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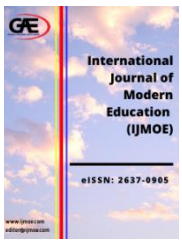

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ENHANCING STUDENT ENGAGEMENT WITH AUTHENTIC ASSESSMENT IN TECHNOLOGY-BASED PROGRAM: A MULTI-FACETED APPROACH

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Abstract:

This paper builds upon a preliminary investigation into the effectiveness of authentic assessment within a Mobile Application Development course. Aligning with Luan & Cowling (2015), authentic assessment has been shown to enhance student motivation and satisfaction through engagement with real-world client projects. However, while the initial pilot study revealed increased motivation and satisfaction among most students engaged with real clients, a minority expressed concerns regarding performance pressure. This earlier pilot highlighted student anxiety associated with performance expectations in authentic assessment contexts. Notably, the current research on authentic assessment in mobile application development fails to adequately address this specific concern. To address these concerns and further investigate student acceptance of authentic assessment, this study proposes a novel multi-faceted approach for a Technology-based program offered at Central Queensland University. The approach integrates real-world client involvement with faculty-provided support resources. Clients will offer project insights, while faculty will curate relevant websites and examples to bridge the gap between client expectations and student understanding. This combined approach aims to leverage the benefits of authentic assessment (client interaction, real-world application) while mitigating student anxieties by providing targeted academic support. The study will evaluate the impact of this multi-faceted approach on student acceptance of authentic assessment and their motivation to complete the assessment task. The study will evaluate the impact of this multi-faceted approach on student acceptance of authentic assessment and their motivation to complete the assessment task.

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Authentic Assessment, Multi-Facetted Approach, Pilot Study

Introduction

This research proposes an innovative multi-faceted approach to authentic assessment for undergraduate programs within the School of ICT and Engineering and the School of Education and the Arts at Central Queensland University (CQU). It directly addresses concerns identified in a prior pilot study on authentic assessment within a Mobile Application Development course. While the initial study showcased heightened motivation and enriched learning for many students, a notable minority expressed apprehensions stemming from perceived inadequate support (Luan & Cowling, 2015). This study aims to bridge this gap by presenting a fresh, multi-dimensional approach to authentic assessment crafted specifically for technology-based programs. This approach integrates real-world client engagement with targeted academic support delivered by lecturers. Clients will contribute invaluable project insights, furnishing students with deeper understandings of real-world expectations. Acting as intermediaries between students and clients, lecturers will curate pertinent online resources and showcase successful project outcomes. Drawing inspiration from the Dunn and Dunn Learning Styles Model (Dunn & Dunn, 1996), this approach customizes a practical step-by-step framework within the multi-faceted model to cater to diverse learning styles. The objective is not only to amplify student engagement but also to alleviate anxieties commonly encountered in authentic assessment scenarios. This study goes beyond simply addressing student motivation. The multi-faceted approach offers a range of benefits. These include enhanced industry readiness, whereby students garner practical experience collaborating with real clients and adhering to industry standards. Additionally, students will develop sharpened critical thinking and problem-solving acumen as they navigate intricate project requisites and real-world challenges. Finally, the approach fosters a deeper grasp of course content, where theoretical knowledge is applied to authentic projects, fostering a more meaningful learning journey. By mitigating student anxieties through targeted academic support and fostering engagement through diverse learning style considerations, this research aims to promote wider student acceptance of authentic assessment. The study will evaluate the impact of this multi-faceted approach on student acceptance, motivation, and overall learning outcomes within technology-based programs at Central Queensland University (CQU). The findings will contribute valuable insights into the effectiveness of this approach in enhancing the student experience and preparing graduates for successful careers in the technology field.

Contextualising the Multi-Faceted Assessment Approach

While the proposed multi-faceted approach holds merit for technology-based programs in higher education, it's important to consider the specific context of its application. This study focuses on its implementation within the Bachelor of Information and Computing Technology (ICT) offered by Central Queensland University's School of ICT and Engineering, and the Bachelor of Digital Media from the School of Education and the Arts. These undergraduate programs provide students with a diverse range of expertise within the ICT landscape. Notably, both programs offer courses that cultivate comprehensive skills in ICT and Digital Media. One such shared course example is Developing Mobile Applications.

