Malaysia Architectural Journal

Investigating Academic Excellence in Part 1 Architectural Education through comparison of Public Research Universities' Program Learning Outcomes

Bashira Mohd Bahar[1*], Nurul Alia Ahamad[1] & Siti Balkish Roslan[2]

[1] School of Architecture, Building and Design, Taylor's University, Selangor, Malaysia
[2] Department of Architecture, Xi'an Jiaotong-Liverpool University, Suzhou, China

* bashira.mohdbahar@taylors.edu.my

This paper aims to evaluate the existing curriculum model in Malaysia's architectural education system. The authors investigated the academic excellence of selected public universities by comparing their Program Learning Outcomes (PLOs), whilst considering the limitations of the research. The importance of this study is to create fruitful discussion among different architectural faculties to ensure future studies can offer a credible framework for achieving academic excellence within the Part 1 Program of the Malaysian Architectural Programs. The paper considered two mappings of PLOs against two accountable guidelines: the Manual of Accreditation for Architecture Programme (MAAP) 2013 and the Malaysian Qualification Framework (MQF) 2nd Edition 2017. The outcome of this research revealed three indispensable issues related to the PLO mappings, which are the lack of description the need to redefine the scope of certain mastery skills, and to reformulate certain PLOs to be in sync with the overall aim of the institution's program.

Keywords: Architectural Education, Academic Excellence, Program Learning Outcomes

1. INTRODUCTION

An architect is someone who is professionally and academically qualified by law to practise architecture within the jurisdiction which he is licensed for. The architect is also responsible for advocating fair and sustainable development of the welfare, and cultural expression of society's habitat in terms of space, forms and historical context, all of which he must encompass and embody skills and knowledge. Through education, the formation and execution of educational objectives for refining the achievement of stipulated learning outcomes of the architect's practice is being developed systematically.

The design of educational objectives is to equip students with adequate skills to respond to market and professional opportunities (Charalambous & Christou, 2016). The main target is to hone certain aspects of the students' education in terms of communication and collaborative skills to empower them to perform in interdisciplinary leadership roles and confidently steer and motivate teams in future professional practice.

Educational objectives and learning outcomes are statements that clearly define what the student should know or be able to execute as a result of having attended an educational programme or an activity. The articulation of these two components should be observable and measurable where the focus on the learner is evident and contains action verbs to describe specific measurable behaviours (Zimmerman, 2001).

In this research, we evaluated the Programme Learning Outcomes of selected universities within the Klang Valley to identify a framework that has the needed components to ensure Academic Excellence in architectural education.

2. LITERATURE

2.1 The Trinity: Architecture Education Providers (AEP), Lembaga Arkitek Malaysia (LAM), and Council of Architectural Accreditation and Education Malaysia (CAAEM)

Since the 1950s, Architecture schools in Malaysia have been established. Universiti Teknologi Malaysia which was at the forefront of architectural education, paved the way for other schools by establishing the Faculty of Architecture in 1970. Then it progressed further to the setting up of the Faculty of Built Environment in 1974, presently called the Faculty of Built Environment and Surveying. The beginning of architectural education was based and modelled after the British syllabus whilst considering the needs of the local context. With the expansion of architectural education, all established institutions in Malaysia have been constantly under pressure to achieve academic excellence. Driven by this, the educational objectives and learning outcomes have also evolved in lock-step fashion.

In order to improve and implement an idealistic system which can evolve the programme to encourage innovative learning, it is important to know the system of programme learning outcomes which are of relevance to the essence of architectural education. Lembaga Arkitek Malaysia (LAM) or the Board of Malaysian Architects is a statutory body that regulates the standard for the architectural profession and its education (Shari & Jaafar, 2006). The Council of Architectural Accreditation and Education Malaysia (CAAEM) was formed under LAM to administer all matters relating to architectural and interior design education. In 2013, the Manual of Accreditation for Architecture Programme (MAAP) was published by CAAEM and this was used until 2022 as the guideline for all Architecture Education Providers (AEP) to apply for accreditation. The education level administered by LAM through CAAEM comprises three levels: LAM Part I, LAM Part II and LAM Part III. Each denotes a degree, masters and professional level. LAM Part I and LAM Part II are closely monitored by the Malaysian Qualifications Agency (MQA) as these are conducted as formal education courses in institutions of higher learning. Therefore, part of the requirements and guidelines set by CAAEM are based on the current developments of the MQA Framework. In addition to the vigilant monitoring by MQA, MAAP in 2013 specified that the minimum study years for LAM Part I and LAM Part II should be 3 and 2 years respectively.

