

Design and development of psychomotor assessment framework in open distance learning for hospitality education

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Goal and objectives of the dissertation

Goal

The main aim of this study was to address a key challenge in hospitality education, which traditionally depends on hands-on, face-to-face training, by designing and developing an adaptive psychomotor assessment framework for Open Distance Learning (ODL).

Objectives

This goal was supported by three research objectives:

RO1: to analyse the readiness and pedagogical needs of hospitality educators and students for an adaptive psychomotor assessment framework in ODL

RO2: to design and develop an adaptive psychomotor assessment framework for hospitality education in ODL

RO3: to evaluate the usability of the adaptive psychomotor assessment framework in ODL to ensure its feasibility and relevance for higher education institutions (HEI).

Methodology

This study employed a multiphase mixed-methods approach using Design and Development Research (Richey & Klein, 2007). Phase I conducted a needs analysis using triangulated data from semi-structured interviews (9 educators, 6 students) and document analysis; data were synthesized via reflexive thematic analysis (Braun & Clarke, 2022). Phase II adopted a quantitative design to reach expert consensus. A heterogeneous panel of 21 experts (academics, TVET practitioners, and hotel managers) was selected through purposive sampling to evaluate a 308-item instrument using the Fuzzy Delphi Method (FDM). Items were validated based on threshold values ($d \leq 0.2$), agreement ($> 75\%$) and defuzzification (α -cut value > 0.5) (Chen, 2000; Cheng & Lin, 2002) to instantiate the final frameworks. Finally, Phase III involved an evaluative survey with a separate purposive sample of 7 experts to confirm the frameworks' relevance and practicality for hospitality ODL settings.

Results

The results directly align with the study's three research objectives. For RO1 (needs and readiness), thematic analysis identified a critical lack of institutional policies for remote psychomotor assessment, despite educator-led improvisations like asynchronous video. Findings revealed four major readiness themes, which include governance, curriculum outcomes, method feasibility, and stakeholder support—supported by fifteen sub-themes. For RO2 (design and development), these qualitative insights were translated into 39 design constructs. Through the Fuzzy Delphi process, consensus was reached on 34 constructs and 255 items, resulting in two sequentially dependent frameworks: the Ecosystem of ODL Psychomotor Assessment (addressing institutional governance) and the Adaptive Formative and Summative ODL Psychomotor Assessment Framework (addressing pedagogical flexibility). Finally, for RO3 (evaluation), usability testing confirmed that this dual-framework approach provides a scientifically validated and practical roadmap for institutionalizing remote psychomotor assessments in hospitality education.

Theoretical conclusions

This study advances the understanding of psychomotor skills assessment in open distance learning (ODL) by establishing a comprehensive framework that underpin quality assurance, standards, leadership, governance, and best practices. This foundational framework enables the development and operationalization of adaptive formative and summative assessments. Integrating adaptive assessment principles from Miller's Pyramid and the SAMR model, the study demonstrates how assessments can

accommodate diverse learner needs and improve outcomes. The research also incorporates validity, reliability, fairness, and consistency (VRFC) properties, providing a structured theoretical foundation for evaluating psychomotor assessments in ODL environments. Although conducted in Malaysia, these insights are transferable to European higher education contexts, offering guidance for enhancing distance education and psychomotor assessment research internationally.

Practical Applications of the Dissertation

The study provides practical guidance for educators and institutions to implement effective psychomotor assessments in ODL, beginning with the establishment of a robust ecosystem that ensures quality and sustainability. Recommendations emphasize adaptive formative and summative assessments, integration of digital tools such as virtual reality and simulations, and strong educator support systems, ensuring assessments are valid, reliable, fair, and consistent. Adopting these frameworks can enhance assessment quality, standardize practices, and foster student-centered, future-ready learning while supporting Sustainable Development Goal 4 on Quality Education by providing equitable and effective learning opportunities. Although derived from the Malaysian context, the findings are applicable to European higher education, particularly in hospitality, tourism, and other disciplines requiring psychomotor skill development, offering scalable, adaptable, and sustainable solutions for remote assessment.

Content of the dissertation

Abstract of Chapter 1

Hospitality education in Malaysia is fundamentally skill-based, with national standards mandating that laboratory courses comprise 70% practical components to ensure industry readiness (Bilsland et al., 2020; MQA, 2019). However, the global pandemic catalysed a shift toward open and distance learning (ODL), precipitating a validity crisis in practical assessment. This chapter identifies a significant gap in institutional policies and pedagogical structures required to evaluate hands-on competencies remotely. Reliability concerns regarding student evaluations necessitate a structured, scalable roadmap. Consequently, this research aims to develop an adaptive psychomotor assessment framework to fill this void, ensuring that hospitality graduates continue to meet the rigorous demands of the international tourism industry despite the transition to digital learning environments.

