

Competency Levels of Construction Technology Lecturers and Their Implementation of Outcome Based Continuous Assessment in Malaysian Vocational Colleges

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Abstract

The implementation of continuous assessment in Malaysia's Technical and Vocational Education and Training (TVET) system continues to show varied practices and misalignment with the core principles of Outcome Based Education (OBE), despite its mandate as an institutional requirement. Previous studies have highlighted that many lecturers face challenges in translating theoretical knowledge into authentic learning outcome based assessments. However, there remains a lack of empirical studies that systematically evaluate lecturers' competency in implementing continuous assessment based on OBE, particularly in the context of the Construction Technology program in Vocational Colleges. Therefore, this study aims to examine the competency levels of Construction Technology lecturers in implementing continuous assessment based on OBE at Malaysian Vocational Colleges. The study focuses on three core competency constructs namely knowledge, skills and attitude, and investigates the relationship between competency levels and teaching experience. This quantitative survey involved a questionnaire administered to 151 lecturers from 44 Vocational Colleges across five main zones in Malaysia. Data were analysed using SPSS version 27, incorporating descriptive statistics (percentage, mean) and inferential analysis (Pearson Correlation). Findings revealed that knowledge ($M = 4.14$) and attitude ($M = 4.49$) levels were high, while skill levels were moderately high ($M = 3.86$). The correlation analysis also indicated a statistically significant but very weak relationship between teaching experience and competency level ($r = 0.163$), suggesting that experience alone does not guarantee proficiency in OBE based assessment practices. This study contributes to the enhancement of competency theory in the TVET context by proposing the development of contextual and hands-on assessment modules. The implications of this study support the development of a community of practice among educators, the strengthening of professional training strategies and the refinement of institutional competency monitoring policies.

1. Introduction

Technical and Vocational Education and Training (TVET) is now globally recognized as a key driver in the development of competent and industry-responsive human capital, particularly in light of the demands of the Fourth Industrial Revolution. In Malaysia, the implementation of the Outcome Based Education (OBE) framework has been central to the reform of TVET systems, aiming to align educational delivery and assessment with authentic learning outcomes and industry needs (Aziz & Subramaniam, 2023; Ambon et al., 2024). Since the establishment of Vocational Colleges in 2012, numerous initiatives have been introduced to strengthen the curriculum, enhance industrial based training and institutionalise more effective and holistic assessment practices (Nasir et al., 2024; Nawi, 2021).

Within the OBE framework, Continuous Assessment (CA) plays a pivotal role as a mechanism for measuring students' achievements across cognitive, psychomotor and affective domains. Unlike summative assessments, which are episodic in nature, CA provides ongoing and formative feedback that supports progressive, reflective and contextual learning (Rusmawati Othman & Mohd. Isha Awang, 2021; Pilai & Kutty, 2022). However, the success of CA largely hinges on lecturers' competencies including pedagogical knowledge, technical skills and professional attitudes towards evolving assessment practices (Ambon et al., 2024; Hussin et al., 2020).

Despite the widespread introduction of OBE in Malaysia's TVET landscape, the implementation of CA among Construction Technology lecturers remains inconsistent and fraught with challenges. Previous studies reveal that although lecturers possess satisfactory theoretical knowledge of OBE, their skills in designing authentic assessment tools and aligning Course Learning Outcomes (CLOs) with Programme Learning Outcomes (PLOs) remain underdeveloped (Raof et al., 2022; Mohd Khaizer et al., 2020). Confusion over the principles of criterion-referenced assessment and the continued reliance on norm-referenced methods contradict the foundational values of OBE, which emphasize mastery of outcomes (Adalla et al., 2022; Alonzo et al., 2023).

Furthermore, studies have identified several barriers to effective CA implementation including passive attitudes, high workloads and a lack of continuous technical training. The absence of institutional support, along with inadequate understanding of constructive alignment between learning objectives, instructional strategies, and assessment forms has significantly undermined the success of OBE implementation (Makuvire et al., 2023; Damit et al., 2021). Indeed, findings by Rusmawati Othman and Mohd. Isha Awang (2021) and Agir et al. (2023) confirm that weaknesses in alignment practices hinder the integration of classroom pedagogy with real world industry demands.

