.ittoday.info/AIMS/Information_Management/1-04-35.pdf.

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the pros and cons of the training. The objectives of this study were defined as follows:

- To analyse and to determine the employment status of graduates from the FOA.
- To evaluate the contribution of the programmes of studies to the graduate's personal knowledge, skills and attitudes.
- To define further training needs of graduates.
- To identify the pros and cons of the training undergone at the faculty.

The main important information that can be extracted from the tracer study is detailed out below. Out of 398 past graduates, the employment rate had reached a percentage of 88% in 2010 (Figure 1). From those 88% of student who have been employed, about 50% of them have found employment in the first year after their graduation.[26]

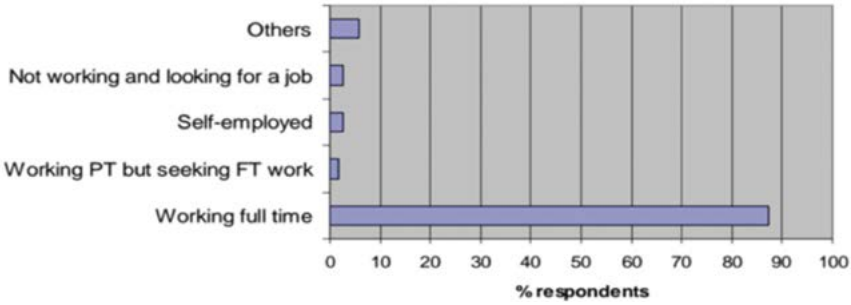

Figure 1

Employment status of FoA graduates in 2010[27]

Source: FoA Tracer Study, 2010.

More than 1 out of 2 respondents found a job within five months after graduation and only 1 out of 4 took more than 10 months to secure a job (Figure 2).

[26] Kamleshwar Boodhoo, Dayawatee Goburdhun, Sunita J. Santchurn and Arvind Ruggoo, "Faculty of Agriculture. Tracer study of graduates (2003-2007)." (2010). Edited by The Faculty of Agriculture, University of Mauritius, 4-5 (unp.).

[27] Ibid.

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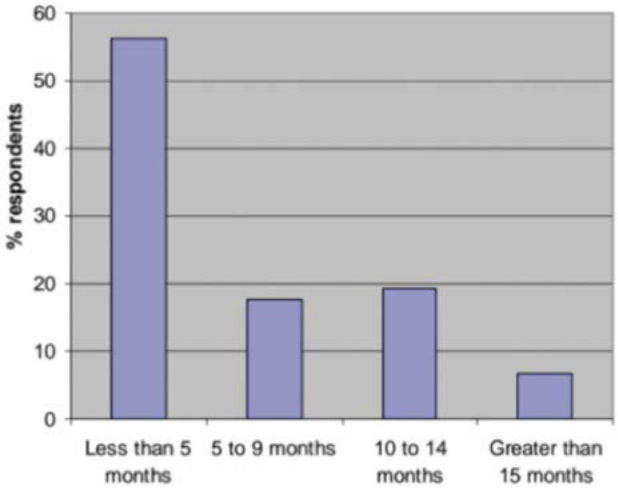

Figure 2

Time lag between graduation and first job

Source: FoA Tracer Study 2010.

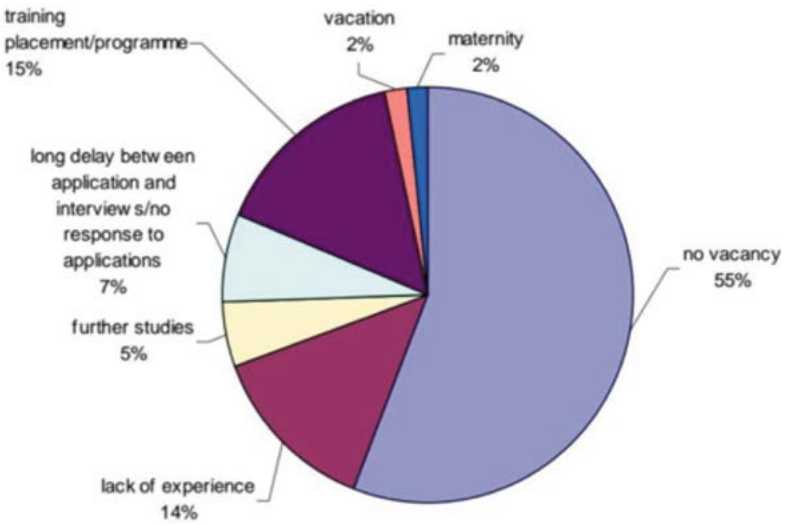

Figure 3

Reasons for time gap between graduation and first job

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The most frequent reason to explain the time gap between graduation and first job was the lack of vacancy in the field of Agriculture (Figure 3).

The results of this tracer study were useful to formulate questions for the survey of FoA alumni.

III. **Results**

III.1. *Quantitative results*

The results section has been divided into two main sections namely quantitative results from the different surveys carried out, and qualitative results from the analysis of on-site placement supervisors' evaluation forms.

III.1.1. Perceptions of current FoA students on their training at FoA and their employability skills

III.1.1.1. General profile of students

Out of the 80 respondents, there were 53.3% female students (43 female students). From the total respondents, 38.3% (31 students) of them were students who registered in 2013, 23.3% (18 students registered in 2014 and 38.3% (31 students registered in 2015).

III.1.1.2. Satisfaction of the students with the course BA&T

The students were asked to rate their satisfaction level with the course BSc (Hons) Agriscience and Technology (BA&T). From the survey, it was found that a majority of them (56.7% — 45 out of 80 students) was slightly satisfied with their course; 33.3% (27 students) of them were slightly dissatisfied and only 1.67% (13 students) of them were very dissatisfied.

III.1.1.3. Perceptions of current students on their employability skills

Current FoA students were surveyed on their perceptions of skills that they consider they have acquired during their training at FoA at different levels of study, that is, from year one to year three (Table 1).

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Table 1

Percentage of current FoA students who agree that they have achieved employability skills

Employability skills	Percentage of current FoA students who agree that they have achieved employability skills
Team working skills	61.7
Communication skills	63.3
Writing and reporting skills	46.7
Statistical analysis skills	46.7
Awareness of modern technologies in Agriculture	65.0
Management skills	60.0
Practical (Laboratory) skills	64.0

A number of students (35%; 21 out of 60 students) were of the view that the module content of the BA&T course was not up-to-date with modern technologies in the agricultural sector. They proposed the following innovations to the course content:

- The addition of more modern machines and equipment in the FoA laboratories.
- Implementation of new structured modules in relation with the new technologies in the agricultural sector locally and internationally.
- The setting up of a new framework of study that will encompass innovative ways of teaching and learning.
- The addition of new modules that are in relation with the new Mauritian Agriculture strategic plan of 2015 such as organic farming.
- More focus on modules related to climate change and preparing student to contribute to the issue of climate change in the world.
- Increasing the number of hours concerning the modules related to hydroponics and greenhouses production systems.
- Increasing the amount of site visits to modern enterprise and companies where students will have knowledge in the production systems of modern Agriculture.

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- Some students feel that seminars related to their course of study and future career should be proposed so that they know what is happening in the job- market in the island and around the world.

III.1.2. Perceptions of alumni of FoA on their training at FoA and employability skills

III.1.2.1. Employment profile of the FoA alumni who have followed a BA&T course

59.3% (21 out of 35 alumni) of the respondents of the survey were male. The average age of all the respondents was about 27 years old. 86.2% (30) of those alumni had completed an undergraduate course at the Faculty of Agriculture; 11.1% (39) had successfully completed a Post graduate; and 3.7% (1) had received a Diploma from the Faculty.

The results of the survey indicated that 70.4% (25) of graduates from the FoA had already secured a job, and were actually in employment. The rest could not manage to find a job.

About 36.07% (13) of respondents were employed in the Public sector, mainly the ministry of Agriculture and related departments. 26.2% (9) of those alumni managed to find a job in the Private sector of Mauritius. It was also observed that about 14.75% (5) of alumni have created their own business and have become entrepreneurs. 11.18% (4) of those alumni have found a job at the Faculty of Agriculture as a Lecturer or a technical assistant. About 8.2% (3) have changed their field of work, and are working in sectors such as information technology, health, and engineering amongst others.

40% (14) of the alumni have secured a job only after one to three months. Some graduates (30% — 11 alumni) have been employed for the first time after four to twelve months. 18% (6) of those graduates have found their first job after one to two years after their graduation. Only 6% (2) of those students had the opportunity to engage themselves in their first job after one to four weeks after completing their course BA&T at the FoA. 4% (2) of those students found it really difficult to find a job; they secured their job only after two to five years after their course. It is to be noted that 2% (1) of those graduates already found a job before their graduation.

III.1.2.2. Perceptions of FoA alumni on their employability skills

The course BA&T has its own curriculum framework from which, courses, lectures, field visits and other activities are organised. The curriculum framework

contains as well all the learning outcomes and all the attributes that have to be grasped by the student upon completion of the course. During the survey, only 11.1% (4) of alumni agreed that they have grasped all the learning outcomes from their curriculum framework after the completion of their course.