In order to support LAM in defining the standards for architectural practice and education, the Malaysian Institute of Architects (PAM) was formed in 1967. Part of its objective is to promote and increase the knowledge, study, and practice of architecture. LAM and PAM have worked hand in hand in providing a suitable platform for the activities and exposure needed for the betterment of the industry.

2.2 Academic Excellence and its importance in architecture education

The standard of the architectural education curriculum can potentially define the intellectual capacity and quality of future architects (Findeli as cited in Gafar, Kasim, & Martin, 2012). Architectural schools in Malaysia have increasingly been under pressure to pursue excellence in architectural education, to be aligned with the *Hala Tuju Pendidikan Senibina Negara* 2021-2030 report. Academic excellence is a contextual phenomenon and there are many definitions, which need to be considered from different perspectives, values and cultural diversities. According to Grifoll (2016), academic excellence can be defined as ‘the fulfilment of a certain standard’ and has been traditionally related ‘to a distinction, a quality which is unusually good and surpasses the ordinary’. Williams, Venville & Gordon (2013) support the idea that academic excellence in educational discourse can be perceived as a prime descriptor for a much sought-after level of achievement’.

Grifoll (2016) believes that academic excellence can be achieved by deploying: (a) a combination of quality teaching and learning inputs to generate quantity outputs, (b) a culture of using improved inputs and cyclical progress for better outputs and (c) a list of expected targets. Rogaten & Moneta (2016) claim that academic excellence is determined by students’ motivation, learning progress and personal development and therefore, it is commonly constructed from the

outcomes of a talent development process (Williams, Venville & Gordon, 2013). In this view, the outcomes are essential in determining educational excellence (Chinapah, Cars & Grinberg, 2013).

2.3 Definition of Programme Learning Outcome (PLO)

One of the most prominent developments in the 1950s in Malaysia is the development of Outcome-Based Education (Mohayidin, Suandi, Mustapha, Konting, Kamaruddin, Man, Adam, & Abdullah, 2008). It has been implemented across all levels of education from primary, secondary to tertiary and has been transformed over the years to prepare students with a respected level of education for life and the workplace upon graduation. Outcome-Based Education (OBE) has been the pillar of reference in the accreditation and quality enhancement process for programs across the globe (Bhat, Bhat, Raju, D'Souza, & K.G., 2020). Tertiary education outcomes are usually demarcated by three levels namely: Programme Education Outcome (PEO), Programme Learning Outcome (PLO) and Course Learning Outcome (CLO) and each of these levels corresponds to one another linearly.

The relationship between PEO, PLO and CLO is based on a hierarchical input. According to the Guideline for Good Practice: Curriculum Design and Delivery published by MQA in 2011, CLO is used to measure the understanding that students have upon completion of the courses. PLO is used to measure the collective understanding of all courses in a certain programme, upon completion of the study, while PEO is an extension of the two, measuring the skills obtained by an alumnus of the programme upon graduation, after completing all the courses within 3 – 5 years. Therefore, in architectural education, PEO is the final indicator of a successful programme that responds to the needs of the industry.