In this context, the continued reliance on traditional assessment methods and the underutilization of instruments such as rubrics and portfolios raise critical questions regarding the actual competency level of lecturers in transforming assessment practices into authentic, competency-based measures. More concerning is the widening gap between theoretical knowledge and practical execution, particularly due to insufficient emphasis on attitudes, professional values and hands-on training. This observation aligns with the Iceberg Model by Spencer & Spencer (1993), which highlights that real competency is not only determined by visible aspects such as knowledge and skills but also by hidden components like attitudes, values and professional beliefs. Current studies underscore the need for more contextualized, learning outcomes driven assessment approaches to ensure students are not only academically successful but also industry ready (Ederio, 2023; Damit et al., 2021; Leong, 2022).

In response, this study seeks to examine the competency levels of Construction Technology lecturers in implementing continuous assessment under the OBE framework, focusing on three key constructs namely knowledge, skills and attitudes. The study also explores the relationship between teaching experience and lecturer competency in delivering outcome focused and authentic assessment practices (Makuvire et al., 2023; Leong, 2022).

The findings of this study are expected to have significant implications for lecturers, vocational college administrators and policymakers within the Ministry of Education Malaysia. They will help formulate more targeted and relevant strategies for improving TVET assessment practices. Beyond enhancing professional development for lecturers, the findings also serve as a robust foundation for the reform of the national TVET assessment system towards one that is more sustainable, transparent and impactful (Ealangov & Jamaludin, 2024; Nguyen et al., 2020).

2. Methodology

This study employed a quantitative survey design to examine the competency level of Construction Technology lecturers in implementing continuous assessment based on the Outcome Based Education (OBE) framework in Malaysian Vocational Colleges. The population comprised lecturers teaching Construction Technology programmes across 44 Vocational Colleges in Malaysia. A sampling frame was obtained from the official lecturer directory, and respondents were selected using simple random sampling to ensure that each lecturer had an equal probability of participation. Random selection was conducted using a computer-generated randomization procedure, and the selected lecturers were invited to participate through institutional emails. The questionnaire

was distributed using Google Forms as the data collection platform. A total of 151 lecturers participated in the study.

The research instrument was a structured questionnaire based on the Iceberg Competency Model by Spencer and Spencer (1993), measuring three constructs: knowledge, skills and attitudes. The instrument consisted of 55 items measured on a five-point Likert scale. Content and face validity were evaluated by five experts in TVET and educational assessment, while a pilot study involving 33 respondents was conducted to determine reliability. The instrument demonstrated excellent internal consistency with a Cronbach's Alpha value of 0.974.

For analysis, items under each construct were aggregated into composite mean scores. Although the questionnaire used Likert-type items, parametric statistical techniques were applied because composite Likert scale scores can be treated as continuous variables when sample sizes are sufficiently large (Norman, 2010; Boone & Boone, 2012). Descriptive statistics (mean and percentage) were used to determine competency levels, while Pearson correlation analysis was conducted to examine the relationship between lecturers' teaching experience and competency levels.

3. Result and Discussion

This section presents a detailed discussion of the findings and analysis. The study involved a total of 151 lecturers from 44 Vocational Colleges across Malaysia.

3.1 Result Demographic

Through the distributed questionnaire, two questions were used to capture the background of the respondents, focusing on their teaching experience and frequency of attendance at OBE related courses. Table 1 clearly and comprehensively presents the demographic background of the lecturers.

Table 1 Demographic background of study sample

Demographics	Frequency (f)	Percentage (%)
Teaching Experience		
Less than 1 year	2	1.3
1 - 5 years	42	27.8
6 - 10 years	56	37.1
11 - 15 years	23	15.2
16 - 20 years	12	7.9
Frequency of Course Attendance		
More than 21 years	16	10.6
None	3	2
Once a year	79	52.3
Twice a year	58	38.4
Three times a year	6	4
Four times a year	3	2
Five times or more a year	2	1.3

Based on the teaching experience, the largest group of respondents had between 6–10 years of experience (37.1%), followed by those with 1–5 years (27.8%) and 11–15 years (15.2%). Only a small number had less than 1 year (1.3%) or more than 21 years of experience (10.6%).

