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Game-Based Learning in the Accounting Curriculum: Impact on Intrinsic Motivation and Gender

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Abstract. Game-based learning (GBL) demonstrates significant potential in addressing the challenges associated with teaching the technical aspects of the accounting curriculum. However, its application in accounting education remains limited despite its potential to enhance students' engagement and performance. This study investigates two key factors associated with GBL in accounting education: intrinsic motivation and gender differences. Intrinsic motivation is vital in educational settings as it encourages students to engage in learning driven by genuine interest rather than external rewards. This is particularly significant in accounting education, where the technical nature of the subject matter often creates challenges to sustaining student engagement. Moreover, this study explores how gender differences influence motivational elements in the classroom, addressing a relatively under-explored area. Gender differences are significant because they affect how students interact with and respond to game-based learning environments. We conducted an experimental design involving 121 undergraduate accounting students at a higher education institution. Theoretically, this study provides evidence that GBL positively impacts enjoyment and perceived usefulness in accounting education, while also highlighting gender differences in intrinsic motivation. Practically, it demonstrates the benefits of integrating GBL activities into traditional teaching methods to create more effective learning experiences in accounting education.

Keywords: accounting education, gender, cognitive evaluation theory.

1. Introduction

Educators have explored various educational strategies to enhance classroom engagement, including incorporating games into their teaching materials. When lessons are presented in engaging and interactive game formats, students become more actively involved in their learning, enhancing both their knowledge acquisition and competency development. Game-Based Learning (GBL) is an approach that incorporates elements and mechanics of game design into non-gaming contexts. Previous research has demonstrated that the utilisation of GBL leads to improved learning outcomes and increased student engagement (e.g. Nadeem, Oroszlanyova & Farag, 2023; Dahalan, Alias & Shaharom, 2024; Liu,

Shaikh & Gazizova, 2020; Jamaluddin, Mahali, Din, Ahmad, Fadzilah & Jabar, 2020; Cerra, Alvarez, Parra & Iglesias, 2022; Zou, Zhang, Xie & Wang, 2021, Selamat & Ngalim, 2022; Zahedi, 2019; Hallifax, Serna, Marty & Lavoue, 2019).

In accounting education, GBL has been employed to enhance students' learning experiences by helping them better visualise various business activities and accounting processes (Hoffjan, 2005; Selamat & Ngalim, 2022), develop their understanding of accounting fundamentals, and foster group interaction and cooperative learning among students (Nitkin, 2012; HajiMoradkhani, Mashayekh & Khodabandelou, 2023; Kao, Yuan & Wang, 2023). Despite the growing need to adopt game-based pedagogy in education, the application of GBL in accounting education is still low (Dichev & Dicheva, 2017; Bhavani, Mehta & Dubey, 2020) largely due to concerns about the perceived suitability of games for this field (Calabor, Mora & Moya, 2019; Kao, et al., 2023). This study explores the effect of intrinsic motivation and gender on the GBL in accounting education.

Intrinsic motivation is crucial in predicting students' genuine interest, commitment, and study effort (Deci & Ryan, 1985). GBL has the potential to promote intrinsic motivation through the integration of playfulness and interactivity. Elements such as immediate feedback, challenges, and goal-oriented tasks can enhance students' enjoyment and perceived relevance of the material (Hamari et al., 2016; Kao et al., 2023). Despite a growing academic interest in the topic (Dahalan et al., 2024) and studies have demonstrated GBL's general efficacy in improving motivation (Baah, Govender & Subramaniam, 2023; Dreiman, 2019; Koivisto & Hamari, 2019), there is still a lack of in-depth research on how and why it influences motivation within learning environments (Fazamin, Ali, Mohd Saman, Saman, Yusoff & Yacob, 2015). Particularly, the association between intrinsic motivation and GBL in technical fields such as accounting has been less explored (Zainuddin, Chu, Shujahat & Perera, 2020).

Intrinsic motivation is essential in GBL as it drives learners to engage deeply and persistently with educational activities, enhancing their enjoyment, creativity, and long-term knowledge retention. Therefore, understanding its role is crucial for designing effective learning experiences in accounting education, a technically complex field where motivation is key to student success.

Research on gender differences in education reveals varying responses to motivational elements, influenced by differences in perceptions of self-efficacy, task interest, and the value placed on collaboration versus competition (Baker, Richey & Zhang, 2024; Richey et al., 2024; Jamil, Nadeem Faisal, Habib, Jabbar & Ahmad, 2020; Malik, Al-Emran, Mathew, Tawafak & Alfarsi, 2020; Venkatesh, Morris & Ackerman, 2000). While there has been research on how gender influences preferences and behaviours in electronic or video gaming (Koivisto & Hamari, 2014), there is limited research on how these gender-based differences translated to educational contexts where games are used as learning tools. This distinction is important because gaming in education primarily enhances students' cognitive learning outcomes, whereas electronic gaming

focuses on entertainment and game progression. These differing objectives may result in distinct perceptions of gaming between educational and entertainment contexts. As a result, the gender dynamics in gaming for entertainment may not directly apply to GBL in a classroom setting. Understanding these distinctions enables educators to design inclusive interventions that enhance learning outcomes while avoiding stereotypes or disparities (Sung & Hwang, 2013).

