Gamification as an innovation: a tool to improve organizational marketing performance and sustainability of international firms

Received 11 May 2022
Revised 18 September 2022
22 December 2022
9 February 2023
Accepted 10 February 2023

Abhishek Behl
Management Development Institute Gurgaon, Gurgaon, India
Vijay Pereira
People and Organizations, NEOMA Business School – Campus de Reims, Reims, France
Nirma Jayawardena
OP Jindal Global University Jindal Global Business School, Sonipat, India
Achint Nigam
Birla Institute of Technology and Science – Pilani Campus, Pilani, India, and
Sachin Mangla
OP Jindal Global University Jindal Global Business School, Sonipat, India

Abstract

Purpose – This study aims to investigate an under-researched area, an international marketing perspective, based on international dynamic capability, environmental sustainability and organizational marketing performance in gamification and non-gamification-based organizational culture (OC). This paper deepens the understanding of gamification-based and non-gamification-based OC influence on innovation capability and environmental and organizational marketing performance through the theory of organizational creativity and the theory of administrative behavior (AB).

Design/methodology/approach – The authors collect data from firms that abide by the ISO 14091 certifications to ensure the proper quality standards. Primary data from 384 firms are used to test the hypotheses. The results would help firms invest in technological solutions by practicing creativity over time. Additionally, the study helps explore how AB is critical in steering technological creativity for making firms climate-conscious.

Findings – The study's findings identified that OC has a positive influence on technological innovation capabilities and environmental innovation capabilities. Technological innovation capabilities have a beneficial impact on environmental sustainability. Environmental sustainability appears to have a substantial correlation with technological innovation skills. Environmental innovation capabilities positively impact environmental sustainability and organizational marketing performance. A moderating effect of gamification on the international dynamic capabilities within a relationship between organizational culture and environmental innovation capabilities exists.

Originality/value – The investigation is confined to understanding how gamification-based and non-gamification-based organizational marketing culture affects innovation capability, environmental sustainability and organizational performance through the lens of theory of organizational creativity and theory of AB.

Keywords Gamification, Sustainability, Innovation, Organizational culture, Environment sustainability, International dynamic capabilities, Organizational marketing performance

Paper type Research paper

1. Introduction

Due to the wide spread of knowledge sources for innovation in today's economic environment, a firm's ability to remain competitive depends on opening its boundaries (Gustavs and Clegg, 2005; Primasari, 2022). This paper deepens the understanding of

International Marketing Review

0265-1335
DOI 10.1108/IMR-05-2022-0113

gamification-based and non-gamification-based organizational culture (OC) influence on innovation capability (Achi *et al.*, 2022), environmental sustainability (Lam *et al.*, 2021) and organizational performance (Lam *et al.*, 2021) through the theory of organizational creativity (Mikalef and Gupta, 2021) and theory of administrative behavior (AB) (Peters, 2021). When considering gamification-based innovation capability, one of the most significant challenges facing corporate innovation and entrepreneurship is getting the entire organization on board with innovation (Wachs and Vedres, 2021).

Previous studies have used various theoretical and practical methods to integrate climate change and technology (Achi *et al.*, 2022; Lam *et al.*, 2021). Furthermore, innovation has served as a foundation for firms to evolve technologically and improve their sustainable business operations (Wachs and Vedres, 2021). The importance of understanding technology, sustainability and creativity from both a theoretical and a practical perspective cannot be overstated (Wachs and Vedres, 2021). Thus, we examine how gamification-based OC impacts international dynamic capability in innovation, environmental sustainability and organizational performance in international marketing using theories of organizational creativity and AB (Ouariachi *et al.*, 2020; Wu *et al.*, 2020).

In relation to gamification-based organizational marketing performance, competencies are defined as the acquired skills and abilities needed to effectively fulfill a task, role or mission (Gimenez-Fernandez *et al.*, 2021; Lam *et al.*, 2021; Morganti *et al.*, 2017). Developing work competencies through work-integrated learning ensures transfer and relevance to the workplace (Pesare *et al.*, 2016). Furthermore, newly acquired skills must also be applied in the workplace in addition to developing competencies. In this regard, motivation is crucial. The best work environments promote feelings of competence, autonomy and relatedness (Ryan and Deci, 2000). Gamification is a recent innovation in employee motivation (Perryer *et al.*, 2016). The purpose is to improve employee engagement and motivation using game design principles and mechanics (Perryer *et al.*, 2016). The disparity between employee and employer information is exacerbated by gamification in enterprise environments. Stress may negatively impact employment relationships for employees forced to adopt such systems (Perryer *et al.*, 2016).

To manage the entire innovation life cycle, all levels of the organization must be involved (Wachs and Vedres, 2021). Besides encouraging entrepreneurial behavior in employees, coordination is also critical at the level of management (Kuratko *et al.*, 2021; Peters, 2021). Innovation requires leadership behaviors and capabilities such as creativity, collaboration, innovation, experimentation, risk-taking and a growth mindset (Gimenez-Fernandez *et al.*, 2021). The development of new methods and tools enables such values and norms to become visible and tangible (Krath *et al.*, 2021; Manzano-León *et al.*, 2021; Primasari, 2022) and is crucial to this happening.

1.1 Gamification and marketing

Marketers need to use innovative strategies to engage customers and drive sales continuously. A customer retained is more profitable and cost-effective than onboarding a new customer (Prentice and Nguyen, 2020). One of the long-term strategies used by marketers is gamification. It is defined as "a process of enhancing a service with affordances for gameful experience to support users' overall value creation" (Huotari and Hamari, 2017, p. 25). Gamification is used for engaging customers in brand value co-creation activities, tourism marketing at domestic and international levels, driving sales for luxury products and experiences and e-marketing activities (Noorbehbahani *et al.*, 2019; Xu *et al.*, 2016). The effectiveness of gamification comes from the multiple inherent sources of fun, competition, interactions, recognition, rewards, sense of belongingness and individual level of customization for every customer (Noorbehbahani *et al.*, 2019). In marketing, the role of

gamification is to make the consumers buy and buy more rather than change behavior. Companies like Nike, McDonald and Bing and artists like Jay-Z have successfully used gamification in their business practices and have gained handsome boost in their revenues, customer engagement and retention (Xu *et al.*, 2016).

1.2 Importance of gamification-based environmental sustainability

Gamification-based environmental sustainability (Negruşa, Toader, Sofică, Tutunea and Rus, 2015) is just beginning to engage consumers in pro-environmental behavior for energy efficiency (Morganti *et al.*, 2017). Despite interest in energy efficiency products and initial attempts, research on their capacity to manage energy has been lacking (Gimenez-Fernandez *et al.*, 2021; Morganti *et al.*, 2017). For instance, a change in purchasing habits may be more beneficial to the environment than recycling and reusing (Ouariachi *et al.*, 2020; Wu *et al.*, 2020).

Thus, it appears that the triple perspectives of innovation capability, environmental sustainability and organizational performance have not yet been examined from the perspective of organizational creativity and AB (Deterding *et al.*, 2011; Marston *et al.*, 2016; Mikalef and Gupta, 2021; Perryer *et al.*, 2016). When considering the theory of organizational creativity, this paper aims to investigate the organizational innovation hypothesis that innovation results from individual efforts and organizational systems that facilitate creativity (Beheshtifar and Kamani-Fard, 2013; Gustavs and Clegg, 2005; Krath *et al.*, 2021).

Creativity is a property of thought that can be acquired and enhanced through instructions and practice (Beheshtifar and Kamani-Fard, 2013; Helzer and Kim, 2019; Shalley *et al.*, 2004). Moreover, it may be argued that creativity in business organizations cannot be viewed in the same way as individual or group creativity at work (Beheshtifar and Kamani-Fard, 2013). The context of an organization, which represents a specific environment, influences creativity in various ways (Beheshtifar and Kamani-Fard, 2013; Helzer and Kim, 2019).

The past studies primarily focused on "environmental sustainability" and excluded social concerns that would be considered sustainable (Sciarelli *et al.*, 2021). Due to their demonstration that the literature points in different directions, it would be pertinent to assess the current state of knowledge concerning the relationship between sustainability innovation and competitiveness among firms (Urbaniec *et al.*, 2021). This relationship can be understood more fully if we understand how sustainability innovation competitiveness is framed in academic and popular literature. Sustainable innovation and competitiveness can be seen from two distinct perspectives. Traditionalists regard sustainability as a cost driver (Urbaniec *et al.*, 2021). Furthermore, entrepreneurial cultures naturally put forth OCs centered on the ability of corporations to leverage innovation to improve their environmental sustainability.

The role of companies in achieving sustainable development has grown increasingly important over the last decade, especially in today's rapidly changing environment (Chang *et al.*, 2017; Dasgupta *et al.*, 2009). Due to fierce competition, firms must continue to improve their competitive edge (Chang *et al.*, 2017). Innovation and research and development (R&D) capabilities are becoming increasingly crucial to high-tech companies (Chang *et al.*, 2017; Dasgupta *et al.*, 2009). Thus, a firm's sustainability is crucial after it pursues technological advancements and innovations (Krath *et al.*, 2021; Lim and Rubasundram, 2018; Miller and Floricel, 2007; Negruşa *et al.*, 2015).

The concept of "organizational marketing performance" on the innovation capability of firms has a direct link with international marketing culture (Chang *et al.*, 2017; Lam *et al.*, 2021). This is identified through knowledge management as it has become widely recognized as a major factor in an organization's success or failure (Jyoti and Rani, 2017). As a marketing

strategy, it can be viewed to manage organizational knowledge assets in a way that facilitates management decision-making, increases competitiveness and increases creative and innovative capacity (Abualoush *et al.*, 2018). An organization that implements a set of specific work practices, e.g. a high-performance work system, is likely to experience higher performance (Lam *et al.*, 2021). A high-performance work practice is defined as a set of human resource (HR) practices that aim to improve employee performance, motivation and opportunities to contribute to an organization's success (Lam *et al.*, 2021).