In terms of course attendance, more than half of the respondents (52.3%) reported attending OBE related courses once a year, while 38.4% attended twice a year. The remaining respondents attended three times or more, and only 2.0% had never attended such courses. In particular, teaching experience was included as an explanatory variable to examine whether professional experience influences lecturers' competency levels. This relationship was further analyzed using Pearson correlation analysis.

3.2 The Competency Level of Construction Technology Lecturers in Continuous Assessment through the OBE Approach from the Knowledge Aspect

Table 2 presents the descriptive findings on the knowledge dimension, showing that the Construction Technology lecturers demonstrated a high level of knowledge regarding the implementation of continuous assessment aligned with Outcome Based Education (OBE), with an overall mean score of 4.14. This reflects a strong grasp of the principles of constructive alignment between Course Learning Outcomes (CLO), instructional strategies and

assessment methods (Biggs & Tang, 2011; Adalla et al., 2022). Lecturers expressed confidence in designing appropriate assessment methods, developing domain aligned test items and analyzing students' achievement based on learning outcomes.

The top-rated items highlight lecturers' ability to ensure alignment between assessment methods and CLOs (mean = 4.37), assess all CLOs with appropriate tools (mean = 4.34) and design relevant assessment types (mean = 4.33). These findings affirm that lecturers possess sound theoretical knowledge in the strategic planning of assessments under the OBE framework.

However, technical gaps remain evident. Specifically, the items related to determining suitable Student Learning Time (SLT) (mean = 3.95) and developing effective rubrics (mean = 3.98) scored at a moderately high level, suggesting room for improvement in applying OBE principles to practical and authentic assessment design. This observation supports the findings of Alonzo et al. (2023), who highlighted that while theoretical understanding of OBE may be strong, its translation into the construction of valid, holistic instruments particularly for assessing non-cognitive domains remains limited.

Moreover, studies by Raof et al. (2022) and Rusmawati and Mohd. Isha (2021) indicated that assessment practices at the institutional level often rely on generic guidelines without adaptation to the specific context of each course. This underscores the urgent need for targeted professional development programmes that are contextualized, practice oriented and reflective (Agir et al., 2023). Only through structured, hands-on training and guided mentoring can lecturers' theoretical knowledge be effectively transformed into practical competence.

In response, TVET institutions are urged to enhance professional development through phased implementation, including structured technical support and internal monitoring systems. The development of rubrics and assessment instruments must also be guided by the Good Practice Guidelines (GPAB) and involve active collaboration with relevant stakeholders (Tungpalan & Antalan, 2021; Mohd Asnawi & Mohd Effendi, 2022).

In sum, the lecturers' high knowledge level should serve as a strategic foundation for reforming assessment practices within TVET towards more authentic, context responsive and industry relevant implementation. In the future focused education landscape, assessment competence will be measured not only by what lecturers know, but by how effectively they apply that knowledge to support quality learning and graduate employability.

Table 2 *Descriptive analysis of knowledge aspect*

No.	Items	Mean Score	Mean Interpretation
C1.1	I can ensure that the selected assessment method aligns with the learning outcomes.	4.37	High
C1.2	I can plan the appropriate types of assessment to measure the intended learning outcomes.	4.33	High
C1.3	I can design assignments that are aligned with the stated learning outcomes.	4.32	High
C1.4	I can ensure that each statement in the Course Learning Outcomes (CLO) is assessed through appropriate assessment.	4.34	High
C1.5	I can plan continuous assessments based on the designated Student Learning Time (SLT).	4.03	High
C1.6	I can determine the appropriate SLT for a selected type of assessment.	3.95	Moderately High
C1.7	I can understand the differences between formative and summative assessments in the context of OBE.	4.17	High
C1.8	I can develop assessment items based on the established learning outcomes.	4.23	High
C1.9	I can develop questions based on the levels of domain specified in the JSUPB.	4.25	High
C1.10	I can determine the mark allocation suitable for the time given to answer.	4.12	High
C1.11	I can determine the number of questions and the time allocation based on the type of questions.	4.04	High