Abstract of Chapter 2

This chapter synthesizes international literature on Outcome-Based Education (OBE), psychomotor taxonomies, and digital pedagogy within hospitality and tourism contexts. It evaluates the challenges of remote skill assessment, specifically focusing on the acceleration of online education and the subsequent concerns regarding fair evaluation. By critically reviewing traditional methods alongside digital innovations such as virtual reality and video-based verification, the review identifies theoretical synergies between Simpson's psychomotor domain (Simpson, 1972), Miller's Pyramid (Miller, 1990) of clinical competence, and the SAMR model (Puentedura, 2006) for technology integration. The synthesis reveals a notable absence of structured frameworks for remote skill verification, establishing the theoretical foundation for an integrated model that bridges the gap between digital tools and practical competency standards in ODL.

Abstract of Chapter 3

Adopting multiphase mixed-methods approach using Design and Development Research (DDR), this chapter details a three-phase methodology structured around the ADDIE instructional model. Phase I employs a qualitative needs analysis, triangulating semi-structured interviews from educators and students with course document analysis to identify real-world challenges via reflexive thematic analysis.

Phase II utilizes the Fuzzy Delphi Method (FDM), engaging a heterogeneous panel of 21 experts to reach consensus on the framework's essential assessment items. Phase III concludes with a usability evaluation conducted by seven national accreditation agency members. This systematic approach ensures the resulting framework is both theoretically robust and practically aligned with the specific accreditation requirements of hospitality education in a digital environment.

Abstract of Chapter 4

Phase I findings reveal a profound "validity crisis" in remote hospitality assessment. While educators utilized makeshift solutions like asynchronous video and peer feedback, a fundamental lack of institutional policy and pedagogical structure persists. The thematic analysis identified four critical readiness dimensions: governance and quality assurance, curriculum alignment with taxonomies, method feasibility, and stakeholder support. These results highlight that readiness is not merely technical but deeply rooted in the need for standardized guidance to validate remote practical competencies. These qualitative insights provided the empirical basis for the subsequent design phase, ensuring the proposed framework addresses the specific challenges and resource constraints identified by students and educators in the ODL environment.

Abstract of Chapter 5

The design and development phase translated qualitative themes into 39 initial design constructs, operationalized through a 308-item instrument. Using the Fuzzy Delphi Method (FDM), a heterogeneous panel of 21 experts reached consensus on 34 constructs and 255 items, ensuring the framework's components are both critical and feasible. This process resulted in a dual-framework architecture: the Ecosystem of ODL Psychomotor Assessment, focusing on institutional leadership and governance, and the Adaptive Formative and Summative ODL Psychomotor Assessment Framework, which provides flexible, taxonomy-aligned pedagogical approaches. By integrating expert consensus with empirical data, this chapter establishes a scientifically validated model for measuring hands-on skills in digital hospitality education.

Abstract of Chapter 6

The final evaluation phase confirms the dual framework's practical utility and relevance. Usability testing conducted by a separate panel of seven experts including representatives from national accreditation bodies indicates that the frameworks effectively bridge the gap between ODL flexibility and the rigorous standards of hospitality program. The evaluation emphasizes the framework's clarity, comprehensiveness, and potential for institutionalization. Results suggest that the "Ecosystem" approach successfully addresses macro-level governance, while the "Adaptive" framework provides micro-level pedagogical tools for educators. Ultimately, the validation confirms that the framework serves as a reliable roadmap for maintaining the integrity of psychomotor assessments in distance learning.

Abstract of Chapter 7

The dissertation concludes by establishing the theoretical and practical significance of the developed frameworks. Theoretically, the study extends the application of psychomotor taxonomies into the digital realm, offering a new synthesis of the SAMR and Miller's Pyramid models. Practically, it provides a strategic toolkit for hospitality institutions to navigate the transition to ODL without compromising student competency. While the study is grounded in the Malaysian context, the findings offer a scalable template for global tourism education. The chapter recommends that future research explore the integration of emerging technologies, such as Artificial Intelligence and haptic feedback, to further enhance the precision of remote psychomotor evaluation and institutional policy development.

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