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Challenges in Open Distance Learning (ODL): An Exploratory Study on Pandemic Era Quantity Surveying Graduates

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ABSTRACT

The need to maintain educational continuity during the COVID-19 pandemic has accelerated the adoption of Open Distance Learning (ODL). However, whether ODL can adequately prepare graduates from technical disciplines, such as Quantity Surveying (QS), for industry demands has not been verified in detail. In response, this study investigates employer perceptions of QS graduates trained through ad hoc Open Distance Learning (ODL), a mode of education widely adopted during the COVID-19 pandemic. The objectives are to assess employers' views on the performance of these ODL graduates, evaluate the effectiveness of ODL in preparing QS graduates for employability, and identify strategies to improve the alignment of ODL implementations with employer expectations. Data were collected using a structured questionnaire survey from 71 employers in the Malaysian construction industry in Selangor and analysed using descriptive statistics, Cronbach's alpha to assess reliability, and the Kruskal-Wallis's test to identify differences in employer perceptions. The findings reveal mixed perceptions. While some employers appreciated the knowledge and general understanding of ODL graduates, concerns were raised regarding their technical skills, ability to meet industry demands, and proficiency in using industry-specific tools. Employers also highlighted gaps in teamwork, communication, and the overall readiness of graduates to handle real-world challenges. Scepticism remains regarding the alignment of ODL programs with practical industry needs. To address these issues, employers recommended involving industry professionals in ODL curriculum development, improving access to

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industry resources, and establishing stronger collaborations between academia and industry. These recommendations aim to ensure that future ODL graduates are better equipped to meet the expectations of the construction industry. This study emphasises the need for future ODL implementations to align more closely with industry demands, providing actionable insights for educators, policymakers, and stakeholders to enhance the employability and acceptance of ODL QS graduates within the construction industry.

INTRODUCTION

The global outbreak of the COVID-19 pandemic in late 2019 profoundly disrupted numerous sectors, including education, which includes Quantity Surveying (QS) programmes. Governments worldwide, including Malaysia, implemented stringent measures such as lockdowns and social distancing to curb the virus's spread (Jæger & Blaabæk, 2020). These measures compelled higher education institutions to rapidly transition from traditional classroom-based learning to online and open distance learning (ODL) modalities (Ratten, 2020). While this shift ensured educational continuity amidst unprecedented challenges, it also highlighted various issues, particularly regarding the readiness and employability of graduates from ODL programmes. This is because ODL poses significant challenges for higher education institutions, especially in fields like QS, which relies on hands-on training, site visits, and direct mentorship.

ODL leverages digital platforms to facilitate education, enabling students to access course materials, participate in online activities, and complete assessments remotely (Ulanday et al., 2021). Despite its flexibility and inclusivity, ODL has faced scrutiny from stakeholders, particularly employers, who question its ability to adequately prepare graduates with the practical skills and competencies required in professional settings (Soomro et al., 2018). These concerns are especially pronounced in fields like QS, where technical proficiency, hands-on experience, and familiarity with construction methods are critical. Moreover, limited face-to-face interaction may have curtailed crucial soft skills such as teamwork and communication, which are essential for QS professionals.

The construction industry, a vital contributor to Malaysia's economy, relies heavily on skilled QS for measurement of quantities, cost estimation, project budgeting, and resource management. However, the pandemic's forced reliance on ad hoc ODL has raised questions about the readiness of fresh QS graduates to meet industry standards when they graduate. Employers often perceive a disparity between the theoretical knowledge taught through ODL and the practical expertise demanded by the workplace, potentially affecting the employability of ODL graduates (Adnan & Anwar, 2020; Ag-Ahmad, 2020). The challenges of limited face-to-face interaction, lack of hands-on training, and potential gaps in digital literacy further intensify this issue (Arias et al., 2018). Therefore, there is a need to clarify how these remote learning experiences influence QS graduate employability – a pressing gap in the literature to uncover ODL's effectiveness in technical disciplines that requires further enquiry (Tarmuji et al., 2024; Bedoya-Guerrero et al., 2024).

As a result, this study investigates employers' perceptions of fresh QS graduates who completed their education through ODL during the pandemic. The research addresses critical questions about the challenges employers face in hiring these graduates regarding their performance and acceptance within the industry and proposes improvements to enhance the employability of ODL-trained QS professionals. By examining these perspectives, the study provides actionable insights for educators, policymakers, and industry

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stakeholders to bridge the gap between academic training and professional expectations, ensuring that ODL graduates can successfully integrate into the construction workforce.