Similarly, high-performance work systems promote a sound organizational environment where employees feel contended and are willing to go the extra mile to achieve the organization's objectives to improve performance (Flatla *et al.*, 2011; Jyoti and Rani, 2017; Lam *et al.*, 2021). As a result, high-performance work systems increase the value, individuality and unique nature of employees' knowledge and skill, which ultimately leads to competitive advantage and improved marketing performance (Flatla *et al.*, 2011; Jyoti and Rani, 2017; Lam *et al.*, 2021), namely financial performance (Barauskaite and Streimikiene, 2021), employee performance (Oldham and Cummings, 1996) and operational marketing performance (Filsecker and Hickey, 2014; Helzer and Kim, 2019; Kuratko *et al.*, 2021) which led by the OC with organizational marketing performance. The discussion above leads to the first research question as follows:

RQ1. What is OC's effect on firms' innovation capability to improve environmental sustainability and organizational marketing performance?

In the international marketing environment, innovation sources are widely distributed within the economy, which has caused firms to adopt open innovation models rather than closed innovation models. First, if we consider technological capability, gamification improves firms' technological capability to help achieve environmental sustainability in various ways. Gamification involves introducing gaming elements into non-game contexts (Deterding *et al.*, 2011). It has been demonstrated that video games help overcome inertia in health and well-being situations, similar to changing eating habits (Nour *et al.*, 2018) and quitting smoking (Hamari and Lehdonvirta, 2010; Helzer and Kim, 2019). Gamification has become a popular way to motivate employees. It has, therefore, been used to encourage and support changes in attitudes, behaviors and beliefs in a variety of fields, including education, business and healthcare (Dicheva *et al.*, 2015; Georgsdottir and Getz, 2004; Gustavs and Clegg, 2005; Ko *et al.*, 2015; Lee *et al.*, 2013; Mikalef and Gupta, 2021).

Further, the use of gamification has been demonstrated to be effective in enhancing environmental sustainability in a variety of ways. In the early 20th century, neuroscientists were concerned that carbon dioxide emissions might lead to global warming. Due to the actions of deniers, skeptics and economic policies, the warning has not always been taken seriously. According to Ouariachi *et al.* (2020), several gamification methodologies have been demonstrated to encourage pro-environmental behavioral change, provided they are based on intrinsic and extrinsic motivation elements, short and long-term drivers and game attributes that promote engagement. As a result of their strong core drivers and well-balanced extrinsic and intrinsic motivations, SaveOhno and JouleBug have been rated as good practices with the potential to engage users in behavioral change. Ouariachi *et al.* (2020) analyzed 181 climate change or sustainability-related platforms to select 6 gamification platforms. Therefore, this discussion creates the second research question of this study as follows:

RQ2. How can gamification improve firms' technological and environmental innovation capability, leading firms to achieve environment sustainability?

The next section of this paper discusses the theoretical underpinnings used in developing the study's conceptual model.

2. Theoretical underpinning and hypotheses development

This study used the theoretical frameworks of theory of organizational creativity and the theory of AB to create the conceptual framework to investigate the gamification-based OC on innovation capability, environmental sustainability and organizational performance. Climate and technology have thus been integrated with previous studies in various theoretical and practical ways (Marston *et al.*, 2016; Mikalef and Gupta, 2021; Perryer *et al.*, 2016). Additionally, innovation has been a foundation for firms to evolve technologically and to improve their sustainable business processes (Kuratko *et al.*, 2021; Miller and Floricel, 2007). Thus, it is important to understand the technology, sustainability and creativity from a theoretical and practical perspective. Hence, we use theory of organizational creativity (Woodman *et al.*, 1993) and theory of AB (Simon and Latsis, 1976) to understand how gamification-based organizational culture affects innovation capability, environmental sustainability and organizational performance. This section justifies the applicability of these two theories in detailed manner.

2.1 Theory of organizational creativity

Woodman *et al.* (1993) developed the theory of organizational creativity. It is defined by them as "the creation of a new and valuable product, service, idea, procedure or process by individuals working together within a complex social system" (Woodman *et al.*, 1993). Creativity and innovation are distinct concepts (Shalley *et al.*, 2004). Companies are increasingly seeking to nurture creativity as a source of both organizational innovation and competitive advantage (Georgsdottir and Getz, 2004). The idea of creativity has been studied from a variety of angles and is linked to a number of distinctive characteristics and components (Helzer and Kim, 2019). An example of organizational creativity is the development of a valuable, useful product, service, concept, procedure or process by individuals within a complex social system (Helzer and Kim, 2019).

2.2 Effect of organizational culture on the innovation capability of firms to improve organizational marketing performance

The concepts of "organisational marketing performance" on the innovation capability of firms have a direct link with OC (Chang *et al.*, 2017; Lam *et al.*, 2021). Knowledge management has come to be widely recognized as a major factor in an organization's success or failure (Jyoti and Rani, 2017). As a strategy, it can be viewed to manage organizational knowledge assets in a way that facilitates management decision making, increases competitiveness and increases creative and innovative capacity (Abualoush *et al.*, 2018). Knowledge acquisition, knowledge sharing and organizational memory are concerned (Abualoush *et al.*, 2018).

Research in the creativity literature has primarily been conducted through three main streams: individual characteristics, organizational influences (a somewhat limited stream) and the most recent stream which attempts to integrate the two. Additionally, two types of creativity are discussed. In the first place, pure creativity is process-oriented rather than product-oriented. Individual artists who create solely for self-expression are examples of this. An applied creativity or product-oriented creativity is determined by and directly related to the consumer, client or market for its ultimate success. However, despite attempts to define it, researchers have increasingly questioned the relevance of the general literature on creativity to an organizational setting in which context is often neglected, especially within management research, which is relatively underdeveloped (Woodman *et al.*, 1993).

It was identified that, a high-performance work practice refers to a set of HR practices that aims to improve employee ability, motivation and opportunities to contribute to an organization's success (Beheshtifar and Kamani-Fard, 2013; Deterding *et al.*, 2011; Lam *et al.*, 2021). The importance of customer orientation in marketing cannot be overstated. The

objective is to align the value chain with customer needs (Sheth and Parvatiyar, 1995). Since the 1990s, integrated marketing has taken on more of a relationship orientation (Sinha and Van de Ven, 2005). This has resulted in the dominance of objectives such as customer satisfaction and loyalty, as well as the development of long-term customer relationships (Anderson and Sullivan, 1993; Rust and Zahorik, 1993). As a result of this orientation, customer relationship management (CRM) has become increasingly important (Sheth and Parvatiyar, 1995). Marketing performance is characterized by three dimensions in this study as work practices relating to relationship marketing, operational performance in relationship marketing and organizational culture with organizational marketing performance.

An organization that implements a set of specific work practices, e.g. a high-performance work system, is likely to experience higher performance (Lam *et al.*, 2021). Similarly, high-performance work systems promote a sound organizational environment where employees feel contended and are willing to go the extra mile to achieve the organization's objectives in order to improve performance (Flatla *et al.*, 2011; Jyoti and Rani, 2017; Lam *et al.*, 2021). As a result, high-performance work systems increase the value, individuality and inimitable nature of employees' knowledge and skill, which ultimately leads to competitive advantage and improved performance (Flatla *et al.*, 2011; Jyoti and Rani, 2017; Lam *et al.*, 2021), namely financial performance (Barauskaite and Streimikiene, 2021), employee performance (Oldham and Cummings, 1996) and operational performance (Filsecker and Hickey, 2014; Helzer and Kim, 2019; Kuratko *et al.*, 2021) which led by the organizational culture with organizational performance. This leads to the formation of the first hypothesis in this study:

H1. Organizational culture has a positive influence on the technological innovation capabilities.

As discussed above, organizational culture and technological innovation capabilities play a vital role in business context. Through the first hypothesis we investigate the positive influence on the game elements-based organizational work methods toward technological innovation capabilities. To enhance resilience, innovation has been identified as a strategic driver. The capability of business to innovate has been identified as a prerequisite for sustainable economic development (Teece *et al.*, 1997). For the survival, competitiveness and long-term sustainability of enterprises, innovation capability is considered the most valuable and inevitable knowledge-based intangible resource. It is difficult, however, to measure innovation capability. Innovation has resulted in multifaceted constructs (Barauskaite and Streimikiene, 2021). Markets, new products, redesigning, processes and production are all interrelated processes in innovation. A set of potential capabilities and progressive thoughts combine to create successful innovation (Teece *et al.*, 1997). When considering the three concepts of innovation capability, environmental sustainability and organization performance, recently, several eminent scholars have focused their attention on intangible resources that are based on knowledge, such as human potentialities and tangible resources (Teece *et al.*, 1997). In order to navigate organizations in the right direction, it has been necessary to combine the three concepts of innovation capability, environmental sustainability and organizational performance (Teece *et al.*, 1997). By implementing strategies of innovation capability, organizations can achieve greater performance. The paradigm shift is from resource-based competitiveness to knowledge-based competitiveness (Teece *et al.*, 1997). Organizational performance depends primarily on tacit and collective knowledge. Individual and firm knowledge is input to generate products and services, according to innovation capability, environmental sustainability and organizational performance. Therefore, knowledge-driven organizations can generate higher returns than their counterparts and knowledge has been identified as a unique resource (Teece *et al.*, 1997).

This discussion further emphasizes the applicability in marketing, as individuals working together in a complex social system create a valuable, useful new product, service, idea,

procedure or process (Falahat *et al.*, 2018; Teece *et al.*, 1997). Organizational performance is primarily determined by tacit and collective knowledge. As a result of innovation capability, environmental sustainability and organizational performance, individual and firm knowledge contributes to the generation of products and services. Consequently, knowledge-driven organizations can generate higher returns than their counterparts and knowledge is recognized as a unique resource (Teece *et al.*, 1997; Falahat *et al.*, 2018).