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This emphasis on shared technological knowledge strengthens the rationale for applying the multi-faceted assessment approach within these programs. The approach can leverage the synergies between ICT and Digital Media, potentially leading to a more holistic and engaging learning experience for students.

Therefore, the paper proposes a multi-faceted authentic assessment approach for the Bachelor of Information and Computing Technology (ICT) and Bachelor of Digital Media programs at CQU. The assessment would be implemented in the final year of the programs, where students have established a strong foundation in technological skills through coursework. This prepares them for industry expectations, challenges, and working with real clients.

To achieve this, lecturers or course designers will develop authentic assessments based on genuine client tasks and adhere to industry standards. A key challenge lies in establishing connections with appropriate organisations or businesses to facilitate the design of these assessments. Fostering strong partnerships between lecturers/course designers, students, and industry representatives is crucial for successful tripartite collaboration.

Challenges and Refinements in Authentic Assessment

A pilot study employing authentic assessment achieved a 100% pass rate, but a concerning finding emerged. Around 25% of students reported feeling unnecessarily burdened when working with real clients. Analysis revealed these students engaged less with course materials and assessment requirements. This aligns with Wolf's (1989) assertion that assessments, with limited opportunities for self-evaluation and critical thinking, are a concern. This has led to a growing movement among educators advocating for more diverse and humanistic evaluation practices. Additionally, communication issues stemming from unclear assessment expectations were identified. Villarroel et al. (2018) highlight that discrepancies in student understanding can pose a challenge in designing assessments that accurately reflect the essence of authentic assessment. A poorly conceptualised understanding of the concept at the course level can hinder the development of assessments that effectively replicate real-world applications. These issues hindered students' acquisition of crucial industry knowledge during the assessment, ultimately impacting the overall success of the authentic assessment implementation.

These findings highlight the importance of ensuring strong links between teaching and learning. As Phil (2015, p. 5) suggests, a "powerful case for constructive alignment" exists in higher education. He emphasises the need for systematic connections between intended learning outcomes, teaching methods, assessment strategies that evidence achievement, and clear criteria for evaluation.

To address the identified challenges, this study proposes a systematic approach grounded in the Dunn and Dunn Learning-Style Model. This model, as defined by Dunn and Dunn (1996), conceptualises learning style as the way individuals' approach, process, internalise, and retain new and complex information. The model encompasses a range of elements (20-21) tailored for age-appropriate assessments. Five key elements within the model pertain to an individual's learning preferences regarding the environment, emotional state, social interaction, physiological needs, and psychological needs, as shown in Figure 1, adapted from (Dunn & Dunn, 1996).

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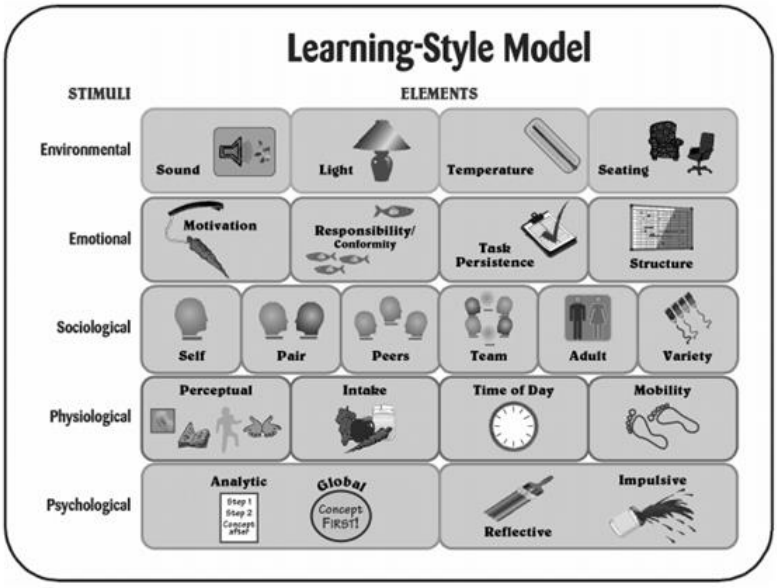

Figure 1: Learning-Style Model

The Dunn and Dunn Learning Style Model (Dunn & Dunn, 1996) offers a valuable framework for understanding individual student learning preferences. This study proposes integrating this model into the design of a multifaceted authentic assessment for technology-based programs.