It was found that a majority of the alumni had some trouble in the completion of their technical skills. Most of them specified that after completion of the course, they were not aware of and could not use modern technologies in the agricultural sector. The main skills which they have failed to master include management skills, problem solving skills, communication skills, leadership skills and the implementation of innovative ideas; as well as entrepreneurial skills.

Alumni were asked about the main skills and attributes that were required at the enterprise level and which were not completed by the course BA&T. 13.3% (5) of alumni think that their IT skills were not well developed. 8.8% (3) feels that their communication and writing skills have not evolved properly and faced some problems at their workplace. About 4.4% (2) of those students were not well trained to work with other members of their enterprise due to the fact that they did not understand the interpersonal relationships with other employees.

The main attributes and skills that those alumni use at their workplace are their technical skills. The most important skills which students referred to was working under stress which were new to them. They also tend to have a greater sense of responsibility while working at their workplace that is either in laboratories, fields or enterprises.

After completion of their course at the FoA, a majority of 64% (22) would recommend future students to undertake a course at the Faculty of Agriculture.

III.1.3. Perceptions of employers on employability skills of FoA undergraduates

A sample of employers, who usually employ undergraduates who have studied on the course BA&T, were surveyed on the competences and skills that they have observed from their employees.

It was found that 31.9% (11) of the undergraduates were employed for their technical ability, 23.4% (8) have been given a managerial role at the enterprise; 23.4% (8) work as Health & Safety officers; 17.02% (6) worked as researchers; 2.12% (1) of those graduates entered the human resource section; and 2.13% (1) were assigned other jobs such as maintenance officer, IT officer and some entered the engineering sector.

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III.1.3.1. Satisfaction of Employers about employability skills of BA&T-trained employees

It was found that only 6.6% (< 1 employer) of the employers were very satisfied with the performance of their employees, that is, less than 1 out of 16 employers. 13.3% (2) of the employers were slightly dissatisfied with technical and laboratory skills of their recruited graduates. 53.3% (9) of employers were slightly satisfied with the team working skills of their workers. About 40% (6) of the employers were slightly satisfied with the communication skills of their workers. Only 20.1% (3) of them were slightly satisfied with the writing skills of their workers. 6.6% (1) were very satisfied with the management skills and the research and innovative ideas of their employees. 33.3% (5) of the employers were only slightly satisfied with the problem solving skills. Only 46.7% (7) of them were slightly satisfied with the statistical skill of their workers. 46.7% (7) were slightly satisfied with the awareness of their employees about modern technologies in Agriculture. 66.6% (11) of them were slightly satisfied with the overall performance of their employees.

III.1.4. Perceptions of technical staff on employability skills of current FoA undergraduates

A total of 18 technicians from the FoA participated in the survey; 55.6% (10 technicians) of them were male technicians. Students enrolled in the course BA&T have practical laboratory classes during their three academic years until the completion of their course. Thus, all the technicians working in those laboratories are familiar with the students' performance and skills. From the survey, only 11.1% (2) of the technicians were satisfied with the technical skills of the students. 44% (8) of the technicians agreed that students receive all the technical skills required to enter the job market.

The technicians proposed a few reasons for their poor evaluation of the technical skills of undergraduate students:

- They fail in grasping protocols; and experiments are not informed by a review of relevant literature.
- There are not enough on-site practical classes.
- They do not understand the principles of chemistry behind the experiments and practical classes.
- They receive only the basic training in Food science and Post harvesting, they will not be able to work in such enterprises.

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- They lack skills where IT can be used in the experiments, such as the use of GIS software in the soil sciences practical.
- They lack the use of modern technologies and equipment in the laboratories.
- They need more site visits in farms or enterprises where they can learn how experiments and analysis are done in the real world.

III.2. *Qualitative results*

This section present the analysis of the on-site supervisor's evaluation of the student work placement that usually takes place for 6-8 weeks at the end of the second year of the curriculum.

III.2.1. Evaluation of the students' employability skills by the on-site supervisor

On-site supervisors provided an assessment of the students on work placement as shown in Table 2.

Table 2

Employers' perceptions on undergraduates' skills and attributes

Student's Personality	Student's Quality	Drawbacks of Student
Good adaptation in company	Responsive	Poor Attendance
Cooperative	Positive attitudes	Timid
Attentive	Hardworking	Fright of other members
Good team spirit	Willing to learn	Lack of Experience
Disciplined	Enthusiastic	More to learn in team spirit
Dedicated to work	Innovative Ideas	Limited Ability in conducting research
Responsive	Fast-Learner	Need too much continual technical report
Available	Courteous	Very shy

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Student's Personality	Student's Quality	Drawbacks of Student
Keen interest In work assigned	Good Decision making	Lack of confidence
Motivated students	Pro-active	
	Good Skills and Knowledge	

Table 3 shows the assessment of the employability skills of the students on work placement by the on-site supervisor. Only the percentage marked excellent has been shown with the basis that this is the highest achievement from the perception of the employers. It can be observed that the lowest score has been given to written skills and the highest score to team working ability.

Table 3

Assessment of the employability skills of the students on work placement

Employability skills demonstrated by the students	Percentage of students who scored excellent for the employability skill
Adherence to the organisation	25.9
Oral communication	12.1
Written skills	8.6
Interpersonal relationship	17.2
Enthusiasm at work	19.3
Problem solving	17.2
Working capacity	17.5
Team work	63.2
Contribution to the activities of the organisation	15.8

III.2.2. Ways to improve the students' employability on the work placement program

From the on-site supervisors' point of view, it is important that the students should know well in advance what they are expected to achieve in

the work placement. In order to do so, it is important that the students document themselves well about the vision, the mandate and the objectives of the enterprise or workplace well-before coming for their placement. One of the striking point from the report states that the students should prepare their communication skills well before they start their placement program.

Many employers feel that the placement period is too short, that is the 6-8 weeks are not enough for the student to learn about the daily work at an enterprise. Most of them are willing to extend the placement period to a 6 month basis.

Employers are much in favour that the student's academic tutor from the FoA should come and assess the student at a regular basis so that they can see what is missing from the placement and how it can be improved.

The employers also note that more and more students are having problems to work in a laboratory because they are unaware of new equipment in labs and are not well up to date about new technologies in the agricultural sector.

This study, using the Tuning methodology, has contributed to the construct of a meta-profile for the subject of Agriculture (Table 4). The generic and subject-specific competences of graduates in Agriculture, expected to contribute to the development of Agriculture in the Republic of Mauritius and in the region are: (i) problem-solving, (ii) critical thinking, (iii) oral and written communication, (iv) practical (v) self-management and professional development, (vi) knowledge of new technologies in Agriculture, (vii) management, (viii) conduct research and contribute to innovation and economic growth.

IV. **Conclusion**

The focus of this study was on the employability and employability skills of undergraduates for the job market. The study was applied in a specific context and discipline, namely undergraduates studying Agriculture at the Faculty of Agriculture of the University of Mauritius. The perceptions of different actors were sought namely current FoA students, alumni of FoA, current technicians working at FoA, and current and potential employers of FoA undergraduates.

From the study it was revealed that 56.7% of the students (45 students) were alumni slightly satisfied with the course BA&T. However, some of the students feel they lack skills in: management (14.3% -11 students), research and innovative ideas (13.9% — 11 students) and other skills such as problem

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solving skills and communication skills. This reflects some of the findings of Robinson and Garton[28] who carried out a study on the assessment of employability skills required by graduates in Agriculture; and the findings of Baharun and Suleiman[29] on transferable skills of importance to graduates. In addition, Most of the students feel that they are not confident enough to embark on a training program at post-graduate level. This points out to a lack of self-confidence of the graduates who cannot make use of their acquired skills as a stepping stone to chart out their future autonomously. As put forward by Hodzic[30] developing an entrepreneurial attitude in university-trained future job seekers should be on the agenda of TEIs whereby graduates look for opportunities either in the job market or for further studies.

Although 80% (64) of the students interviewed feel that they have upgraded their practical skills during the course, they put forward that "*limited time is allocated to complete practical sessions"* and some stated that the laboratory standards were not comparable to laboratory facilities in a professional environment. This fact is more institution-specific and especially for public-funded universities like the University of Mauritius whereby access to funding are limited hence restricting the modernisation of laboratory facilities.

Many students who go on work placement during their course face difficulties with respect to their report writing skills. Indeed, generic skills as reported by Selvadurai[31] have found their way in university curricula as a way of promoting graduates employability. From the report, it was also found that the students should improve their communication skills and other attributes related with socialising with other employers and members in the workplace. It was also stated that for students undertaking a placement in enterprises, where field work is a must, those students should be more prepared to work under the conditions. A question that remains though, as stated by Archer and Davison,[32] although universities may provide, within their curriculum, opportunities for students to develop their soft skills, to

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[28] Shane J Robinson and Bryan L Garton, "An assessment of the Employability skills needed by graduates in the college of Agriculture, food and natural resources at the university of Missouri," *Journal of Agricultural Education* 49(4) (2008): 96-105.

