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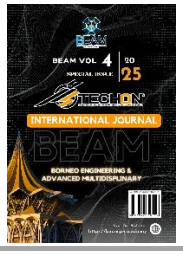

Exit Survey-Based Assessment for Continuous Quality Improvement of the Diploma in Civil Engineering Program at Mukah Polytechnic

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Abstract

The lack of empirical data on graduating students' attainment of all twelve Programme Learning Outcomes in Politeknik Mukah's Diploma in Civil Engineering programme constrains evidence-based verification against Engineering Accreditation Council requirements. This evidentiary gap jeopardises the programme accreditation credibility and blunts strategic quality improvement initiatives that ensures graduates are industry ready. As such, this study evaluates the effectiveness of Politeknik Mukah's Diploma in Civil Engineering programme by analysing exit-survey responses from the 2021/2022 graduating cohort. Correspondingly, the primary objective is to assess students' perceptions attainment of Programme Learning Outcomes (PLOs) and core graduate attributes in line with the Outcome-Based Education (OBE) framework and Continuous Quality Improvement (CQI) practices. Additionally, this study examined 94 students who completed Diploma in Civil Engineering programme during Session II 2021/2022. Seventy-nine survey items that grouped into job skills, soft skills, instructional effectiveness, and campus services, were analysed descriptively in Microsoft Excel and SPSS. Subsequent, this study has found that the respondents rated their achievement in all 12 PLOs as high, with the highest score recorded for PO9: Individual and Team Work (mean: 4.28) and PO8: Ethics (mean: 4.11). The core graduate attributes, particularly critical thinking (mean: 3.95), job skills (mean: 4.04), and instructional effectiveness (mean: 4.11) also earned strong rating. Some areas were identified for improvement include entrepreneurial skills (mean: 3.69), support services, and campus facilities. The results underscore the program's overall effectiveness in preparing students with technical competence, ethical awareness, and soft skills required for industry and lifelong learning. Overall, this study recommends targeted enhancements in infrastructure, student support, and curriculum design to ensure continuous improvement and sustained program quality.

Keywords: - Exit survey, Programme Learning Outcomes (PLOs), Outcome-Based Education (OBE), Continuous Quality Improvement (CQI), graduate attributes, student satisfaction

1. Introduction

The exit survey delivers higher education institutions an unfiltered verdict on programme effectiveness by revealing the extent of learning outcome attainment as well as spotlighting precise targets for improvement. According to Wang & Baker (2018), feedback from graduating students allows institutions to gauge learning outcome attainment and identify precise targets for improvements. As added by Chin et al. (2022), outcome-based surveys empower universities and polytechnics to make evidence-based enhancements to curricula, pedagogy, and student support services.

In Malaysia, engineering education accreditation is overseen by the Board of Engineers Malaysia (BEM)

through the Engineering Accreditation Council (EAC), in accordance with the *Registration of Engineers Act 1967 (Revised 2015)*. The EAC mandates the adoption of Outcome-Based Education (OBE), which emphasises not just content delivery, but demonstrable competencies aligned with defined Programme Learning Outcomes (PLOs). These PLOs are developed under Malaysian Qualifications Agency (MQA) and Engineering Technology Accreditation Council (ETAC) guidance and align with global benchmarks such as Dublin Accord. Several Malaysian studies demonstrate that exit and alumni surveys could provide credible evidence of Outcome Based Education implementation. For instance, secondary data analysis from Universiti Utara Malaysia reported that graduating students perceived strong attainment across several key Program Learning Outcomes, particularly in communication skills, ethical values, and teamwork abilities (Yusoff, 2019). Besides, alumni feedback analysed by Salim et al. (2022a) showed that achievement of the Programme Educational Objectives ranged from 60% to 88% has underscored the value of survey evidence for quality assurance.

Despite adopting Outcome-Based Education in June 2019 curriculum revision, Politeknik Mukah's Diploma in Civil Engineering programme still has no published evidence showing the extent to which its twelve PLOs are achieved. As such, this study aims to analyse exit-survey responses from the 2021/2022 graduating cohort of Politeknik Mukah's Diploma in Civil Engineering programme.