The Dunn and Dunn Model highlights the importance of tailoring learning environments and approaches to cater to diverse learning styles. By incorporating this understanding into the multi-faceted assessment, we aim to create a more responsive and engaging student experience. This could improve student motivation and knowledge acquisition during the assessment process.

Building upon previous research by Luan and Cowling (2015), the proposed multi-faceted method directly involves students with real clients as part of the assessment. This exposure to real-world industry expectations and client demands encourages students to actively seek new information and acquire practical experience beyond course materials. The most important thing is to teach students how to produce excellent intellectual and professional work on their own (Sadler, 2013). This involves giving them the ability to be responsible for their own learning and performance. The role of the lecturer in this approach is multifaceted:

- Facilitator: The lecturer guides and encourages students to explore external resources (websites) relevant to the client's needs and industry expectations. Considering the abundance of online resources readily available to support students' understanding of the client's industry (Race.P, 2015).
- Motivator: The lecturer fosters student motivation to achieve client satisfaction and adhere to industry standards.
- Proxy Client: In situations where direct client interaction may be limited, the lecturer can act as a proxy, providing feedback and guidance that reflects real-world client expectations.

This approach fundamentally differs from prior research by offering students a direct point of reference – the real client – when seeking information and understanding project specifications.

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As Bandura (1977) suggests, direct and observational learning can promote the acquisition of behavioural patterns and strengthen students' self-efficacy regarding task completion.

The proposed multi-faceted assessment will be implemented as an individual or group project for third-year technology-based students. This collaborative approach, involving students, lecturers, and real clients, aims to establish a workable, authentic assessment model that addresses the following research questions:

1. How does the multi-faceted model improve student motivation to perform better in authentic assessments?
2. How does the multi-faceted model help students align with industry expectations and standards in technology-based production?
3. How does the multi-faceted model influence how students approach knowledge acquisition and application in authentic assessment tasks?

Drawing on the theoretical underpinnings established by Wiggins (1996), recognises that genuine restructuring, as is all too common in educational practice, necessitates a continuous process of questioning.

A Multi-Faceted Approach to Authentic Assessment in Technology based program: An Experimental Design

This study proposes a multi-faceted approach to authentic assessment within the Bachelor of Information and Computing Technology (ICT) and Bachelor of Digital Media program, specifically targeting third-year students. The approach integrates the principles of the Dunn and Dunn Learning Style Model (Dunn & Dunn, 1996) to create a learning environment that caters to diverse student strengths.

Dunn and Griggs (2000) outlined practical steps for leveraging student learning styles in higher education. We have adapted these recommendations to suit the multi-faceted assessment approach:

1. **Assessment Task Design:** Clearly defined learning objectives and assessment outlines are crucial. Authentic assessments, being based on real-world tasks, necessitate industry-standard expectations. Students will receive comprehensive briefings detailing the client organisation's background, goals, assessment expectations, potential obstacles, design briefs, and marking criteria.

   The previous study by Luan and Cowling (2015) identified a shortcoming where students lacked clear direction due to unrestricted app design freedom. This study addresses this by ensuring the real client provides detailed specifications and outcome expectations for the ICT product. The lecturer will monitor student progress and serve as the first point of contact for any project concerns.

2. **Individualised Learning Support:** The lecturer will analyse each student's learning style strengths and determine appropriate instructional methods and resources. This includes examining student perceptual preferences and suggesting strategies for tackling and reinforcing challenging information within the assessment context. Additionally, the lecturer will recommend comfortable learning environments based on individual needs.

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For example, collaborative technology-based project courses often involve partnerships with existing businesses. The lecturer is crucial in identifying suitable partner organisations for student collaboration. Selecting the right real client is vital, as their willingness to guide and support students during the authentic assessment is essential.