[29] Rohaizat Baharun and Ebi Shahrin Suleiman, "The employers' perceptions of what makes graduates marketable," *Academia.edu* 1-17 (2009).

[30] Sabina Hodzic, "Increasing PhD students' employability by focusing on the academic entrepreneurship. The analysis of entrepreneurial competences," *Tuning Journal for Higher Education* 3, no. 2 (2016): 347-387.

[31] Sivapalan Selvadurai, Er Ah-Choy, and Marlyna Marosi, "Generic skills of prospective graduates from the employers' perspectives," *Asian Social Science* 8, no. 12 (2012): 295-303.

[32] Will Archer and Jess Davison, "Graduate employability. What do employers think and want. The Council for Industry and Higher Education, UK," (2008).

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what extent students are willing to 'take-up' those skills? The important role of career advisory services on university campus is therefore highlighted here both for pre-and post-graduation students.

About 35% of students (28 students) feel that the course is still oriented towards current traditional agricultural production systems and is not in line with the Mauritian agricultural strategic plan (2016-2020) which lay emphasis on the production of high quality strategic commodities to satisfy local demand and reduce the dependence of the country on importation. This percentage represents about one-third of the respondents and points out indirectly to the inability of those students to become autonomous learners and to be proactive and adaptable to the job market and learn about new techniques independently. This is certainly a skill that needs to be developed at the level of students as mentioned by Tomlinson[33] whereby he talks of the transition from higher education to the labour market as being an active process for graduates and that the latter should be able to develop labour market strategies to increase their employability. As Harvey[34] stated, a degree is no more a "passport into graduate employment", it does not guarantee a job or a career and should be seen by the graduate as a stepping stone in the recruitment process.

The results have showed that 70.4% (25) of the alumni managed to find a job either in the public (36.1% -13 alumni) or private sector (26.03% -9 alumni) of Mauritius. From the study it was found that 40% (14) of them were employed only one to three months after their graduation. From the FoA Tracer study 2010, it was found that about 55.6% (221) of the graduates were employed after one to three months, this shows that it is becoming more difficult to find a job in the agricultural sector in Mauritius. However, as Brown[35] have pointed out, it is difficult to directly relate unemployment to unemployability as there may other external factors such as political and economic environment that may not be conducive for job seekers.

After the completion of their degree, 63% (22) of the alumni agreed that they have grasped all the learning outcomes of the course. There were; however some students who stated that "*I have completed my degree only for the sake to pass my exam, but at the end of the day, only small amounts of learning outcomes were grasped*." The major learning outcomes and skills they feel that they have not completed are the practical technical skills

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[33] Michael Tomlinson, "Graduate employability and student attitudes and orientations to the labour market," *Journal of Education and Work* 20, no. 4 (2007): 285-304.

[34] Lee Harvey, "New realities: the relationship between higher education and employment," *Tertiary Education and Management* 6 (2000): 3-17.

[35] Phillip Brown, Anthony Hesketh, and Sara William, "Employability in a knowledge-driven economy," *Journal of Education and Work* 16, no. 2 (2003): 107-126.

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(27.5% — 10 alumni). However, 15.1% (5) of alumni feel that they have not grasped any outcomes related to the modern technologies in the agricultural sector; this point is a major leitmotiv from the different categories of students (current and alumni). These issues point again to the importance of continuously bringing the student from his/her first year at university in relation to the professional world so that he/she realises the expectations of potential employers and are not left to face the consequences post-graduation.

The major skill identified by alumni as being very important in their workplace is technical skill. The fact that 27.5% (10 alumni) of them felt they have not achieved good technical skills shows that some alumni had some struggle to adapt themselves at the workplace. In spite of drawbacks, a majority of 64.0% (22) of alumni would recommend future tertiary students to enroll on the BA&T course. Some students stated that "*There is no job prospect and I had to change my career path*." Developing graduates' attitudes and labour market strategies should be encouraged in TEIs and reinforced through regular interactions with the professional world through internships, site-visits, seminars involving employers' participation amongst others[36].

Most of the undergraduates from the BA&T course were employed as Technical staffs (31.9% — 11 alumni). From the employer's perspectives 60.1% (10 employers) of them were satisfied with the overall performance of the graduates. Employers seem to appreciate the theoretical level of the students, and their team working ability. Some state that "*the students are really pro-active and they have the zeal to work, (…) they are hard workers*". However, most of the employers are not satisfied with the technical skills, communication skills and the writing skills of their employees. The emphasis placed by employers on soft skills is very much present in the literature. A study by Archer and Davison[37]on employers' perceptions and wants regarding graduate employability confirmed that more than 85% of employers regard soft skills as more important than degree qualification. The top three rated skills and qualities sought after by employers include (a) communication skills, (b) team-working skills and (c) integrity. The evaluation by technical staff of FoA on the technical skills of students was quite revealing. 55.6% (10) of the technicians feel that their laboratories are not up to date with modern laboratories. For instance, students have problems in preparing chemical solutions; they have difficulties in the implementation of practical

[36] Kevin Lowden, Stuart Hall, Dely Elliott, and Jon Lewin, "Employers' perceptions of the employability skills of new graduates" (Research commissioned by the Edge Foundation. SRCE Centre, University of Glasgow, 2011).

[37] Will Archer and Jess Davison. "Graduate employability. What do employers think and want. The Council for Industry and Higher Education, UK" (2008).

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sessions on the UoM farm; and some of them lack concentration and thus lack interest in laboratory practicals. About 55.6% (10 technicians) of them do not agree with the fact that the student receives all the technical skills required to enter the job market. Thus, the fact that employers are dissatisfied with the technical skills of their employees is justified. The general rating on technical skill that technical staffs attribute to the actual students is 5 out 10.

Employers, in this present study, also specify that graduates are not up to date with the modern technologies in the agricultural sector around the world. 13.3% (2) of the employers are very dissatisfied with the ability of their employees to work with modern technologies, some stated: "*My employees were thought only about the traditional ways of cultivation of crops at the university; they have to be further trained to adapt themselves with new technologies nowadays*." A question that can be asked here is whether it is fair for TEIs to produce oven-ready graduates that can be a perfect-fit for the job market? As Atkins[38] put forward, if all students had the same portfolio of employability skills, their comparative market advantage would disappear. The same author also talks about 'graduateness' and query the fact whether a student should be denied graduation if he or she did not attain the minimum threshold in core and generic skills in the same way as graduation is usually denied for empirical evidence of non-mastery of subject and discipline-specific skills.

According to this study, there seems to be a mismatch between what employers in the agricultural sector expect from their employees and what undergraduates from the FoA can provide in terms of skills and attributes. The focus of employers on undergraduates having very good technical skills is very high and should be addressed by the FoA in terms of upgrading of its laboratory facilities. Even though in a context of economic crisis, major investments may not be possible in the short term, other strategies can be envisaged such as establishing partnerships with employers so that students, during their studies at the University of Mauritius, can be trained in professional and modern laboratories in the public and private sectors for the benefit of all parties concerned. As put forward by CBI/Pearson,[39] addressing employability skills shortcomings of graduates is best done in partnership with the students, the employers and the Tertiary Education Institutions.

The findings of this study point to the fact that the FoA should find new ways of teaching agricultural sciences, where the students will achieve all the

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[38] M J Atkins, "Oven-ready and self-basting: taking stock of employability skills," *Teaching in Higher Education* 4, no. 2 (1999): 267-280, doi:10.1080/1356251990040208.

[39] CBI/Pearson, "Learning to grow: what employers need from education and skills" in *Education and Skills Survey* (2012), www.cbi.org.uk.

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required skills and attributes to boost up their employability skills. The creation of a new framework and structure of programs will help future students to be more skillful and will be up to date with the modern activities in Agriculture prevailing in Mauritius. A curriculum map should be developed to addresses graduate attributes and learning outcomes, as they relate to professional competencies. The task of this new framework will be to upgrade and modernise the value addition that the future graduates profile will require. The employability of graduates should be the main issue and objectives before the creation of new programs at the University level, to promote the employability of the students, the program should be more focused on the approaches to placements, work based learning and internships. This should be implemented for a significant duration. Hence, this study proposed an enhanced curriculum map (Annex A-Table 4) for the course BA&T that could be used for the development of a new curriculum framework. The new course will help in boosting up the employability of the graduates and improve the profile of the graduates.

Contributing to the enhancement of employability skills of undergraduates from FoA is important for the country. The actual unemployment rate in Mauritius[40] is about 8.70%, and if this continues to increase, it will affect the growth of the Mauritian economy. Each year about 50-70 students complete their undergraduate studies in Agriculture. Those graduates face a lot of difficulties in achieving their first job. With this high rate of unemployment, the Mauritian government has to invest on them, by providing incentives and other employment schemes to keep them in the society. The social expenses of unemployment are hard to compute, but no less real.[41] The employability of the graduates, if not addressed by all stakeholders, will become a pervasive problem. It will affect not only the students' self-confidence but will also affect the whole Mauritian society. The strategic plan 2016-2020 for the agricultural will only be a myth if no remedies are found in the near future to ensure that the adequate workforce is being trained to operationalise and sustain these strategies which aim at ensuring food security for the Mauritians. However, it should also be noted that as in all dynamic economies, job markets can become congested at some point and as rightly stated by Brown[42] in a knowledge-driven economy, graduates may be employable but not in employment.