2. Literature Review

Robust programme assessment provides the evidence base that sustains quality assurance in higher education. A study conducted by Konting et al. (2009) found that exit surveys among graduating students at Universiti Putra Malaysia yielded moderately high satisfaction (mean≈ 3.55) while confirming these tools as effective measures of teaching and learning quality. Additionally, a study carried out by Yusoff (2019) reported that Universiti Malaysia students perceived strong attainment of every Programme Learning Outcomes (PLOs) and this proved that exit-survey data could credibly showcase OBE success.

Various frameworks emphasize the utility of exit surveys in Continuous Quality Improvement (CQI). This includes a European study involving programme competence assessments demonstrated how exit surveys facilitated stakeholder dialogue and curriculum alignment. A study reported by Shirley et al. (2020) found that visual analytics of PLO achievement data could highlight anomalies and guided targeted improvements in an engineering program at Universiti Malaysia Sarawak (UNIMAS).

Salim et al. (2022b) also applied an alumni survey in Malaysia to gauge attainment of the Programme Educational Objectives which recorded achievement levels of 60–88% and underscoring graduate feedback as an essential driver of quality assurance. Furthermore, Takriff et al. (2011) demonstrated that exit-survey feedback could catalyse substantive curriculum reform which subsequently prompted Universiti Kebangsaan Malaysia to embed integrated projects and open-ended assessments across its engineering programme. In engineering education, robust CQI processes require both direct and indirect outcome measures. Cartwright et al. (2009) and related studies document combined exit surveys and exit exams as a comprehensive approach for measuring PLO achievement. This dual-measurement strategy increases confidence in assessing whether graduates truly meet program standards. Although several studies in the literature endorses exit surveys integrated with PLO mapping, its effectiveness remains unverified in Malaysian polytechnic engineering diplomas.

3. Methodology

This study utilized purposive non-probability sampling by targeting Diploma in Civil Engineering students who completed industrial training in Semester II 2019/2020 and were eligible to graduate in Academic Year 2020/2021. Purposive sampling was chosen to include participants with recent graduation and direct industry experience to allow their feedback to yield rich insights into the programme's effectiveness (Thoo et al., 2022). A similar methodological approach was adopted in a study done by Thoo et al. (2022) on AHIBS UTM graduates, which evaluated graduates' satisfaction across various areas such as academic advising, teaching and learning, curriculum, resources, and facilities.

The questionnaire was administered electronically through Google Forms to give student contact-free access as well as automatically collating the data for subsequent statistical analysis. The data collection was also focused on students enrolled in the Diploma in Civil Engineering program for Session II 2021/2022. Moreover, the instrument utilized in this study consisted of four main sections, as presented in Table 1, and applied a 5-point Likert scale ranging from 1 = "Strongly Disagree (very low)" to 5 = "Strongly Agree (excellent)". This scale aligns with established practices in educational assessment research.

Table 1: Survey sections and item counts overview

Part	Aspects		Items
A	Respondent Demographics		7
B	Skill/Attribute		
	i	Job Skills	10
	ii	Entrepreneurial Skills	4
	iii	Critical thinking	5
	iv	Citizenship/Services	5
C	Instructional Effectiveness		10
D	Campus Facilities		
	i	Campus Facilities	11
	ii	Support Services	14
	iii	Student centredness	10
	Other Information		3
		Total	79

Upon completion of the survey, responses were screened for completeness and consistency to eliminate any incomplete submissions. The final dataset was analysed using Microsoft Excel and IBM SPSS for Windows (version 26). Standard statistical procedures were applied, including descriptive statistics profiled the respondents, means and standard deviations summarised each scale items, and Cronbach's alpha verified the internal consistency of the Likert-scale items.

4. Result and Discussion

4.1 Respondent Demographics

As illustrated by Fig. 1, a total of 63.7% of the respondents were female, while the remaining 36.4% were male. The total number of students who completed their studies in Session II 2021/2022 was 94. Out of this, 80 students responded to the survey, indicating a response rate of 85.1% among the Diploma in Civil Engineering students for Session II 2021/2022.