No.	Items	Mean Score	Mean Interpretation
C1.12	I can determine the appropriate mark allocation for each test question.	4.17	High
C1.13	I can determine the appropriate criteria and descriptors for developing rubrics.	3.98	Moderately High
C1.14	I can construct a marking scheme aligned with the assessment items developed.	4.15	High
C1.15	I can set a suitable timeline to implement continuous assessment in a planned and effective manner.	4.05	High
C1.16	I can understand the need to use data from continuous assessment to adapt my teaching methods.	4.05	High
C1.17	I can detect items that are not aligned with the learning outcomes during the vetting process.	4.03	High
C1.18	I can analyze continuous assessment results to evaluate student achievement of learning outcomes.	4.11	High
C1.19	I can prepare achievement reports aligned with the requirements of the vocational college management.	4.05	High
C1.20	I can prepare detailed reports on student achievement based on continuous assessment results.	4.03	High
Mean Average		4.14	High

3.3 The Competency Level of Construction Technology Lecturers in Continuous Assessment through the OBE Approach from the Skills Aspect

The descriptive analysis (Table 3) reveals that the overall skill level of Construction Technology lecturers in implementing continuous assessment based on Outcome Based Education (OBE) was moderately high, with a mean score of 3.86. Only one item reached a high level interpretation namely the ability to provide clear guidance to students during assessment implementation (mean = 4.09). This reflects lecturers' confidence in facilitating assessment processes a critical skill in ensuring clarity and alignment during execution.

However, most of the items scored within the moderately high range indicating that while lecturers possess basic competencies in administering and analyzing assessments their technical skills in developing rubrics, designing high order items and resolving moderation issues remain underdeveloped. Notably, items related to rubric construction such as generating domain specific descriptors (mean = 3.72) and aligning rubrics for the affective domain (mean = 3.79) recorded some of the lowest scores. This supports findings by Rusmawati Othman (2020) and AlSalem (2020), who reported that educators often struggle with formulating specific measurable descriptors aligned with learning outcomes particularly for non-cognitive domains.

Moreover, the ability to craft higher order assessment items that promote critical thinking and creativity is still lacking. Nguyen et al. (2023), Atukunda and Maja (2022) highlighted a continued reliance on traditional assessment formats with limited use of alternative, authentic forms such as project-based assessments, simulations or portfolios. This misalignment contributes to an imbalanced evaluation that inadequately reflects students' real-world competencies.

In line with Evardo (2020), this study also reveals a disconnect between theoretical alignment of CLOs and actual assessment practices, particularly in designing holistic rubrics that map to Program Educational Objectives (PEOs). This indicates a limited understanding of the learning outcome hierarchy and its role in informing strategic assessment design within the OBE framework.

In conclusion, while lecturers demonstrate foundational skills in implementing OBE aligned assessments, significant capacity building is needed to enhance their expertise in advanced assessment design. It is recommended that targeted hands-on professional development programmes be introduced, focusing on rubric development anchored to CLOs, the construction of higher order assessment items based on Bloom's Taxonomy and effective use of assessment data for instructional improvement. These findings align with the

recommendations of Atukunda and Maja (2022), Nguyen et al. (2023) and Rusmawati Othman (2020), who emphasize that strengthening lecturers' assessment literacy is essential for achieving meaningful and impactful OBE implementation in TVET institutions.

