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## Architecture graduate work readiness: The gap between learning and employability.

Mari TS<sup>1</sup>, Srirangam S<sup>2</sup>, Gunasagaran S<sup>3</sup>, Kuppusamy S<sup>4</sup> and Ang FL<sup>5</sup>

<sup>1,2,3 & 5</sup> School of Architecture, Building & Design, Faculty of Innovation and Technology Taylors's University Lakeside, Selangor, Malaysia

<sup>4</sup>School of Built Environment, University of Reading Malaysia, Iskandar Puteri, Johor, Malaysia.

E-mail: [TamilSalvi.Mari@taylors.edu.my](mailto:TamilSalvi.Mari@taylors.edu.my)

**Abstract.** The study investigates and compares the experience and expectation of employers and graduates on architecture graduate work readiness in relation to employability skills using a quantitative method. A total of 141 graduates and 85 employers completed a set of survey measuring the same variables but from different perspectives. The collected data was analyzed using SPSS v 25. Study findings show that perception of employers and graduates are similar on the architectural course and how it trains the graduates for practice. However there is a small gap in the perception graduates work readiness; architectural course curriculum, and graduates' practical skills. The results revealed that the graduates confidence level in their work readiness is moderate (M = 3.42., SD = 0.843), concurring with the employers who reported that graduate are not entirely ready (M = 3.62., SD = 0.648). However, the employers' score employability skills is lower than the graduates' score, especially in areas such as knowledge of Uniform Building By-Law (UBBL) requirements and sustainable approaches (RK) (M=3.29, SD=0.881) and CTS (M= 3.41, SD=0.837). Thus, the study suggests opportunities in current learning in architectural course to be transformed using "work based learning" to enhance the graduates employability skills.

### 1. Introduction

Employability is an important outcome of Higher Education Institutions (HEI). It is inevitable that HEI system address the employers' needs in designing the curriculum. Many literatures have reported that recent graduates lack of employability skills required by the industries. Additionally, the economic down turn has intensified the pressure on HEIs to produce graduates that has the required skills to join the work force [4]. Paper qualification alone does not guarantee employment in the competitive job market as the graduates lacks the skills required by the industry. Fadil Suhaili, Esa Ahmad Padil, and Mohamed Jamal Abidah Ainah [6] reported that lack of suitable soft skills by graduates affected their job application (p. 123). Meanwhile, severe criticism has emerged against the traditional and relatively outdated university curricula, for which the major burden of rising graduate unemployment (Fernandez-Chung & Leong, 2018). As a result, the non-compatibility of university curricula has created a mismatch between the graduate skills and the skills required by the practice or industry creating the gap between learning and graduate readiness for practice [2]. Several literatures have shown that the architectural education places the least importance on development of employability skills [22 and 21]. Architecture graduates lack the employability skills and HEIs have taken numerous efforts to embed teaching or assessment of the skills in the programme, for instance to enhance the skills development, work related



activities could be integrated in teaching and learning [11]. There are evidences to support that work experience leads to positive outcomes [9]. The study identifies two gaps in the existing literatures: i) that there is a need for critical evaluation of the learning in architecture education and the immediate need for interventions to prepare its graduates for the real world, and ii) there are abundance of employability skills related studies mostly in other fields with very limited in the architecture studies of Malaysian context. Thus, the study seeks to investigate the readiness of architecture graduates for the practice from the graduates and employers perspectives. The study aims to compare the experiences and expectations of employers and graduates, of their employability skills and to what extent these skills are acquired through their learning in the selected HEI.