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[40] "Statistics Mauritius," Ministry of Finance and Economic Development (2015). http://statsmauritius.govmu.org/English/StatsbySubj/Documents/Digest/Digest%20of%20Agricultural%20Statistics%202014.pdf.

[41] Stephen Simpson, "How unemployment rates affects the economy," *Elite Daily* 1 (2011): 2, http://elitedaily.com/news/business/how-unemployment-rates-affect-the economy/.

[42] Phillip Brown, Anthony Hesketh, and Sara William, "Employability in a knowledge-driven economy," *Journal of Education and Work* 16, no. 2 (2003):107-126.

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The present study has its limitations as it is confined to a small sample, and is based on one discipline only and in a specific context. It is therefore not within the scope of this study to compare findings with more developed economies. This does not, however, preclude future investigations as discussed hereafter. This study aims at contributing to the debate on employability and employability skills of university graduates and the need to have a more structured and harmonised approach with the involvement of all stakeholders' concern. An analogy can be made to the concept of a value chain in the agri-food sector whereby all actors involved in the value chain need to develop mechanisms to work together so as to increase the efficiency of the chain at all levels from production (of graduates) to consumption (by employers in the workplace). There are elements of trust and governance that also come into play to ensure that whatever is produced in that value chain abides to the norms and standards of the society. Who will be the governor or main driver in the chain? Will that be a demand-driven chain whereby it is the job market that imposes the types of graduates they want? Supporting public and private institutions also play a major role in ensuring the proper functioning of the value chain. In the same way, higher education institutions are providers of education and training in the majority of disciplines that are sought after in the job market; and employers are the final consumers. If there is a weak link in the chain, it is of national interest to strengthen that link for the betterment of society at large. As proposed by Alshamy,[43] "all stakeholders including academics, students, graduates, potential employers and professional organizations should be indirectly involved at different stages in the process of curriculum design and quality enhancement." Selvadurai[44] also proposed in their study in the Malaysian context, that future studies should look at ways and means whereby employers can help in transferring skills to university trainees as part of stakeholders' involvement in the development of tertiary curriculum. There are a lot of scope for further studies whereby all the employable skills identified both by the TEIs and the employers can be strengthened as part of a partnership, and looking for new alternatives for each of the drawbacks that may be identified. Figure 4 (Annex B) proposes a model of the dynamic partnership that should exist between stakeholders in the higher education sector. There should be a discussion with the different stakeholders of the sector, and create a new curriculum framework which reflect the needs of the job market. Even though

[43] Alsaeed Alshamy, "Teacher education programmes at Alexandria University with reference to Tuning Methodology," *Tuning Journal for Higher Education* 3, no. 2 (2016): 281-317.

[44] Sivapalan Selvadurai, Er Ah-Choy, and Marlyna Marosi, "Generic skills of prospective graduates from the employers' perspectives," *Asian Social Science* 8, no. 12 (2012): 295-303.

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in some context, employability may not be a panacea for unemployment[45],[46], in emerging economies like Mauritius, it is important to have a clear and harmonised tertiary education policy which englobes all stakeholders concerned.

The results from this study have revealed some very interesting facts about how current students perceive their employable skills and the difference in perception for past (alumni) students. The expectations of employers have also shed light on what is currently taught in the BA&T course at FoA and what employers actually look for. There are discrepancies indeed between different stakeholders' perspectives; however, the aim is to come to a consensus on the way forward for the benefit of all concerned and the benefit of the country at large.

Bibliography

Alshamy, Alsaeed. "Teacher education programmes at Alexandria University with reference to Tuning Methodology." *Tuning Journal for Higher Education* 3, no. 2 (2016): 281-317.

Archer, Will, and Davison Jess. "Graduate employability. What do employers think and want. The Council for Industry and Higher Education, UK." 2008.

Atkins M J. "Oven-ready and self-basting: taking stock of employability skills." *Teaching in Higher Education* 4, no. 2 (1999): 267-280. doi:10.1080/1356251990040208.

Baharun, Rohaizat, and Suleiman Ebi Shahrin. "The employers' perceptions of what makes graduates marketable." *Academia.edu* 1-17 (2009).

Boodhoo, Kamleshwar, Goburdhun, Dayawatee, Santchurn, J. Sunita, and Ruggo, Arvind. "Faculty of Agriculture. Tracer study of graduates (2003-2007)." (2010). Edited by The Faculty of Agriculture, University of Mauritius, 4-5 (unp.).

Brown, Phillip, Hesketh Anthony, and William Sara. "Employability in a knowledge-driven economy." *Journal of Education and Work* 16, no. 2 (2003): 107-126.

CBI/Pearson. "Learning to grow: what employers need from education and skills." *Education and Skills Survey*. 2012. www.cbi.org.uk.

Central Statistics Office (Mauritius). "Mauritius in Figures." Ministry of Finance and Economic Development. http://statsmauritius.govmu.org/English/Publications/Documents/MIF/mif09.pdf.

Dinan, Pierre. "The agricultural sector in Mauritius: Economic aspects-Past, present and future." Presented at the Symposium on Agriculture in Mauritius: Evolution and Prospects on 29th October 2003. Mauritius Chamber of Agriculture. 2003. www.mchagric.org/images/pdf/p_dinan.pdf.

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[45] Nick Wilton, "Business graduates and management jobs: an employability match made in heaven?" *Journal of Education and Work* 21, no. 2 (2008): 143-158.

[46] Nick Wilton, "Do employability skills really matter in the graduate labour market? The case of business and management graduates," *Work, Employment and Society* 25, no. 1 (2011): 85-100.

© University of Deusto. ISSN: 2340-8170 • ISSN-e: 2386-3137. Volume 4, Issue No. 1, November 2016, 169-219
doi: http://dx.doi.org/10.18543/tjhe-4(1)-2016pp169-219 • http://www.tuningjournal.org/

Harvey, Lee. "New realities: the relationship between higher education and employment." *Tertiary Education and Management* 6 (2000): 3-17.

Hillage, Jim, and Pollard Emma. "Employability: developing a framework for policy analysis." Research Brief No. 85. London: Department for Education and Employment, 1998.

Hodzic Sabina. "Increasing PhD students' employability by focusing on the academic entrepreneurship. The analysis of entrepreneurial competences." *Tuning Journal for Higher Education* 3, no. 2 (2016): 347-387.

Lees, Dawn. "Graduate Employability — Literature Review." LTSN Generic Centre. University of Exeter, 2002. http://www.palatine.ac.uk/files/emp/1233.pdf.

Lowden, Kevin, Hall Stuart, Elliot Dely, and Lewin Jon. "Employers' perceptions of the employability skills of new graduates." Research commissioned by the Edge Foundation. SRCE Centre, University of Glasgow, 2011.

Murray, John. "A Gap Analysis Process to improve IT management." In The gap Analysis Process; Practical Example; Process Goals and Hurdles; Process Mechanics. 2000. Auerbach Publications. CRC Press LLC. http://www.ittoday.info/AIMS/Information_Management/1-04-35.pdf.

OECD. "Tertiary Education for the Knowledge Society: OECD Thematic Review of Tertiary Education: Synthesis Report." 2008. Accessed August 11, 2016. http://oecd-conference-teks.iscte.pt/downloads/OECD_overview.pdf.

Robinson, J Shane, and Garton Bryan L. "An assessment of the Employability skills needed by graduates in the college of Agriculture, food and natural resources at the university of Missouri." *Journal of Agricultural Education* 49(4) (2008): 96-105.

Rothwell, Andrew, Jewell Steven, and Hardie Marie. "Self-perceived employability: investigating the responses of post-graduate students." *Journal of Vocational Behavior* 75 (2009): 152-161.

Selvadurai, Sivapalan, Ah-Choy Er, and Marosi Marlyna. "Generic skills of prospective graduates from the employers' perspectives." *Asian Social Science* 8, no. 12 (2012): 295-303.

Simpson Stephen. "How unemployment rates affects the economy." *Elite Daily* 1, no. 2 (2011). http://elitedaily.com/news/business/how-unemployment-rates-affect-the economy/.

Statistics Mauritius. Ministry of Finance and Economic Development, 2015. http://statsmauritius.govmu.org/English/StatsbySubj/Documents/Digest/Digest%20of%20Agricultural%20Statistics%202014.pdf.

Stwine, Elinor Edvardsson, and Alves Mariana Gaio. "Higher Education and employability of graduates: will Bologna make a difference?" *European Educational Research Journal* 9, no. 1 (2010): 32-44.

Tomlinson, Michael. "Graduate employability and student attitudes and orientations to the labour market." *Journal of Education and Work* 20, no. 4 (2007): 285-304.