3 METHODOLOGY

3.1 Identification of chosen universities

This research employs a comparative research method to compare and analyse the architectural PLOs of three public research universities in Malaysia against the LAM guidelines. The selected universities are: Universiti Malaya (UM), Universiti Putra Malaysia (UPM) and Universiti Kebangsaan Malaysia (UKM). A comparative study is defined as an analysis and comparison of two or more subjects to determine whether significant differences exist for certain predefined measures among these three prominent public research universities. The variables taken into consideration for the selection of these three universities included the following: -

- They are accredited by LAM
- They are public universities
- They are categorized under mature universities (universities that are over 15 years old) by the SETARA rating.

The process of determining the universities is also based on their reputation and credibility. According to Miri (2019), the selection of case studies is the most challenging with regard to comparative research. Esser & Vliegenthart (2017) suggest that the comparative study can only be meaningful when the case study selection is related to the same theoretical framework and the same set of variables that rationalize the research structure and subsequently enables it to contribute to the cumulative development of knowledge and theory. The generic learning outcomes are intended to provide a framework to reduce the gap between the world of education, work, and responsible global citizenship and to further harmonise or integrate these systems. This is demonstrated by the skills and knowledge of learners to successfully perform in professional, educational, and other life contexts.

3.2 Understanding of the Architecture Education Provider's (AEP) Program Learning Outcome (PLO)

The applied methodology of the research is through comparative analysis and with this, part of the content to analyse are the PLOs of the three selected universities. The PLOs are chosen as the component of comparison as they benchmark the competency of students upon program completion as required by each education provider chosen for this research. Each chosen education provider in its own domain, covers the mastery of core skills such as practical skills, social skills, responsibilities, values, professionalism, attitude, problem-solving, scientific skills, communication, leadership and teamwork skills, information management, lifelong learning skills, managerial and entrepreneurial skills. All of these

make up the core of architectural education which should ensure that the graduates from each school have obtained and retained the knowledge and ability to execute and carry out architectural design. The consideration for health, safety and ecological balance is another area of mastery. Other areas include the understanding of culture, intelligence and the historical, social and economic contexts for architecture. This is done through comprehension of the architect's role and responsibilities in society and is practised through technical systems and requirements which are stated in the PLO of the program conducted by the education provider and evaluated against the requirements of LAM.

3.3 The relationship of the LAM mastery and architecture education

MAAP 2013 listed 10 mastery skills of the PLOs which are to be adopted by AEP as their respective PLOs. These 10 mastery skills include the body of knowledge, practical skills, social skills and responsibilities, values, attitudes and professionalism, problem-solving and scientific skills, communication, leadership, and teamwork skills, information management and lifelong learning skills, and managerial and entrepreneurial skills. These 10 mastery skills are based on the Malaysian Qualification Framework (MQF) 1st Edition, 2007.

Apart from adhering to MQF's listed domains, MAAP 2013 required AEP to personalize the 10 mastery skills to define the AEP's programme aim and philosophies with clarity. This includes technical systems and requirements as well as consideration for health, safety, and ecological balance. It is also essential for students of such programs to understand the cultural, intellectual, historical, socio-economic, and environmental contexts for architecture, to fully appreciate the architect's roles and responsibilities in society. All these will ultimately depend on their having a cultivated, analytical, and creative mindset.

In 2017, MQA updated these 10 domains through the MQF 2nd Edition. The new list of domains was built up from 8 of the previous domains. With a reduced number of 5 domains, this new set of core skills are still relatable to the 1st edition but with an elaborated domain on Functional Work Skills. 6 Skills clustered under Functional Work Skills include Practical Skills; Interpersonal Skills; Communication Skills; Digital Skills; Numeracy Skills; and Leadership, Autonomy, and Responsibility. All six skills are aimed to address the needs of the Industrial Revolution 4.0, which has a strong focus on Digital and Numeracy Skills.