LITERATURE REVIEW

Open Distance Learning (ODL) is a teaching approach that allows students to engage in their studies remotely, utilising digital platforms and online tools to access course materials, participate in activities, and complete assessments. It emphasises flexibility, providing opportunities for learners to study at their own pace and location. It is particularly valuable for non-traditional students, working professionals, and those with geographic or physical barriers to traditional education (Ulanday et al., 2021).

Historically, ODL began with correspondence education in the late 1800s, where learners and educators communicated via postal systems. The rapid advancement of technology, particularly the internet, has since revolutionised this mode of education, transforming it into a dynamic, interactive, and accessible system (Zawacki-Richter & Bozkurt, 2023). In Malaysia, ODL gained traction during the COVID-19 pandemic as an emergency response to nationwide lockdowns. Universities were compelled to transition from traditional face-to-face instruction to online platforms, a shift that highlighted both the opportunities and limitations of ODL (Soomro et al., 2018).

Previous studies have highlighted the flexibility and accessibility of ODL (Soomro et al., 2018). However, more recent investigations post-pandemic indicates that ad hoc ODL implementation can exacerbate challenges in technical fields like quantity surveying (Chen et al., 2020; Falode et al., 2020). Unlike traditional face-to-face formats—which allow hands-on labs, immediate feedback, and direct mentorship—ODL often relies on theoretical content delivery, potentially limiting the practical exposure essential for QS competencies. As Arias et al. (2018) suggest, online learning environments may reduce student engagement when practical tasks are required.

ODL integrates information and communication technologies (ICT) to facilitate learning. Higher education institutions adopted this model during the pandemic, emphasising asynchronous learning to overcome physical restrictions. Despite its advantages, recent work by Tarmuji et al. (2024) highlights accessibility and scalability constraints to implementing ODL in Malaysia, including inadequate infrastructure, insufficient digital literacy, and a lack of strategic planning for curriculum development and assessment methods. These issues underscore the need for a more comprehensive framework to ensure effective ODL delivery.

Impact of Online Distance Learning on Students

One (1) significant impact of ODL on students is the academic challenge posed by the limited opportunities for hands-on learning, particularly in technical fields like QS. Research indicates that students engaged in online learning environments often perform worse in assessments than their peers in traditional settings. This performance gap is attributed to reduced engagement, the absence of immediate feedback, and difficulty adapting to self-directed learning models (Arias et al., 2018). Practical competencies such as cost estimation, project management, and technical report writing are critical for QS students. ODL's reliance on theoretical knowledge delivery can limit exposure to these essential skills, creating a gap between educational outcomes and industry expectations. Furthermore, the lack of structured, real-world training opportunities exacerbates this issue, leaving graduates less prepared for the demands of professional roles.

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The financial burden associated with ODL is another significant challenge. Students often need to invest in reliable internet access, digital devices, and specialised software, which can strain the resources of those from economically disadvantaged backgrounds (Kabir et al., 2021). These financial barriers are further compounded by the digital divide in Malaysia, where students in rural areas may lack the necessary infrastructure to participate fully in ODL programmes (Adnan & Anwar, 2020). For QS students, the high costs of acquiring industry-specific tools and technology required for their studies further widen the gap in educational equity. This financial strain affects participation, academic performance, and engagement, as students may struggle to balance their economic and educational responsibilities.

ODL has profound social and psychological impacts, particularly the sense of isolation it can foster among students. The absence of in-person interactions diminishes opportunities for collaboration, peer learning, and networking, which are integral to the holistic development of QS professionals (Chen et al., 2020). This isolation often leads to increased stress, reduced motivation, and challenges in maintaining self-discipline, particularly for students accustomed to structured, classroom-based learning environments. Moreover, the lack of informal social interactions limits opportunities to develop soft skills, such as communication, teamwork, and problem-solving, which are critical for QS graduates in professional settings. Addressing these issues requires innovative strategies to foster community and engagement in ODL programmes.

Employers' Perceptions Toward ODL Graduates

Employers' perceptions of ODL graduates often revolve around concerns about credibility and expertise. In technical professions like QS, practical experience and hands-on training are essential. Employers frequently perceive ODL graduates as less prepared for industry roles due to their limited exposure to real-world scenarios during their education (Gauvreau et al., 2016). These perceptions are exacerbated by the belief that online programmes may compromise on rigour and the depth of practical training. Additionally, the absence of face-to-face interactions with instructors and peers in ODL environments may hinder the development of essential interpersonal and professional skills. This further reinforces employers' scepticism about ODL graduates' readiness to meet the construction industry's demands.