Table 3 *Descriptive analysis of skills aspect*

No.	Item	Mean Score	Mean Interpretation
D1.1	I am skilled at identifying students' needs when planning assessments.	3.85	Moderately High
D1.2	I am skilled at mapping items to cognitive domain levels based on CLO requirements.	3.84	Moderately High
D1.3	I am skilled at developing assessment questions that promote students' critical thinking.	3.81	Moderately High
D1.4	I am skilled at developing appropriate rubrics to measure learning outcomes.	3.83	Moderately High
D1.5	I am skilled at constructing assessment items based on learning outcomes stated in the JSUPB.	3.88	Moderately High
D1.6	I am skilled at producing rubric descriptors that clearly distinguish between scale levels.	3.72	Moderately High
D1.7	I am skilled at producing rubrics with aligned statements to measure learning outcomes in the cognitive domain of CLO.	3.8	Moderately High
D1.8	I am skilled at producing rubrics with aligned statements to measure learning outcomes in the psychomotor domain of CLO.	3.82	Moderately High
D1.9	I am skilled at producing rubrics with aligned statements to measure learning outcomes in the affective domain of CLO.	3.79	Moderately High
D1.10	I am skilled at designing appropriate task instructions based on learning outcomes comprehensively.	3.93	Moderately High
D1.11	I am skilled at identifying appropriate mark allocations according to the required mark weighting in questions.	3.89	Moderately High
D1.12	I am skilled at giving constructive feedback to students in a specific and helpful manner.	3.81	Moderately High
D1.13	I am skilled at providing clear guidance to students regarding assessment implementation.	4.09	High
D1.14	I am skilled at reviewing key elements during the vetting process of continuous assessment.	3.89	Moderately High
D1.15	I am skilled at resolving issues during the moderation process of assessment papers when mark discrepancies occur.	3.71	Moderately High
D1.16	I am skilled at administering continuous assessment items suitable to students' abilities.	3.9	Moderately High
D1.17	I am skilled at analyzing continuous assessment results to identify students' strengths and weaknesses.	3.94	Moderately High

D1.18	I am skilled at evaluating the effectiveness of continuous assessment items based on student performance.	3.87	Moderately High
D1.19	I am skilled at translating continuous assessment data into improvement suggestions for teaching and learning.	3.92	Moderately High
D1.20	I am skilled at preparing student performance reports as required by the department and OBE standards.	3.92	Moderately High
Mean Average		3.86	Moderately High

3.4 The Competency Level of Construction Technology Lecturers in Continuous Assessment through the OBE Approach from the Attitude Aspect

Based on the data presented in Table 4, the analysis reveals that Construction Technology lecturers demonstrated a high level of positive attitude towards the implementation of continuous assessment within the OBE framework (mean = 4.49). Lecturers demonstrated strong belief in the value of assessment to support learning and a high sense of responsibility to conduct it fairly and effectively. The highest rated item, "I feel responsible to ensure continuous assessment is implemented fairly and effectively" (mean = 4.56) reflects a strong sense of professional commitment.

Lecturers were also receptive to professional development and open to transitioning from traditional to outcome-based practices. These findings align with studies by Muhd Khaizer et al. (2020) and Awad (2023), which highlight that a positive attitude is crucial in fostering reflective and structured assessment practices aligned with OBE.

However, such positive attitudes do not automatically translate into consistent implementation of authentic and holistic assessments. As noted by Makuvire et al. (2023) and Rusmawati and Mohd. Isha (2021), time constraints, lack of technical training and the absence of validated instruments continue to hinder effective assessment of affective and psychomotor domains.

Therefore, while the attitude is highly encouraging, institutional support systems must be enhanced. Structured hands-on training, reflective self-assessment and collaborative mentoring as recommended by Adalla et al. (2022) and Baguio (2019) are necessary to transform positive beliefs into consistent classroom practice.

In conclusion, positive lecturer attitudes form the foundation for successful OBE implementation. However, sustained effectiveness requires a structured support ecosystem involving professional development, continuous reflection and communities of practice to foster holistic and authentic assessment at scale.

Table 4 Descriptive analysis of attitude aspect

No.	Item	Mean Score	Mean Interpretation
E1.1	I believe that carefully planning assessments is important to enhance students learning quality.	4.54	High
E1.2	I am confident that analyzing assessment results can help improve my teaching methods.	4.49	High
E1.3	I feel responsible for ensuring that continuous assessment is implemented fairly and effectively.	4.56	High
E1.4	I am confident that continuous assessment through OBE enhances the effectiveness of student learning.	4.49	High
E1.5	I believe that assessment data analysis helps clearly identify students learning gaps.	4.46	High