This set of updated domains by MQA is relevant to MAAPS expectations and guidelines. MAAP 2013 also addresses the need to adhere to MQA's specified PLO by relating it to the architecture field. Based on the MQA's revised domains, LAM Part I graduates are expected to be able to produce designs of appropriate complexity and scales up to the schematic level, using appropriate communication tools to demonstrate understanding of cultural, historical and established architectural theories, philosophies and context. They are also required to demonstrate creativity, innovation and imagination and translate these into an architectural design solution which develops the design to a level for regulatory application for Building Plan submission that complies to the requirements of local authorities. Besides the understanding of building regulations, basic building construction and materials, environmental considerations and building services, graduates should be able to translate the design into construction drawings with appropriate construction details. They should also be conversant with established architectural drawing convention and be ready to work collaboratively in teams to actively participate in the design process. All of these domains are related to MQF's 1st and 2nd editions.

In short, LAM through MAAP expects AEPs to produce graduates who can communicate their ideas at the Schematic Design Phase and demonstrate their technical understanding to comply with various requirements for Building Plan submission, while having teamwork skills. All these criteria are to ensure graduates will have a smooth transition into the demanding practices of the architecture industry.

3.4 The relationship of the LAM requirements and architecture education

A comparative method was used to analyse the architectural PLOs of three public research universities in Malaysia, against the LAM guidelines. By employing comparative analysis, an in-depth understanding can be obtained by exploring different options and solutions that can facilitate an alternative to similar problems (Esser

& Vliegenthart, 2017). In this study, three sets of PLOs were analysed and delineated in detail. Subsequently, keywords were identified and grouped into distinct categories with identifiable and shared characteristics. The overall procedure was iterative and required constant comparisons between the keywords and the MAAP specified domains.

4 FINDINGS: Comparison of similarities and differences PLO against MQF Learning Outcome Domain and MAAP Mastery Skills

4.1 MQF Learning Outcome Domain against MAAP Mastery Skill

	K&U	CS	FWS						P&ES	E&P
			PS	IS	CS	DS	NS	LA&R		
Body of knowledge Mastery Skills	√		√							
Practical Mastery Skills										
Social Skills & Responsibilities Mastery Skills				√						
Values Mastery Skills									√	√
Attitudes & Professionalism Mastery Skills										√
Problem Solving & Scientific Mastery Skills		√	√							
Communication Mastery Skills					√					
Leadership & Team Mastery Skills								√		
Information Management & Lifelong Learning Mastery Skills						√				
Managerial & Entrepreneurial Mastery Skills									√	

*K&U: Knowledge and understanding
CS: Cognitive Skills
FWS: Functional Work Skills
PS: Practical Skills
IS: Interpersonal Skills
CS: Communication Skills
DS: Digital Skills
NS: Numeracy Skills
LA&R: Leadership, Autonomy & Responsibility Skills
P&ES: Personal & Entrepreneurial Skills
E&P: Ethics & Professionalism Skills

The table above exemplifies clear similarity and connection between LAM requirements through its 10 mastery skills in MAAP 2013, and MQA's learning outcome domain through its guidelines in the Malaysia Qualification Framework (MQF) 2nd Edition 2017. It can be concluded that all the criteria listed in MAAP 2013 have been reflected in the MQF's guidelines. In MAAP 2013, the mastery skills listed that had to be incorporated into architecture programs were not elaborated. Therefore, the mapping of the stipulated skills in the table above is based on the MQF 2017 description of each of these domains.

The mapping revealed direct areas of convergence between the LAM mastery skills and MQF learning outcome domains. These are: Knowledge & Understanding / Body of Knowledge, Practical Skills, Communication Skills, Ethics & Professionalism / Attitudes & Professionalism, and Leadership, Autonomy & Responsibility / Leadership & Team Skills. In addition, Cognitive Skills as defined by MQF 2017, is to enable students to think intellectually. This involves analysing, problem solving, critical / creative thinking and synthesising. According to this definition, Cognitive Skills is reflected by Problem Solving & Scientific Mastery Skills in MAAP 2013. By extension to the later version of this referred mastery skills, Scientific Skills is more elaborated in the Practical Skills sub-domain. Hence this can be mapped against both domains.