While technological advancements have enabled ODL programmes to incorporate innovative teaching methods, such as virtual simulations and case-based learning, employers' recognition of these skills remains limited. Concerns persist regarding the applicability of theoretical knowledge in practical contexts, particularly for QS graduates, whose roles often require detailed understanding and application of construction methodologies, budgeting, and legal frameworks (Falode et al., 2020). Employers also highlight the importance of industry-specific certifications and partnerships between ODL institutions and professional bodies to enhance the credibility of graduates. Such collaborations could improve perceptions of the employability of ODL-trained QS professionals.

Enhancing Employability Prospects of ODL Graduates

Integrating practical training and internships into ODL programmes is crucial for bridging the gap between theoretical knowledge and industry requirements. These opportunities provide students with hands-on experience, enabling them to apply learnt concepts in real-world scenarios and develop technical and professional competencies (Harrison et al., 2017). For QS students, such initiatives could include virtual internships, site visits through augmented reality, and project-based assessments aligned with industry standards. Engaging employers in curriculum development and programme delivery can enhance the credibility and acceptance of ODL graduates. Strategies such as industry-led workshops, co-developed

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training modules, and expert guest lectures can provide students with insights into professional practises while addressing employers' concerns about skill gaps (Obi, 2024).

Advanced technology, including virtual reality (VR), simulations, and digital collaborative platforms, can replicate practical experiences for ODL students. These tools enable students to engage in interactive learning, develop problem-solving skills, and simulate real-world scenarios relevant to QS roles (Soomro et al., 2018). Additionally, adaptive learning platforms can personalise learning experiences, helping students address individual weaknesses and build confidence in their competencies.

This extended literature review highlights the complexities and opportunities associated with ODL in the context of quantity surveying education. While ODL offers flexibility and accessibility, its implementation challenges maintaining academic rigour, ensuring equity, and meeting industry expectations. Addressing these challenges through practical training, employer engagement, and technological innovation can significantly enhance the employability of ODL graduates and bridge the gap between education and industry requirements.

RESEARCH METHODOLOGY

This study adopts a quantitative research approach to explore employers' perceptions of pandemic-era ODL graduates in QS. The design emphasises the systematic collection and analysis of data to uncover challenges and perceptions related to the employability of QS graduates trained through ODL. A structured survey questionnaire was used as the primary data collection tool to capture employers' experiences with ODL graduates' performance, attitudes, and suggestions for improvement.

Data Collection, Survey Design and Sampling

As exploratory in nature, due to limited time and resources, this study opted for purposive sampling – focusing on employers who had first-hand experience hiring or evaluating QS graduates who had undergone ODL courses during the pandemic. This purposeful criterion ensured that all data collected came from employers familiar with ODL-trained QS graduates' performance in the workplace. In addition, based on Viechtbauer et al. (2015), the estimated size for an exploratory study is $\frac{n=ln\ (1-\gamma)}{ln\ (1-\pi)}$, where γ is the confidence level, while the probability is. Given the expected confidence level of 0.95 and event probability of 0.05, the estimated number of samples is 59. For this study, 71 samples were collected from 300 questionnaires sent online, equivalent to a 24% response rate over a period of four (4) weeks.

The study utilised a structured questionnaire survey to collect quantitative data from employers within the Malaysian construction industry in Selangor. The survey's primary objective was to explore employers' perceptions of QS graduates from pandemic-era ODL implementations. The questionnaire was carefully structured into sections to ensure comprehensive data collection aligned with the study's objectives:

(i) Section A: Respondent Demographics — This section gathers information about respondents' backgrounds and organisations. It includes questions on the respondents' years of professional experience, the type of firms they represented (e.g., contractors, QS consultants, or other industry-related specialisations), and the years their firms had been established.

(ii) Section B: Perceptions in Recruiting ODL QS Graduates — This section identifies employers' perceptions of ODL graduates' performances.

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(iii) Section C: Perceptions of Employability — This section assesses how well ODL QS graduates met industry standards and expectations. Key focus areas included graduates' technical skills, software proficiency, adaptability, and ability to handle industry challenges.