2.3 Effect of organizational culture on the environmental capability of firms to improve organizational performance

Various theoretical frameworks and models have been developed to explain and quantify the relationship between industrial development and environmental degradation, including studies regarding OC and environmental performance (Kelle *et al.*, 2011; Marston *et al.*, 2016; Zichermann and Cunningham, 2011). In previous reviews, a common characteristic was that they primarily focused on "environmental capability" and excluded social concerns that would be considered sustainable (Sciarelli *et al.*, 2021).

2.3.1 Dynamic capability theory with focus on international marketing. Dynamic capability refers to a theory of competitive advantage in rapidly changing environments (Marston *et al.*, 2016; Zichermann and Cunningham, 2011). In this study the focus is the international dynamic capabilities which explains strategic processes that integrate, combine and generate new technology and marketing resources, which in turn shape an organization's performance in international marketing (Marston *et al.*, 2016; Sciarelli *et al.*, 2021). Dynamic capability theory helps to develop the international marketing capabilities within the firms in two main ways (Teece *et al.*, 1997; Falahat *et al.*, 2018). First, internal resource-based views are static and are not dynamic (Elia *et al.*, 2021, Falahat *et al.*, 2018). The major challenge for firms today is to adapt to technological advancement and embrace the ongoing industrial revolution, which is primarily digital. Among the most effective strategies to achieve this goal is to engage in digital export, i.e. to use e-commerce to access new international markets. A firm's capabilities have been defined as its ability to deploy resources to achieve a desired end result. According to current research, firms' capabilities are defined as their ability to combine, assemble, integrate and exploit resources in order to achieve a competitive advantage (Teece *et al.*, 1997).

Cross-border electronic commerce and firm performance are positively impacted by dynamic capabilities, rather than fixed resources (Falahat *et al.*, 2018). A firm's capabilities are not limited to its internal resources (Falahat *et al.*, 2018). Based on the diverse ways in which their resources are used, a firm's capabilities are its bundles of skills and knowledge (Falahat *et al.*, 2020; Kim and Lim, 2022). As a result, we applied the concept of international dynamic marketing capability, which illustrates how a firm deliberately integrates, develops and modifies internal and external resources (Kim and Lim, 2022; Jones and Rowley, 2011). Second, international dynamic marketing capabilities are used by small and medium-sized businesses (Taiminen and Karjaluoto, 2015). Since most small companies are run by a single owner, they rely heavily on the entrepreneur's abilities (Taiminen and Karjaluoto, 2015). International dynamic marketing managerial capabilities provide an explanation for a variety of entrepreneurs' abilities (Taiminen and Karjaluoto, 2015). The international dynamic marketing capabilities hence provides a useful theoretical framework for understanding how various capabilities can be converted into small business resources (Falahat *et al.*, 2018).

This explanation is reconciled with previous theories of competitive advantage, showing how it complements and informs explanations based on market positions, firm resources and Schumpeterian creative destruction (Marston *et al.*, 2016; Zichermann and Cunningham, 2011). Therefore, the "adaptive marketing capabilities" and "dynamic capabilities" streams

are converging with resource-advantage (R-A) theory because R-A theory has long emphasized the importance of "renewal" competences/capabilities as "higher order" firm resources (Hunt, 2000; Hunt and Morgan, 1995). The R-A theory suggests that firm competences (i.e. the complex activities that firms excel at) are distinct packages or bundles of basic resources: "the socially complex, interconnected combinations of tangible basic resources (e.g. machinery) and intangible basic resources (e.g. specific policies, procedures and the knowledge and skills of specific employees) that fit coherently together in a synergistic manner" (Hunt, 2000).

Dynamic capabilities enable you to achieve new forms of competitive advantage. Competitive advantage requires an in-depth understanding of the terms dynamic and capabilities (Miller and Floricel, 2007; Negruşa *et al.*, 2015). To gain a competitive edge in the global marketplace, companies need to employ a strong strategy, understand local labor laws, focus on speed to market and utilize partnerships to drive efficiency and innovation (Miller and Floricel, 2007; Negruşa *et al.*, 2015). Several studies have pointed in different directions, and it is necessary to evaluate our understanding of the relationship between sustainability innovation and firm competitiveness (Urbaniec *et al.*, 2021). The first step is to understand how sustainability innovation competitiveness is defined in academic and popular literature. Sustainability innovation competitiveness can be viewed from two perspectives. Traditionally, sustainability advances have been viewed as cost drivers (Urbaniec *et al.*, 2021). As a result, corporate cultures are focusing on innovation to enhance environmental sustainability (Krath *et al.*, 2021; Lim and Rubasundram, 2018; Miller and Floricel, 2007; Negruşa *et al.*, 2015).

Within the last decade, the role of companies in achieving sustainable development has increased, especially in today's rapidly changing environment (Chang *et al.*, 2017; Dasgupta *et al.*, 2009). During the marketing planning process, the target customers are narrowed down to those who are most likely to purchase. As a result, the company can use its limited marketing resources to reach out to these prime customer targets and not waste resources trying to sell to customers who are not in need of the product (Chang *et al.*, 2017). Firms must continuously improve their ability to develop and maintain a competitive advantage in an increasingly competitive environment (Chang *et al.*, 2017). High-tech businesses are increasingly relying on sustainable R&D and innovation capabilities (Chang *et al.*, 2017; Dasgupta *et al.*, 2009). Following technological advancements and innovations, a company's sustainability is crucial (Krath *et al.*, 2021; Lim and Rubasundram, 2018; Miller and Floricel, 2007; Negruşa *et al.*, 2015). This leads to the formation of the second hypothesis in this study:

H2. Organizational culture has a positive impact on environmental innovation capabilities.

As discussed above, organizational culture and environmental innovation capabilities play a vital role in business context. Through the second hypothesis we investigate the positive influence on the organizational culture and environmental innovation capabilities.

2.4 Effect of technological innovation capabilities on environmental sustainability

A number of arguments have been presented regarding the role knowledge creation plays in a company's competitive advantage (Arsawan *et al.*, 2020; Sciarelli *et al.*, 2021). The knowledge-based view of competitive advantage was first formulated by Penrose, who proposed that a company's success is based on an interaction between productive services and knowledge creation (Lee *et al.*, 2013; Negruşa *et al.*, 2015; Sciarelli *et al.*, 2021). As a result of the consumption of goods and services, resources are extracted, greenhouse gases are released and other environmental impacts are being made that are already impacting the climate of Earth (Negruşa *et al.*, 2015). There has been development in the field of persuasive

technology of information and communication technology (ICT) applications that have been designed to persuade consumers to change their behavior in a "green" direction in order to transition to sustainable consumption patterns (Lee *et al.*, 2013).

Technology innovation plays a vital role in sustainable development (Cancino del Castillo *et al.*, 2018). Different scholars have different opinions on what technology innovation. According to some scholars, a company's sustainable competitive advantage stems from its resources (Wernerfelt, 1984; Xu *et al.*, 2020) hence, companies cannot replicate scarce resources associated with the creation of R&D activities (Bakar and Ahmad, 2010; Mustafa *et al.*, 2019). Innovation is seen as a critical tool for simultaneously attaining economic growth, environmental protection and social development, and it is the most efficient method to use resources (Hermundsdottir and Aspelund, 2021; Klewitz and Hansen, 2014). As a result, they believe that investing in innovation can easily result in major financial constraints (Wu and Mei, 2022), inhibiting rather than enhancing company performance (Wang *et al.*, 2022). This leads to the formation of the third hypothesis in this study:

H3. Technological innovation capabilities have a positive impact on environmental sustainability.

As discussed above, technological innovation capabilities and environmental sustainability play a vital role in business context. Through the third hypothesis, we investigate the positive influence on the technological innovation capabilities and environmental sustainability.

2.5 Theory of administrative behavior

By presenting the manager as an administrative man using decision premises, Simon and Latsis (1976) introduced the theory of AB of the Fir. Decision premises explain how the organization can be understood by its decision process; decision premises influence behavior (Ngugi and Kilika, 2018; Boateng, 2009, 2020; Greenfield, 2013); behavior can also modify decision premises; a company's decision premises can be influenced by its structures or objectives, resulting in decisions that are aligned with the organization's goals (Ngugi and Kilika, 2018; Boateng, 2009, 2020; Greenfield, 2013).

AB is a broad term that refers to how people in organizations relate to one another (Peters, 2021). This research seeks to provide some insights into the relationship between AB and mediated control. In the process, the study intends to draw conclusions, however tentative and incipient they may seem, about the influence of international marketing perspectives based on international dynamic capability, environmental sustainability and organizational marketing performance in gamification and non-gamification-based organizational culture (Ngugi and Kilika, 2018; Boateng, 2009, 2020; Greenfield, 2013).

The theory of administrative conduct is based on two fundamental notions, both of which are credited to Simon. The first is the notion of limited rationality (Simon and Latsis, 1976). Bounded rationality acknowledges the cognitive limitations of decision-makers (Simon and Latsis, 1976). The theory of AB provides a far superior explanation for doing a detailed analysis and discussion against the background of this study's objectives (Ngugi and Kilika, 2018; Boateng, 2009, 2020; Greenfield, 2013). In addition to exploring mediated control in collaborative engagements and manifestations of control in administrative endeavors, these objectives are also stated elsewhere as Simon argues in models of My Life that most people are only partially rational and that the rest of their behavior is irrational and emotional (Simon and Latsis, 1976). Further, he outlines a variety of dimensions in which traditional models of rationality may be made more realistic while remaining true to their formalization principles (Kuratko *et al.*, 2021; Simon and Latsis, 1976). Specifically, structuration and institutional theories have the potential to shed light on routines and norms of sanction against both organizational and individual actions over a specified period, particularly in

regards to international dynamic capability, environmental sustainability and organizational marketing performance under gamification and non-gamification-based OCs.

