

# A Cross-Cultural Evaluation of Digital Game-Based Learning's Impact on Accounting Students' Motivation

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**Abstract.** This study investigates whether differences in students' cultural backgrounds affect their motivation in a digital game-based learning (DGBL) experience. The research involved two culturally distinct groups of business students from China and Spain, who were surveyed after three months of DGBL. The data revealed that the Spanish group experienced a significantly higher motivation level. A multi-group analysis of a structural equation model identified common patterns in the relationship between the studied cultural dimensions and motivation, suggesting a certain level of consistency in the motivational effects of DGBL. However, the strength of the correlations between cultural dimensions and motivation varied significantly across the studied cultures, accounting for the observed difference in motivation between the two groups. Taken together, these findings, while acknowledging the cross-cultural potential of DGBL, suggest the convenience of culturally tailored DGBL strategies.

**Keywords:** culture, learning, motivation, digital games, accounting.

**ARCS:** Attention, Relevance, Confidence and Satisfaction model; **AS:** Achievement and Success; **CD:** Cultural dimension; **DGBL:** Digital game-based learning; **IC:** Individualism-Collectivism; **IR:** Indulgence-Restraint; **LTO:** Long-term orientation; **PD:** Power distance; **UA:** Uncertainty avoidance.

## 1. Introduction

Digital game-based learning (DGBL) refers to the use of the engaging qualities of digital games for educational purposes (Prensky, 2001). Earlier research has shown that DGBL contributes to the achievement of cognitive, behavioural, and affective learning outcomes (Carvalho & Neto, 2022; Coleman & Money, 2020). The effects of DGBL are attributed to the active engagement and motivation it promotes, leveraging the intrinsic entertainment value of games to sustain interest in learning tasks (Kageyama et al., 2022). This heightened motivation often leads to deeper cognitive processing and improved retention of knowledge (da Silva et al., 2019).

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Parallel to this, educational research recognises the influence of culture in shaping student motivation (Joy & Kolb, 2009; Lukosch et al., 2017; Sikkema & Sauerwein, 2015). Students' perceptions of learning environments, instructional materials, peers, and instructors, are influenced by cultural factors essential to understanding motivation within diverse learner populations (Hofstede, 1986; Korkofingas & Macri, 2019; Y. Wang et al., 2020). As DGBL becomes more widely adopted and the internationalisation of business education continues to expand (Khandaker, 2012), it is imperative to explore whether students from varying cultural backgrounds experience the motivational benefits of DGBL equally. However, the influence of cultural differences on motivational outcomes in DGBL environments remains relatively underexplored. Although previous studies have examined the relationship between culture and motivation in DGBL (e.g., Hernández-Lara et al., 2018; Zaharias & Papargyris, 2009), much of this research has focused on individual cultural dimensions in isolation, such as individualism (Hornik & Tupchiy, 2008), long-term orientation (Jung et al., 2020), or uncertainty avoidance (Fischer et al., 2021). Furthermore, these studies often lack integration with motivational models specifically designed to assess the effectiveness of instructional materials. The present study adopts a more integrative approach, aiming to deepen the understanding of how cultural contexts influence learners' responses to the motivational mechanisms embedded in DGBL. Specifically, this study aims to explore the following research question: Do differences in students' cultural backgrounds affect their motivation in a DGBL experience? This is a timely question, as DGBL is increasingly applied in culturally diverse contexts. Furthermore, the study offers guidance for educators seeking to adapt their teaching to today's multicultural higher education landscape.

The study involved two culturally distinct groups of undergraduate business students from China and Spain. The selection of Spain and China was guided by both theoretical and practical considerations. Theoretically, it draws on Nisbett's (2003) proposition that Eastern and Western cultures differ fundamentally in cognition and perception. By comparing Spain and China as representatives of Western and Eastern cultures, the study examines how culturally embedded values influence students' motivational responses to DGBL. Practically, the research leveraged an existing academic exchange between a Spanish university and a Chinese partner institution. Survey data from students in both countries were analysed using multi-group structural equation modelling to assess the impact of cultural differences on motivation.

From a theoretical perspective, the study draws on the ARCS model of motivation (Keller, 1987, 2008, 2010) and Hofstede's six cultural dimensions framework (1980, 1986; 2001; Hofstede et al., 2010). The ARCS model provides the framework for assessing learners' motivational responses to instructional materials, in this case, a digital game. Hofstede's framework is used to examine how cultural context shapes learners' motivational responses to DGBL.