(iv) Section D: Recommendations for Improvement — This section seeks suggestions from employers on strategies to enhance the employability of ODL QS graduates. Questions addressed the importance of practical training opportunities, industry placements, and curriculum alignment with industry needs.

Data Analysis

The collected data were analysed using descriptive statistics to summarise respondents' perceptions of Quantity Surveying (QS) graduates trained through Open Distance Learning (ODL) during the COVID-19 pandemic. Likert-scale responses from respondents' views on ODL graduates' competencies, employability and recommendations were analysed to identify overall sentiment and trends. Likert-scale questions were used to measure respondents' agreement with statements related to ODL fresh graduates. Key metrics for descriptive statistics include means and standard deviations, which were calculated to provide an initial overview of employers' perceptions.

This research uses Cronbach's Alpha to assess the degree of correlation among items within a scale, reflecting the overall reliability of the instrument for Sections B, C, and D. It ensures that all items consistently evaluate the same underlying construct (Taber, 2018). In addition, this research uses the Kruskal-Wallis (KW) test to determine whether there are statistical differences in opinions based on the mean values of two (2) or more independent samples. It is a robust technique for detecting variations across groups, even when the data does not meet the assumptions required for parametric tests (Richardson, 2018).

RESULTS AND DISCUSSION

The following are the analysed results and discussion.

Demographic Profile of Respondents

The survey included responses from 71 employers in the Malaysian construction industry, ensuring a diverse and experienced sample. Most respondents had substantial professional experience, with 50.7% having over 25 years of experience and 42.3% having 11–25 years of experience. Only 4.2% of respondents had less than five (5) years, and 2.8% had 6–10 years of experience. Regarding firm establishment, nearly all organisations had been operational for over ten (10) years, with 49.3% in the 11–15-year range and 47.9% for more than 16 years. Firms established for less than ten (10) years comprised only 2.8% of the sample. Regarding specialisation, contractors represented the largest group at 49.3%, followed closely by QS consultant firms at 42.3%. Minimal representation came from government organisations (1.4%), interior design (4.2%), suppliers (1.4%), and others (1.4%). Because of few respondents from government agencies, interior design companies, suppliers, etc. For comparison, this study separates two (2) groups of employers, i.e., Group 1 (QS consultants and government) and Group 2 (contractors, interior designers, suppliers, and others).

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Reliability of the Survey Instrument

The reliability of the survey instrument, which was assessed using Cronbach's alpha, indicated acceptable internal consistency for all constructs measured. The general understanding of QS graduates, evaluated through three (3) items, had a Cronbach's alpha of 0.675, with a slightly improved standardised value of 0.679. For items assessing preparation for employability, Cronbach's alpha was higher at 0.811, with a standardised value of 0.814, indicating strong reliability. Based on seven (7) items, the construct evaluating recommendations for ODL learning improvement had a Cronbach's alpha of 0.644, with a standardised value of 0.660. According to Moss et al. (1998), a Cronbach's alpha value of 0.60 or higher in social science research is considered acceptable. Thus, the instrument demonstrated reliability across all constructs.

Employers' Perceptions of ODL QS Graduates' Performance

Table 1 presents employers' perceptions of ODL QS graduates' performance, which were evaluated across three (3) key areas: general understanding (basic principles), technical skills (hands-on competencies), and overall performance (broad and holistic context). The level of general understanding received a mean score of 1.490 (SD = 0.531), with significant differences between Group 1 (QS consultants and government, and Group 2 (contractors, interior designers, suppliers, and others). For technical skills, the mean score was 1.450 (SD = 0.529). The overall performance had a mean score of 1.591 (SD = 0.575).

Employers' perceptions of ODL graduates vary based on their roles within the construction sector. Those in consultancy and government roles tend to have more favourable views of graduates' general understanding and overall performance. In contrast, employers from contractors and field-oriented roles expressed concerns about the graduates' ability to meet hands-on technical demands. This reflects a broader trend in the industry where theoretical knowledge may be better appreciated in analytical environments, while practical roles demand stronger practical application skills. These findings are consistent with previous studies, such as those by Bedoya-Guerrero et al. (2024), which emphasise the theoretical strength but practical limitations of ODL graduates in technical fields.