2.6 Effect of environmental innovation capabilities and environmental sustainability

Product and service consumption contributes to the exploitation of resources, greenhouse gas emissions and other environmental impacts that adversely affect Earth's climate (Negruşa *et al.*, 2015). It is crucial to make ICT applications which encourage customers to change their behavior in a "green" manner as part of the transition to sustainable consumption patterns (Lee *et al.*, 2013). Despite an increasing interest in energy-efficient behavior and some preliminary attempts (Deterding *et al.*, 2011; Gimenez-Fernandez *et al.*, 2021; Lam *et al.*, 2021; Mikalef and Gupta, 2021), the potential to engage consumers is still untapped. As an example, social sciences in energy efficiency are concerned with addressing the individual in order to mitigate climate change, minimize energy costs and enhance system reliability (Armenakis and Bedeian, 1999; Barauskaite and Streimikiene, 2021; Chen and Paulraj, 2004). We consider the potential moderating and indirect effects of environmental management systems (EMS) by taking a firm-level approach to environmental innovation and taking into account both the firm's environmental capabilities as well as the benefits derived from the combination of the firm's different environmental practices (Deterding *et al.*, 2011; Guide and Ketokivi, 2015). Specifically, the paper examines the complementarity between EMS and environmental innovation capabilities, as well as the impact of this correlation on firm performance (Bakar and Ahmad, 2010; Cancino del Castillo *et al.*, 2018; Cunningham *et al.*, 2018).

Environmental researchers have examined the relationship between EMSs and corporate success as well as EMSs and environmental performance extensively over the previous decade (Amores-Salvadó *et al.*, 2015). Despite this, the findings of this research provide inconclusive evidence, leaving open the questions of whether EMSs help or hinder business performance, or whether they improve environmental performance or, conversely, hinder firms' ability to innovate (Amores-Salvadó *et al.*, 2015; Cronbach, 1951; Cunningham *et al.*, 2018). This leads to the formation of the fourth hypothesis in this study:

H4. Environmental innovation capabilities have a positive impact on environmental sustainability.

As discussed above, environmental innovation capabilities and environmental sustainability play a vital role in business context. Through the fourth hypothesis, we investigate the positive influence on the environmental innovation capabilities and environmental sustainability.

2.7 Effect of environmental sustainability and organizational marketing performance

Corporations can reduce their environmental impact by employing environmental policies such as cleaner manufacturing processes (Lam *et al.*, 2021). The UN Development Program developed the Cleaner Production (CP) program as a basic instrument for building a preventative program that was adopted in a number of developing nations (Severo *et al.*, 2015). In fact, the Cleaner Production International Center, which is made up of more than 20 centers from across the world, uses the program (Lim and Rubasundram, 2018; Severo *et al.*, 2015). According to Deshpande and Webster (1989) OC is defined as "the pattern of shared values or beliefs that all individuals come to understand organizational behavior and that thus provide individual with a set of norms for behavior in the organization." There has been debate between organizational culture and technological innovation capabilities; however, mixed results have been reported, which include positive, negative, significant and insignificant findings (Chang *et al.*, 2017; Cunningham *et al.*, 2018; Lam *et al.*, 2021).

On the one hand, the present study aims to examine the relationship between organizational culture and technological innovation capabilities (Lam *et al.*, 2021). Firms have, nevertheless, increasingly adopted technological techniques and focused on innovative operations as a result of globalization (Lam *et al.*, 2021). According to recent studies, innovation is the best option for businesses seeking to thrive in volatile market conditions over the long run (Aboramadan *et al.*, 2020; Arsawan *et al.*, 2020). It has been proposed that a range of various sorts of innovation, such as eco-innovation, social innovation, product innovation and marketing innovation, can have an impact on a company's performance (Aboramadan *et al.*, 2020; Arsawan *et al.*, 2020). This leads to the formation of the sixth hypothesis in this study: This leads to the formation of the fifth hypothesis in this study:

H5. Environmental sustainability has a positive impact on organizational marketing performance.

As discussed above, environmental sustainability and organizational marketing performance play a vital role in business context. Through the fifth hypothesis, we investigate the positive influence on the environmental sustainability and organizational performance.

2.8 Gamification has a moderating effect on the relationship between organizational culture and technological innovation capabilities

Gamification is a technology that can affect a wide range of industries, including retail, media, consumer goods and healthcare (Dicheva *et al.*, 2015; Johns and Shaw, 2006; Lee *et al.*, 2013). There is a lack of general understanding of gamification, whether the intended results can be achieved and how they can be achieved (Dicheva *et al.*, 2015; Johns and Shaw, 2006; Lee *et al.*, 2013). To accumulate knowledge in research, a solid theoretical and methodological foundation must be established (Gustavs and Clegg, 2005; Manzano-León *et al.*, 2021; Morganti *et al.*, 2017). The technological innovation capabilities have affected several gamification elements by considering International dynamic marketing with the organization as organizational marketing performance outcomes including performance evaluation at companies (Gustavs and Clegg, 2005; Manzano-León *et al.*, 2021; Morganti *et al.*, 2017). Performance evaluation is an essential component of performance management. This is the point at which performance evaluation and feedback should be implemented (Georgsdottir and Getz, 2004; Kafai and Burke, 2015; McCosh *et al.*, 1998; Negruşa *et al.*, 2015). More and more firms are evaluating performance more frequently than once a year. For example, Hunter and Werbach (2012), who are believers in the benefits of gamification to businesses, assert that gamification needs to be considered in practice (Deterding *et al.*, 2011; Georgsdottir and Getz, 2004; Krath *et al.*, 2021; Lee *et al.*, 2013).

Gamification consists of two elements: mechanics and dynamics (Krath *et al.*, 2021; McCosh *et al.*, 1998; Miller and Floricel, 2007). In gamification, an example of international dynamic capabilities is the implementation of a mechanism that responds appropriately to the inputs of the player based on anticipated player interactions. Recently, gamification has been widely promoted as a method of integrating technology into a variety of fields, including education, health and organizational development (Dicheva *et al.*, 2015; Johns and Shaw, 2006; Papa *et al.*, 2021). Considering the next step, the implementation methods such as how to direct new entrants to the system and the role of social involvement in the design should all be considered (Cunningham *et al.*, 2018; Dicheva *et al.*, 2015; Gustavs and Clegg, 2005).

Please refer Table 1 for classification process of gaming systems.

Gamification of business websites enhances their playfulness and enjoyment by motivating users to use serious applications (Flatla *et al.*, 2011). It is important to consider the elements of gamification and gamification characteristics when studying gamification (Flatla *et al.*, 2011; Krath *et al.*, 2021; Manzano-León *et al.*, 2021). The elements of gamification

Level	Definitions	Applicable gaming element
Design patterns for game interfaces	Interaction design components and design solutions that are common and successful for a given context, including examples of prototype implementations	Game levels, badges and leader boards
Patterns and mechanics of game design	Playability components that recur frequently in a game's design	Limited resources, time constraints, turns in levels
Principles of game design	Guidelines for evaluating platform design	The consistency of games, the clarity in objectives and the variety of game styles
Gameplay models	Models of game components or experiences	A game's mechanics, dynamics and esthetics, challenge, fantasy and curiosity
Methods of game strategy	Practices and processes specific to game design	Designing games based on play testing, play centricity and value awareness

Table 1.
The classification process of gaming systems

Note(s): Author's Own Compilation
Source(s): Cunningham *et al.* (2018), Dicheva *et al.* (2015), Gustavs and Clegg (2005), Kelle *et al.* (2011) and Lim and Rubasundram (2018)

include the game, the product, the security, the process and the information (Miller and Floricel, 2007; Morganti *et al.*, 2017). Design, visibility, usefulness, theories (mechanics) and aims are all hallmarks of gamification (goals). In a non-game context, games are gamified to simulate its interactive features and key game play (Filsecker and Hickey, 2014). There are more than just points and badges associated with gamification, since companies use it as a means to learn how to play better and to achieve their business goals (Deterding *et al.*, 2011). Despite significant investments in improving their websites, some banks fail to meet their customers' and business goals (Ko *et al.*, 2015). There are several other factors that contribute to website failures, including poor interface design (Artara and Huseynlib, 2017; Cunningham *et al.*, 2018; Georgsdottir and Getz, 2004), insufficient website availability and dissatisfied customers (Dicheva *et al.*, 2015; Flatla *et al.*, 2011).

Gamification may also be applied to organizational marketing performance through websites, online communities, learning management systems or business intranets to increase the participation of customers (Gimenez-Fernandez *et al.*, 2021; Gustavs and Clegg, 2005). Using gamification strategically can improve business results in a variety of ways, including improving the adoption and adoption of learning management tools, improving employee retention and productivity, improving employee knowledge sharing to improve service levels and improving call center employee performance and satisfaction (Armenakis and Bedeian, 1999; Artara and Huseynlib, 2017; Beheshtifar and Kamani-Fard, 2013). This leads to the formation of the first section of the sixth hypothesis in this study:

H6a. Gamification has a moderating effect on the relationship between organizational marketing culture and technological innovation capabilities.

Through the sixth hypothesis, we investigate the moderating effect of organizational marketing culture on technological innovation capabilities.

2.9 Gamification has a moderating effect on the relationship between international dynamic capabilities within the organizational marketing culture and environmental innovation capabilities

According to scholars, cultural differences are particularly influential in e-word of mouth (eWOM) contexts; they have found that cultural differences explain product evaluations, online

rating submissions (extreme and moderate ratings), as well as movie sales (review variance and average rating) in Asian and Western countries (Mariani *et al.*, 2020; Papa *et al.*, 2021). Additionally, consumers from different cultures have different thinking styles, information seeking behaviors (Filieri and Mariani, 2021; Mariani *et al.*, 2020) and search for different types of information, which may affect the way they process, evaluate and use information. Scholars have recommended further analysis of the role of cultural factors in evaluating the helpfulness of reviews, however, there are currently no studies investigating this issue in the literature.

