Profiling Industry-Relevant Competencies of Graduate Architect through Online Job Advertisements

Rohani Salleh[1], Md Anwar Md Yusoff[2], Sufian Che Amat[2], Azelin Mohamed Noor[1] & Neta Suredah[2]

[1] Department of Management and Humanities, Universiti Teknologi PETRONAS, Malaysia

[2] Department of Architecture, Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA, Seri Iskandar Campus, Malaysia

Correspondence: Rohani Salleh, Department of Management and Humanities, Universiti Teknologi PETRONAS, Seri Iskandar, Perak, Malaysia. Tel: 605-368-7760. E-mail: rohanisalleh@petronas.com.my

Abstract

This paper aims to explore and profile industry-relevant competencies of graduate architect in Malaysia. Content analysis conducted on online job advertisements offering positions for graduates were collected and analyzed to determine the common competencies listed in the recruitment of graduate architects. Competencies are divided into three main components: knowledge, skills and personal traits. Findings revealed a cluster of key competencies deemed necessary by the architectural firms in Malaysia. This competency profile is useful as a guide for architectural graduates towards meeting the employers' expectations. It can also provide information for architecture schools in reassessing possible competency gaps of their graduates and to realign their curriculum towards meeting the industry requirements. Finally, it is recommended for extending the content analysis for a longer duration and to include newspaper and magazines advertisements to further validate and strengthen the competency profile identified in the current study.

Keywords: competencies, graduate architect, industry, job advertisements, Malaysia

1. Introduction

The rules of employment has transformed and become more challenging for job seekers. New technologies emerge continuously and ways of task execution are constantly changing. Accordingly, duties are becoming more demanding. In line with such developments, employers nowadays demand that employees be equipped with relevant knowledge and skills for performance and productivity. As employers' demand increases, graduates need to be equipped with appropriate and corresponding competencies to meet this escalating prerequisite in the workplace. Employees are now expected to be competent not just in their specialized area or field but also in a wider spectrum of skills.

In preparing graduates to succeed in their prospective employment, they need to be equipped with the competencies deemed essential by the industry. Higher learning institutions play a critical role in enhancing the capacity of their graduates. In Malaysia, concerns have been raised on graduates' lack of employment competencies (Singh & Singh, 2008). Although graduates are well trained in their technical or specialized skills, they lacked in soft skills (Juhdi, Jauhariah & Yunus, 2007). The exam-oriented education system in Malaysia (Henwood, 2006) and the mismatch of university curriculum and expectations of the industry (Vijan, 2007) are partly blamed. Disturbingly, fingers are pointing at universities for not generating sufficient skilled workforce for the society (Weligamage & Siengthai, 2003). Additionally, institutions of higher learning are no longer considered as pro-active in providing the appropriate learning opportunities for students to develop the necessary skills and competencies (Eynde & Tucker, 1997).

As with many other professions, the role of architects is constantly evolving and has become more multidisciplinary. Architects today are not just involved in the planning, designing and modeling of building construction, but often, are also required to write contracts, lead a team of specialists, deal and negotiate with clients and contractors and solve problems. They are the key players within the building industry. Given the broad roles of architects, it is reasonable to assume in order to be competent, architects need diverse qualities from technical expertise to soft skills.

There is a vital need for identifying and understanding marketable qualities of graduate architects in Malaysia. To date, there is a deficiency in studies which specifically address the competencies of graduate architects in Malaysia. Therefore, this exploratory study aims to fill this gap by investigating and identifying workplace competencies of graduate architects. These competencies are gathered through content analysis of online job advertisements for graduate architects in Malaysia.

2. Competency

Before delving further into trying to identify competency components of graduate architects, it is worthwhile to define the term competency. According to the Australian Institute of Quantity Surveyors, competency is "*the ability to perform the activities within an occupation to the standard expected for employment*" (Australian Institute of Quantity Surveyors (AIQS)). Other scholars have defined it as "*a composite of skills, knowledge, attitudes or traits*" (Grzeda, 2005), the trait and knowledge that contribute to work performance (McLagan, 1983) and "*a combination of relevant attributes that underlie aspects of successful professional performance*" (Moore, Cheng & Dainty, 2002).