This study makes the following contributions: First, while there is substantial empirical evidence supporting the effectiveness of gaming tools in improving student motivation and engagement in the learning process (Koivisto & Hamari, 2019; Baah, et al., 2023), limited research has delved into how GBL specifically influences the various facets of intrinsic motivation. Therefore, our study aims to address this gap in the existing literature by presenting empirical evidence of the impact of GBL on the specific domain of students' intrinsic motivation, particularly in accounting education.

Second, building on self-determination theory (Deci & Ryan, 1985), this study bridges the gap by empirically examining how GBL impacts students' intrinsic motivation in a technically complex and engagement-challenged field like accounting. This contributes to the literature by advancing the understanding of how educational gaming tools align with psychological needs to drive motivation in academic settings.

Third, drawing on gender theories (Venkatesh, et al., 2000), this study examines how gender differences shape students' perceptions of intrinsic motivation within the GBL environment. Prior research has highlighted gender-specific variations in self-efficacy, task interest, and preferences for collaboration versus competition in educational contexts (Baker, et al., 2024; Malik, et al., 2020). However, the application of these findings to GBL has been under-explored. Our study addresses this gap by investigating how gender dynamics influence intrinsic motivation in the GBL accounting course.

The following section discusses the literature review of GBL, the theoretical model used and the hypotheses development, followed by the research methodology. The next section presents the results of the study and a discussion of the findings. We conclude this paper with a summary of findings and future research directions.

2. Theoretical Background and Hypothesis Development

GBL in Accounting Education

The technicality of accounting education often makes learning challenging, and disengaging for students (Elo, Patari, Sjogren & Matto, 2023). Educational games address these challenges by transforming abstract concepts into interactive and immersive experiences, enabling students to apply their knowledge in an enjoyable and interactive way. The philosophy behind educational games is to

provide a platform for students to "learn as if they were playing a game," making learning interactive and enjoyable (Simões, Redondo and Vilas 2013; Torres-Toukoumidis, Carrera, Balcazar, & Balcazar, 2021). GBL incorporates "game design elements in non-game contexts" that include achievements, for instance, experience points, bonuses, badges, socialisation, practices, and feedback (Attali & Arieli-Attali, 2015; Selamat & Ngalim, 2022; Silva, Rodrigues & Leal, 2021).

Studies in accounting education have utilised game activities and gaming elements to enhance learning in financial accounting courses (see Table 1). Prior studies documented the use of games such as Monopoly, Hasbro's Game of Life, mobile game, Putra Salamis and AccountinGame to help students visualise business activities and related accounting processes, and develop and improve understanding of accounting fundamentals. Utilizing Game-Based Learning (GBL) in accounting education has demonstrated advantages over traditional teaching methods, as more engaging, efficient, and effective (HajiMoradkhani et al., 2023). GBL assignments also offer a valuable avenue for experiential learning, enabling students to internalize accounting concepts and principles more effectively (Jamaluddin et al., 2020).

Table 1: Genre of games boards and elements utilized in the accounting education

Game element	**Key Findings**	**Scope studies**	**Reference**
Digital game of 'Accounting Principles'	Positive effect on academic performance and intrinsic motivation	Introductory Accounting	HajiMorakhani et al. (2023)
Accounting mobile game and mobile learning system (TRON)	Improved learning experience	Accounting	Kao et al. (2023)
Putra Salamanis (Board games)	Improved learning outcomes	Introductory Accounting	Selamat & Ngalim (2022)
AccountinGame	Motivation and attitudes influence perceived learning outcome	Accounting	Silva, Rodrigues & Leal (2021)
Accounting on the Block (AOTB)	Positive effect on motivation	Financial Accounting	Jamaluddin et al. (2020)
Monopoly	Interactive game aligns with learning outcomes	Financial Accounting	Mousa (2019)
Quizizz	Enhance learning experience	Introductory Accounting	Zhao (2019)
Platform Wars Simulation	Games are perceived as a teaching technique	Management Accounting	Calabor. Mora & Moya (2015)
Simulation learning	Enhance understanding of Balance Score Card	Management Accounting	Capelo, Lopes & Mata (2015)
Accounting game software	Enhance learning experience	Introductory Accounting	Chrismatuti & Purnamasaari (2015)
Hollywood Squares an Connect Four	Enhance learning experience	Accounting Information System	Moncada & Moncada (2014)
Group decision-making system (PM)	Extrinsic and intrinsic motivations enhance learning and participation	Taxation	Buckley & Doyle (2014)
Farmville	Positive effect on learning, satisfaction and interaction	Management Accounting	Krom (2012)
Hasbro's Game of Life	Improved understanding	Introductory Accounting	Nitkin (2012)