Employers' uneven acceptance of ODL graduates can be attributed to the lack of simulated or on-site training during the pandemic era, which may have hindered the development of key technical competencies (Soomro et al., 2018; Falode et al., 2020). For instance, contractors deal with real-time project variations, requiring QS employees to quickly adapt to unexpected site conditions or cost fluctuations. Without hands-on practise or immersive simulation in ODL, fresh graduates may lack the confidence and practical judgment gained through face-to-face labs or supervised internships (Obi, 2024). These insights justify the notable group differences shown in our results and support calls for enhanced industry-academia partnerships to improve ODL's practical components.

Table 1. Employers' Perceptions of ODL QS Fresh Graduates' Performance (based on three (3) points Likert's scale)

Item	Mean	SD	Group 1 (MR)	Group 2 (MR)	df	Kruskal-Wallis H
Level of general understanding of QS fresh graduates from ODL	1.490	0.531	30.29	40.42	1	5.554*
Level of technical skills of QS fresh graduates from ODL	1.450	0.529	33.42	38.00	1	1.153
Level of overall performance of QS fresh graduates from ODL	1.591	0.575	35.31	36.54	1	0.080

*p<0.05, SD is standard deviation, Group 1 (QS consultants and government), Group 2 (Contractors, interior designers, suppliers and others), MR is Mean Rank score, df is degree of freedom.

Source: Authors (2024)

Employers' Perceptions of ODL Learning in Preparing QS Fresh Graduates

Table 2 presents the effectiveness of ODL learning in preparing QS graduates for industry demands across eight (8) items, ranked based on their mean scores. The preparation of graduates for industry-required technical skills was rated the highest (Mean = 2.41, SD = 0.803, Rank = 1). This item showed significant differences between Group 1 and Group 2.

The second-highest rated competency was the preparation of graduates for requisite skills and knowledge for the role, with a mean score of 2.30 (SD = 0.782, Rank = 2). Significant differences were observed between Group 1 and Group 2. Prepare graduates being on par with physical learning graduates also received a mean score of 2.30 (SD = 1.126, Rank = 3).

Handling challenges faced in the industry was rated fourth (Mean = 2.21, SD = 0.984, Rank = 4), with significant group differences between Group 1 and Group 2. Adaptability and resilience in job tasks were rated fifth (Mean = 2.17, SD = 0.941, Rank = 5), with Group 2 providing more favourable ratings. Industry acceptance of ODL graduates was ranked sixth, with a mean score of 2.11 (SD = 0.903, Rank = 6). Significant differences were observed, with Group 1 scoring higher than Group 2.

The preparation of graduates for skills in using industry software and tools was rated seventh (Mean = 2.07, SD = 1.125, Rank = 7. Finally, the lowest-rated competency was the preparation of graduates to meet overall industry demands, with a mean score of 1.86 (SD = 0.930, Rank = 8).

Employers noted that while ODL QS graduates exhibit strengths in adaptability and resilience, there are concerns about their technical skills and familiarity with industry-specific software. These gaps reflect the inherent limitations of ODL compared to face-to-face interactions in providing hands-on experience, which is critical in the construction industry (Falode et al., 2020). However, the adaptability and problem-solving skills developed through ODL were acknowledged as valuable in dynamic workplace settings (Bedoya-Guerrero et al., 2024). This suggests that while ODL imparts essential soft skills, its delivery methods must be complemented with practical components to meet industry expectations fully.

Table 2. Employers' Perceptions of ODL Learning in Preparing QS Fresh Graduates' Employability (based on five (5) points Likert's scale)

Item	Mean	SD	Rank	Group 1 (MR)	Group 2 (MR)	df	Kruskal-Wallis H
Prepare QS fresh graduates based on demands of the industry.	1.86	0.930	8	40.15	32.79	1	2.558
Prepare QS fresh graduates for requisite skills and knowledge for the role.	2.30	0.782	2	43.08	30.51	1	7.588*
Prepare QS fresh graduates for skill in using industry software and tools.	2.07	1.125	7	34.40	37.24	1	0.365

Prepare QS fresh graduates for the industry-required technical skills.	2.41	0.803	1	43.52	30.18	1	8.630*
Prepare QS fresh graduates to handle the challenges faced in the industry.	2.21	0.984	4	41.32	31.88	1	4.190*
Prepare QS fresh graduates to be adaptable and resilience in their job tasks.	2.17	0.941	5	28.23	42.03	1	8.729*
Prepare QS fresh graduates' acceptance by the industry	2.11	0.903	6	42.15	31.24	1	5.486*
Prepare QS fresh graduates to be on par with physical learning graduates	2.30	1.126	3	39.65	33.17	1	1.870

*p<0.05, SD is standard deviation, Group 1 (QS consultants and government), Group 2 (Contractors, interior designers, suppliers and others, MR is Mean Rank score, df is degree of freedom.

