RELIABILITY OF SELF-ASSESSMENT QUESTIONNAIRES: DO ARCHITECTURE POSTGRADUATE STUDENTS OVERESTIMATE THEIR EMPLOYABILITY SKILLS? FEEDBACK FROM GRADUATES AND EMPLOYERS

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Article Info	Abstract
	This study examines the reliability of 94 self-assessed questionnaires employing architecture postgraduates and employers via t-tests and descriptive statistics. This is important as many studies employ self-assessment questionnaires with likert-scale responses to assess employability skills in non-technical disciplines such as design and the humanities. However, first-degree graduates often overestimate their skills in comparison with results from employers. Results reveal no significant differences between postgraduates and their employers for generic (t =-1.34, p =0.183) and professional (t=1.38, p = 0.17) skills and competencies. The study concludes that questionnaires self-assessed by postgraduate students are reliable for assessing employability potentials of architecture graduates.

1. INTRODUCTION

Graduate employability has become a highly researched subject in academia and a trending issue in media circles. This is because unemployment is the bane of any society with enormous implications for economic development. "A good supply of skilled employable graduates is essential for national, economic and social well being and the failure to equip young people with employability skills has far reaching consequences" [1]. Traditionally, Higher Education Institutions (HEIs) are saddled with the responsibility of equipping graduates with the requisite knowledge and skills to be employable after graduation [2]. Arguably, the main reason parents and students invest heavily in university education is to enhance their prospects of securing better employment, remuneration and ultimately, a better lifestyle. [3] however note that good academic qualifications, however highly valued, are no longer sufficient to secure employment. Employers now seek an extra edge in graduate skills beyond certification [4], as several studies have established a gap between graduate qualifications and requisite skills in the workplace [2] [5] [6], [7], [8]. Employers in practice consistently complain of a mismatch between skills graduates actually possess and what they think they possess to carry out specific work to a satisfactory degree [9], [10], [11], [12]. This trend necessitates a deeper look at the relationship between employment, skills/competencies and curricula in Higher Education (HE). While research on graduate employability has continued well beyond a decade, unemployment continues unabated. In Nigeria, unemployment rates have reached unprecedented levels in recent times, with attendant consequences such as armed robbery, kidnapping, cultism, terrorism and other related vices [10]. Very few studies empirically explore the relationship between employability, graduate skills and curricula in HEIs especially regarding feedback from both graduates and their employers [1].

Several practical and methodological reasons exist for this dearth in literature. First, it is practically difficult to obtain responses or test graduates' employability attributes after they have graduated [13]. Several institutions have addressed this issue through alumni outreaches and programs. HEIs in the UK

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are examples of this practice where graduate surveys have been beneficial in keeping track of employability progress of graduates especially following the first five years after graduation [14]. Secondly, it is even more difficult to track down employers of said graduates to obtain feedback regarding on-the-job progression and use of skills learnt while in school in the workplace [8]. Thirdly, testing such skills poses methodological problems. The best-case scenario is to test graduates while at work to ascertain the degree to which HE instruction and curricula impacts on current job performances [15], [16], [17]. This is sometimes possible with technical disciplines such as the basic sciences or courses like Information and Communications Technology (ICT) where computer skills can effectively be tested in the workplace. Methodological problems arise when testing skills of graduates from applied disciplines such as the humanities and design, in part due to the subjective nature of assessment in such disciplines. Consequently (and fourthly), many studies regarding the relationship between employability and HEIs report findings from self-assessed survey instruments such as likert scale responses and descriptive statistics from respondents, the reliability of which has been called to question [18], [19], [20]. Fifthly, studies employing self-assessment methodologies have emerged reporting findings that graduates often overestimate their skills when compared to ratings from employers [1], [16], [17], [8]. Reasons proffered for the overestimation of skills range from the pressure to impress employers and obtain jobs quickly, genuine misconceptions of developed skill sets required in the workplace [5] [21]; lack of adequate priorities regarding work requirements while in school [3], as well as lack of confidence in the actual skill sets developed and possessed by such individuals [22]. These findings underscore the issue of how reliable results from self-assessment instruments can be employed for establishing skills developed by graduates towards employment in the workplace. This is important in investigating the often contradictory requirements of skill sets which need to be developed within the curricula for employability purposes [2].