This study contributes to business education literature in two ways. First, it expands research on DGBL in management education. While earlier studies highlight DGBL's potential to boost student motivation (Krath et al., 2021; Wouters et al., 2013; Hsu, 2013; Tafazoli et al., 2018), less is known about how cultural background influence motivation in this context. Some prior work has examined individual Hofstede dimensions, such as individualism (Hornik & Tupchiy, 2008), long-term orientation (Jung et al., 2020), and uncertainty avoidance (Fischer et al., 2021). This study takes a broader approach by incorporating all of Hofstede's cultural dimensions, offering a more comprehensive view of the relationship between cultural background and motivation in DGBL. Second, while DGBL offers benefits to students (Coleman & Money, 2020), it also poses risks if cultural contexts are overlooked, as responses to educational technologies can vary across cultures (Cronjé, 2011). To address this, the study provides educators with guidance on implementing culturally adapted activities that bridge gaps or align with students' cultural backgrounds. These insights highlight the need for culturally sensitive DGBL approaches and caution against directly transferring practices across cultural contexts.

## 2. Literature Review

### *Digital Game-Based Learning*

DGBL refers to combining the engaging aspects of digital games with learning content (Prensky, 2001). Prior research has examined the effects of DGBL on cognitive, behavioural, and affective learning outcomes, consistently indicating that it enhances learning (Lameras et al., 2017; Wouters et al., 2013). Jackson and Meek (2021) characterise DGBL as a scalable and effective form of work-integrated learning, highlighting its capacity to enhance student engagement and support the development of professional skills while acknowledging limitations related to cultural sensitivity, among others. Similarly, Kuang et al. (2024) affirmed DGBL's potential to foster motivation, engagement, and complex cognitive skills such as decision-making and critical thinking yet emphasised that its implementation may remain constrained by limited lecturers' acceptance.

DGBL is considered helpful primarily for its ability to manage cognitive load efficiently (Woo, 2014) and enhance learner motivation (Nadolny et al., 2019). To reduce mental strain, digital games structure content into manageable chunks, use visual and interactive elements, and present tasks progressively (Sevcenko et al., 2021), helping learners process and retain knowledge more effectively (Krath et al., 2021; Wouters et al., 2013).

Literature drawing on various motivational frameworks shows that DGBL enhances student motivation. Self-determination theory suggests digital games support autonomy, competence, and relatedness through challenge, feedback, and

interactivity (Buil et al., 2020; Uysal & Yildirim, 2016). Flow theory highlights how games foster deep engagement by balancing challenge and skill, setting clear goals, and offering immediate feedback (Perttula et al., 2017; Silva et al., 2019). The ARCS model postulates that games capture attention through visuals and interactivity, establish relevance via meaningful contexts, build confidence with achievable challenges and feedback, and promote satisfaction through rewards and progress tracking (Lee & Hao, 2015). Table 1 summarises key motivational mechanisms in DGBL.

Table 1. Principles and mechanisms of DGBL

<b>Principles</b>	<b>Mechanisms</b>
1. Motivation. DGBL engages learners through immersive game-based experiences.	1. Rules. Games operate through structured rules, goals, and choices with consequences.
2. Learning through intense enjoyment and 'fun'. Games foster an engagement state where learners are absorbed and in control.	2. Challenging goals. Demanding tasks help learners see the impact of their efforts.
3. Authenticity. DGBL emphasises contextual over abstract learning.	3. A fictional setting that provides a compelling background. It enables the safe exploration of skills and identities.
4. Self-reliance and autonomy. Encourages exploration and independent inquiry.	4. Progressive difficulty levels. This should be understandable criteria for progression and levelling up. Clear criteria and repeatable challenges support mastery.
5. Experiential learning. Learning occurs through active engagement and reflection.	5. High degree of student control. Players shape their learning through meaningful choices, with the certainty that effort will be acknowledged and rewarded.
	6. A degree of uncertainty and unpredictability. Injecting unpredictability sustains engagement.
	7. Immediate and constructive feedback that helps improve performance.
	8. A social element that allows people to share experiences and build bonds. DGBL can foster collaboration and shared experiences.

Source: Abridged and adapted from Perrotta et al. (2013, p. 9)

DGBL aligns well with digital natives, those raised with technology. by embedding learning in familiar digital and interactive formats (Prensky, 2001; Berns et al., 2016). Its multimedia design supports their visual–auditory preferences (Sanchez-Mena et al., 2017) and multitasking skills (Carvalho & Neto, 2022). Meta-analyses confirm that motivation is central to DGBL's effectiveness (Barz et al., 2023; Krath et al., 2021; Li et al., 2023), while also highlighting the need to explore moderating factors such as participation mode, device type, game format, and cultural background. Ultimately, DGBL's impact