No.	Item	Mean Score	Mean Interpretation
E1.6	I believe attending seminars and training related to the preparation and implementation of continuous assessment based on OBE can enhance my competency as an educator.	4.53	High
E1.7	I am willing to shift from traditional approaches to OBE in conducting continuous assessment.	4.53	High
E1.8	I am willing to use various assessments to evaluate students achievements.	4.46	High
E1.9	I believe that the process of constructing continuous assessment questions enhances my professional capability as an educator.	4.53	High
E1.10	I believe that developing good continuous assessment instruments requires deep understanding of OBE.	4.48	High
E1.11	I feel responsible for ensuring that students understand the criteria for continuous assessment.	4.5	High
E1.12	I strive to develop various assessment tools to evaluate students' performance.	4.44	High
E1.13	I believe OBE allows more flexibility in using different assessment methods in my class.	4.45	High
E1.14	I believe that good assessment reports can be used as tools for improving course credibility and continuous enhancement.	4.45	High
E1.15	I believe that good rubrics and assessment instruments improve fairness in student evaluation.	4.52	High
Mean Average		4.49	High

3.5 Relationship between Teaching Experience and Lecturer Competency

Pearson correlation analysis revealed a significant but very weak positive relationship between teaching experience and lecturers' competency in implementing continuous assessment based on OBE ($r = 0.163$, $p = 0.046$) as presented in Table 5. This suggests that teaching experience alone does not necessarily enhance competency in assessment practices.

This finding aligns with studies by Mohd Zaini Osman (2019) and Sithol et al. (2021), which highlight that experienced lecturers often struggle with assessment implementation due to the lack of structured professional development. In the Malaysian TVET context, Nor Hayati Ramlan (2018) emphasized that involvement in hands-on training, rubric development and authentic assessment plays a more critical role than mere teaching tenure.

Although findings by Tungpalan & Antalan (2021) show that experienced lecturers can successfully implement OBE, their effectiveness is largely dependent on institutional support and access to systematic training. Vahed et al. (2023) further assert that mentoring and communities of practice are essential in translating experience into meaningful practice.

In conclusion, lecturer competency should not be viewed as a natural outcome of seniority. Instead, it must be cultivated through reflective, contextual and structured professional development. Institutions must build a supportive ecosystem that translates experience into high impact assessment practices aligned with OBE principles (Raof et al., 2022; Nor Hayati et al., 2017).

Table 5 *Correlation between competency level and teaching experience*

	Pearson Correlation Coefficient (r)	Significant (p)	Sample Size (N)	Interpretation of Relationship Strength
Lecturers' Competency Level in Construction Technology	0.163	0.046	151	Very Weak

4. Conclusion

This study has provided a comprehensive overview of the competency level among Construction Technology lecturers in implementing continuous assessment through the Outcome Based Education (OBE) approach in Malaysian Vocational Colleges. The findings indicated that lecturers demonstrated high levels of knowledge and attitude, while their technical skills remained at a moderately high level. This suggests that although conceptual understanding and attitude toward OBE are positive, limitations persist in practical execution.

Furthermore, the statistically significant but very weak correlation between teaching experience and competency levels confirms that experience alone does not guarantee proficiency in outcome-based assessment practices. Therefore, enhancing lecturers' competency requires targeted interventions such as hands-on training, structured mentoring and active participation in communities of practice.

This study contributes to the advancement of competency theory in the TVET context by emphasizing the need for alignment between knowledge, skills and attitudes. The implications include the development of more contextualized OBE training modules; revision of assessment guidelines and continuous professional development strategies tailored to TVET lecturers. The findings serve as a valuable reference for institutions, policymakers and researchers committed to improving the quality of assessment implementation in Malaysia's vocational education system

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Conflict of Interest

There is no conflict of interest regarding the publication of the paper.

Author Contribution

The authors confirm contribution to the paper as follows: **study conception and design:** Jumatirah Mohd Alias, Faizal Amin Nur Yunus; **data collection:** Jumatirah Mohd Alias; **analysis and interpretation of results:** Jumatirah Mohd Alias, Faizal Amin Nur Yunus; **draft manuscript preparation:** Jumatirah Mohd Alias, Faizal Amin Nur Yunus. All authors reviewed the results and approved the final version of the manuscript.

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