UNESCO. "The 2015 Global Monitoring Report – Education for All 2000-2015: Achievements and Challenges." 2015. http://unesdoc.unesco.org/images/0023/002322/232205e.pdf.

Tuning Journal for Higher Education
© University of Deusto. ISSN: 2340-8170 • ISSN-e: 2386-3137. Volume 4, Issue No. 1, November 2016, 169-219
doi: http://dx.doi.org/10.18543/tjhe-4(1)-2016pp169-219 • http://www.tuningjournal.org/

Wagenaar, Robert. "Competences and learning outcomes: a panacea for understanding the (new) role of Higher Education." *Tuning Journal for Higher Education* 1, no. 2 (2014): 279-302.

Wilton, Nick. "Business graduates and management jobs: an employability match made in heaven?" *Journal of Education and Work* 21(2) (2008): 143-158.

———. "Do employability skills really matter in the graduate labour market? The case of business and management graduates." *Work, Employment and Society* 25, no. 1 (2011): 85-100.

World Bank. "Education, Quality and Economic Growth." 2007. http://siteresources.worldbank.org/EDUCATION/Resources/278200-1099079877269/547664-1099079934475/Edu_Quality_Economic_Growth.pdf.

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and stakeholders in the public and private sector so that students can benefit from targeted industrial placements with the possibility of conducting their dissertation work in collaboration with the industry. She firmly believes in a student-centred pedagogical approach.

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Annexes

A) *Curriculum Mapping for BSc (Hons) Agriscience and Technology (BA&T)*

Table 4

Curriculum Mapping[47] for BSc (Hons) Agriscience and Technology (BA&T)

Graduates Attributes	Professional Competencies	A graduate of the course BA&T should be able to
1. Ability to embark on training program at postgraduate level	The student will have to apply their theories and practical modules acquired during the course and reproduce them in the workplace. Adapt effectively to changes. Take responsibility for their own development. Use their critical thinking to evaluate assumptions	1.1. Take responsibility for their own professional development and learning to work in a new environment 1.2. Work for about 6 months in a placement, and adhere to the rules and regulations of the enterprise. 1.3. To complete all assigned work in a professional manner.

[47] Source: Kevin Lowden, Stuart Hall, Dely Elliott, and Jon Lewin, "Employers' perceptions of the employability skills of new graduates," Research commissioned by the Edge Foundation. SRCE Centre, University of Glasgow (2011).

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Graduates Attributes	Professional Competencies	A graduate of the course BA&T should be able to
		1.4. Prepare a good and focused placement report that would englobe all the task accomplished at the enterprise 1.5. Demonstrate independence and leadership
2. Up-to-date to modern technologies	Learn to use new technologies; Recognise their benefits and limitations; to know when to use the new technologies to avoid any issue to the environment in regard to the climate change	2.1. Use the new and existing technologies relevant to their studies. 2.2. Apply their theoretical knowledge in the application of these new technologies
3. Management skills	Recognise all the various sectors related to management in Agriculture, the setting up a business plan, the implementation of entrepreneurship structures and the development of new management programs.	3.1. To be able to develop a business plan and an entrepreneurship structure. 3.2. To relate any management skills with their assignments, thesis and dissertation
4. Research and Innovative Ideas	Work independently to produce good innovative ideas in the construction of assignments; Boost up their research level to find innovative ideas. Think globally.	4.1. To develop new ideas and propose then in their assignment or thesis, the student will be more critical.
5. Problem Solving Skills	Analyse a problem and try to find the best possible solution to alleviate the problem or use their critical thinking to resolve them	5.1. To find problems and to analyse them 5.2. To find solution to solve problems in either theoretical issues or practical issues 5.3. To come up with innovative solution that will resolve all the issues

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Graduates Attributes	Professional Competencies	A graduate of the course BA&T should be able to
6. Communication/ Oral Skills	Exchange of information with colleagues; have appropriate inter-personal skills; facilitate conflicts; persuasively argue for the right of the worker	6.1. Communicate at an advanced level with individuals and groups and advocate for the improvement of graduate profile
7. Technical/ Laboratory skills	Apply the logical and rational behind the practical work; understand the chemistry behind the practical work, use modern apparatus for their practical work	7.1. To apply their theory in the technical work 7.2. Will be able to understand the chemistry behind all practical work 7.3. To find solutions to improve their laboratory skills
8. Writing skills/ Report skills	To write in scientific language and understand the plagiarism concept; the use of good referencing in reports, thesis; develop good practical reports and the good mounting up of thesis.	8.1. To write in a scientific way and to implement good referencing in reports, assignments and thesis 8.2. To write in a good scientific structured way
9. Theoretical Understanding	Use of logic and critical thinking for the understanding of the theory part of the module; being able to grasp all necessary data; Apply all theoretical data to practical work or during placement programs	9.1. Use their theoretical knowledge in practical work, internships and in the scientific writing of thesis or assignments. 9.2. Application of knowledge in placement programs 9.3. Propose new ideas, using their critical knowledge and their theoretical knowledge
10. Team Working skills	Ability to work in a group of colleagues and to work efficiently; Propose and discuss information with other members of enterprise; Recognise individual and collective human rights; respect other members point of view	10.1. Ability to join an enterprise and communicate with respect with other colleagues 10.2. To work efficiently in group projects

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B) *Dynamic model for stakeholders in the Higher Education sector*

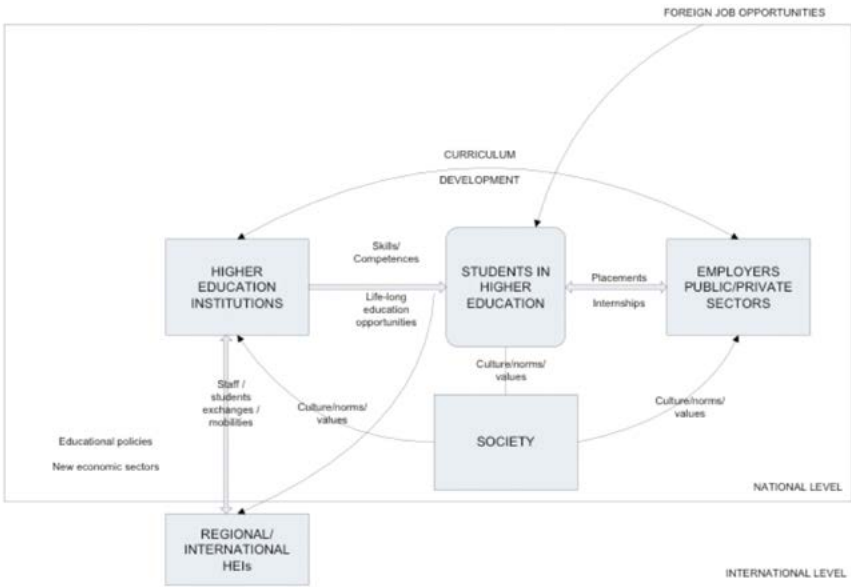

Figure 4

Dynamic model of stakeholders in the Higher Education Sector

Source: Authors.

C) *Survey questionnaire for current FoA students*

UNIVERSITY OF MAURITIUS
FACULTY OF ACRICULTURE

Dear Students,

I am XXX, currently enrolled as full-time BSc student at the Faculty of Agriculture, University of Mauritius. In this respect, I am doing a survey on "*Analysis on Actual students of BSc (Hons) Agriscience & Technology*" so as to propose an innovative curriculum framework for the teaching of Agriculture sciences. I seek your valuable opinion in this research study. Your response will be of great help for this study. Note that the data collected will remain strictly confidential. Thank you for your assistance in my educational endeavours.

SECTION A — DEMOGRAPHIC INFORMATION

1. Gender

   ❑ Male ❑ Female

2. During which year have you joined the Faculty of Agriculture?

   ❑ 2012 ❑ 2014
   ❑ 2013 ❑ 2015

3. Are you enrolled in the course BSc (Hons) Agriscience & Technology?

   ❑ Yes ❑ No ❑ No, but related to it

4. Are you generally satisfied with the course BSc(Hons) Agriscience & Technology?

   ❑ Very Dissatisfied
   ❑ Slightly Dissatisfied
   ❑ Neither Dissatisfied nor Satisfied
   ❑ Slightly Satisfied
   ❑ Very Satisfied

SECTION B

According to the BSc (Hons) program of study, upon completion of the course, the graduate should have grasped all the learning outcomes as per his/her course. These are the main skills and Competences you should have grasped:

- Theoretical Understanding
- Technical/ Laboratory skills
- Practical Application
- Team Working
- Communication/ Oral Skills
- Up to date to Modern technologies
- Writing Skills/ (Report, analysis…)
- Management skills
- Research and Innovative Ideas
- Problem Solving Skills
- Use of Statistics methods in evaluation
- Embark on training programs of postgraduate level

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5. According to you, from the given list, what are the skills and competences that you have not received and completed until now?

1	
2	
3	
4	
5	

6. From your point of view, do you think you have achieved a good practical/ technical skill from the module you have completed till now?