This study aims to fill this gap using graduates of architecture and employers engaged in architecture related services in Nigeria. Architecture graduates from Ahmadu Bello University Zaria were chosen for this study for three reasons. First, the department is the oldest department of Architecture in Nigeria [23], a country with the largest population in Sub-Saharan Africa, a region with increased HEI enrolments and high unemployment rates [12]. Secondly, architects play a major role in the Construction Industry (CI), which provides employment to a large number of people and is a primary driver of many economies worldwide [24]. Thirdly, research comparing ratings of skill sets between architecture graduates and their employers are rare in literature. Architecture graduates in this study refer to post-graduates who have completed their masters degree program and are eligible after two years internship to qualify for the Part II professional examinations of the Nigerian Institute of Architects, NIA [25]. The following research question is posed: Are there any differences between ratings of skills developed by graduates and corresponding ratings from their employers employing self-assessment likert scale questionnaires?

2. REVIEW OF RELATED LITERATURE

Employability is a multi-faceted construct [26]. [27] define it as the capacity to gain and maintain employment as well as the ability to obtain a new one if the need arises. [28] notes that employability is the capacity of graduates to exhibit the requisite qualities sought by employers. [29] makes the explicit link between the internal and external influences of employability by defining it as a set of achievements consisting of skills, understandings and personal attributes that make graduates more likely to gain employment and be successful in their chosen occupations, which benefit the individual, workforce, community and economy. These definitions point to the moderating influence of internal and external factors notably personal effort through the development and enhancement of personal attitudes, influences of higher educational training and characteristics of the environment where work is sought within the macrocosm of the economy. Employability is usually a measure of these capabilities as expressed in skills and competencies displayed by an individual.

Skill denotes the ability to carry out a specific task or function well and is recognized as a component of competency. Competence, according to [16] refers to the ability to successfully meet complex demands in a particular context through the mobilization of psychosocial capabilities. It is a composite of skills, knowledge, attitudes and personal traits [30]; "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" [31]. Consequently, competency is often assessed through skills, knowledge and personal attributes as a measure of the degree one is employable [16]. Skills are usually categorised as generic or professional. Generic skills are transferable across different job contexts while professional skills, also referred to as hard, job or technical skills are specific to job contexts and disciplines. Research has established that while many graduates are prolific in professional, hard job-specific skills, soft, personal, generic and transferable skills are often less developed by graduates and are increasingly becoming the most sought after attributes by employers [32] [33] [34] [35] [3] [36].

In architecture, the most important generic skills according to graduates, academics and employers are high level of computing skills, ability to learn, creativity, analysis and synthesis of ideas and forms, communication skills, application of knowledge in practice, critical thinking, transdiciplinary understanding, decision making, time management, self-criticism, ethical commitment and leadership skills [37] [23]. However, about a quarter of generic developed in architecture school were found to be subsumed among professional or job specific skills (ibid). These include basic knowledge of the field or discipline, creativity, computing/ICT skills, capacity to learn as well as applying knowledge in practice [ibid]. Consequently, a recent survey of graduates and employers established that architecture bachelor graduates tend to overestimate their generic skills [21].

Several other studies in diverse disciplines report the tendency of graduates especially from bachelor and first-degree programs to overestimate their skills [14] [38] [39]. Overestimation of employability skills is often delineated along educational qualification and gender related lines. Graduates tend to place premium over the branding and image of the institutions they graduate from as well as the educational qualification they obtain [14] [5] [8]. In the case of gender differences, literature reveals that females tend to overestimate skills related to communication and social activities such as literacy and self-confidence [1] [16].

[8] in a 2016 study comparing responses from 178 graduates and 29 human resource managers (HRMs) and recruiters in Greece assert that graduates rated the most important aspect of employability to be their academic qualifications and were unaware of how much soft generic skills are required in the labor market. "The only competencies that companies believe graduates have at a high level are academic qualifications, but these are less important to employers" [ibid]. This supports findings by [32] that academic qualifications were the least rated skills by employers of Business Management graduates. [8] identified emotional intelligence; ethics/integrity, learning orientation, teamwork, flexibility/adaptability, communication as well as professionalism as highly rated generic skills by employers. [5]'s 2014 study on employability skills required by WIT's graduates from the School of Construction Economics and Management reports a similar tendency where graduates felt they were prepared for the workplace "through the respective degrees they obtained at university" [ibid]. This is in contrast to what the employers felt with citations of issues such as lack of managerial skills and personal conduct on construction sites. The study concluded that graduateness, which is preparedness of a graduate after completing a degree/course, was a conflicting issue between graduates and employers.