Consequently, this answers one of the characteristics and attributes of architectural graduates in MAAP 2013: LAM Part 1 graduates should have the ability to demonstrate creativity, innovation and imagination, and translate these into an architectural design solution. Three out of the six subdomains of MQF's Functional Work Skills Domain that are not directly reflected in MAAP 2013 Mastery Skills are Interpersonal Skills, Digital Skills and Numeracy Skills.

Interpersonal Skills as described by MQF 2017 is essentially the social skills which involve interacting and networking with people from different cultures. This also relates to the ability to manage relationships within teams. Through this definition, it is mapped to Social Skills & Responsibilities from MAAP 2013 Mastery Skills.

Another subdomain is Numeracy Skills. As described in MQF, this is not meant to be implemented in every programme, but is only subjected to specific related programmes. Previously in the 1st edition of MQF's Learning Outcomes Domain, Numeracy Skills is part of the Information Management & Lifelong Learning Skills Domain. This is for the student to be able to evaluate information using Information and Communication Technology (ICT), with continuous professional development through lifelong learning skills. Although architecture in general could not be separated from mathematics and physics, as it is closely related to engineering and quantity surveying, MQF defines Numeracy Skills as higher level numerical abilities, which are not required in architecture programmes. This confirms that Numeracy Skills are not a core requisite for architecture programmes for MAAP 2013. Therefore, Numeracy Skills was omitted by MAAP 2013.

The final subdomain to be mapped is Digital Skills. According to MQF 2017, it is the ability to source and store information, and also process the data obtained. In MAAP 2013, this skill was combined with Lifelong Learning Skills. Lifelong learning skills are two skills which are interrelated with continuous learning pathways that are ever-growing. This is parallel to the nature of digital skills that are ever-changing with time and the multiple phases of the industrial revolution. As for Lifelong Learning Skills, this can be relevantly mapped to MQF's Personal & Entrepreneurial Skills Domain. These are defined as the skills that learners are expected to use daily and since they change from one education level to another, they are most relevant to the lifelong learning domain. The other part of this domain is entrepreneurial skills, and these are grouped together with Managerial & Entrepreneurial Mastery Skills from MAAP 2013. Due to this, lifelong learning skills could be a common term that can be slotted into more than one mastery skill or domain.

Value is another MAAP 2013 mastery skill that is applicable to be mapped to multiple MQF 2017 learning outcome domains. In the table above, Value is plotted under Personal & Entrepreneurial, and Ethics & Professionalism Skills. The definition of Value that brings to this double domain mapping is either personal value growth in task and learning context, or the ability to understand the different cultural values. Neither MQF 2017, nor MAAP 2013 gave a clear definition of what constitutes Value for AEPs to arrive at a specific conclusion.

To complicate matters, MQF 2017 did not specifically identify any domain as Value; however, the 1st edition of MQF had one of the listed domains as Values, Attitude & Professionalism. In the current MQF 2017, this has been replaced by the Ethics & Professionalism domain. Yet in the MQF 2017 Level Descriptors table, the description of personal value growth in task and learning context is present in both Personal & Entrepreneurial Skills, and Ethics & Professionalism. This leads to the concern of the undefined mastery skills for Value in MAAP 2013.

4.2 MAAP Mastery Skills against AEP's PLO

	BoK	P	SS&R	V	A&P	PS&S	C	L&T	IM&LL	M&E
UNIVERSITI MALAYA										
PLO 1: Adequate knowledge	√									
PLO 2: Scientific skills with integrated knowledge						√				
PLO 3: Practical skills in designing quality 3-dimensional spaces		√								
PLO 4: Social skills and a responsible attitude			√							
PLO 5: Responsible ethically, professionally and possess integrity					√					