❑ Yes ❑ No

If No, what are the main constraints?

7. According to you, do you feel you have increased and upgraded your Team Working ability?

8. According to you, do you feel you have increase and upgrade your Communication skills?

❑ Strongly Disagree
❑ Disagree
❑ Neither Agree nor Disagree
❑ Agree
❑ Strongly Agree

From previous studies, it was found that the writing skills of students from BSc (Hons) Agriscience & Technology was average and need more focus

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on it, do you feel your writing skills has evolved since starting the course? (Writing skills: Report, Dissertation, Assignment, portfolio)

- ❑ Strongly disagree
- ❑ Disagree
- ❑ Neither Agree nor disagree
- ❑ Agree
- ❑ Strongly Agree

10. According to you, do you feel you have received a good knowledge of Statistical Analysis to tackle the world's job market?

- ❑ Strongly disagree
- ❑ Disagree
- ❑ Neither Agree nor disagree
- ❑ Agree
- ❑ Strongly Agree

SECTION C

11 According to you, do you feel that the course BSc (Hons) Agriscience & Technology is up to date to our present modernised Agriculture?

❑ Yes ❑ No

If No, what do you feel can be done?

12. What are the main constraints that you have underwent until now during the course?

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13. Would you recommend the course BSc (Hons) Agriscience & Technology to future students starting their tertiary education?

❑ Yes ❑ No

D) Survey of FoA Alumni

UNIVERSITY OF MAURITIUS
FACULTY OF AGRICULTURE

Dear Sir/Madam, I am XXX, currently enrolled as full-time BSc student at the Faculty of Agriculture, University of Mauritius. In this respect, I am doing a survey on *"FoA Alumni Student Satisfaction survey"* so as to propose an innovative curriculum framework for the teaching of Agriculture sciences. I seek your valuable opinion in this research study. Your response will be of great help for this study. Note that the data collected will remain strictly confidential. Thank you for your assistance in my educational endeavors.

SECTION A: DEMOGRAPHICS and QUALIFICATION

1. Gender

❑ Male ❑ Female

2. Age Group

❑ 18-25 ❑ 26-30
❑ 31-40 ❑ 41-50

3. Marital Status

❑ Married ❑ Single

4. What level of Course have you followed at the Faculty?

❑ Certificate
❑ Diploma
❑ Undergraduate
❑ Postgraduate

5. What course have you completed at the FOA?

1	
2	
3	

6. In which year have you completed your course? Year: ……

SECTION B — EMPLOYMENT

6. Are you employed?

❑ Yes ❑ No

If Yes, Where are you actually working?

7. How long did it take you to find a job since obtaining a degree?

8. Which one of the following best describes your current position with regard to paid work?

	Tick
Working Full time	
Working part-time but seeking full-time work	
Working part-time but not seeking full time work	
Self-employed	

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	Tick
Not working and looking for a job	
Not working and unavailable for paid work	
Others, please specify below	

Others: .....

SECTION C

According to the BSc (Hons) program of study, upon completion of the course, the graduate should have grasped all the learning outcomes as per his/her course. These are the main skills and Competences you should have grasped:

- Theoretical Understanding
- Technical/ Laboratory skills
- Practical Application
- Team Working
- Communication/ Oral Skills
- Up to date to Modern technologies
- Writing Skills/ (Report, analysis…)
- Management skills
- Research and Innovative Ideas
- Problem Solving Skills
- Use of Statistics methods in evaluation
- Embark on training programs of postgraduate level

9. Do you think that you have grasped all the learning outcomes listed after completion of your course?

10. According to you, what are the learning outcomes or skills that you have missed? Or not fully completed?

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
My student workload was manageable	❑	❑	❑	❑	❑

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
The quality of teaching was satisfactory	❑	❑	❑	❑	❑
The Learning environment was adequate	❑	❑	❑	❑	❑
The work placement was useful	❑	❑	❑	❑	❑
The Faculty offers a wide range of modules	❑	❑	❑	❑	❑
The course was valuable to me in my professional and personal development	❑	❑	❑	❑	❑

11. Could you please, list some skills or attributes that are required at your enterprise/ Workplace that you did not receive upon completion of your course?

1	
2	
3	
4	
5	

12. What is the main attribute or skill you have used at your workplace/ enterprise?

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SECTION D- RELEVANCE OF TRAINING

In this section, we aim to get your feedback on the study process you underwent at the Faculty

13. Please tick the appropriate box beside each statement that most accurately reflects your views on the training you underwent at the faculty

14. Please tick the appropriate box beside each statement that most accurately reflects your views on the study process you underwent at the FOA:

15. Would you recommend the FOA to anyone wishing to undertake an Undergraduate course?

❑ Yes ❑ No

Why?

……
……
……
……
……
……
……

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E) *Survey on employers*

UNIVERSITY OF MAURITIUS
FACULTY OF ACRICULTURE

Dear Sir/Madam, I am XXX, currently enrolled as full-time BSc student at the Faculty of Agriculture, University of Mauritius. In this respect, I am doing a survey on "*Assessing the level of Expectations of Employers/Stakeholders from students who graduated from BSc (Hons) Agriscience and Technology*" so as to propose an innovative curriculum framework for the teaching of Agriculture sciences. I seek your valuable opinion in this research study. Your response will be of great help for this study. Note that the data collected will remain strictly confidential. Thank you for your assistance in my educational endeavors.

Name of your Organisation:.....
Address: .....

SECTION 1: RECRUITMENT OF GRADUATES FROM THE FACULTY OF AGRICULTURE (FOA)

This section asks for information regarding your organisation's employment of FoA graduates.

1. Does your Organisation recruit graduates from the Faculty of Agriculture?

   ❑ Yes ❑ No

2. Do your employees possess a degree in BSc (Hons) Agriscience and Technology?

   ❑ Yes ❑ No

3. How many of your employers from the FOA, have completed a BSc in Agriscience and Technology?

   Number of graduates with BSc Agriscience and technology: ……

4. In what roles do you use those graduates within the first five years of their recruitment?

   ❑ Technical ❑ Teaching
   ❑ Managerial ❑ Human Resource

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❑ Health & Safety Officer ❑ Research
❑ Others
For Others; please specify:

5. How far are you satisfied with your employees from those graduates?

❑ Very Dissatisfied
❑ Slightly Dissatisfied
❑ Satisfied
❑ Slightly Satisfied
❑ Very Satisfied

SECTION 2: ASSESSING THE QUALITIES AND COMPETENCES OF GRADUATES IN THE WORKING PLACE

6. On a scale of (1-5), how satisfied is your organization with the following skills and competences from students graduated in BSc Agriscience and Technology?

Skill and Competences	Very Dissatisfied	Slightly Dissatisfied	Neither Satisfied nor Dissatisfied	Slightly Satisfied	Very Satisfied
Theoretical Understanding	1	2	3	4	5
Technical/ Laboratory skills	1	2	3	4	5
Practical Application	1	2	3	4	5
Team Working	1	2	3	4	5
Communication/ Oral Skills	1	2	3	4	5

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Skill and Competences	Very Dissatisfied	Slightly Dissatisfied	Neither Satisfied nor Dissatisfied	Slightly Satisfied	Very Satisfied
Writing Skills/ (Report, analysis…)	1	2	3	4	5
Management skills	1	2	3	4	5
Research and Innovative Ideas	1	2	3	4	5
Problem Solving Skills	1	2	3	4	5
Use of Statistics methods in evaluation	1	2	3	4	5
Up to date to Modern technologies	1	2	3	4	5
Overall Performance	1	2	3	4	5

7. What are the best attributes students from the course BSc (Aons) Agriscience and Technology possess?

1	
2	
3	
4	
5	

SECTION 3: ASSESSING SKILLS AND ATTRIBUTES OF GRADUATES

8. According to you, what are the reasons why students graduating in the BSc (hons) Agriscience & Technology have difficulties in finding a job? (You can have multiple answers)

❑ Lack of Experience and Skills ❑ Not satisfied with salary
❑ Failed their interview ❑ Not Proactive enough

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❑ Lack of job Opportunities
❑ Lack of Qualification
❑ Overqualified
❑ Lack of Team-Work
❑ Lack of Theoretical Understanding
❑ Too much competition

9. According to you, are you satisfied with the skills and attributes of your employees, and if no, what do they lack?

	Skills and Attributes	Are you satisfied with this skill/ attributes from your employees?		If No, what types of skills do they lack?
		Yes	No	
1	Practical and Technical Skills			
2	Communication Skills			
3	Written/Report Writing Skills			
4	Use of Statistics methods in evaluation			
5	Theoretical Understanding			
6	Management skills			
7	Research and Innovative Ideas			

10. From your own perspectives, what are your expectations from graduates of BSc (Hons) Agriscience and Technology in terms of competences?

F) *Survey on FoA Technicians*

UNIVERSITY OF MAURITIUS
FACULTY OF ACRICULTURE

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doing a survey on "*Assessing Laboratory & Technical competences acquired upon completion of BSc (Hons) Agriscience & Technology*" so as to propose an innovative curriculum framework for the teaching of Agriculture sciences. I seek your valuable opinion in this research study. Your response will be of great help for this study. Note that the data collected will remain strictly confidential. Thank you for your assistance in my educational endeavors.