Source: Authors (2024)

Employers' Recommendations to Improve ODL Learning

Table 3 presents employers' detailed recommendations to enhance the employability of ODL QS graduates, with items ranked based on their mean scores. The most highly rated recommendation was the involvement of industry professionals in curriculum development and reviews to ensure alignment with industry requirements (Mean = 4.28, SD = 0.659, Rank = 1). This item showed significant differences between Group 1 and Group 2.

The inclusion of industry-focused coursework for QS graduates was ranked second (Mean = 4.20, SD = 0.786, Rank = 2). Improving access to industry resources to enhance graduates' industry-specific knowledge also received a mean score of 4.20 (SD = 0.786, Rank = 3).

Employers rated industry placements as the fourth most important recommendation (Mean = 4.18, SD = 0.867, Rank = 4). This item demonstrated significant group differences with Group 1 and Group 2. Providing clear information about the ODL structure to help employers recognise QS graduates' skills and knowledge was ranked fifth (Mean = 4.14, SD = 0.850, Rank = 5).

Establishing partnerships with professional organisations to enhance recognition and credibility was ranked sixth (Mean = 4.03, SD = 0.755, Rank = 6). This item exhibited significant group differences with Group 1 and Group 2. Finally, including industry certifications to boost the acceptability of QS graduates was ranked seventh (Mean = 3.90, SD = 0.679, Rank = 7). Significant differences were observed between Group 1 and Group 2.

Table 3. Employers' Recommendations to Improve ODL Learning (based on five (5) points Likert's scale)

Item	Mean	SD	Rank	Group 1 (MR)	Group 2 (MR)	df	Kruskal-Wallis H

Industry placements will better prepare ODL QS graduates practically.	4.18	0.867	4	25.13	44.43	1	17.568*
ODL should include industry-focused coursework's for QS graduates.	4.20	0.786	2	33.03	38.30	1	1.308
ODL's Industry certifications can boost acceptability of quantity surveyor graduates.	3.90	0.679	7	27.34	42.71	1	11.841*
Access to industry resources improves ODL QS graduates' industry-specific knowledge.	4.20	0.786	3	33.24	38.14	1	1.130
Industry professionals' involvement in ODL curriculum development and reviews ensures alignment with industry requirements.	4.28	0.659	1	21.15	47.51	1	34.861*
Establishing partnerships with professional organisations would enhance the recognition and credibility of ODL QS graduates.	4.03	0.755	6	24.65	44.80	1	19.101*
Providing clear information on ODL structure helps employers recognise QS graduates' skills and knowledge.	4.14	0.850	5	37.77	34.63	1	0.466

*p<0.05, SD is standard deviation, Group 1 (QS consultants and government), Group 2 (Contractors, interior designers, suppliers andothers), MR is Mean Rank score, df is degree of freedom.

Source: Authors (2024)

Employers highlighted several strategies to enhance the employability of ODL QS graduates, emphasising the need for practical exposure, curriculum relevance, and industry alignment. One (1) of the key suggestions was the inclusion of structured industry placements to provide graduates with real-world exposure, bridging the gap between theoretical knowledge and practical application. This aligns with Koseda et al. (2024), who stress the importance of experiential learning in improving graduate employability. Additionally, involving industry professionals in curriculum design was identified as crucial to ensuring that the content remains relevant and aligned with current industry standards. Rebelo et al. (2023) similarly advocate for close collaboration between education providers and professional bodies to enhance the applicability of ODL curricula.

Another recommendation was fostering professional partnerships to boost the credibility and recognition of ODL graduates. Collaborations with industry organisations can offer networking opportunities and certifications that appeal to employers, as highlighted by Mathew and Chung (2020). Furthermore, introducing more practical training opportunities, such as virtual labs and simulations, was suggested to address the absence of hands-on experience in ODL programmes. These initiatives would not only equip students with industry-relevant skills but also alleviate employer concerns about the readiness of ODL graduates to meet workplace demands (Falode et al., 2020). Together, these measures underscore the importance of bridging the gap between education and industry to enhance the acceptance and employability of ODL QS graduates.