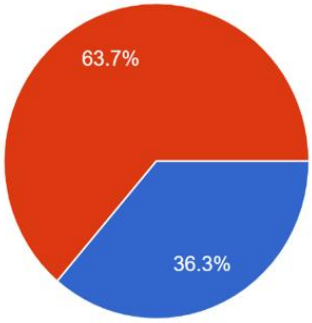

Fig. 1: Number of respondents by gender

4.2 Job Skills

In this study, the graduates rated their job-related competencies highly, with an overall average score of 4.04, as shown by Table 2. Team productivity topped the skill ratings (mean = 4.28), whereas numerical and statistical interpretation ranked lowest (mean = 3.93).

Table 2: Average scores for job skills evaluation items

No.	Item	Average
1	Skills with computers and information technology	3.95
2	Ability to work productively in teams or groups	4.28
3	Ability to make effective oral presentations	3.95
4	Ability to produce effectively written documents for multiple purposes	3.96
5	Ability to understand and interpret information presented	4.08
6	Ability to proficiently interpret and utilise numbers and statistics related to my field of study	3.93
7	Ability to consistently execute planned tasks in a timely manner	4.05
8	Demonstrate an awareness and consideration for societal, health, safety, legal and cultural issues and their consequent responsibilities	4.08
9	Able to apply theoretical knowledge in my field of study	4.03
10	Able to practice job related practical skills in my field of study	4.09
	Average Score	4.04

4.3 Entrepreneurial Skills

Survey responses on entrepreneurial competence revealed broadly solid proficiency, yet with clear variation across specific skills. Table 3 shows an average score of 3.69 which reflects a moderate to high level of entrepreneurial competence. The highest-rated item was organizing time and resources (3.79), while negotiation skills (3.63) received the lowest rating, suggesting potential for enhancement in business-related skills.

Table 3: Average score for evaluation of entrepreneurial skills items

No.	Item	Average
1	Ability to prepare effective business plan.	3.68
2	Understanding of capital markets and potential business opportunities	3.69
3	Ability to negotiate deals and business agreements	3.63
4	Ability to effectively organise time and other resources to provide a service/product	3.79
	Average Score	3.69

4.4 Critical Thinking

Respondents expressed strong confidence in their critical-thinking competence by achieving a mean rating of 3.95, as tabulated in Table 4. Graduates felt most confident in their ability to use feedback to improve work (4.19), while analytical critique skills (3.83) received the lowest score.

Table 4: Average score for evaluation of critical thinking items

No.	Item	Average
1	Ability to synthesise information from multiple sources to improve my understanding of a topic	3.89
2	Ability to analyse and critique the work of others based on my knowledge and expertise	3.83
3	Ability to apply my learning to solve problems or innovate	3.84
4	Ability to use feedback from others to improve the quality of my work	4.19
5	Recognise the needs for professional development and to engage in independent and lifelong learning	3.99
	Average Score	3.95

4.5 Citizenship/Services

This study has also noticed graduates exhibited robust civic awareness and ethical responsibility by achieving mean score of 3.97, as shown by Table 5. The highest-rated item was understanding ethical standards (4.18), while knowledge of national issues (3.68) was rated the lowest.

Table 5: Average score for evaluation of citizenship / services items

No.	Item	Average
1	Knowledge of major national issues (social, political, economic)	3.68

2	Sensitivity to issues of the ethnic and cultural diversity in Malaysia	3.93
3	Commitment to use my learning to make a difference in my community	3.99
4	Understanding of moral values and ethical standards	4.18
5	Commitment to make sound moral decisions and act ethically	4.09
	Average Score	3.97

4.6 Instructional Effectiveness

Table 6 shows that instructional quality was rated very high, with an average score of 4.11. Students valued lecturers' knowledge (4.20) and clear communication of learning outcomes (4.18). These results reflect a strong teaching and learning environment.