## **2. Current state of architecture graduates' employability skills**

As a professional discipline, architecture requires its students to acquire appropriate skills and knowledge during their tenure of studies to facilitate architectural practice. Despite, the commitment by architecture schools to provide architectural education that will enable its graduates with skills related to architectural practice, graduates still lack employability skills. Similarly, report by [18] pointed out that the architectural profession has failed to capitalize on its essential capability by not creating the range of skills required to meet the demands of the present construction industry (p. 9). The Skills Survey by [17] reported that employers and recent graduates are not impressed with the skills and abilities of newly qualified architects. The study revealed few interesting alliances in the perspective of employers and students, for instance both the employers (80%) and graduates (73%) agreed that recent graduates are not equipped with practical skills required to practice architecture; more than 80% of employers and graduates agreed that graduates lack the knowledge to construct what they designed; 81% of employers and 74% of students agreed that architectural schools put theoretical knowledge above practical ability, and more than 75% of both the employers and graduates believe that architecture students should spend more time learning in practice during their studies. A Malaysian study by [19] on architecture graduates soft skills from employers' perspective, revealed communication and presentation skills in English (mean scores of 4.51 and 4.64) as most important followed by teamwork skills (mean score 3.7). Whilst the study among the architecture undergraduates by [15] revealed that students overrate the level of skills and identified three (3) skills that lacked in the graduates they are; capacity for synthesis and analysis, creativity and capacity to generate new ideas, and organization, planning and time management skills. Study by [21] highlighted that sound Computer Aided Design skills and teamwork skills are highly valued discipline skills by employers at time of hiring followed by self-management (mean score 4.2), communication (4.15), creative initiative and enterprise (4.13), planning and organization (4.08), problem solving (4.0), technical (3.9), and lifelong learning (3.8). Savage, Davis, and Miller [20] pointed out that professionals emphasized on graduates critical thinking skills in addressing issues such as sustainability in their research. Falk [7] stated that employers pay high importance to graduates' readiness in teamwork (p. 4). A Malaysian study by [22] to find how the employers view the set of skills being facilitated in the design studio modules, concludes with the various discrepancies in terms of academic training and industry expectation, recommends for the universities to set their direction in studio teaching with reference to industry expectation in mind.

### *2.1. The Architecture education*

The teaching and learning of the architectural education traditionally includes various learning experience to prepare graduates to real world. Over years this teaching and learning has faded due to numbers of students, logistics, facilities and others issues. Currently most of the class activities with "simulated or virtual" problems and sites do not provide students with real life experience and sense of connection to context-people and place. Author [13] criticized that current architectural education is built upon analogic reality where students are given a "virtual problem" and are requested to assume that it is a real problem (p. 86). Students generally lack the opportunity to reflect the acquired theory or content knowledge in solving practice-based issues. Authors [7] and [13] corroborate that real life projects can contribute towards development of collaborative techniques, communication skills and

participatory practice and all other approaches that are vital and relevant for future architects (p. 19). WBL is an integral part of linked learning and help foster the goal of providing students with the skills they need to succeed in college and career. Thus, WBL paves solution to narrow the gap between learning and employability.

## 2.2. *Work Based Learning (WBL)*

WBL is a new educational programme, the significance of this form of education in the modern and rapidly changing society is shown in a recent examination of practice and literature indicating a growing sophistication in the way that work-based learning is being theorized and facilitated in higher education. With its gradual growth as a distinct field of practice and study with the support of relevant pedagogies and concepts of curriculum [14]. The main characteristics and essential aspects of WBL programs profitably different from traditional university programs. They are relevant to actual production processes, student centricity, flexibility of content, which is built proceeding from interests of an employer and a student. It is highly considered as a point of difference in developing graduate employability by enhancing skill outcomes amongst team-work, communication, self-management, and problem-solving, employment prospects and student understanding of the world-of-work [12]. Thus, by incorporating WBL the architecture course will have a strong foundation that will shape architecture undergraduates into architects. As criticized by [8], "relying on past and even present architecture education models is not the best strategy" (p. 70). Jackson [12] investigates the role WBL in improving undergraduate employability skills, reported a significant improvement in undergraduates' perceived ability to perform employability skills following placement. WBL is a new education programme that is increasing participation in higher education because there is support to enhance employability and upgrading skills for a competitive market [14].