Name of your Laboratory department: .....

SECTION A — DEMOGRAPHIC INFORMATION

1. Gender

   ❑ Male ❑ Female

2. Age Group

   ❑ 18-25 ❑ 26-30
   ❑ 31-40 ❑ 41-50
   ❑ 51-60 ❑ ≥61

3. At which department do you work?

   ❑ APS ❑ AFS

4. In which laboratory do you work?

   ❑ Zoology Lab ❑ Botany Lab
   ❑ Microbiology Lab ❑ Food Science Lab
   ❑ Soil Lab ❑ Animal Science Lab
   ❑ UOM Farm ❑ Biotechnology Lab
   ❑ Biochemistry Lab ❑ Tissue Culture Lab

5. Do you work with students from the BSc (Hons) Agriscience and Technology Cohort?

   ❑ Yes ❑ No

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SECTION B — SATISFACTION OF SKILLS AND ATTRIBUTES

6. Are you satisfied with the level of technical skills of current students in BSc (Hons) Agriscience and Technology?

   Year 1:
   ❑ Very Dissatisfied
   ❑ Slightly Dissatisfied
   ❑ Satisfied
   ❑ Slightly Satisfied
   ❑ Very Satisfied

   Year 2:
   ❑ Very Dissatisfied
   ❑ Slightly Dissatisfied
   ❑ Satisfied
   ❑ Slightly Satisfied
   ❑ Very Satisfied

   Year 3:
   ❑ Very Dissatisfied
   ❑ Slightly Dissatisfied
   ❑ Satisfied
   ❑ Slightly Satisfied
   ❑ Very Satisfied

7. Do you feel that those students grasp all the necessary technical knowledge and skills for them to have a future job in the field of Agriculture?

   ❑ Really Disagree
   ❑ Slightly Disagree
   ❑ Nor Agree nor Disagree
   ❑ Slightly Agree
   ❑ Really Disagree

8. According to you, are the apparatus found in your laboratory up-to-date with the modernized apparatus found in the workplace in the field of Agriculture?

   ❑ Yes ❑ No ❑ I Don't Know

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SECTION C

9. Could you please, list some technical skills and knowledge according to your field that students in BSc (Hons) Agriscience and Technology lack?

1	
2	
3	
4	
5	

10. Could you list some Experiments or Analysis that students in BSc (Hons) Agriscience and Technology have difficulties to perform?

1	
2	
3	
4	
5	

11. According to you, do you feel that those students acquire all the technical skills they should have to work for an enterprise or a Laboratory?

❑ Yes ❑ No

If No, What skills do they lack?

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SECTION D — SAFETY LEVEL IN LABORATORY OR UOM FARM

12. Do current students have the knowledge about Hazard and Safety precautions in a laboratory or UoM Farm?

- ❑ Very Dissatisfied
- ❑ Slightly Dissatisfied
- ❑ Satisfied
- ❑ Slightly Satisfied
- ❑ Very Satisfied

13. According to you, do students in BSc Agri&Tech respect the Hazard and Safety systems of Laboratories or UOM Farm?

❑ Yes ❑ No

14. Can you please rate the Technical skills of the actual students enroll in the course BSc (Hons) Agriscience & Technology? (Please tick one box only)

1	2	3	4	5	6	7	8	9	10

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Editors' Acknowledgments

Editors' Acknowledgments

The Editors would like to express their appreciation to the Editorial Board and the Panel of Advisory Editors for their advice and help in producing Volume Four, Issue 1. Particular thanks are due to the Managing Editor who oversaw this whole Issue in relation to production of both print and electronic copy and was a constant source of help and encouragement. Finally, we would like to offer our sincere, warmest and heartfelt thanks to those listed below who gave of their time and wise expertise to assist with the reviewing process. We are grateful to all of them and particularly to those, who suffered from adverse technological situations or generously reacted to pressing time conditions.

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Anna Serbati
November 23rd, 2016

Guidelines for Authors

Guidelines for Authors

VERSION 1ST NOVEMBER 2016

General Information

The *Tuning Journal for Higher Education*, TJHE, 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. The submitted manuscript should not have been previously copyrighted or published in any form, including electronic media and databases, and must not be currently under consideration for publication elsewhere.

These Guidelines should be used with reference to TJHE Ethical Guidelines for Publication. Both documents are available at the web page of the Journal (http://www.tuningjournal.org/).

Manuscript Preparation

To expedite the review process, please format your manuscript as follows:

1. Prepare your manuscript as a single editable Microsoft Word or Open Office document with line numbering, using the template downloadable from the web page of the Journal (http://www.tuningjournal.org/index.php/tuning/about/submissions#onlineSubmissions). The file should include the complete text, references, tables and figures. All revised manuscripts should again be sent as a single editable document.
2. Manuscripts must be written in either UK English or US English consistently and include a 100-300 word abstract. The title page should include authors' affiliations plus the email address of a single corresponding author. The Chicago Manual of Style (CMOS), 16th edition, should be used as a reference for manuscript preparation (www.chicagomanualofstyle.org/home.html).
3. Format of references, notes, and bibliography list.
   a) Authors are required to format their citations and references using the 'Notes and Bibliography' system of the CMOS, 16th edition (http://www.chicagomanualofstyle.org/tools_citationguide.html) and not its 'Author-date' system.
   b) Note references must be numbered in superscript format in the text and arranged numerically (in the order they appear in the text) at the bottom of each page, in line with the CMOS 'Footnotes' system.
   c) 'Notes' include complete bibliographic information when cited for the first time. For subsequent citations of the same source, shortened versions are preferred.

d) The 'Bibliography' list includes all and only sources cited in the 'Notes' and provides complete reference information.

e) 'Bibliography' entries are to be arranged alphabetically by (first) author's last name following the CMOS guidelines.

f) Microsoft Word (2010 and later) can be used with such software as "EndNote", "RefWorks", "Reference Manager", RefME, and "Zotero", to simplify the task of managing citations and references according to the recommended CMOS.

4. Authors are asked to provide between 5 and 10 keywords immediately following the Abstract.
5. Authors are reminded that it is their sole responsibility to ensure that the use of English in their manuscripts is either UK English or US English, but not both, and that they can resort to professional editing services prior to submission.
6. Please ensure that all the characters and special characters in the text, tables, figure legends, footnotes and references are in a single typeface and point size – such as 12 pt Times New Roman. Once a manuscript is accepted, a copy editor will decide the typeface and size of the different elements of the article.
7. Please submit all figures or photographs as separate jpg or tif files with distinct characters and symbols at 500 dpi (dots per inch). Tables and equations should be in an editable rather than an image version. Tables must be edited either with Microsoft Word or Open Office. Equations must be edited with the appropriate Equation Editor. Tables, table captions, figures and figure captions should be appended after the 'Bibliography' section, as indicated on the standard template for manuscript preparation (http://www.tuningjournal.org/index.php/tuning/about/submissions#onlineSubmissions).
8. Type your manuscript single-spaced. This will conserve paper and makes it easier for reviewers to handle.
9. Manuscripts should normally be between 5,000 and 12,000 words including notes, references, captions, and diagrams. Diagrams should be reckoned at the equivalent of 500 words if they occupy a full page and proportionately less if smaller. Longer articles require editorial approval.
10. Authors of manuscripts should each submit a biographical note of 150-200 words. The note must contain the following information:
    - Full Name
    - E-mail address
    - Affiliation
    - Current post
    - Relevant experience
    - Principle fields of research
    - Highest academic qualification

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In OJS, editorial correspondence related to a manuscript is reserved for the person who actually submits the manuscript in question. In cases of various authors, the submitting author is the sole co-author with access to the manuscript and related files and correspondence. It is therefore important that the corresponding author, referred to as "Principal contact for editorial correspondence" in OJS terminology, be the actual submitter of the manuscript.

Authors are invited, in their covering email, to provide the names of three well-qualified reviewers. Current e-mail addresses must be provided for all suggested reviewers. They should also supply the email address of a single author who will act as corresponding author.

A copyright transfer agreement must be signed after acceptance but before publication. To that effect, they receive in due course a standard copyright assignment form from the Managing Editor of the Journal.

Review Process

The Editor, with the assistance of the Managing Editor and or any other member of the editorial team, makes a first check of conformity of submitted manuscripts with the Journal policy and submission guidelines.

Manuscripts not conforming to journal guidelines will be returned to authors without evaluation.

The Editor hands each manuscript accepted for review to a member of the Panel of Advisory Editors, who will control the review and revision process of that manuscript.

The Editor will prepare a decision letter based on the comments of the reviewers and the recommendation of the Advisory Editor, which will be sent to the corresponding author by email.

It is our intention that all non-reviewed manuscripts will be sent back within 21 days of submission acknowledgement and that a first decision letters for manuscripts will be sent within 8 weeks of receipt.