Table 6: Average score for evaluation of instructional effectiveness items

No.	Item	Average
1	Lecturers were knowledgeable in their field.	4.20
2	Lecturers were approachable	4.10
3	Lecturers treated students fairly	4.05
4	Lecturers provided adequate tutorial support	4.15
5	Lecturers provided timely feedback about students' progress	4.08
6	Lecturers were accessible to students outside of class	4.13
7	Lecturers took into consideration students' differences when they taught	4.03
8	Lecturers used aids to enhance the classroom learning experience	4.06
9	Lecturers used appropriate assessment methods	4.16
10	Lecturers clearly communicated intended learning outcomes	4.18
	Average Score	4.11

4.7 Campus Facilities

Campus facilities elicited only moderate satisfaction by only registering a mean rating of 3.77, as shown by Table 7. The Islamic Centre (4.15) was most positively rated, while on-campus internet access (3.08) and healthcare services (3.61) were the lowest-rated items.

Table 7: Average score for evaluation of campus facilities items

No.	Item	Average
1	Parking facilities	3.66
2	Sport and recreational facilities	3.91
3	Gym or fitness centre on campus	3.65
4	Islamic Centre	4.15
5	Rooms for religious observances at each department	3.94
6	Cafeteria spaces	3.96
7	Healthcare facilities (e.g. beds, equipment, etc.)	3.61
8	Student common area	3.78
9	Classrooms (e.g. seating, lighting temperature)	3.78
10	Laboratories and workshops (e.g. engineering labs, computer labs.)	3.91
11	On-campus internet access (e.g. speed, dependability, etc.)	3.08
	Average Score	3.77

4.8 Support Services

Table 8 shows an overall score of 3.78, reflecting moderate satisfaction. Library services (4.08) and career development (4.06) were strong points, while hostels (3.25) and internet reliability (3.30) emerged as key concerns.

Table 8: Average score for evaluation of support services items

No.	Item	Average
1	Library services	4.08
2	Academic advising services (help with making choices about programmes and courses)	3.93
3	Intellectual climate (debate or discussion of ideas or issues)	3.93
4	Performance monitoring and guidance (from polytechnic administration)	3.94
5	Remedial assistance (special help in weak areas)	3.86
6	Counselling services	3.88
7	Career development services (resume writing, interview skills, career advising)	4.06
8	Student orientation programmers (help to transition to polytechnic)	3.98
9	Classrooms (e.g. seating, lighting temperature)	3.85
10	Laboratories and workshops (e.g. engineering labs, computer labs.)	4.00
11	On-campus internet access (e.g. speed, dependability, etc.)	3.30
12	Food and beverage services (e.g. choices and quality of food and beverage).	3.63
13	Overall campus maintenance (e.g. grounds, bathrooms, walls, lighting, etc.)	3.33
14	Hostels (e.g. comfort, safety, maintenance)	3.25
	Average Score	3.78

4.9 Student centredness

Table 9 shows an average of 3.71, indicating moderate satisfaction with student support and administration. Graduates appreciated security services (3.93) and communication (3.91), while faculty care (3.25) and the complaint system (3.45) were weaker areas.

Table 9: Average score for evaluation of student-centredness items

No.	Item	Average
1	Administrative staff helpfulness (e.g. courteous, accommodating)	3.71
2	Administrative office business hours (e.g. convenient to students' schedules)	3.81
3	Course change (add/drop) process (e.g. flexible, hassle free)	3.81
4	Healthcare personnel attentiveness	3.79
5	Security personnel responsiveness (to safety concerns/situations)	3.93
6	Faculty members care and concern for students	3.25
7	Students' freedom of expression (speak freely without victimisation/ intimidation)	3.63
8	Students' complaints systems	3.45
9	Student disciplinary processes	3.80
10	Communication with students	3.91
	Average Score	3.71

4.10 Other Information

The programme achieved a high overall satisfaction rating with a mean score of 3.90, as shown by Table 10. Graduates felt most prepared for further studies (3.99) and least prepared to start their own business (3.81), though all areas were positively rated.

Table 10: Average score for evaluation of satisfaction with the PMU programme

No.	Item	Average
1	You are better prepared to be successful in the current job market	3.90
2	You are better prepared to be successful in your own business	3.81
3	You are better prepared to be successful at advanced/further study in a similar or related field	3.99
	Average Score	3.90

4.11 Analysis of Exit Survey Findings on the Achievement of PLO

The exit survey was rigorously aligned with every Programme Learning Outcome in Politeknik Mukah's Diploma in Civil Engineering by converting raw student feedback into a precise dashboard of outcome attainment and targeted improvement priorities. This mapping aimed to gather students' perspectives on the programme they had completed over three years and to evaluate the extent to which the intended learning outcomes were achieved. The survey questions were developed based on indicators of all 12 PLOs, which are expected to be attained by students upon completion of the DKA programme.