[1]'s 2010 study of computer science graduates in Sri Lanka reports the tendency of female graduates to demonstrate and report a comparatively higher level of self confidence and learning skills than their male counterparts. Graduates, teachers and employers identified problem solving, self-confidence and teamwork as the most important generic skills for employability. The study also reports both gender groups tend to rate the importance of skills more highly than their ability in that skill, implying that graduates often over or underrate skills due to a lack of confidence while conducting self assessments of acquired skills developed in HEIs.

Similarly, [17] in a survey of a group of participants aged 15-64 in European countries reports that people generally tend to over-estimate their digital skills in self-assessed tests compared to actual skills in practical tests. The study also asserts that digital skill gaps exist even among the young, who are generally perceived to be technologically savvy. Additionally, people with previous digital skill certification perform better than those without certification. Consequently, the study argues that with respect to digital skills, only practical tests can reliably check the actual levels of skills.

[40] 2012 study of graduates, academic staff and employers of health and humanities programs in Australia revealed the extensive use of ICT, "possibly as a result of ICT underpinning all components of a degree program" [ibid]. The study however reports that while graduates viewed knowledge and by implication, academic qualification highly, employers rated generic skills related to problem solving, teamwork and communication as critical to employability. Academic staff were also found to be confident in teaching and assessing the employability capabilities of their students, "yet feedback from all stakeholders, including staff, suggests there is a significant gap in the acquisition of these skills among graduates" [ibid].

Modalities for future assessments were also the focus of a study by [16] to ascertain the reliability of both objective and subjective self-assessment tests across several European countries, fields of study and gender. Results reveal "self assessments very accurately predict within-country differences in skill levels between fields of study" [ibid]. The study however revealed that females tend to overestimate their literacy skills, but on average scored lower in problem solving using technology rich environments. This supports the observation by [41] that females tend to perform lower than their male counterparts in technically oriented tasks. [42] note that females are generally more hesitant about using new technologies, in line with the finding that male students were more successful in Information Literacy (IL) than their female counterparts. This trend presents a disadvantage from the view of graduates, who view the acquision of technical hard qualifications as essential for employability, unlike employers who in [3]'s 2010 study of biomolecular programs in the UK, ranked a number of personal attributes and core skills higher than technical and subject specific skills [ibid]. This finding does not negate the importance of subject specific skills [8] but emphasizes the importance and added value of effective soft personal skills. [3] also report that unlike sandwich students within work-placement positions, graduates rated themselves more highly than their employers, underscoring the influence of the work environment on skills assessment and evaluation. In essence, sandwich students with work experience were more objective in self-assessments compared to graduates not assessed within work environments.

3. MATERIALS AND METHODS

In order to address the research question posed by the study, two sets of independent t-tests were conducted to establish whether differences exist in overall mean ratings from graduates and their employers for generic and professional competencies expected of graduates in architecture. Independent t-tests are employed to test differences between means of normally distributed data from two conditions when different respondents participate in an experiment or when two means come from different groups of entities [43]. Distributions of ratings from the self-assessed questionnaire were not significantly different from normal distributions for both employers and graduates. Values for means (M) and standard deviations (SD) for all skills and competencies in the questionnaire were also computed to graphically compare if differences exists for each skill/competency between ratings provided by graduates and the employers. The latter are represented in radial graphs for visual comparisons.

The list of generic skills for graduates was obtained from the Tuning template. This is a list of generic skills and competencies widely employed to assess competence levels towards establishing employability skills [44]. The questionnaire contains 17 skills/competencies with the addition of time management and leadership skills obtained from literature [45] [23]. The list of professional competencies employed in the study was obtained from [46] which presents 16 competencies and skills expected from architecture graduates in line with international standards of university education for the training of architects. An additional skill, Continuing Professional Practice (CPD) from literature [28] [47] was added to the list, bringing the total to 17 professional architectural skills and competencies. Respondents were requested to rate the degree to which these skills and competencies are developed and exhibited by postgraduates of architecture from ABU on a five point likert scale. Results from these procedures are presented in the succeeding section.