## 3 Research Methodology

The study employed a quantitative method using survey questionnaire [5]. The survey questionnaire was customized based on the HEI's graduate capabilities and employability skills. Two (2) sets of survey questionnaire was developed containing same questions but addressing two (2) groups of respondents; employers and graduates. The graduate respondents comes from a particular private HEI in Klang Valley while the employers are from architecture firms that recruits graduates from this HEI based on the list provided the HEI's Placement Centre. The graduates completed their undergraduate degree in the year 2016 and 2017 and have experience working in architectural firms. Survey questions was piloted and validated by two experts. From September 2018 to January 2019, a total of 141 graduates and 85 employers completed two sets survey measuring the same variables but from different perspectives. The collected data was analyzed using Statistical Package for Social Studies v. 25 (SPSS). Descriptive analysis (frequency, mean, scores and standard deviations) were used to analyze and explain the reported data.

## 4 Results and Discussion

To discuss the findings from the study, mean scoring is divided into 3 main levels of interpretation: scoring of 1.00 to 2.33 as low, 2.34 to 3.66 as medium, and 3.67 to 5.00 as high. For the purpose of discussion and analysis the scale of strongly agree (SA) and agree (A) will be summed up, likewise for the disagree (D) and strongly disagree (SD) scales. Table 1 shows the comparison of total means for architectural course and graduates readiness. Results suggest that the Graduate Readiness for employer and students are at moderate level with students scoring of  $M = 3.42$  ( $SD = 0.843$ ), while employers scored slightly higher ( $M = 3.62$ ,  $SD = 0.648$ ). Thus, both opinioned that graduate readiness is not high. Efforts need to be taken by the HEI to address the issue associated with graduate readiness.

Table -1. Perception of Employers and Graduates of Architectural Course and Graduate Readiness

	Employer (N=85)		Graduates (N=141)	
	Mean	Std.	Mean	Std.
		Deviation		Deviation
Architecture Course	3.67	0.442	3.43	0.388
Graduate Readiness	3.62	0.843	3.42	0.648

Table-2 exhibits the findings on architectural course (AC) offered by the selected HEI. Surprisingly almost 75% of both employers and graduates agreed (A)/strongly agreed (SA) that the architecture course offered by selected HEI emphasizes theoretical knowledge above practical skills. This finding concurs with the findings reported by The Skills Survey Report from RIBA Appointments (2014). The architectural curriculum assumes an adequate theory and, in turn, inevitably reveals the quality of the theory on which it is based. Ayiran ([1] argued that theory is required because it is not possible to design in an intellectual vacuum. While theory is needed, it contradicts with the essential intention of design if the theory is taken as a prescriptive principle for successful design activity. There seem to be a considerable difference among employers (77.6%) and graduates (53.2%) agreement on the alignment of the architecture curriculum to reflect current needs. The finding is not surprising, as the employers seem to have an opinion that the students may have not been exposed to adequate practical training that is critical for employment, while the graduates expect whatever they learned in school to be literally applicable in practice. In support of the above opinion almost more than 80% of employers and graduates agreed (A/SA) that the learning in AC should include real-life projects and the findings corresponds with the findings by RIBA [17]. To address this concern, majority of employers (92%) and graduates (70.2%) agree that the schools should offer internship for a minimum of six (6) months as oppose to the current duration of internship eight (8) weeks. The result can be supported by statement by [16]. Currently, the programme offer a maximum of 8 weeks of internship in the undergraduate programme. The duration is considered as inadequate by both the employers and graduates, as longer and thoughtful internship programs can help smooth that transition by better integrating the realities of client service, budgets, and building codes and etc. More than half of the employers (56%) and graduates (66%) agreed that the AC trains students to work independently, whilst almost 75% of both the employers and graduates agreed that the architectural education trains students to be more adaptable to change or the need to learn.