In reviewing the literature, there seem to be no single definition of the term competency. The diverse perspectives on how competency is defined indicated the presence of conceptual confusion and fuzziness felt by both scholars and practitioners (Sultana, 2009). Concerns over this issue and its possible negative implications have recently been raised by Jackson (2010). He explained: "... empirical studies on graduate employ ability liberally adopt different terms for competencies, resulting in confused findings which are often used to form the back bone of employ ability skills programs in HEIs throughout the UK, Australia and USA. This lack of clarity and uniformity drastically heightens the risk of HEIs developing competencies not prioritized by employers, leading to inefficient use of public funding and reduced impact of efforts to address the graduate skills gap" (Jackson, 2009).

Although it is recognized that diverse views have been used, it is vital that before proceeding further into identifying competency of graduate architects, clear conceptualization over the term is presented. In general, there seems to be some common elements in the above definitions, namely knowledge, skills, abilities and personal attributes. Knowledge and skills will "make-up" the right individual to fit the job scope of graduate architects as the employers expected. In addition, employers also seek individuals with the right personal attributes who fit well with the environment of the industry. Thus, it can be concluded that to be competent, a person not only requires the right knowledge and skills but also the right personal attributes. Competency thus, is the ability of an individual to perform his duties effectively and efficiently which requires the possession of specific knowledge, skills and personal attributes deemed important to both the job requirements and context of the industry.

It seems essential then a holistic view on architecture competency framework to include three major components, namely knowledge, skills and personal attributes. Therefore, this study proposes that the competency components to be viewed and measured, as presented in Figure 1. Knowledge, skills and personal attributes form an important triad of making a competent architect.
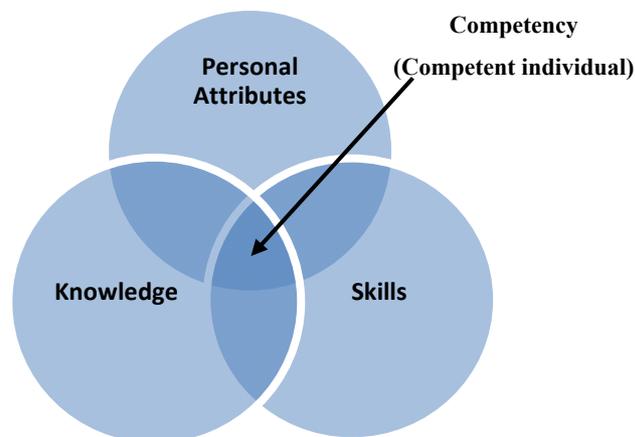

Figure1. Competency framework

3. Architectural Education and Skills

Architects are often acknowledged as products of the current architectural design education. Architectural design education, like most other types of education, reflects the values of the professions and society at large with the process of design education that is said to be interdependent and ever so often created in the field of tension between reasons, emotions and intuitions; that touches almost everything related to humanism. This complexity in dealing with problems and 'designing' the solutions is the very essence of the architectural education (Salama, 2008).

In Malaysia, an architecture graduate who holds Part 1 and Part 2 Degrees in Architecture qualifications are recognized by the Board of Architects Malaysia or *Lembaga Arkitek Malaysia* (LAM) and can be officially be acknowledged an 'architect'. These two qualifications are the equivalent to RIBA (Royal Institute of British Architects), RAIA (Royal Australian Institute of Architects), RIAS (Royal Incorporation of Architects in Scotland) and NZIA (New Zealand Institute of Architects Incorporated) qualifications. These graduates abide by the Architect Act 1967 and Architects Rules 1996 (Rule 17), including the Code of Professional Conduct for Professional Architects as specified in sub-rule 28(2) of the Architects Rules 1996. A graduate with Part I and Part 2 qualifications are then permitted to sit for the LAM Part 3 examination which upon success allows them to be registered as 'professional architects'. In this study, we use the term 'graduate architect' to differentiate from the 'professional architect' who has passed the LAM Part 3 examination.