4. RESULTS

Table 1 presents a summary of the demographic profile of respondents, indicating that 53% (N 50) of the respondents are graduates, out of which 80% are males. The latter is typical of most studies involving architecture students, where the gender distribution is usually skewed in favor of males. Half of the employers work in organizations with more than 10 employees, although 39% of employers did not disclose the size of their organizations. Quantity surveyors record the highest proportion of employers in the sample (N 15, 34%), followed by Planners (N 14, 32%) and Architects (N 8, 18%). Employers in the sample had worked an average of 5 years 7 months with graduates of architecture from ABU.

Table 1. Demographic profile of respondents

Category of Respondent	N	%	Category of Employer (E)	N	%
Graduate (G)	50	53%	Quantity Surveyors	15	34%
Employer (E)	44	47%	Planners	14	32%
Gender of Graduates (G)			Architects	8	18%
Male	40	80%	Builders	3	7%
Female	10	20%	Contractors	2	5%
Size of Organization (E)			Engineer	1	2%
1-10 employees	5	11%	Missing	1	2%
11-20 employees	12	27%			
21-30 employees	3	7%	**Work experience with graduates, E (average)**	5.7 yrs	NA
More than 30 employees	7	16%			
Missing	17	39%			

Results from the first t-test reveal that ratings of generic skills and competencies for graduates (M = 3.22) were on average lower than that from their employers (M = 3.41). The difference, -0.18, was not significant t (74) = -1.34, p = 0.183. This result is reflected in Figure 1 and Table 2 where means of the 19 skills and competencies are presented side by side. With the exception of time management and research skills, ratings from graduates for all generic skills were on average, lower than those from their employers.
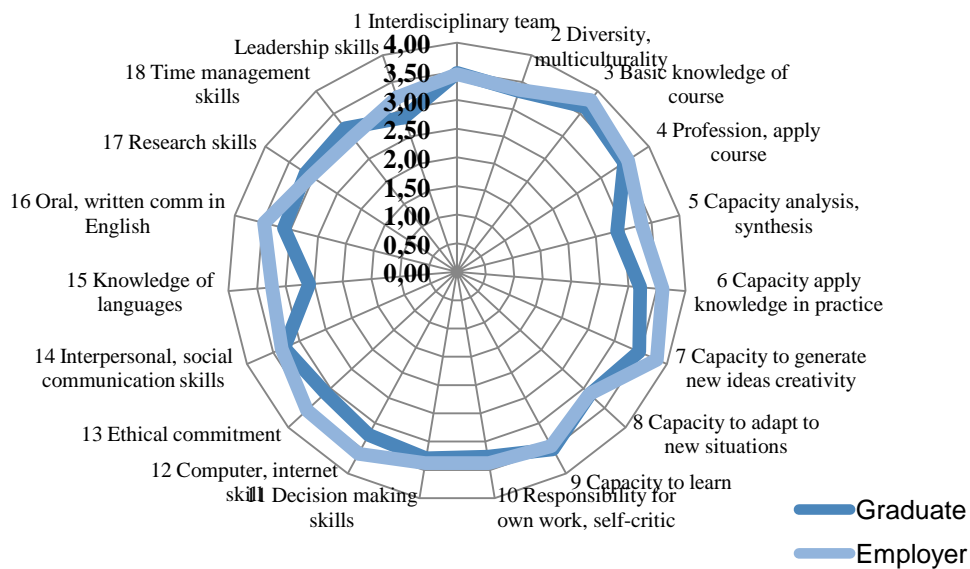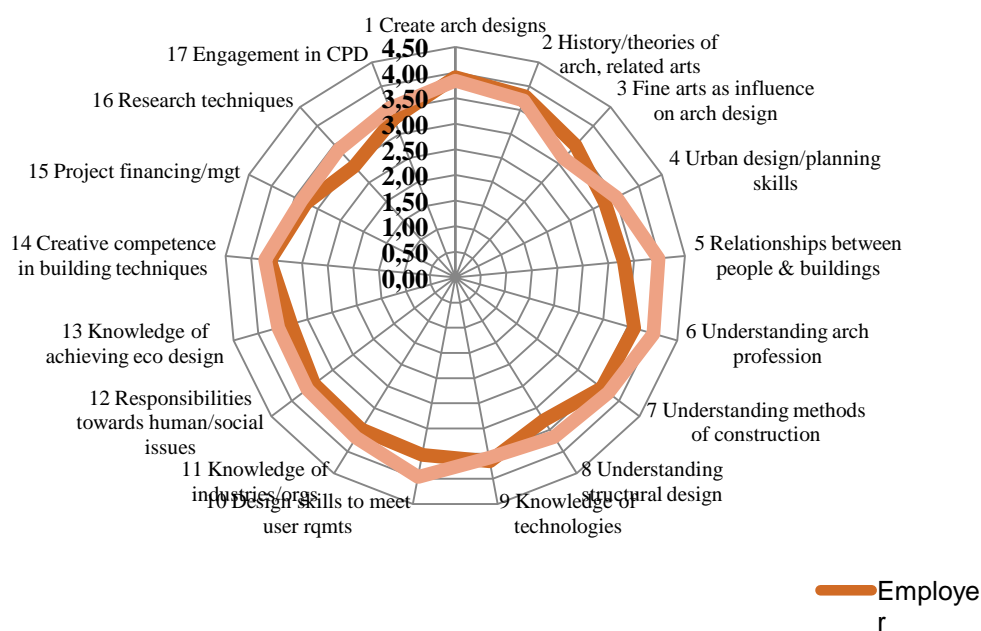