In cases of required revision work, a second editorial decision letter will be sent after assessment of the revised version within 11 weeks (in case of "Revisions Required") or 12 weeks (in case of "Resubmit for Review") of initial receipt.

Publication Cost

Currently, no charges for submission and publication are applicable.

More information and correspondence

Detailed and updated information is available at <http://www.tuningjournal.org/>. Editorial correspondence should be sent to the Editor (Luigi F. Donà dalle Rose, <dona@pd.infn.it>), Assistant Editor (Anna Serbati, <anna.serbati@gmail.com>), and or Managing Editor (Ladislas Bizimana, <ladislas.bizimana@deusto.es>, <tuningjournal@deusto.es>). The mailing address is the following:

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TJHE
Ethical Guidelines for Publication

TJHE Ethical Guidelines for Publication

FINAL VERSION (MARCH 2015)

Tuning Journal for Higher Education (TJHE), Tuning Journal in short, is an international journal publishing in English original research studies and reviews in all aspects of competence-based, student-centred, and outcome-oriented education reforms at university level across the globe. It is published by the University of Deusto's Publications department on behalf of the International Tuning Academy (Tuning Academy in short), a jointly managed project of the Universities of Deusto (Spain) and Groningen (The Netherlands). The Journal, essentially an open access, online and peer-reviewed publication, is committed to maintain the highest ethical standards. Hence, the involvement of any stakeholder in any function connected with TJHE, including acting as an editor, the reviewing of manuscripts, the management and production of the Journal and the authorship and submission of manuscripts implies acceptance of and adherence to **TJHE Ethical Guidelines for Publication**.

* The term *Editor(s)* as used below refers to Editors, Advisory Editors, Guest Editors, and Editorial Board members when delegated to serve in an editorial capacity.

1. Publishers, Managing Board, Editorial Board

1.1. The Editorial Board is appointed by the Tuning Academy in consultation with the Universities of Deusto and Groningen.

1.2. The Editorial Board is responsible for setting policy, appointing the Editor and Advisory Editors of the Journal.

1.3. The Editor is responsible for ensuring that publication policies set by the Editorial Board are carried out.

1.4. The Management Board is appointed by the Tuning Academy in consultation with the Universities of Deusto and Groningen.

1.5. The Managing Board is responsible for the commercial management of the Journal and appointing a Managing Editor.

1.6. The Managing Editor is responsible for ensuring that the commercial policies set by the Management Board are carried out.

1.7. Members of the Editorial or Management Boards or employees and, or members of the Tuning Academy should not intervene in or comment on editorial decisions on individual manuscripts.

2. Editors, Advisory Editors, and Guest Editors

2.1. *Editors* of the Journal and Specialist Volumes are expected to carry out editorial duties in a manner consonant with policies set by the Editorial Board.

2.2. The Editor has full responsibility, which he/she may delegate to an Advisory Editor, for editorial and technical decisions on Journal and specialist volume content.

2.3. *Editors* will give manuscripts unbiased consideration.

2.4. *Editors* should process manuscripts expeditiously.

2.5. The Editor has sole responsibility for acceptance or rejection of a manuscript. Manuscripts should have peer review, but the Editor may reject any manuscript for other causes (inappropriate for journal, clearly of poor quality, contents previously published elsewhere, etc.)

2.6. The Editor should not disclose information about submitted manuscripts except to reviewers, Advisory Editors, Editorial Board members, and staff at the University of Deusto's Publications department. Information about a manuscript may be shared after electronic publication (e.g., news releases or inclusion in a list of contents, etc.).

2.7. Manuscripts submitted by an *Editor* should be delegated to another Advisory Editor or Editorial Board member.

2.8. An *Editor* should not handle manuscripts for which there is a real or perceived conflict of interest. Examples include, but are not restricted to, past (within the last 5 years) or current collaboration, employer or employee, close friend, family relationship, institutional relationship, past or present graduate advisor or advisee, someone with whom the reviewer has had a past or on-going academic controversy, or situations where the *Editor* could stand to gain or lose economically or in any other way by publication or rejection of the manuscript. Editorial responsibility should be delegated to another Editor, Advisory Editor, or Editorial Board member.

2.9. An *Editor* must not use information, data, theories, or interpretations of submitted manuscript in her/his own work unless that manuscript is in press, published or the author has given permission to do so.

2.10. If an *Editor* is presented with convincing evidence that the main substance or conclusions of a publication is/are erroneous, he/she should facilitate publication of a report (e.g., correction, follow-up manuscript, or other appropriate means) pointing out the error and, if possible, correcting it. The report may be written by the person who discovered the error or by the original author. The original publication does not disappear from the published record.

3. Authors and Co-authors

3.1. Manuscripts should contain original, new results, data, ideas and/or interpretations not previously published or under consideration for publication elsewhere (including electronic media and databases).

3.2. Authors should be encouraged to avoid fragmentation of their work where practical, so that the submitted manuscript is as comprehensive and authoritative as possible.

3.3. Authors should inform the Editor of related manuscripts under consideration elsewhere and provide copies if requested.

3.4. Fabrication of data, results, selective reporting of data, theft of intellectual property of others, and plagiarism are unethical practices and unacceptable.

3.5. Information obtained privately (e.g., in conversation, correspondence, or discussion with third parties) should be avoided as it is not in the public domain and is thus unverifiable. If considered necessary, it should not be used or reported in a manuscript without explicit permission from the party with whom the information originated. Information obtained in the course of confidential services (e.g., refereeing manuscripts or grant applications) should be treated similarly.

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3.6. Manuscripts will contain proper citation of works by others, especially publications of the original hypotheses, ideas, and/or data upon which manuscript is based or addresses.

3.7. Authorship

a) Authorship should be limited to those who have made significant contributions to the concept, design, execution or interpretation of the work reported in a manuscript; others who have contributed should be acknowledged;

b) Author order should be agreed on by all authors as should any changes in authors and order that occur while the manuscript is under review or revision. Changes in authorship must be submitted to the Editor in writing and must be signed by all authors involved.

c) Authors and co-authors should review and ensure the accuracy and validity of results prior to submission; co-authors should have opportunity to review manuscript before submission.

3.8. Authors should reveal to the Editor any potential conflict of interest (e.g., a consulting or financial interest in a company) that might be affected by publication of the results contained in a manuscript. The authors should ensure that no contractual relations or proprietary considerations exist that would affect the publication of information in a submitted manuscript.

3.9. Authors are encouraged to disclose major funding sources (e.g., government agencies, private foundations, private industry, and universities) for reported research.

4. Reviewers

4.1. A reviewer should disclose real or perceived conflict of interests to the Editor before agreeing to write a review. Examples include, but are not restricted to, past (within the last 5 years) or current collaboration, close friend, employer or employee, family relationship, institutional relationship, past or present graduate advisor or advisee, someone with whom the reviewer has had a past or on-going scientific controversy, or situations where the reviewer could stand to gain or lose economically or in any other way by publication or rejection of the manuscript. The Editor will decide if the conflict is severe enough to prevent the reviewer from writing a fair, objective review.

4.2. A reviewer should decline to review a manuscript if she/he feels technically unqualified, if a timely review cannot be done, or if the manuscript is from a competitor with whom the reviewer has had an acrimonious professional relationship or a conflict of interest as defined above (section 4.1).

4.3. Reviewers should be encouraged, but not required, to sign reviews. The Editor will preserve anonymity of reviewers should a reviewer elect to remain anonymous.

4.4. Reviewers must treat the manuscript as confidential.

4.5. Reviewers must ask the Editor for permission to discuss the paper with others for specific advice, giving names and reasons for such consultation.

4.6. Reviewers must not pass the manuscript to another to carry out the review without permission from the Editor.

4.7. Reviewers must not use information, data, theories, or interpretations of the manuscript in their own work unless that manuscript is in press, published or the author has given permission to do so.

4.8. Reviewers should clearly support and justify the basis for their review analysis.

4.9. Reviewers should alert the Editor to similar manuscripts published or under consideration for publication elsewhere in the event they are aware of such. However, it is the responsibility of the Editor, not the reviewer, to decide on the proper course of action once so informed.

5. Citation Manipulation

5.1. Citation manipulation is considered unethical. Manipulation may include adding citations not contributing to a manuscript's content or solely aiming at increasing an author's or a journal's citations.

6. Sanctions

6.1. Suspected breaches of this policy may be handled by the Editor or may be forwarded to the Editorial Board for review and recommendation.

6.2. If an *Editor* is determined to have violated the **TJHE Ethical Guidelines for Publication**, the matter will be referred to the Editorial Board.

6.3. If an author is determined to have violated the **TJHE Ethical Guidelines for Publication**, TJHE reserves the right to impose sanctions, which may include restriction from further consideration of accepting the author's work, retraction of a published paper, or withdrawal of a submitted paper.

Date: 16 March 2015

Approved by the TJHE Editorial Board and signed on behalf of the Tuning Academy by:

Pablo Beneitone
Director, Tuning Academy (Deusto)

Robert Wagenaar
Director, Tuning Academy (Groningen)

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