According to LAM, there are some basic skills needed by an architect. These include planning, building construction knowledge, design skills, written and oral communication skills, architectural communication skills and CAD skills. Malaysian Institute of Architects, an important body that represents architects in Malaysia, states that architects need to acquire the following skills: planning, building design, landscape design, urban design, interior design, leading and coordinating, liaising and supervision.

Basically, the architectural education curriculum in Malaysia has four major fields namely History/Theory, Technology, Design and Professional Practice, with the overall aim is to ensure that the students "*receive a balanced education of these fields, as their value judgment of multifaceted issues will influence their architectural design output*" (Ibrahim, 2008). A recent study (Amat & Azhar, 2010) has demonstrated noticeable interest amongst students and tutors at an institution of higher education on current global issues such as environmental sustainability. The study has empirically established that if the knowledge acquired by the students and the emphasis level by tutors on similar issues can be increased, the students' ability to consider comparable issues in their design can also be improved. It is also suggested that periodic monitoring can be useful whilst at the undergraduate level to ensure effective attributes or traits are instilled or well before the students graduated into the world of professional practice (Amat & Azhar, 2010; Amat, 2009).

A study by Thinker and Butt (2004) revealed problems on learning and understanding of construction related subjects in that, little effort is consciously exerted to coordinate on-going design projects with construction assignment. Correspondingly the effectiveness of architectural education is constantly being scrutinized and the designer's ability to affect meaningful changes to the physical environment that we live in today is also being critically appraised (Sanoff, 1995). Hence, there exist gaps between current architectural education and the subsequent practice of architecture which evidently results in numerous pitfalls and problems for the built environments (Yunos, 2000).

A survey conducted on graduates majoring in architecture by the 2004 College of Design Alumni of Iowa State University (2004) found that design skill, math and sciences skills were perceived as less important by employers than the emphasis that had been placed in the curriculum by the university. The findings have triggered recommendation for the college to place more emphasis on areas such as presentation skills, critical thinking, problem solving, human behavior and work ethics. All these views have provided useful hints on the importance to constantly monitor university curriculum so students will be taught on competencies required at the workplace.

Changes in the construction industry, technological advances and rapid growth in information, have made it a necessity for those in the industry to keep their knowledge and skills updated. According to Nicol and Pilling (2000), architects need to "*become more skilled in human dimensions of professional practice and more adaptable, flexible and versatile over the span of their professional careers*". Architecture education, as they added, must adapt to changes in the industry and assist students to develop the skills, strategies and attitudes needed for professional practice.

4. Methodology

4.1 Data Gathering and Compilation

The requirements highlighted by the industry are a major means of indicating the requirements of potential employees (Kennan et al., 2008). As a method of profiling the three competencies of graduate architects, which are knowledge, skills and attributes, data from job advertisements or advertisements, were collected, compiled and analyzed. For this purpose, local online job advertisements from e-recruitment sites, company websites and niche sites, such as PAM, were collected and analyzed.

Since the position of a graduate architect is the focus of this study, careful selection of relevant advertisements were made. First, only advertisements with job positions suitable for Part 1 and Part 2 Degree holders were selected. Noticeably, different job titles were used in the advertisements, including Graduate Architect, Architect, Assistant to Architect, Design Architect, Project Architect, Junior Architects, Assistant Architect and Resident Architect. Secondly, only advertisements that required working experience of up to 3 years were considered.

4.2 Respondents

Based on the information, the expectations of the industry were compiled and tabulated. In total, 78 job advertisements were collected throughout a month period. Based on this screening exercise, 36 advertisements were excluded from further analysis and content analysis was conducted only on 32 advertisements. It should be highlighted that the advertisements had varied information stated in the text. For example, some advertisements were more detailed and longer than others. This inconsistency may be attributed to organizational factors such as the size and reputation of the firm.