PLO 6: Communicate clearly and exhibit leadership and teamwork skills through appropriate media							√	√		√
PLO 7: ICT information management and practise life-long learning skills				√					√	
UNIVERSITI PUTRA MALAYSIA										
PLO 1: Designs at appropriate levels of complexity and scale using appropriate communication methods.	√	√		√			√			
PLO 2: Accepted culture, history and architectural theory, philosophy, and context.										
PLO 3: Creativity, innovation and imagination						√				
PLO 4: Develop the design to a level that is consistent with legislation and regulations		√			√				√	
UNIVERSITI KEBANGSAAN MALAYSIA										
PLO 1: (Knowledge) Able to acquire and apply knowledge of Architecture to meet cultural, aesthetic, environmental and technical needs.	√								√	
PLO 2: (Sustainability & social awareness) Able to understand built environment			√	√						
issues in the context of social, cultural and environmental responsibility for the needs of sustainable development.										
PLO 3: (Practicality and Innovation) Able to inspire innovation in architectural design that is responsive to culture, aesthetics, environment and technical needs.		√				√				
PLO 4: (Communication) Able to communicate about design ideas and effective design solutions in the General Body Arts community.							√			
PLO 5: (Leadership, Collaboration and Teamwork) Able to collaborate and collaborate effectively as individuals and members in a multidisciplinary team with the ability as a leader.								√		√
PLO 6: (Ethics) Able to understand and apply built environment codes and regulations related to local context and practice.					√					
PLO 7: (Entrepreneurship) Able to understand and implement the basic principles of entrepreneurship.										√

*BoK: Body of Knowledge Mastery Skills
P: Practical Mastery Skills
SS&R: Social Skills & Responsibility Mastery Skills
V: Values Mastery Skills
AP : Attitudes & Professionalism Mastery Skills
PS&S: Problem Solving & Scientific Skills
C: Communication Skills
L&T: Leadership & Team Mastery Skills
IM&LL: Information Management & Lifelong Learning

Mastery Skills
M&E : Managerial & Entrepreneurial Mastery Skills

The Table above is the mapping done from three selected Architecture Education Providers (AEP) against the 10 Mastery Skills from MAAP 2013. Each AEP has a different number of PLOs for its program. Universiti Malaya (UM) and Universiti Kebangsaan Malaysia (UKM) have seven PLOs, while Universiti Putra Malaysia (UPM) has only four PLOs. In comparison with the 10 Mastery Skills from MAAP 2013, it can be inferred that it is possible to map a few mastery skills against one PLO.

Every one of the 3 AEPs selected, has its direct adaptation of Body of Knowledge mastery skills, listed as its first Programme Learning Outcome (PLO). Other mastery skills with direct adaptations are Attitudes & Professionalism, Problem Solving & Scientific Skills, and Communication Skills. In this context, "direct adaptation" refers to the clear presence of the mastery skill's keyword in the AEP's PLO. As explained in 5.1, the Values mastery skills is described as personal value growth in task and learning context. Each AEP has defined these mastery skills differently in their PLOs. Among all the seven PLOs from UM, there is no clear link to keywords such as growth in task or growth in learning context, except for lifelong learning skills. Thus this mastery skill is mapped to UM's PLO4. Meanwhile, as for the PLOs of both UPM & UKM, Values can be linked to the PLO that suggests understanding and acceptance towards the context of the built environment and its related field.

As for Practical Mastery Skills, this refers to work skills and operational skills in a common architectural employment environment. This pertains to the ability to visualize, design and create, that an architecture graduate should possess. Both UM and UKM have keywords that highlight the relationship of their PLOs with this mastery skill. However for UPM, this can be mapped against two of its PLOs - PLO1 and PLO 4- as both suggest the same relevance to practical skills. With reference to the Social Skills and Responsibility mastery skills, UM is again portraying a clear direct reflection into its PLO. However, for UPM and UKM, there is a need for clarification. Social Skills and Responsibilities was previously mapped to Interpersonal Skills from MQF 2017, Chapter 4.1, where Social Skills was described as the ability to network with different people and cultures. It is not explained or suggested to mean social awareness. With that being said, both UPM and UKM's PLOs do not have clear indications of such an idea. This is being highlighted due to the choice of words used to explain the potentially related PLO. UPM described it as cultural acceptance while UKM described it as the ability to understand built environmental issues in the social and cultural contexts. In view of that, as compared to UPM, UKM's explanation could help to paint a better understanding of the mastery skills as it falls into the understanding that results in sustainable development.