International dynamic capabilities within the organizational marketing culture deliberates learning activities to determine whether they have achieved their operational objectives and, ultimately, whether those objectives are aligned with organizational objectives (Deterding *et al.*, 2011; Gimenez-Fernandez *et al.*, 2021). Further, international dynamic **capabilities within the organizational** marketing **culture** have gained a lot of attention to the negative effects of computer games but also to their positive effects (Deterding *et al.*, 2011; Gimenez-Fernandez *et al.*, 2021; Lam *et al.*, 2021; Mikalef and Gupta, 2021). When considering the **environmental innovation capabilities based on dynamic capabilities within the organizational** marketing **culture, s**ince the 1960s, the field of "applied gaming" has developed for serious reasons (serious games and gamification) (Helzer and Kim, 2019; Manzano-León *et al.*, 2021; Ouariachi *et al.*, 2020). The appealing and useful new method of educating and empowering that imparts knowledge in an engaging and motivating way to a new generation has led to optimism that digital games can be an appealing and useful new method of educating and empowering that imparts knowledge in an engaging and motivating way to a new generation (Beheshtifar and Kamani-Fard, 2013; Benito-Santos *et al.*, 2021; Helzer and Kim, 2019; Lam *et al.*, 2021).

By using goods and services consumers are extracting resources, emitting greenhouse gases, and creating other impacts on the environment which are already negatively affecting the climate of our planet (Negruşa *et al.*, 2015). To transition to sustainable consumption patterns, ICT applications that encourage consumers to change their behavior in a "green" manner are required (Lee *et al.*, 2013). In order to combat current environmental problems, environmentally friendly technologies are required (Hervas-Oliver *et al.*, 2018; Son *et al.*, 2018).

It is critical to build ICT applications that can encourage customers to shift their behavior in a "green" direction as part of the transition to sustainable consumption patterns (Hervas-Oliver *et al.*, 2018; Son *et al.*, 2018). Many scholars believe that an enterprise's growth may be hindered by the inability to address the challenges arising from changes in the external environment (Aboramadan *et al.*, 2020; Chang *et al.*, 2017; Lam *et al.*, 2021). International dynamic innovation capabilities, however, can help enterprises gain competitiveness in uncertain environments (Aboramadan *et al.*, 2020; Chang *et al.*, 2017; Deshpande and Webster, 1989; Lam *et al.*, 2021). These capabilities enable firms to develop, integrate and reconfigure resources and operational capabilities (Aboramadan *et al.*, 2020; Chang *et al.*, 2017; Deshpande and Webster, 1989; Lam *et al.*, 2021). This leads to the formation of the second section of the sixth hypothesis in this study:

H6b. Gamification has a moderating effect on the relationship between organizational marketing culture and environmental innovation capabilities.

As discussed above, through the sixth hypothesis, we investigate the moderating effect on the relationship between OC and environmental innovation capabilities. Due to the current call for papers in gamified based research, the triple perspectives of innovation capability, environmental sustainability and organizational performance have yet to be investigated from the perspective of the theory of organizational creativity and theory of organizational behavior (Deterding *et al.*, 2011; Marston *et al.*, 2016; Mikalef and Gupta, 2021; Perryer *et al.*, 2016). This leads to development of the study conceptual framework as follows. Please refer Figure 1.

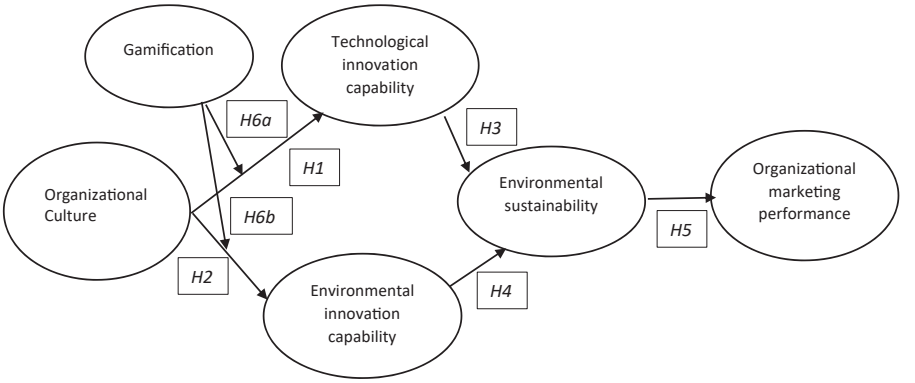

Figure 1.
Conceptual framework

Note(s): Author's Own Compilation

3. Research design

In order to test the relationships proposed in the conceptual model, we collected primary data through a structured survey. The questionnaire was discussed with academicians and industry professionals who have a formal degree or relevant experience in research. We also invited international marketing experts and consultants to participate in validating the content and context of the questionnaire. As per their suggestions, we further pilot tested the questionnaire with ISO 14091 certified firms spread across the world. A sample of 45 firm-level data from their marketing and technology experts were collected in the pilot survey. In order to take the overall view of the firm, the questionnaire was filled by both the respondents and their average score was considered against each firm. Based on the feedback received from the experts and the preliminary test results of the pilot survey, the final questionnaire was developed. Also, some of the items were modified slightly to understand the sub dimensions of the constructs clearly in the context of the study. The final data were collected from 384 firms that abide by the ISO 14091 certifications to ensure quality and standardization of the responses received from firms.

3.1 Instrument design and the operationalization of our constructs

We designed the initial questionnaire by borrowing items from established scales. We collected the data for each measurement item using a five-point Likert scale ranging from 1 = "Strongly Disagree" to 5 = "Strongly Agree." We gauged the study's constructs using subjective measures, in line with the practice found across the organization and information literature (Behl *et al.*, 2021, 2022; Pereira *et al.*, 2022). Organization culture is measured using the modified scale of Glaser *et al.* (1987). The modifications are made in the context of international marketing and global firms. Technological innovation capability also has established scales that measures attributes like product innovation, process innovation, R&D cooperation and investment made on it and research resource. It is measured using Weerawardena (2003) scale and it is modified for the current study. The scale for environment innovation capability was modified from Jaworski and Kohli (1993). We also ran exploratory factor analysis (EFA) to finalize the scale wherever required. Environmental sustainability is measured using Severo *et al.* (2015), while organizational marketing performance is captured using Vorhies and Morgan (2003) scale that captures marketing effectiveness and marketing efficiency. Lastly, we captured gamification using Eppmann *et al.* (2018).

3.2 Data collection

Primary cross sectional data are collected from firms from their marketing and technology department. As the study revolves around the concept of gamification, marketing and sustainability, we briefed the respondents by showing them a series of videos to make them understand the background of the study. The authors also tested their understanding of the same by asking them to answer some questions so that the contextual background of the study is set right. The data are collected in two rounds. The first round was collected in October 2021 where a total of 1,783 firms were approached of which only 189 firms responded with complete information. The completeness of the information was decided upon by the similarity and synchronized responses received from the marketing and the technology experts of the firms. In order to increase the sample size, we again contacted the remaining pool of firms to again participate in the survey in January 2022 and we received additional responses to reach a total of 384 responses. For all the firms where more than one person filled the form from either of the two departments, we took average of the responses of the department to develop the final questionnaire. In order to validate the responses, we also used one-time password and captcha that were sent to their official email IDs only. We performed wave analysis suggested by Armstrong and Overton (1977) to understand if there is any difference between the responses received in the first and the second wave of the responses. We picked up 35 responses from each of the 2 waves and performed a *t*-test. The results of the *t*-test confirmed that there is no significant difference between the two waves which confirmed that the study does not suffer from a non-responses bias. The profile of the respondents can be referred to from Table 2:

4. Results and discussion

4.1 Measurement model

To determine the reliability, validity and unidimensionality of data, we used a three-stage approach (Chen and Paulraj, 2004). To determine the reliability of these constructs,

Factor	Classification	Respondent count
Gender	Male	156
	Female	228
Years of experience	Less than 5 years	28
	5–10 years	115
	10–15 years	73
	15–20 years	46
	20–25 years	63
	25–30 years	31
	More than 30 years	28
Education qualification	Undergraduate degree	37
	Post graduate degree	289
	PhD	19
	Professional degree	39
Age of the firm	Less than 10 years	85
	10–20 years	48
	20–30 years	114
	30–40 years	58
	40–50 years	34
	50–60 years	27
	More than 60 years	18

Note(s): Author's own compilation

Table 2. Respondent demographic characteristics

Cronbach's alpha was greater than 0.7 (Cronbach, 1951). We calculated construct validity using EFA (Chen and Paulraj, 2004). Principal component analysis (PCA) and varimax rotation are used in this EFA. To ensure unidimensionality and construct validity, a confirmatory factor analysis was conducted. Each construct must also have three components. We calculated factor loadings and found that they were greater than 0.5, indicating convergent validity. The following Table 3 illustrates this.

In Shiu *et al.* (2011), the square root of AVE should be greater than its correlation with other constructs. Therefore, the square root of AVE was greater than its correlation with other constructs (see Table 4). Cronbach's alpha was calculated to assess reliability. The composite reliability (0.814) and individual construct reliability (0.7) are greater than threshold values (Shiu *et al.*, 2011). In terms of the Variance Inflation Factor (VIF), this was confirmed by values (4.112) below 5 (threshold value).

In addition to this, studies suggest the ideal VIF should be less than three. However, any value below five is considered acceptable. According to the results of our analysis, we calculated the average path coefficient (APC) and average R square, which are important indicators of good fit for the data, and this was not a problem. Table 5 summarizes the parameters of model fit and quality indices.