3. **Methods for Mastering Challenges:** Strategies to support students in tackling complex assessment tasks include demonstrations of industry-standard practices, showcasing completed product examples, and introducing software and applications currently used in the industry. Additionally, a series of tutorials and workshops will be conducted for students. According to Sandler (1993), as basic principle, it is paramount for learners to be competent in overseeing the quality of what they produce for them to become better.

4. **Leveraging Social Learning:** Students will be paired to foster peer support and collaboration during the assessment process. Regular meetings with the real client or their representatives will provide students with opportunities for personal consultations regarding the authentic assessment task. The lecturer will schedule formal and informal meetings with students to discuss project milestones and address any assessment-related issues. Furthermore, the lecturer or course coordinator will initiate contact with the real client, considering the course's direction.

5. **Instructional Environment Design:** Formal environments will be established for meetings with both the real client and the lecturer. Informal settings will also be provided to encourage interaction and discussion among students regarding their assessments. Appropriate physical spaces include classrooms, university lounges, labs, or lecturer offices. Online collaboration tools such as Skype, Zoom, Blackboard Collaborations, Teams and others will be utilised, considering the advancements in online communication technologies.

Benefits of a Multi-Faceted Approach

This multi-faceted model facilitates face-to-face feedback for students. Phil (2015) advocates for the value of face-to-face feedback, highlighting its significant learning benefits for students. In such situations, lecturers and real clients can gauge student comprehension of feedback and engage in dialogue to address any student queries.

The five steps, inspired by the Dunn and Dunn model, encourage students to focus on authentic assessment and actively engage with the formative feedback provided by both lecturers and real clients. These constructive comments and criticisms on the progress of the authentic assessment are intended to provide ample opportunities for students to refine their work throughout the production process. According to Wiggins (1993), the design of new assessment systems that can investigate the deeper cognitive structures of students have the potential of offering teachers and policymakers with useful feedback that is not only more reliable but also more enlightening.

Overall, this experimental design aims to evaluate the effectiveness of the multi-faceted assessment approach in improving student engagement, knowledge acquisition, and alignment with industry expectations within the context of authentic assessment in technology-based programs. Brown (2015) suggests that well-designed, authentic, and integrated assessments are

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vitally important for student learning. Such assessments become an intrinsic element of the learning process, fostering deeper understanding and knowledge retention.

Analysis and Comparison of Research Problem and Results from Previous Study to Proposed Multi-faceted Approach.

A previous study using authentic assessment achieved high pass rates but identified concerns. Some students (25%) felt burdened and disengaged, potentially due to limited opportunities for self-evaluation and unclear expectations (Wolf, 1989; Villarroel et al., 2018). This hindered knowledge acquisition, impacting the overall success of the assessment. To address these issues, a new multi-faceted approach grounded in the Dunn and Dunn Learning Style Model (1996) is proposed. This model tailors learning environments to individual preferences, potentially improving motivation and knowledge acquisition.

Building on Luan and Cowling's (2015) research, the new approach directly involves real clients. This exposure encourages students to seek new information and gain practical experience beyond course materials (Sadler, 2013). The lecturer acts as a facilitator, motivator, and proxy client, providing guidance and feedback reflecting real-world expectations (Race, 2015; Bandura, 1977). This differs from prior research by offering a direct point of reference – the real client – for information and understanding project specifications. This aligns with Bandura's (1977) concept of observational learning promoting self-efficacy.

The proposed multi-faceted method, grounded in the Dunn and Dunn Learning Style Model, aims to address these concerns by creating a more supportive and engaging learning environment. By directly involving real clients, fostering diverse learning styles, and providing targeted support, this approach has the potential to improve student motivation, knowledge acquisition, and alignment with industry expectations. The research will evaluate the effectiveness of this multi-faceted model in achieving these goals, paving the way for a more successful and enriching authentic assessment experience for students in technology programs.

A Multi-Method Approach to Evaluating a Multi-Faceted Authentic Assessment

This study will employ a multi-method approach to evaluate the effectiveness of the proposed multi-faceted authentic assessment model within the Bachelor of Information and Computing Technology (ICT) and Bachelor of Digital Media program. The approach combines quantitative and qualitative research methods to gain a comprehensive understanding of student experiences and learning outcomes.