Figure 1. Comparison of ratings of generic skills from employers and graduates

Table 2. Mean ratings of generic skills from employers and graduates

	Generic skill	Employer		Graduate	
		Mean	SD	Mean	SD
1	Interdisciplinary team	3.45	.749	3.47	1.022
2	Diversity, multi-culturality	3.36	.932	3.33	1.021
3	Basic knowledge of course	3.80	.939	3.65	.849
4	Profession, apply course	3.56	1.074	3.48	.870
5	Capacity analysis, synthesis	3.33	1.141	2.88	.880
6	Capacity apply knowledge in practice	3.60	1.037	3.21	1.122
7	Capacity to generate new ideas creativity	3.80	.928	3.47	1.022
8	Capacity to adapt to new situations	3.15	1.014	3.15	1.132
9	Capacity to learn	3.45	1.109	3.52	1.004
10	Responsibility for own work, self-criticism	3.38	1.011	3.26	1.082
11	Decision making skills	3.38	1.081	3.29	.906
12	Computer, internet skill	3.61	1.022	3.24	1.156
13	Ethical commitment	3.56	.896	3.12	.913
14	Interpersonal, social communication skills	3.34	1.196	3.29	1.115
15	Knowledge of languages	3.24	1.185	2.59	1.104
16	Oral, written communication in English	3.48	.987	3.12	1.274
17	Research skills	3.05	1.048	3.15	1.064
18	Time management skills	2.98	1.165	3.18	.936
19	Leadership skills	3.22	1.037	2.85	.857
	Average	***3.41***	*1.03*	***3.22***	*1.02*

Although ratings for professional skills and competencies from graduates (M = 3.65) were on average higher than those from their employers (M=3.46) this difference (0.18), was also not significant t(92)=1.38, p=0.17. In contrast to ratings for generic skills, results for ratings of professional skills reveal that graduates rated 13 of the 17 skills (76.5%) higher compared to ratings from employers (Figure 2, Table 3).

Figure 2. Figure 1: Comparison of ratings of professional skills and competencies from employers and graduates

Table 3. Mean ratings of professional skills and competencies from employers and graduates