The analysis focused specifically on Part B of the questionnaire, as detailed in Table 12, which assessed graduate competencies and attributes, including job skills, entrepreneurial skills, critical thinking, and citizenship/service. These components were purposefully aligned with the key outcomes of the DKA curriculum to ensure a focused evaluation of graduate preparedness. This mapping approach allowed for precise insights into the programme's effectiveness in equipping students with the core skills and personal attributes demanded by the industry and society. By turning exit-survey data into a spotlight that reveals both standout strengths and hidden gaps, the mapping process equips CQI teams with a comprehensive blueprint for focused improvement.

The mean score interpretation framework used in this study followed the guideline established by Zaki & Ahmad (2017), which is widely adopted in Malaysian social science research. Table 11 classifies mean scores into four performance tiers.

Table 11: Mean score level

Mean Score	Level
1.90-2.69	Low
2.70-3.49	Moderate
3.50-4.29	High
4.30-5.00	Very High

The findings from Table 12 indicate that all twelve Programme Learning Outcomes (PLOs) for the Diploma in Civil Engineering (DKA) at PMU were achieved at a high level, with mean scores ranging from 3.70 to 4.28. These results strongly suggest that the DKA programme is effective in developing the intended graduate competencies. The high rating for PO9: Individual and Team Work (mean: 4.28) aligns with findings by Salim et al. (2022b) & Yusoff (2019), who reported that teamwork and collaboration were among the most consistently attained outcomes in engineering and management programmes in Malaysia. This supports the notion that engineering curricula in polytechnics and universities are successfully integrating project-based and group learning models.

Similarly, the high score for PO8: Ethics (mean: 4.11) reflects a growing emphasis on embedding professional responsibility into technical education, a trend also noted by Cicek et al. (2013), who argued that ethics and citizenship are increasingly vital in multidisciplinary and globalized workplaces. This is particularly relevant as the Washington Accord and Malaysian Qualifications Framework (MQF) stress ethical practice as a core graduate attribute.

Although the overall ratings were positive, entrepreneurial skills (mean: 3.69) received the lowest score among PLO-aligned items. This trend mirrors findings by Goh et al. (2014) & Yunita (2017), which indicated that while technical competencies are often well-developed, students tend to rate entrepreneurial preparedness lower due to limited practical exposure or inconsistent integration of entrepreneurship modules across technical programmes. This highlights a key area for potential curriculum enhancement.

The results also reveal that while students rated job skills (mean: 4.04) and instructional effectiveness (mean: 4.11) highly, ratings for support services (mean: 3.78), campus facilities (mean: 3.77), and student-centredness (mean: 3.71) were slightly lower. These findings are consistent with Mohamed et al. (2012) & Sani et al. (2009), who found that although academic delivery was generally strong, institutional support mechanisms including advisory services, facilities, and student engagement are often lag. This suggests that student experience outside the classroom remains a vital area for CQI intervention.

Collectively, the results reinforce the importance of continuous feedback loops, such as exit surveys, in capturing the holistic quality of the student journey. The direct alignment of graduate feedback with Programme Learning Outcomes (PLOs) allows institutions to measure programme effectiveness and pinpoint improvements needed to meet national and internation outcome-based education standards.