Table 3.
Convergent validity of constructs

Item	Factor loading	Variance	Error	AVE	SCR
OC 1	0.82	0.6724	0.3276		
OC 2	0.81	0.6561	0.3439		
OC 3	0.79	0.6241	0.3759		
OC 4	0.86	0.7396	0.2604		
OC 5	0.84	0.7056	0.2944	0.67956	0.913752
EIC 1	0.78	0.6084	0.3916		
EIC 2	0.75	0.5625	0.4375		
EIC 3	0.83	0.6889	0.3111		
EIC 4	0.88	0.7744	0.2256		
EIC 5	0.79	0.6241	0.3759		
EIC 6	0.8	0.64	0.36	0.649717	0.917355
TIC 1	0.81	0.6561	0.3439		
TIC 2	0.83	0.6889	0.3111		
TIC 3	0.84	0.7056	0.2944		
TIC 4	0.77	0.5929	0.4071		
TIC 5	0.78	0.6084	0.3916		
TIC 6	0.84	0.7056	0.2944		
TIC 7	0.8	0.64	0.36	0.656786	0.930466
OMC 1	0.81	0.6561	0.3439		
OMC 2	0.81	0.6561	0.3439		
OMC 3	0.85	0.7225	0.2775		
OMC 4	0.77	0.5929	0.4071	0.65352	0.930211
OP 1	0.79	0.6241	0.3759		
OP 2	0.78	0.6084	0.3916		
OP 3	0.82	0.6724	0.3276		
OP 4	0.84	0.7056	0.2944		
OP 5	0.85	0.7225	0.2775	0.6666	0.908074
GAM 1	0.82	0.6724	0.3276		
GAM 2	0.81	0.6561	0.3439		
GAM 3	0.83	0.6889	0.3111	0.6346	0.9103
GAM 4	0.82	0.6724	0.3276		
GAM 5	0.75	0.5625	0.4375	0.65046	0.902844

Note(s): Author's own compilation

Shiu *et al.* (2011) suggest that the next step is to examine the data for endogeneity. Our study calculated a non-linear bivariate causality direction ratio (NLBCDR), Sympson's paradox ratio (SPR), R^2 contribution ratio and statistical suppression ratio (SSR). Thus, all four indices were greater than 0.70. Based on the primary data, we conducted a battery of common method bias (CMB) tests. According to Podsakoff *et al.* (2003) self-reported data are also subject to biases such as social desirability and CMBs should be reported. Multiple scales were used in the design of our instrument to minimize the effects of each type of construct. Podsakoff *et al.* (2003) performed a conservative version of Harman's one-factor test to verify that the data were not affected by CMB. Table 6 provides a causality assessment index.

Most empirical studies lose causality while testing hypotheses, according to studies. Our study tests for causality using Guide and Ketokivi (2015) seminal paper. Relationships are unidirectional. To test causality, we used the Durban–Wu–Hausmann test, as per Davidson and MacKinnon (1993). There are no significant residuals, which confirm that the constructs and their relationships are as described in the theoretical model. When causality, endogeneity and CMB are present, the data are ready for analysis.

	OC	TIC	EIC	ES	OP	GAM
OMC	0.74					
TIC	0.44	0.72				
EIC	0.35	0.33	0.68			
ES	0.33	0.38	0.49	0.69		
OP	0.21	0.25	0.38	0.35	0.73	
GAM	0.29	0.06	0.31	0.29	0.38	0.67

Note(s): Author's own compilation
OMC = organisational marketing performance; OC = organisational culture; TIC = technological innovation capability; EIC = environmental innovation capability; ES = environmental sustainability; OP = organisational performance and GAM = gamification

Table 4. Correlation values among constructs (measures for discriminant validity)

Indicators of model fit and quality	Values
Average path coefficient (APC)	0.332 ($p < 0.001$)
Average R^2	0.778 ($p < 0.001$)
Average block VIF	3.55 (Acceptable if value ≤ 5)
Tenenhaus GoF	0.463 (Large if value ≥ 0.36)

Note(s): Author's own compilation

Table 5. Indicators of model fit and quality

Indices for assessing causality	Values
Sympson's paradox ratio (SPR)	0.773 (Acceptable if ≥ 0.7)
R^2 contribution ratio	0.912 (Acceptable if ≥ 0.9)
Statistical suppression ratio (SSR)	0.777 (Acceptable if ≥ 0.7)
Non-linear bivariate causality direction ratio (NLBCDR)	0.782 (Acceptable if ≥ 0.7)

Note(s): Author's own compilation

Table 6. Indices for assessing causality

4.2 Results of hypotheses testing

We performed the analysis using covariance based structured equation model using SEMinR package using *R* language. In order to validate the results, we further used the lavaan package in *R* so that the results are in sync with each other. While it is often debated to use one of the two packages by different researchers, we have used them both to add additional confirmation of the results (Cadogan and Lee, 2022). Table 7 presents the bootstrapping results used in the structural model. We also adopted the bootstrap analysis and the results before and after the analysis are listed below.

For H1, H2, H3, H4, H5, H6a and H6b, we recorded the associated characteristics and their significant levels. The links proposed in H1, H2, H3, H4, H5, H6a and H6b. Figure 2 depicts the strength of their correlations as well as their levels of significance. The moderating effect of "gamification," as proposed in H6a and H6b, was next tested. Gamification's moderation effect is tested to see if it has a positive effect on the relationship between "organisational culture" and "environmental innovation capacity," but the results show that it has no effect on the relationship between "organisational culture" and "technological innovation capacity."

We also computed the model's explanatory power (using R^2) based on the explained variance of endogenous constructs, and found that it is 0.66 for TIC, 0.74 for EIC, 0.77 for ES and 0.87 for OP. The effect size was then calculated using Cohen's f2 formula (Cohen, 1992). According to Cohen's (1992) standards, all of the values are greater than 0.35 and thus large. We used Stone–Q2 Geisser's for endogenous constructs to test the model's prediction abilities as a final step in the investigation. The algorithm recorded Q2 as 0.82, indicating good

Table 7.
Results of hypothesis testing

Hypothesis	Paths	Coefficient	*p* values	Test results
H1	OC → TIC	0.67	0.000	Supported
H2	OC → EIC	0.55	0.000	Supported
H3	TIC → ES	0.46	0.000	Supported
H4	EIC → ES	0.37	0.000	Supported
H5	ES → OP	0.48	0.000	Supported
H6a	OC × GAM → TIC	0.13	0.462	Not Supported
H6b	OC × GAM → EIC	0.38	0.000	Supported

Note(s): Author's own compilation

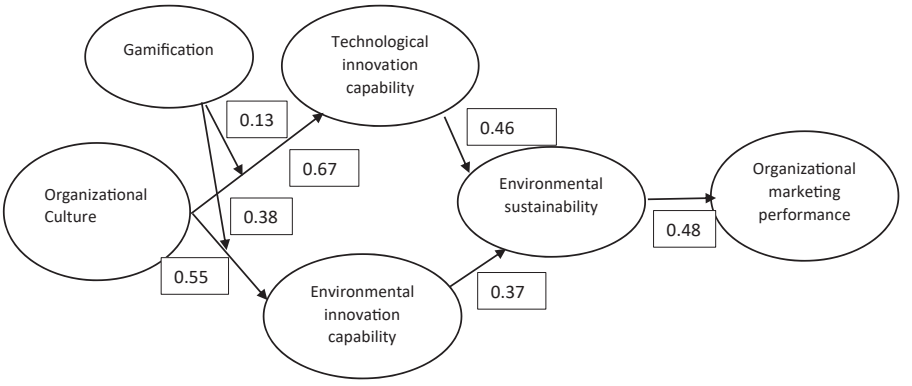

Figure 2.
Results of hypothesis testing

Note(s): Author's Own Compilation

predictive significance. The next section of the paper discusses all the results and their implications concerning the proposed objectives.

5. Discussion of the findings

This section will discuss the findings of each hypothesis.

5.1 Organizational culture has a positive influence on the technological innovation capabilities

When considering the results supporting or extending the dynamic capabilities theory to international marketing context, first hypothesis denotes that organizational culture has a positive influence on the technological innovation capabilities (H1). However, organizational marketing culture deems to have a strong coefficient with innovation capabilities under a beta value of 0.67. Therefore, the dynamic capability within the organizational culture is identified as crucial for the organizations today which operates in a business environment characterized by rapid technological advances, competitive international markets and constantly changing customer preferences (Aboramadan *et al.*, 2020). This extends the concept of dynamic capabilities that comprises three main elements: adhocracy, clan and market cultures (Abualoush *et al.*, 2018; Arsawan *et al.*, 2020). These elements are considered a cornerstone for engagement.

Global marketing strategy literature has included gamification-based support for dynamic capabilities, as well as research on the relationship between culture and performance of organizations (Aboramadan *et al.*, 2020; Arsawan *et al.*, 2020; Chang *et al.*, 2017; Lam *et al.*, 2021). Gamification consists of multiple building blocks (based on dynamic capabilities framework) designed to create a gamified environment that is engaging (Arsawan *et al.*, 2020). These building blocks should not be implemented separately. The purpose of gamification is to create an integrated engaging experience that utilizes various gaming elements to serve a specific purpose (Zichermann and Cunningham, 2011). It has been demonstrated in several previous studies that the relationship between marketing performance and culture exists (Aboramadan *et al.*, 2020; Abualoush *et al.*, 2018; Arsawan *et al.*, 2020; Deterding *et al.*, 2011; Hamari and Lehdonvirta, 2010; Henseler *et al.*, 2014; Kelle *et al.*, 2011). In addition, Kim *et al.* (2019) found a positive correlation between adhocracy, clan and market cultures.

5.2 Organizational marketing culture has a positive impact on environmental innovation capabilities

Second hypothesis denotes that organizational marketing culture has a positive impact on environmental innovation capabilities (H2) with 0.55 beta value. Innovative organizations have been shown to be more flexible and to be able to respond to changes quickly, to capitalize on business opportunities (Aboramadan *et al.*, 2020; Dicheva *et al.*, 2015; Helzer and Kim, 2019). The organizations' performance and success are a key tool in adapting to a rapidly changing environment (Aboramadan *et al.*, 2020; Dicheva *et al.*, 2015; Helzer and Kim, 2019). Research has demonstrated the positive effect of environmental strategy on environmental performance (Geffen and Rothenberg, 2000; Seuring and Müller, 2008) and the positive effect of environmental performance on firm performance (Hong *et al.*, 2009; Mardani *et al.*, 2020). It is advised that firms implement an environmental strategy by developing internal resources that possess unique characteristics of natural resources, such as usefulness, rarity, difficulty to duplicate and non-substitution and their performance is improved as a result of using these resources (Bae and Grant, 2018; Mardani *et al.*, 2020). The exchange theory can be used to explain the relationship between environmental strategy and environmental performance

(Bae and Grant, 2018). Through the exchange of internal and external information and resources among supply chain partners, information and resources become more readily accessible, resulting in improved performance (Bae and Grant, 2018).