Data Collection Methods

1. **Direct Observation:** Unstructured observations will be conducted during the implementation of the multi-faceted authentic assessment. The researcher will act as a non-participant observer, minimizing any potential influence on the process. This allows for objective observation of student interactions, collaboration strategies, and engagement with the assessment tasks. The data collected will be used to identify patterns in student behaviour and document the overall learning environment fostered by the multi-faceted approach.

2. **Unstructured Interviews:** After students complete the authentic assessment, semi-structured interviews will be conducted with them. The interview schedule will begin with

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a set of core questions designed to explore student experiences, perceptions of the assessment process, and learning outcomes. Based on the participants' responses, probing questions may be employed, allowing for in-depth exploration of emerging themes. This method provides rich qualitative data on student perspectives and insights into the effectiveness of the multi-faceted model.

3. **Quantitative Surveys**: Pre- and post-assessment surveys will be administered to students. Pre-assessment surveys will consist of multiple-choice questions gauging students' initial knowledge and expectations of the course, particularly in relation to the authentic assessment. Post-assessment surveys will employ similar multiple-choice questions to capture student reactions and perceptions of their overall experience with the multi-faceted authentic assessment. Additionally, an open-ended qualitative question will be included in the post-assessment survey, inviting students to elaborate on their experiences and provide further insights relevant to the research question: "How effective is a multi-faceted model in authentic assessment?".

Data Analysis

Quantitative data from the surveys will be analysed using descriptive statistics to identify patterns and trends in student responses. Qualitative data from interviews and the open-ended survey question will be analysed thematically, with key themes and patterns emerging from the data used to address the research question.

Triangulation

This study employs a multi-method approach to achieve triangulation. Triangulation involves using multiple data collection methods to corroborate findings and enhance the validity and reliability of the research (Flick,2014). The convergence of data from observations, interviews, and surveys will provide a more holistic understanding of the effectiveness of the multi-faceted authentic assessment model.

Ethical Considerations

Ethical considerations will be paramount throughout the research process. All participants will be given informed consent, and their anonymity will be ensured. Data will be stored securely and in accordance with university ethics guidelines.

This multi-method approach will allow for a comprehensive evaluation of the multi-faceted authentic assessment model, providing valuable insights into its impact on student learning and engagement within the technology-based program. In order to reach credible conclusions, a thorough process will be employed which requires a careful approach at all levels from recording to explanation and examination (Little, 2000). Data collection on human behaviour is an intricate journey of carefulness. At each step-in ranging from data gathering up to interpretation and analysis helps in bringing forth a well-founded conclusion.

Conclusions

This study explored the potential of a multi-faceted authentic assessment approach within the Bachelor of Information and Computing Technology (ICT) and Bachelor of Digital Media program. The proposed model integrates the principles of the Dunn and Dunn Learning Style Model (Dunn & Dunn, 1996) to create a learning environment that caters to diverse student strengths and fosters deeper engagement with industry expectations.

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The experimental design outlined in this paper utilises a multi-method approach, combining direct observation, semi-structured interviews, and pre-and post-assessment surveys to evaluate the effectiveness of the multi-faceted model. This approach will provide a comprehensive understanding of student experiences, learning outcomes, and potential benefits associated with this innovative assessment strategy.

If implemented effectively, the multi-faceted model has the potential to improve student engagement, knowledge acquisition, and alignment with industry standards. Through such assessments, students get more definition of their responsibilities in learning, they engage in tasks which are more significant whereby the educators can have information from the results of their tests hence improving instruction (Wiggins,1990). By providing students with opportunities to work with real clients on authentic tasks, this approach can bridge the gap between theoretical knowledge and real-world practice, better preparing graduates for successful careers in the ICT field.

Further research is warranted to explore the long-term impact of the multi-faceted model on student learning and career trajectories. Additionally, investigations into the scalability of this approach to other disciplines and program contexts would be valuable in expanding the reach and impact of authentic assessment practices in higher education.

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