Table 12: Detailed mapping of DKA PLOs with exit survey findings

PO	Section	Exit Survey Item	Mean	Overall Mean Average	Level	Achievement
PO1	Knowledge: Apply knowledge of applied mathematics, applied science, engineering fundamentals and an engineering specialization as specified in DK1 to DK4 respectively to wide practical procedures and practices	ASPECT B i, ITEM 4	3.96	3.99	High	80%
		ASPECT B i, ITEM 5	4.08			
		ASPECT B iv, ITEM 20	3.93			
PO2	Problem analysis: Identify and analyze well-defined engineering problems reaching substantiated conclusions using codified methods of analysis specific to their field of activity (DK1 to DK4)	ASPECT B i, ITEM 6	3.93	3.98	High	79.6%
		ASPECT B i, ITEM 9	4.03			
PO3	Design/development of solutions: Design solutions for well-defined technical problems and assist with the design of systems, components or processes to meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations (DKS)	ASPECT B iii, ITEM 17	3.84	4.02	High	80.4%
		ASPECT B iii, ITEM 18	4.19			
PO4	Investigation: Conduct investigations of well- defined problems; locate and search relevant codes and catalogues, conduct standard tests and measurements	ASPECT B iii, ITEM 15	3.89	3.86	High	77.2%
		ASPECT B iii, ITEM 16	3.83			
PO5	Modern Tool Usage: Apply appropriate techniques, resources, and modern engineering and IT tools to well- defined engineering problems, with an awareness of the limitations (DK6)	ASPECT B i, ITEM 1	3.95	4.02	High	80.4%
		ASPECT B i, ITEM 10	4.09			
PO6	The Engineer and Society: Demonstrate knowledge of the societal, health, safety, legal and cultural issues. and the consequent responsibilities relevant to engineering technician practice and solutions to well-defined engineering problems (DK7)	ASPECT B i, ITEM 8	4.08	4.05	High	81%
		ASPECT B iv, ITEM 21	3.93			
PO7	Environment and Sustainability: Understand and evaluate the sustainability and impact of engineering technician work in the solution of well-defined engineering problems in societal and environmental cont (DK7)	ASPECT B iv, ITEM 22	3.99	3.99	High	79.8%
PO8	Ethics: Understand and commit to professional ethics and responsibilities and norms of technician practice	ASPECT B i, ITEM 7	4.05	4.11	High	82.2%
		ASPECT B iv, ITEM 23	4.18			
		ASPECT B iv, ITEM 24	4.09			
PO9	Individual and Team Work: Function effectively as an individual, and as a member in diverse technical teams.	ASPECT B i, ITEM 2	4.28	4.28	High	85.6%
PO10	Communications: Communicate effectively on well-defined engineering activities with the engineering community and with society at large, by being able to comprehend the work of others, document their own work, and give and receive clear instructions	ASPECT B i, ITEM 3	3.95	3.95	High	79%
PO11	Project Management and Finance: Demonstrate knowledge and understanding of engineering management principles and apply these to one's. own work, as a member or leader in a technical team and to manage projects in multidisciplinary environments	ASPECT B ii, ITEM 11	3.68	3.70	High	74%
		ASPECT B ii, ITEM 12	3.69			
		ASPECT B ii, ITEM 13	3.63			
		ASPECT B ii, ITEM 14	3.79			
PO12	Life Long Learning: Recognize the need for, and have the ability to engage in independent updating in the context of specialized technical knowledge.	ASPECT B iii, ITEM 19	3.99	3.99	High	79.8%

5. Conclusion and Recommendations

A study was conducted to assess whether Politeknik Mukah's Diploma in Civil Engineering programme meets industry requirements and national accreditation benchmarks. Subsequent, the study reported that graduates were equipped with current knowledge, possess strong practical competence, and the soft skills essential for professional success. Nevertheless, the analysis revealed several critical priorities that demand immediate action within the programme's Continuous Quality Improvement agenda, namely:

a) Enhance Entrepreneurial Training

i. Conduct workshops on business planning, negotiation, and innovation.
ii. Collaborate with industry to offer real-world entrepreneurial challenges.

b) Improve internet and digital infrastructure

i. Upgrade on-campus internet access to support e-learning and digital tools.
ii. Increase bandwidth in labs, hostels, and student common areas.

c) Upgrade physical facilities

i. Improve classroom comfort, hostel conditions, and recreational amenities.

d) Sustain data-driven program review

i. Continue using exit survey tools to gather feedback annually.
ii. Monitor trends in PLO scores to detect gaps or performance dips.

Overall, the implementation of these targeted improvements will elevate the DKA programme's quality as well as further equip its graduates for professional employment, entrepreneurial ventures, and lifelong learning.

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