5.3 Organizational marketing culture has a positive impact on environmental innovation capabilities

With a beta value of 0.46, the third hypothesis states that technological innovation capabilities have a beneficial impact on environmental sustainability. With a beta value of 0.66, environmental sustainability appears to have a substantial correlation with technological innovation skills. It has been determined that ICT applications are available to aid users in making the necessary transition to sustainable consumption. Eco-feedback technologies and Persuasive Sustainability Systems (PSSs), also known as Persuasive Technologies in the field of sustainability (Artara and Huseynlib, 2017; Dicheva *et al.*, 2015; Gimenez-Fernandez *et al.*, 2021; Negruşa *et al.*, 2015; Ouariachi *et al.*, 2020; Perryer *et al.*, 2016), are two examples of Pers Traditionally, eco-feedback technologies have primarily focused on raising sustainability awareness and providing information on measurable aspects, whereas PSS technologies go beyond this and suggest predefined actions for achieving a rational goal (Artara and Huseynlib, 2017; Dicheva *et al.*, 2015; Gimenez-Fernandez *et al.*, 2021; Negruşa *et al.*, 2015; Ouariachi *et al.*, 2020; Perryer *et al.*, 2016).

5.4 Environmental innovation capabilities have a positive impact on environmental sustainability

With a beta value of 0.37, the fourth hypothesis indicates that environmental innovation capabilities have a positive impact on environmental sustainability. In recent years, ICT applications have been developed to assist users in achieving this imperative transition toward sustainable consumption. In particular, eco-feedback technologies and PSSs, a type of persuasive technology in the field of sustainability, are intended to encourage users to adopt sustainable practices (Dicheva *et al.*, 2015; Gimenez-Fernandez *et al.*, 2021; Negruşa *et al.*, 2015; Ouariachi *et al.*, 2020; Perryer *et al.*, 2016). Eco-feedback technologies have conventionally focused on raising awareness of sustainability and providing information on particular object, whereas PSS technologies go beyond this and suggest predefined actions for achieving a sensible goal (Artara and Huseynlib, 2017; Dicheva *et al.*, 2015; Gimenez-Fernandez *et al.*, 2021; Negruşa *et al.*, 2015; Ouariachi *et al.*, 2020; Perryer *et al.*, 2016). Furthermore, this research backs up its conclusions with a significant coefficient value on environmental innovation and sustainability.

5.5 Environmental sustainability positively influences organizational performance

When considering the fifth hypothesis, which has a beta value of 0.48, environmental sustainability positively influences organizational performance. There are a variety of studies on environmental sustainability and organizational marketing performance from around the world (Cunningham *et al.*, 2018; Guide and Ketokivi, 2015). No agreement has yet been reached (Barauskaite and Streimikiene, 2021; Beheshtifar and Kamani-Fard, 2013; Cronbach, 1951; Deterding *et al.*, 2011). According to a study by Zhang *et al.* (2008) in 89 Chinese companies that studied the effectiveness of corporate environmental management, companies prefer to pay an emission tax and fine rather than enhance environmental management.

5.6 The moderating effect of gamification on the relationship between organizational marketing culture and technological innovation capabilities

The sixth hypothesis refers to the moderating effect of gamification on the relationship between organizational marketing culture and technological innovation capabilities, as well

as the moderating effect of gamification on the relationship between organizational culture and environmental innovation capabilities. Parts one and two of the sixth hypothesis have moderating effects of 0.13 (H6a) and 0.38 (H6b), respectively. Gamification features, even when combined with organizational culture, do not help to improve technical innovation skills. This may be further justified by looking at the literature. Much research has looked at the link between organizational culture and performance (Aboramadan *et al.*, 2020; Arsawan *et al.*, 2020; Chang *et al.*, 2017; Lam *et al.*, 2021). There is a relationship between marketing performance and marketing culture (Aboramadan *et al.*, 2020; Abualoush *et al.*, 2018; Arsawan *et al.*, 2020; Deterding *et al.*, 2011; Hamari and Lehdonvirta, 2010; Kelle *et al.*, 2011). Additionally, culture has a direct impact on marketing performance in the Kim *et al.* (2019) found that there is a positive correlation between adhocracy, clan and market cultures. Gamification-based organizational marketing cultures have a positive effect on environmental innovation capabilities.

In addition to retail, media, consumer goods and healthcare, gamification can have an impact on other sectors including gaming (Dicheva *et al.*, 2015; Johns and Shaw, 2006; Lee *et al.*, 2013). There is still a lack of general understanding of gamification, whether the intended results can be attained with it and how these results can be attained (Dicheva *et al.*, 2015; Johns and Shaw, 2006; Lee *et al.*, 2013). There is a need to conduct more research to establish a solid theoretical and methodological foundation for the accumulation of knowledge in research (Gustavs and Clegg, 2005; Manzano-León *et al.*, 2021; Morganti *et al.*, 2017).

There has been a significant impact on several gamifications-based organizational marketing performance outcomes, including the performance evaluation of companies (Gustavs and Clegg, 2005; Manzano-León *et al.*, 2021; Morganti *et al.*, 2017). Marketing performance evaluation is an integral part of performance management. At this point, performance evaluation and feedback should be implemented (Georgsdottir and Getz, 2004; Kafai and Burke, 2015; McCosh *et al.*, 1998; Negruşa *et al.*, 2015). Taking regular stock of progress toward targets at least twice a year ensures that the working teams' focus and concentration are more intense (Lim and Rubasundram, 2018). Increasingly, firms evaluate performance on a more frequent basis than once a year. Hunter and Werbach (2012), who are believers in the importance of gamification to businesses, assert that gamification should be considered in practice. It follows that the process of designing products, services and systems may be gamified, leading to gamification being implemented in the design of the products, services and systems (Deterding *et al.*, 2011; Georgsdottir and Getz, 2004; Krath *et al.*, 2021; Lee *et al.*, 2013). The next section discussed the theoretical and practical implications as follows.

The benefits and results of acquiring technology from outside sources as a vital capability for long-term innovation success have been studied in depth (Aboramadan *et al.*, 2020; Abualoush *et al.*, 2018). Researchers have traditionally viewed the decision to acquire technology from outside a company's borders as a trade-off between the benefits of external acquisition (e.g. higher return on investment, lower costs, increased flexibility, access to specialized skills and creativity) and the disadvantages (e.g. opening the market to new entrants, risk of core competency imitation and reduced value appropriability) (Kotlar *et al.*, 2013). Behavioral analyses are of particular relevance if one seeks to understand the conduct of firms in their acquisition of external technology. While these firms generally tend to favor strategic actions that preserve and enhance their authority and control over their business activities, even at the expense of potential economic benefits (Barauskaite and Streimikiene, 2021; Kotlar *et al.*, 2013), this illustrates the inapplicability of technological capabilities to organizational marketing culture.

The contribution of results to the clubbed effect of international dynamic capabilities with other theories to explain the global marketing perspective differs through several ways.

First, gamification of environmental skills has a positive impact on environmental sustainability (Artara and Huseynlib, 2017; Gimenez-Fernandez *et al.*, 2021; Morganti *et al.*, 2017; Negruşa *et al.*, 2015). Further researchers found that gamification boosted pro-environmental behavior. It has been incorporated into board games, team contests, electronic games, smartphone applications and research apps (Artara and Huseynlib, 2017; Gimenez-Fernandez *et al.*, 2021; Morganti *et al.*, 2017; Negruşa *et al.*, 2015). Additionally, researchers apply game design principles to non-gaming environments, such as reducing energy consumption. There should be clear progression paths and levels for players, allowing them to realize their goals, levels and rewards; enabling them to make autonomous decisions; applying strategy and novelty to engage them; providing feedback; requiring social comparison or competition and encouraging cooperative play or a combination of these principles (Deterding *et al.*, 2011; Gimenez-Fernandez *et al.*, 2021; Lam *et al.*, 2021).

However, international dynamic capabilities within the organizational marketing culture have a strong correlation under a beta value of 0.56. Gamification is considered to have a coefficient under a beta value of 0.71. Gamification is generally understood as involving individuals in playing games to achieve a variety of goals (Roth *et al.*, 2015). Gamification may resemble persuasive technologies that influence behavior without individuals having to change (Lazzarotti and Manzini, 2009; Mikalef and Gupta, 2021; Morganti *et al.*, 2017). There is still a lack of general understanding of gamification, whether the intended results can be attained with it, and how these results can be attained (Dicheva *et al.*, 2015; Johns and Shaw, 2006; Lee *et al.*, 2013). There is a need to conduct more research to establish a solid theoretical and methodological foundation for the accumulation of knowledge in research (Gustavs and Clegg, 2005; Morganti *et al.*, 2017).

6. Implications of the study

6.1 Theoretical implications

An empirical approach rather than a philosophical approach to understanding how firms utilize gamification to engage their digital freelance workforce can be gained by applying theory of organizational marketing creativity and theory of AB. The study provides evidence to support conclusions drawn from theory of organizational creativity and theory of AB on aspects of psychological contract (Benito-Santos *et al.*, 2021; Deterding *et al.*, 2011) and gamification experience among normal workforce (Gimenez-Fernandez *et al.*, 2021; Gustavs and Clegg, 2005; Hamari and Lehdonvirta, 2010). The theoretical contribution can be seen in two main ways.