5. Findings and Discussion

Based on the tabulated information, a list of knowledge, skills and personal attributes was produced. Table 1 to 3 illustrate the frequency distribution chart of the findings according to the components. The results are ranked in descending order of prevalence.

5.1 Knowledge

The content analysis of the job advertisements has revealed a list of knowledge deemed important by the industry. Based on the list, the knowledge can be segregated into five main categories namely "construction details and drawings", "architectural practice", "project management/execution" and "knowledge in materials". The findings are summarized in Table 1.

Table 1. Important knowledge of graduate architects

Knowledge	%
Construction details and drawings	31.3
Project management/execution	12.5
Contract Management	9.4
Building contract	6.3
Knowledge in materials	6.3
Local laws (Planning Act, Building By-Laws)	6.3
Authorities' submission	3.1
Visualization technique	3.1

As shown in the table, knowledge on construction details and drawings was stated in almost a third of the advertisements (31.3%), making it the most important knowledge required by the employers. This was anticipated since the bulk of most building design commonly involves laborious production information work and drawings. The high importance placed on this knowledge also mirrors the tools of the trade where the means to communicate a designer's ideas are through drawings. Our finding identified the necessity for graduate architects to possess knowledge on construction details and drawings before they enter the job market.

The finding also revealed that knowledge on project management/execution was the second highest (12.5%) mentioned in the job advertisements. The demand for knowledge in project management hinted that employers are progressively placing a high value on the ability of employees to handle project management albeit in a

limited capacity. Knowledge on contract management was the third highest (9.4%) stated by the employers. This indicates that although they are normally undertaken by senior partners, junior architectural assistants are also expected to assist matters related to contract management.

It is rather interesting that knowledge on building contract and local laws appeared in only 6.3% of the advertisements. This suggests that both lines of knowledge, which are related to contract implementation and management, are not highly required at the graduate architect level. One possible explanation for this could be due to the responsibility of handling matters related to contract management which are within the portfolio of senior/experienced architects and not under the portfolio of junior staff. Knowledge in materials was reported at only 6.3% of the advertisements, suggesting it is not a highly required skill for graduate architects. Knowledge in materials is not perceived as crucial as in the usage of materials in the construction industry. This trend has remained relatively the same over the years.

This study has also identified two lines of knowledge which surprisingly, are in low demand by the employers. In particular, knowledge on authorities' submission has been found to be minimally cited (3.1%) in the job advertisements. The low requirement for such knowledge may be due to the tendency for firms to assign the submission task to their technicians/draftsmen rather than junior architects. A similarly low percentage (3.1%) has been given to knowledge on visualization technique. Although this is rather unexpected, such knowledge may not be critical to be possessed by graduate architects as the task can easily be outsourced to affordable and professional graphic artists. With this option, it basically reduces the need for a firm to employ full time 3D/graphic visualizers.

5.2 Skills

Based on the analysis of the job advertisement content, various skills have been found to be perceived as important by the employers to be acquired by graduate architects. In general, the skills can be divided into two main categories: hard skills and soft skills. Hard skills are technical skills required for a person to carry out relevant tasks on the job domain. Alternatively, soft skills or people skills are about communicating with other another. This includes listening, speaking, giving feedback, participating in meeting, and problem solving or resolving conflicts. Such skills although observable, are difficult to quantify and measure. Table 2 shows the results for hard skills.

Table 2. Important hard skills of graduate architects

Hard skills	%
Design skills	50.0
Computer-Aided Design (CAD) skills	
AutoCad	75.0
3D Studio Max	43.8
Adobe Photoshop	43.8
Sketch UP	34.4
Revit	12.5
3D CAD	9.4
ArchiCAD	6.3
3D Drawing (General)	6.3
Shop drawing	3.1
Illustrator	3.1
Artlantis	3.1
Other skills	
Microsoft Office	15.6
MS Project	3.1

On hard skills, the list can be further segregated into design skills, computer-aided design skills and others.