	Professional competencies/skills	Employer		Graduate	
		Mean	SD	Mean	SD
1	Ability to create architectural designs that satisfy both aesthetic and technical requirements	3.91	.947	3.84	.912
2	Knowledge of the history and theories of architecture and the related arts, technologies and human sciences	3.79	.925	3.70	.909
3	Knowledge of the fine arts as an influence on the quality of architectural design	3.49	.840	3.14	1.030
4	Adequate knowledge of urban design, planning and skills involved in the planning process	3.26	.964	3.51	.938
5	Understanding relationships between people and buildings, environment, human needs and scale	3.30	.939	3.98	1.000
6	Understanding the architectural profession and role of architect in society, preparing briefs taking social factors into account	3.63	1.113	4.02	.915
7	Understanding methods of investigation and preparation of briefs for a design project	3.58	1.220	3.74	1.006
8	Understanding structural design, construction and engineering problems associated with building design	3.28	.959	3.66	1.002
9	Knowledge of physical problems and technologies, function of buildings to provide internal conditions of the comfort and protection against climate	3.65	.923	3.58	1.012
10	Design skills necessary to meet building user's requirements within constraints of cost and regulations	3.52	1.045	3.96	.880
11	Knowledge of industries, organizations, regulations and procedures involved in translating design concepts into buildings and integrating plans into overall planning	3.49	1.032	3.68	.978
12	Awareness of responsibilities toward human, social, cultural, urban, architectural and environmental values and architectural heritage	3.45	.975	3.62	1.008
13	Knowledge of means of achieving ecologically responsible design and environmental conservation and rehabilitation	3.33	1.162	3.59	1.135
14	Creative competence in building techniques and construction methods related to architecture	3.64	.892	3.73	.984
15	Knowledge of project financing, management, cost control and methods of project delivery	3.26	1.049	3.36	1.005
16	Training in research techniques as an inherent part of architectural learning	2.93	1.009	3.38	1.141
17	Engagement in life long learning, CPD	3.33	1.267	3.54	1.265
	Average	*3.46*	*1.02*	*3.65*	*1.01*

5. DISCUSSION

Results from the study reveal that overall, there were no significant differences between ratings for both generic and professional skills and competencies from the graduates and their employers. In essence, the results suggest that architecture postgraduates, unlike their undergraduate counterparts, do not overestimate their skills compared to their employers using self-assessment questionnaires. These results are reassuring in light of the fact that the use of self-assessment questionnaires for assessing employability skills is likely to continue into the foreseeable future, pending the development of more practical tools of assessment especially for many non-technical disciplines such as obtains in design and

the humanities. More detailed results in figures 1-2 as well as tables 2-3 however present interesting differences.

First, graduates' self-assessment is lower for all generic skills except research and time management. This may be attributed to the fact that research methods is formally taught and graded as a course at both undergraduate and postgraduate levels [48] unlike other generic skills. This observation suggests that graduates are more confident in rating skills based on school qualification and grades, supporting findings by studies such as [5] as well as [8]. This trend may also explain why most of the professional courses were rated highly compared to ratings from employers. Postgraduate students may not be exempt from this trend from literature despite their relative maturity and experience compared to undergraduate students. Further studies across other design related disciplines comparing graduates from first-degree and postgraduate programs will be beneficial in establishing this trend.

Secondly, time management is a contentious issue for architects who generally work and practice with deadlines under pressure. Consequently, it is not surprising that graduates, on average overestimated this skill when compared to ratings from their employers.

6. CONCLUSION AND RECOMMENDATION

This study set out to establish the reliability of self-assessment questionnaires in providing accurate assessments of employability skills and competencies of graduates. This is important for methodological and practical reasons especially for establishing the degree of preparedness of graduates for the workplace from non-technical disciplines in the built environment. The premise for the study was that postgraduate students are unlikely to overestimate their generic and professional skills, unlike their undergraduate counterparts as a few studies in literature suggest that exposure to practical work modulates the tendency to overestimate skill sets [3]. Results from ratings of architecture postgraduates and their employers reveal that there were no significant differences in overall ratings of both generic and professional courses, although comparisons of mean values for individual skills and competencies did unearth some trends in line with findings in literature. Notable is the tendency for graduates to overestimate skills and competencies directly related to formally taught courses and educational qualifications [8]. This observation not withstanding, findings from the study suggest that self-assessment questionnaires from postgraduate architecture students can be relied upon for reporting employability skills and competencies of graduates.

A limitation for this study is the sample size. This is a practically recurring issue for this kind of study as it is difficult to trace employers of graduates in order to ascertain their perception and observations on employability skills of graduates [13]. Future studies involving larger samples across several related disciplines would be beneficial in establishing generalizable trends. Additionally, future studies need to consider the influence of possible intervening factors on employability assessment such as work experience, age, academic performance as well as personal motivation of graduates. Gender was also identified in literature as an intervening factor when self-reporting employability skills. This was not investigated in the present study due to the small sample size.

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