In relation to the Information Management & Lifelong Learning Mastery Skills, UM yet again has provided a direct reflection of this in its PLO7, while UPM & UKM could have interpreted it to suit their programs' intentions. UPM explains its related PLO as developing design to an acceptable level in the industry, while UKM has included a few key elements required to complete a design. Both PLOs correspond uniquely with the explanation of the related mastery skills in MQF 2017, which involve the skills to source, store and process data using information technologies in order to complete a design. While both UM and UKM have evidently stated Leadership and Team Mastery Skills in one of their PLOs, UPM fails to make it visible for mapping to be done. Keywords that carry similar meaning as leading team, risk and autonomy are not present in any of its four PLO. Consequently the absence of any synonym to the term 'leadership' has caused UPM to not be able to map any of its limited PLO to Managerial & Entrepreneurial Mastery Skills.

Having MAAP 2013 separating Leadership and Managerial skills into two different mastery skills has allowed AEP to map its PLO to both of the mastery skills. However the other other part of Managerial Skills is Entrepreneurial Skills, in which both UM and UPM have no reflection of these skills in their respective PLO. In summary, there are missing MAAP 2013 Mastery Skills that are not evidently seen to be mapped to any of some AEP's PLO. As well as that, due to its overlap in description or the merging of descriptions of PLOs, some Mastery Skills can be mapped multiple times to one PLO.

5 DISCUSSION

In MAAP 2013, all ten mastery skills are presented as a list with no further explanation. Hence, there is the need to map them as shown in Chapter 4.1. Through the process, there are a couple of mastery skills that require elaboration as they could not be directly mapped onto MQF 2017 learning domains or its keywords. Therefore, the first and most important issue is the lack of description that could lead to misinterpretation of the mastery skills. The Values mastery skills is stated in vague terms in the MQF 2017, where keywords like 'value' appear in the 'Ethics and Professional' domain and 'Personal and Entrepreneurial Skills' domain. In both these domains, there were different expectations to be achieved. One focuses on the ability to reflect on task and personal values, while the other, on understanding of other cultural and value systems.

Furthermore, Social mastery skills could also be better defined as well. Its differentiation of where the student is situated at the receiving end of learning, affects how the AEP may interpret this mastery skill. Social mastery skills in MQF 2017 is stated as "learners' ability to obtain social awareness of context, or act upon the social context issues", or "improve social skills related to etiquette, or social networking". The second issue encountered during the mapping process at Chapter 4.1, is the need to redefine 'Leadership and Team' as well as 'Managerial and Entrepreneurial' mastery skills as their definitions are inter-related. Previously in the first edition of MQF, these two mastery skills were mapped to the same learning outcome domain. However, after the MQF updates in 2017, MAAP has yet to provide an update to reflect the changes. Even though the changes are not major, they could affect the interpretation of the content as both carry similar elements of managing.

Finally, the number of PLOs, as much as the carefully curated sentences do affect mapping clarity. UPM with its four PLOs did not present much avenue for them to be interpreted into all ten MAAP 2013 mastery skills. In contrast, most of the PLOs from UM were seen to be verbatim versions of the MAAP 2013 mastery skills. This has made the PLOs less unique to any UM school of thought, pedagogy or niche. The importance of having a description of listed attributes, either clearly articulated or suggestive, related to the establishment of a school, is much needed to ensure that AEPs are able to adopt it into their PLOs seamlessly. This is to enable both AEP and MAAP to provide better assistance for the improvement and development of architectural education through methods such as Continuous Quality Improvement.

6 CONCLUSION

The paper considered two mappings of PLOs to two accountable guidelines, MAAP 2013 and MQF 2nd Edition 2017. The analysis of the mapping has put forward three indispensable issues which LAM and AEP may have to heed. These pertain to the lack of description, the need to redefine the scope of certain mastery skills, and for the PLOs to be unique to the program aim of the relevant AEP. Furthermore, to keep abreast with current changes in education goals and the demands unfolded by the industrial revolution, MAAP could implement the changes made by MQF 2nd Edition 2017, in the new MAAP as the current guideline has been in use for close to ten years.