Design skills, as shown in Table 2, appeared in half (50%) of the advertisements. The fact that it was not mentioned in all the advertisements is rather unexpected as design skill is the core activities of any architectural practice. One possible explanation for this is that it is an accepted assumption for all graduate architects to have already acquired the necessary skills in design. It is also possible that employers have already managed to have an organization of highly skilled employees but still lacking that final 'piece' to complement in creating a 'better' and more 'holistic' design team.

For computer-aided design (CAD) skills, the most frequently cited was AutoCAD (75%). This indicates that AutoCAD is probably the most common CAD programmes were used by architectural firms in Malaysia. Proficiency in AutoCAD is therefore highly sought after by architectural firms. Besides AutoCAD, 3D Studio Max (43.8%), Adobe Photoshop (43.8%) and Sketch-up (34.4%) were also highly cited in the advertisements. In general, our findings have highlighted on the actual extensive use of the technology at local architectural practices in Malaysia. Other computer-aided design tools mentioned include Revit 3D CAD, ArchiCAD, Shop drawing, Illustrator and Artlantis. This study also found that a small percentage of firms did not state specific CAD skills but put 3D Drawing in general as one of the basic requirements. Additionally, the analysis also revealed the importance of having skills in Microsoft Office such as Word, PowerPoint and Excel. A small percentage of companies also look for graduates with skill to conduct MS Projects.

Table 3 shows the results for the soft skills category. As shown, communication skill has been found to be most frequently cited (28.1%) in the job advertisements. The findings showed that the industry is emphasizing the requirement for good communication skills in their recruitment effort. The findings also revealed that other soft skills frequently cited were presentation skills (25%) and interpersonal skill (18.8%). In addition, the employers also stated leadership skills and time management skills (9.4% respectively) as required in their job advertisements.

Table 3. Important soft skills of graduate architects

Soft Skills	%
Communication	28.1
Presentation	25.0
Interpersonal	18.8
Leadership	9.4
Time management	9.4

Clearly, the findings on soft skills requirements suggest that the ability to communicate effectively is highly sought after by the industry. The demand for interpersonal skills indicated that employers are placing a high value on the ability of employees to work well with others and in groups. Presentation skills are required as graduate architects are required to give presentations to clients on a frequent basis. The requirements for good time management skills and leadership skills seem are also expected considering graduate architects are often required to ensure timely completion of assigned tasks and projects within a limited time and potentially limited supervision.

In general, the required soft skills identified in this study fairly portray the duties of a graduate architect which likely involved continuously report writing on work progress as well as dealing with clients, construction contractors, engineers, quantity surveyors and authorities throughout the entire construction process. All these duties require them to be able to communicate, interact, present, lead and manage time well. The soft skills side of graduate architects is crucial as it may influence their ability to plan and organize projects as well as to delegate and direct tasks as required. Overall, a high percentage of the job advertisements indicated not only the expected requirement for hard skills (design skills and computer-aided design skills), but also other complementary soft skills which could determine the success or failure of the candidate to be offered the job as advertised.

5.3 Personal Traits

Table 4 shows the frequency distribution chart of the findings with regards to personal attributes. The findings revealed "able to work independently/with minimum supervision" (40.6%) as the most sought after attribute, followed by "team player" (15.6%) and "able to work under pressure" (9.4%). The demand for individuals with

these traits hinted that employers are placing high importance on the ability of graduate architects to be able to work under pressure both independently as well in a team. These findings are expected as architectural field involves various stages of works from inception to completion. The traits that were also mentioned included "flexible and open attitude", "willing to learn", "creative" and "proactive". Although these traits appeared in only 3.1% of the advertisements, the findings revealed that employers were also looking for individuals who were self-motivated, matured and responsible as well as and possess positive attitudes.