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CONCLUSION

This study explored employers' perceptions of QS graduates trained through ad hoc ODL in Malaysia, highlighting challenges and avenues for improvement. The findings reveal that while some employers appreciated the general understanding of QS knowledge demonstrated by ODL graduates, concerns were raised about their technical skills, practical readiness, and ability to meet the demands of the construction industry. Key issues include deficiencies in industry-specific software skills, communication, teamwork, and the alignment of ODL implementations with real-world requirements.

Employers emphasised the need for future ODL programmes to better prepare graduates for practical and industry-specific tasks. Recommendations included involving industry professionals in future ODL curriculum development, providing access to industry resources, and fostering stronger collaborations between academia and industry. These measures aim to bridge the gap between theoretical knowledge and practical application, ensuring that ODL graduates are equipped to meet industry expectations. Overall, the study highlights the importance of aligning ODL programmes with industry needs to enhance the employability and acceptance of QS graduates. The insights provide valuable direction for educators, policymakers, and stakeholders in improving ODL education and addressing the evolving demands of the construction sector.

Theoretically, the findings highlight that the effectiveness of ODL in technical fields depends on integrating more authentic, real-world tasks and building strong university-industry linkages. Practically, employers seeking work-ready QS professionals can collaborate with academic providers to co-develop relevant curricular content, including software training modules and extended internships, ensuring that graduates acquire the hands-on skills necessary for immediate workplace integration. These measures help alleviate employer concerns, improve graduate employability, and inform future ODL policies for better crisis resilience in higher education.

RECOMMENDATIONS

To address the challenges faced by pandemic-era ODL QS graduates, it is essential to enhance practical training opportunities by integrating virtual site visits, simulations, and internships into the curriculum. These initiatives can bridge the gap between theoretical knowledge and practical industry requirements. Collaboration with industry professionals in designing and reviewing curricula will ensure that future ODL programmes remain aligned with workforce expectations, improving employer confidence in graduates. Additionally, leveraging advanced technologies such as virtual and augmented reality can simulate real-world scenarios, enabling students to develop technical skills effectively. Establishing partnerships with professional organisations can further enhance the credibility and recognition of ODL programmes, providing certifications and fostering networking opportunities. Furthermore, ODL institutions should emphasise developing soft skills, such as communication, teamwork, and problem-solving, to better prepare graduates for the collaborative and dynamic demands of the construction industry. These strategies collectively address the identified gaps and ensure that ODL QS graduates are equipped to meet industry expectations.

FUTURE RESEARCH AND LIMITATION

Future research could explore the long-term career progression and performance of ODL graduates within the construction industry to provide a comprehensive understanding of their professional integration.

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Longitudinal studies tracking skills development and career outcomes over time would offer valuable insights into the effectiveness of current ODL practises. Additionally, comparative analyses between ODL and traditional graduates across different technical fields could identify best practises for enhancing practical training and industry alignment. Exploring the perspectives of graduates and employers would provide a more balanced understanding of the challenges and opportunities in ODL education. Furthermore, studies could examine the potential of emerging technologies, such as virtual and augmented reality, in replicating practical experiences for ODL learners. This research could contribute to developing innovative pedagogical approaches that better prepare graduates for industry demands.

Due to its exploratory nature, this study is limited by its focus on 71 construction-related employers within Selangor. While providing valuable insights, this narrow scope may not fully capture employers' perspectives from other regions or sectors in the construction industry, where practises and educational needs may vary. Additionally, relying on a survey-based approach may introduce self-reporting biases and does not provide the depth that qualitative methods, such as interviews or focus groups, could offer.

Another limitation is the timing of the study, which was conducted in a pandemic-era context and may influence employer perceptions of ODL. These views could evolve as industries further adapt to digital education models. Furthermore, the findings are specific to QS graduates and may not generalise to other disciplines. Future research should expand the geographic scope, increase sample size, and employ mixed methods approaches to provide a more comprehensive understanding of ODL graduates' employability.

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CONFLICT OF INTEREST STATEMENT

The authors agree that this research was conducted in the absence of any self-benefits, commercial or financial conflicts and declare the absence of conflicting interests with the funders.

AUTHORS' CONTRIBUTIONS

Afiq Imran Yusni carried out the research and wrote the initial draft. Mohd Azrai Azman supervised the initial work and critically revised the initial draft. Ahmad Faiz Abd Rashid, Noorsaidi Mahat, Nasyairi Mat Nasir, and Abdul Rahimi Abdul Rahman provided a critical review, edited and approved the article submission.

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