In conclusion, it is advisable to expand the scope of the study from the present mapping which is limited to 3 research-based AEPs, all of which are public universities, existing within the confines of the Malaysian education guidelines. The scope of a future study could potentially include private universities whose PLOs could be mapped against the standards set by the Royal Institute of British Architects (RIBA). Most architecture under-graduates who want to embark on their post-graduate architectural education have been choosing European countries as their destinations of choice. Hopefully, with the determination of high benchmarks in the process of PLO mappings, students will be convinced that local AEPs can offer quality accredited courses which are of comparable standards with those offered abroad.

7 REFERENCES

Bhat, S., Bhat, S., Raju, R., D'Souza, R., & K.G., B. (2020). Collaborative Learning for Outcome Based Engineering Education: A lean thinking approach. *Procedia Computer Science*, *172*, 927–936. https://doi.org/10.1016/j.procs.2020.05.134

Charalambous, N., & Christou, N. (2016). Re-adjusting the objectives of architectural education. *Procedia - Social and Behavioral*

Sciences, *228*, 375–382. https://doi.org/10.1016/j.sbspro.2016.07.05

Chinapah, V., Cars, M., & Grinberg, S. (2013). Global efforts towards quality education for all : Evidence and reflections from an international and comparative educational perspective. *Journal of Education and Research*, *3*(2), 39–58. https://doi.org/10.3126/jer.v3i2.8397

Esser, F., & Vliegenthart, R. (2017). Comparative research methods. *The International Encyclopedia of Communication Research Methods*, 1–22. https://doi.org/10.1002/9781118901731.iecrm0035

Gafar, M., Kasim, R., & Martin, D. (2012). *Toward a more entrepreneurship architectural education in Malaysia.* In International Conference of Technology Management, Business and Entrepreneurship 2012 (ICTMBE2012), Renaissance Hotel, Melaka, Malaysia.

Grifoll, J. (2016). External Quality Assurance Agencies and excellence in higher education. *Educación Médica*, *17*(3), 94–96. https://doi.org/10.1016/j.edumed.2016.08.001

Miri, S.M. (2019). *A Short Introduction to Comparative Research* [Doctoral dissertation, Allameh Tabataba'i University]. ResearchGate. https://www.researchgate.net/publication/336278925_A_Short_Introduction_to_Comparative_Research

Mohayidin, M. G., Suandi, T., Mustapha, G., Konting, M. J., Kamaruddin, N., Man, N. A., Adam, A., & Abdullah, S. N. (2008). Implementation of Outcome-Based Education in Universiti Putra Malaysia. *International Education Studies*. 1. 147-160.

Mourtos, N. J. (2003) "Defining, teaching and assessing lifelong learning skills," *33rd Annual Frontiers in Education, 2003. FIE 2003.* [Preprint]. Available at: https://doi.org/10.1109/fie.2003.1263325.

Rogaten, J., & Moneta, G. B. (2016). *Academic excellence: the dynamic relationship between approaches to studying and learning gain.* In: 8th European Conference of Positive Psychology, 2016, Angers, France.

Shari, Z., & Jaafar, M. F. Z. (2006). Towards a holistic sustainable architectural education in Malaysia. *ALAM CIPTA, International Journal of Sustainable Tropical Design Research and Practice*, 1, 57-65.

Williams, L., Venville, G., & Gordon, S. (2013). The appearance of equity in understandings of academic excellence. *International Journal of Educational Research*, *62*, 11–20. https://doi.org/10.1016/j.ijer.2013.06.001

Zimmerman, B. J. (2001). Achieving Academic Excellence: A Self-Regulatory Perspective. In M. Ferrari (Ed), *The Pursuit of Excellence Through Education* (pp. 85–110). New York: Routledge.