Table 4. Important skills of graduate architects

Personal Attributes	%
Able to work independently	40.6
Team player	15.6
Able to work under pressure	9.4
Flexible and open attitude	6.3
Willing to learn	6.3
Creative	6.3
Proactive	6.3
Self-motivated	3.1
Matured	3.1
Responsible	3.1
Positive attitude	3.1

6. Recommendations

This study documents an initial effort to understand important competencies of graduate architects from the perspective of employers. Job advertisements were compiled and analyzed as means of collecting data for the study. Several key knowledge, skills and personal attributes have been found to be highly sought after by employers. The knowledge, skills and traits that were found to be important were not only common competencies or design skills but more so for personal traits such as being able to work independently and also the ability to work as part of a team.

Several interesting points have been gathered based on the findings. First, evidently graduate architects are expected to have many specialized knowledge pertinent to the industry. This knowledge should therefore be developed through formal education. To have a 'balanced education' may well means to have exposure and knowledge on relevant subjects during the learning process. Diverse but related subjects such as critical thinking, problem solving and even current global interest on green building etc. are crucial in the training to become an architect.

Second, the findings have highlighted high requirements for graduate architects to possess computer-aided design. Since the skill of using AutoCAD was the most sought after computer skill by employers, the findings could well indicate the need for graduate architects to be adept in AutoCAD know-how. In parallel to this development, all higher learning institutions have now equipped their architectural graduates with skills of using CAD to assist them in carrying their duties as junior architect. In order for graduate architects to effectively meet the CAD needs of industry, a curriculum must be developed based on the CAD related technical skills and competencies required by the industry.

Third, findings from this study have also identified that soft skills are demanded by the employers. The top three soft skills identified in this study are communication skills, presentation skills and interpersonal skills. The study identified that currently the industry is focusing on the ability to communicate effectively and to function well as part of a team. Coupled with a demand of interpersonal skills we can clearly see that employers are placing a high value on the ability of employees to work well in groups within the organization but also externally with clients/customers. These skills are in line with the job function of a graduate architect and as such one would expect to see these skills in high demand by the industry. The high importance on soft skills suggests the need for architectural education programs to consider creative ways of developing these additional but essential skills. In

general, the findings on soft skills provide evidence that architecture firms viewed soft skills as imperative in complementing graduates' hard skills.

Fourth, this study has managed to compile the attributes perceived important by the industry and thus highlighted that personal attributes are highly emphasized and sought-after by prospective employers. Specifically, the findings highlighted expectations of employers towards candidates who possess the ability to work independently. This suggests the apparent need for architecture education in Malaysia to possibly rethink in emphasizing to develop students' ability to work independently and creatively. The findings indicate that the industry demand graduate architects with not only hard skills, but also soft-skills and personal attributes to make them competent in their profession.

7. Conclusion

Overall, this paper provides the foundation for further understanding on the key competencies of graduate architects. The profile developed serves as a first step towards outlining key competencies necessary for graduate architects in Malaysia. For future research, several recommendations can be considered. Firstly, the content analysis of newspapers, magazines and online advertisements could be compiled over a longer period of time. Secondly, it is proposed that an instrument be developed based on the KSAs (knowledge, skills and attributes) discovered from the present study. Data on the importance of the competencies could then be collected from architectural firms or other stakeholders, using the instrument to further validate and strengthen the findings of the present study. In addition, a study on level of competencies of current graduate architects need to be conducted to identify potential competencies gap. Researchers should also look into the current architecture curriculum to evaluate the degree to which university curriculum is adapting to the expectation of the industry.

Development of a comprehensive competency framework can serve as a guideline for higher education institutions (HEIs) to respond to the competency requirements by the industry and consequently in understanding how well they have prepared or equipped their graduates for employment. This can later assist HEIs to further improve their academic curriculum structure to meet the needs of this highly competitive industry. This framework could also offer assistance in providing prospective employers and practitioners with the basis for the recruitment and selection of future fresh graduate architects.

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