Table-2: Employer v. Graduates Perception of Learning and Training in the Architecture Course

Architecture Course (AC)	Employer N=85					Graduate N=141				
	(%)					(%)				
	SD	D	N	A	SA	SD	D	N	A	SA
Emphasizes the theoretical knowledge above practical skills	3.5	8.2	25.9	45.9	16.5	3.5	2.1	19.1	68.1	7.1
Reflects current architecture needs	0.0	5.9	16.5	49.4	28.2	5.0	12.8	29.1	46.1	7.1
Trains stds to work independently	0.0	15.3	29.4	29.4	25.9	2.8	7.8	22.7	45.4	21.3
Trains stds. to be adaptable to the need to learn	0.0	10.6	15.3	37.6	36.5	0.0	5.0	20.6	53.9	20.6
Should include more real-life projects	0.0	0.0	11.8	42.4	45.9	0.0	0.0	17.7	35.5	46.1
Should offer internship for a min. of 6 months	0.0	0.0	8.2	31.8	60.0	0.7	6.4	22.7	32.6	37.6

Table- 3 depicts employers and graduates perception of graduate readiness for practice. Contradicting to the employers (55%) only 38% of the graduates agreed that they are work ready upon graduation. It is interesting to note that this result contradicts with findings by [17] which is rather low (20-25%).

Similarly, less than half of the graduates (49%) agreed that they have adequate practical skills to practice as compared to the employers (52%). Surprisingly, opinions of employers and graduates are almost similar (more than 50%) agreed that graduates have adequate theoretical knowledge to design, construction knowledge to build what they have designed, and soft skills needed to practice architecture. These findings refute (higher) to previous results reported by [17]. These results indicate that the graduates do possess the skills but not sufficient to practice. This could be because the students were exposed to a very limited set of real life projects, issues and clients hence the opportunity for them to experiment their theoretical and technical knowledge and soft skills are limited. In general, the graduates believed they lack practical skills (49%) and they are not entirely work ready (38%) as compared to the employers who believed otherwise.

Table-3: Employer v. Graduates Perception of Architecture Graduate Readiness for Practice

Graduates Readiness	Employers N=85					Graduates N=141				
	%					%				
	SD	D	N	A	SA	SD	D	N	A	SA
Are "work ready" upon graduation	0.0	20.0	24.7	34.1	21.2	5.0	15.6	41.1	34	4.3
Have adequate construction knowledge to build what they design	0.0	28.2	16.5	25.9	29.4	3.5	17.7	24.1	50.4	4.3
Have adequate practical skills	0.0	20.0	29.4	25.9	24.7	1.4	14.9	34.8	44.7	4.3
Have adequate theoretical knowledge	0.0	10.6	29.4	38.8	21.2	1.4	6.4	33.3	52.5	6.4
Have adequate soft skills	0.0	15.3	21.2	38.8	24.7	0.0	5.00	31.2	54.6	9.2

Table-4 presents the mean score for employability skills demonstrated by graduates during their employment. As anticipated, the graduates tend to overestimate their skills concurring to the study by [15]. The result show that both employers and graduates mean scores is moderate for critical thinking skills (CTS) and knowledge of Uniform Building By-Law (UBBL) requirement and sustainable approaches (RK), career related and teamwork skills (CRT). Interestingly, the highest mean score for both the graduates and employers is for communication skills (COM) ( $M = 3.69$ ,  $SD = 0.783$ ) and ( $M = 3.78$ ,  $SD = 0.533$ ) respectively, thus these results contradicts the findings by [19]. Considerable differences in mean scores are observed for CRT ( $M=3.64$ ,  $SD=0.732$ ), CTS ( $M=3.41$ ,  $SD=0.837$ ), RK ( $M= 3.29$ ,  $SD=0.888$ ) by employers and graduates CRT ( $M=3.76$ ,  $SD=0.557$ ), CTS ( $3.72$ ,  $0.551$ ) and RK ( $M= 3.60$ ,  $SD=0.594$ ). The employers scored lowest for RK ( $M= 3.29$ ,  $SD=0.888$ ), this due to the reason that the graduates knowledge UBBL, requirements and strategies on sustainable architectural approaches are not demonstrated during their employment. These finding perhaps can be associated with the undergraduate AC offered by the HEI is design orientated, emphasizing more on theories, construction and technology. The submission requirements, compliance such as uniform building by law (UBBL), and sustainable approaches are taught in the undergraduate degree but lacks the emphasis in the design studio modules, thus the students focus in creating designs that meet the brief and most often failing to produce holistic designs. The graduates scored lowest ( $M=3.50$ ,  $SD=0.595$ ) for their technical skills (TECH). Among the items they scored low are, their understanding of materials and construction ( $M=3.35$ ) and skills in using Building Information Modeling software (BIM) ( $M=3.49$ ). The employers also report that the graduates demonstration of CTS are at moderate level ( $M=3.41$ ,  $SD=0.837$ ), but the graduates believe otherwise by scoring high ( $M=3.72$ ,  $SD=0.551$ ). These findings corresponds with findings in [15]. Despite of having concerted effort by HEI to focus on CTS as

