

Title	教育評価に関する学習プロセスの解析および思考の世界の力学による理論的考察
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Citation	
Issue Date	2023-03
Type	Thesis or Dissertation
Text version	ETD
URL	http://hdl.handle.net/10119/18418
Rights	
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Abstract

Learning is essential for cognitive development and the acquisition of abilities that express the essence of every human being. Several studies have shown that learning can be facilitated in various ways, including real-life tasks and the incorporation of gamified experiences. Gamification, the incorporation of game elements into non-game contexts, has shown the potential to enhance learning outcomes and increase engagement in educational settings. Several analyses have investigated different techniques to improve learning and maintain student engagement, including the use of challenge-based gamification, flow theory, the zone of proximal development, and prospect theory.

This dissertation presents a comprehensive study on the use of gamification techniques in educational assessments, specifically multiple-choice questions (MCQs). The research employs a mixed-method approach, combining qualitative and quantitative methods, and makes use of numerical computation to evaluate the effectiveness of incorporating these theoretical frameworks into educational assessments to allow for a more comprehensive understanding of the impact of gamification on the learning process. The findings suggest that gamification can be an effective way to enhance learning outcomes and increase engagement in educational contexts. By considering these theoretical frameworks, it is possible to design educational assessments that foster a sense of competence and enjoyment during the learning process, while also balancing competitiveness and enjoyment. This approach can be particularly promising for complementing standardized testing and classroom activities and for bridging the gap between game and non-game contexts.

The main objective of this dissertation is to precisely evaluate and determine the individual's perceived impact and learning process on the educational assessment evolution over time: 1) To capture the impact of the variation in challenge-based gamification over the educational assessment. The purpose was to investigate the optimal level of gamification in the activity and state the position of individual motion using both concepts of motion in

mind and flow theory to bridge the gap between physics and psychology 2) To define the learning comfort based on theoretical approaches using the Kahoot (Quizzing) and MCQs (Testing) testbed. Integrating the scaffolding-based concept in the test characteristics and properties could be described by the motion in mind and zone of proximal development to bridge the gap between physics and learning theory. Also, Introducing the framing effect enables the applicability of prospect theory under decision-making activity 3) To develop the link between learning and play by proposing a new measurement of motion-in-mind perspective that indicates learning processes. Proposing the objectivity and subjectivity measures ensures the conjecture between learning comfort and playing comfort based on the objective point of view. The findings provide a basis for further application in the educational context. Particularly in a conceptual learning environment, a balance between uncertainty and ability is required to emphasize their significance in education. In addition, this dissertation makes a significant contribution to the understanding of how gamification can facilitate the learning process in educational contexts. The practical implications of this research may be useful for educators and researchers looking to enhance student engagement and learning outcomes through the incorporation of gamified techniques into educational assessments. By thoroughly the analysis process, this study increases the transparency and credibility of the findings, providing a strong foundation for future directions.

Overall, this dissertation presents a detailed and robust examination of the use of gamification in educational assessments, specifically MCQs. The proposed approach may be particularly promising for increasing the sense of competence and enjoyment during the learning process and for enhancing learning outcomes and engagement in educational settings. The findings and practical implications of this research offer valuable insights for educators and researchers looking to improve learning and engagement in educational contexts.

Keywords: *Challenge-based Gamification, Motion-in-Mind, Game Refinement Theory, Educational Assessment, Learning Process*