measurable outcome; employers are not seeing the results. Employers highlighted that CTS gap is a significant problem with new hires, specifically in recent graduates.

Table-4.0: Employer v. Graduates: Total Mean Score of Graduate Employability skills

Employability skills		Employers (N=85)		Graduates (N=141)	
		Mean (M)	Std. Deviation (SD)	Mean (M)	Std. Deviation (SD)
CRT	Career related and team work	3.64	0.732	3.76	0.557
CTS	Critical thinking skills	3.41	0.837	3.72	0.551
COM	Communication	3.69	0.783	3.78	0.533
TECH	Technical skills	3.52	0.793	3.50	0.595
RK	By law, requirement and sustainable app.	3.29	0.881	3.60	0.594

#### 4 Conclusion

Findings from the study has revealed employers and graduates have similar perception of the architecture course and how it trains graduates for practice. Majority of both the groups agreed that the course offered by the architecture curriculum of selected HEI emphasizes on theoretical knowledge than practical skills. However, both employers and graduates suggest that more real life projects to address this concern and duration of the internship to be increased to a minimum of 6 months. The employers believe real-life projects in the curricula will equip students with essential practical skills. There is a slight gap in the perception of employers and graduates on graduates work readiness. More than half of the employers believe that the graduates are work ready compared to the graduates. Similar finding is also observed, in evaluating the graduates practical skills which is directly associated with their work readiness. Interestingly opinions of employers and graduates are almost similar on the adequacy of theoretical, construction knowledge, and soft skills. In general, the findings on employability skills of the shows that employers mean scores are generally lower than the graduates. The study highlights that employers acknowledge the school's contribution in providing relevant curriculum but not the learning approaches. In addition to, expecting graduates to have technical and discipline skills they also require graduates to demonstrate a range of skills that include communication, critical thinking, problem solving and practice related skills. Whilst, the graduates on the other hand believe that the HEI will provide the necessary training to equip them with the indispensable employability skills to ensure they are work ready. It can be concluded that both employers and graduates agree that graduates are not entirely work ready, lack practical skills, and AC emphasizes theoretical knowledge by suggesting to include more real life projects to develop their practical skills and suggest that the school to extend its internship from 2 months to a of minimum of 6 months. There is as a serious concern among the employers relating to the moderate development of the graduates employability skills during their undergraduate studies. Therefore, it is the responsibility of the stakeholders, especially HEI, employers and students to ensure the development of work related skills during their studies to ensure graduate readiness. Based on the findings and literatures, the study would like to highlight that employer and graduates value WBL (such as placements and internships) particularly as an effective approach to promote the employability of graduates. HEIs and employers should continue to promote and expand opportunities for students to access WBL and incorporating soft skills in their curricula particularly in assessment. These experiential opportunities require careful planning and time for reflection must be built in as an effective way of providing university students with relevant employment skills, knowledge and awareness of employment

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