In addition, the theoretical constructs of organizational marketing creativity helped to clarify that creativity in an organization arises from the development of the entire organization (Aboramadan *et al.*, 2020; Beheshtifar and Kamani-Fard, 2013). As a result, understanding the creative process of an organization requires analyzing not only the mental processes of individuals or groups, but also the social structures and interrelationships within the organization, as well as all the artificial tools, both abstract and physical (Barauskaite and Streimikiene, 2021; Beheshtifar and Kamani-Fard, 2013; Dicheva *et al.*, 2015). This theory contributed to understand how gamification-based organizational marketing culture affects innovation capability and organizational performance (Fernández-Ruano *et al.*, 2022).

Additionally, the theoretical constructs of theory of AB have helped to explain how gamification-based organizational marketing cultures affect environmental sustainability (Flatla *et al.*, 2011; Henseler *et al.*, 2014; Johns and Shaw, 2006). According to recent studies, this can be further justified. Based on the theoretical frameworks applied here, a meta-analysis of the psychological mechanisms leading to pro-environmental behavior has been published (Fernández-Ruano *et al.*, 2022). Apps and games can influence each of these mechanisms (Artara and Huseynlib, 2017; Beheshtifar and Kamani-Fard, 2013; Fernández-Ruano *et al.*, 2022). Researchers have not yet been able to identify which specific element or

aspect of games or gamification most effectively promotes pro-environmental behavior. Gamification can be viewed as aligning with psychological mechanisms that facilitate behavior change (Artara and Huseynlib, 2017; Beheshtifar and Kamani-Fard, 2013; Fernández-Ruano *et al.*, 2022).

The dynamic capability theory assists firms in developing their international marketing capabilities in two ways (Teece *et al.*, 1997; Falahat *et al.*, 2018). The reality is that internal resource-based views are static and are not dynamic (Falahat *et al.*, 2018). Consequently, cross-border electronic commerce and firm performance are positively impacted by dynamic capabilities rather than fixed resources (Falahat *et al.*, 2018). The capabilities of a firm are not limited to its internal resources (Falahat *et al.*, 2018). An organization's capabilities are determined by the variety of ways in which its resources are used (Falahat *et al.*, 2020; Kim and Lim, 2022). In this regard, we employed the concept of international dynamic marketing capability, which illustrates how a firm integrates, develops and modifies internal and external resources (Kim and Lim, 2022; Jones and Rowley, 2011). Second, small and medium-sized businesses utilize dynamic marketing capabilities (Taiminen and Karjaluoto, 2015). As most small businesses are run by a single owner, they rely heavily on the entrepreneur's abilities (Taiminen and Karjaluoto, 2015). Dynamic managerial capabilities (DMCs) explain a variety of entrepreneurial abilities (Taiminen and Karjaluoto, 2015). It provides a useful theoretical framework for understanding how various capabilities can be converted into small business assets (Falahat *et al.*, 2018).

6.2 Managerial implications

An international marketing perspective highlights how gamification can be viewed from a strategic perspective within organizations (Artara and Huseynlib, 2017). By incorporating users into the game and imparting persuasion knowledge, gamification strategies target psychological responses to international marketing. Gamification techniques may enhance marketing effectiveness in situations where users are reluctant to accept and respond to marketing efforts (Noorbehbahani *et al.*, 2019). Further, managers need understand that not only OC is significant for technological and environmental innovation capabilities, but using gamification will further improve this relationship. When the OC is having game elements embedded, the task on hand will become more fun and with definite long- and short-term goals and the innovation capability will significantly improve.

Researchers have identified gamification as a topic for further study in international marketing. To date, research has focused on the use of gamification to enhance interaction between tourists and brands and tourism destinations (Xu *et al.*, 2016). This study contributes to international marketing research by engaging users with the game and transferring persuasion knowledge to them (Jabagi *et al.*, 2019; Lehdonvirta *et al.*, 2019; Lin *et al.*, 2021; Myhill *et al.*, 2021). Therefore, dynamic capabilities rather than fixed resources have a positive impact on cross-border electronic commerce and firm performance (Falahat *et al.*, 2018). A firm's capabilities are not limited to its internal resources (Falahat *et al.*, 2018). The variety of ways in which an organization uses its resources determines its capabilities (Falahat *et al.*, 2020; Kim and Lim, 2022). Specifically, we employed the concept of international dynamic marketing capability, which describes how a firm integrates, develops and modifies internal and external resources in the real world (Kim and Lim, 2022; Jones and Rowley, 2011).

7. Future research perspectives, limitations and conclusion

We propose further research directions in addition to those proposed by this study. The approach suggested in the current study can be validated and generalized. We may build on our model by looking at other mediating or moderating factors that could change the hypothesized

link. Employee motivating elements and performance factors gathered from digital gig working platforms may also be included in the extension technique (Finkin, 2016; Jayawardena, 2020).

Future studies may, therefore, expand the scope to include larger corporations and emerging economies around the world. As a result, the findings of this study will be able to be confirmed. A further disadvantage is that we collect data from firms that adhere to ISO 14091 quality standards. We test the hypotheses using primary data from 384 firms. Future research may include comparison studies involving other provinces of emerging nations to assess whether the results are comparable and generalizable. Other demographic features of employees, such as their salary, education credentials and employment position, might be examined for a better understanding of the occurrence. Companies that cultivate innovation over time may be able to invest in the proper technical solutions. In addition, the research investigates how organizational behavior affects climate awareness.

This study aims to examine how dynamic capability theory works in international marketing. The scope of this investigation is confined to understanding how gamification-based and non-gamification-based organizational marketing culture affects innovation capability, environmental sustainability and organizational performance through the lens of theory of organizational creativity and theory of AB. Policy makers, human resources professionals and trade unions can use this study to improve workforce performance. Workers have difficulty applying job quality dimensions, particularly safety and respect (Jabagi *et al.*, 2019; Lehdonvirta *et al.*, 2019; Lin *et al.*, 2021; Myhill *et al.*, 2021).

Results are limited to those factors that have a positive impact on organizational marketing culture and should be preserved and protected, in particular the degree of flexibility, which is dependent on the participants. A limitation of the study is that it is based on a relatively small sample of workers in a very narrow range of industries and in a particular geographic region within a country with a distinct political climate. In addition, there is a lack of understanding regarding how gig work is experienced over time. In conclusion, future research should be directed toward longitudinal methods, larger samples, participants recruited from a broader range of industries and locations as well as a greater emphasis on individuals who depend on work for a living (Jabagi *et al.*, 2019; Lehdonvirta *et al.*, 2019; Lin *et al.*, 2021; Myhill *et al.*, 2021).

References

Aboramadan, M., Albashiti, B., Alharazin, H. and Zaidoune, S. (2020), "Organizational culture, innovation and performance: a study from a non-western context", *Journal of Management Development*, Vol. 39 No. 4, pp. 437-451.

Abualoush, S., Bataineh, K. and Alrowwad, A.A. (2018), "The role of knowledge management process and intellectual capital as intermediary variables between knowledge management infrastructure and organization performance", *Interdisciplinary Journal of Information, Knowledge, and Management*, Vol. 13 No. 1, pp. 1-279.

Achi, A., Adeola, O. and Achi, F.C. (2022), "CSR and green process innovation as antecedents of micro, small, and medium enterprise performance: moderating role of perceived environmental volatility", *Journal of Business Research*, Vol. 139, pp. 771-781.

Amores-Salvadó, J., Martin-de Castro, G. and Navas-López, J.E. (2015), "The importance of the complementarity between environmental management systems and environmental innovation capabilities: a firm level approach to environmental and business performance benefits", *Technological Forecasting and Social Change*, Vol. 96, pp. 288-297.

Anderson, E.W. and Sullivan, M.W. (1993), "The antecedents and consequences of customer satisfaction for firms", *Marketing Science*, Vol. 12 No. 2, pp. 125-143.

Armenakis, A.A. and Bedeian, A.G. (1999), "Organizational change: a review of theory and research in the 1990s", *Journal of Management*, Vol. 25 No. 3, pp. 293-315.

Armstrong, J.S. and Overton, T.S. (1977), "Estimating nonresponse bias in mail surveys", *Journal of Marketing Research*, Vol. 14 No. 3, pp. 396-402.

Arsawan, I.W.E., Koval, V., Rajiani, I., Rustiarini, N.W., Supartha, W.G. and Suryantini, N.P.S. (2020), "Leveraging knowledge sharing and innovation culture into SMEs sustainable competitive advantage", *International Journal of Productivity and Performance Management*, Vol. 71 No. 2, p. 25.

Artara, A. and Huseynlib, B. (2017), "Gamification based performance evaluation system: a new model suggestion", *7th International Conference on Leadership, Technology, Innovation and Business Management*, Marmaris, Turkey.

Bae, H.S. and Grant, D.B. (2018), "Investigating effects of organisational culture and learning on environmental collaboration and performance of Korean exporting firms", *International Journal of Logistics Research and Applications*, Vol. 21 No. 6, pp. 614-630.

Bakar, L.J.A. and Ahmad, H. (2010), "Assessing the relationship between firm resources and product innovation performance: a resource-based view", *Business Process Management Journal*, Vol. 16 No. 3, pp. 420-435.

Barauskaite, G. and Streimikiene, D. (2021), "Corporate social responsibility and financial performance of companies: the puzzle of concepts, definitions and assessment methods", *Corporate Social Responsibility and Environmental Management*, Vol. 28 No. 1, pp. 278-287.

Beheshtifar, M. and Kamani-Fard, F.B. (2013), "Organizational creativity: a substantial factor to growth", *International Journal of Academic Research in Business and Social Sciences*, Vol. 3 No. 3, pp. 1-98.

Behl, A., Sampat, B. and Raj, S. (2021), "Productivity of gig workers on crowdsourcing platforms through artificial intelligence and gamification: a multi-theoretical approach", *The TQM Journal*, Vol. ahead-of-print No. ahead-of-print, doi: 10.1108/TQM-07-2021-0201.

Behl, A., Jayawardena, N., Ishizaka, A., Gupta, M. and Shankar, A. (2022), "Gamification and gigification: a multidimensional theoretical approach", *Journal of Business Research*, Vol. 139, pp. 1378-1393.

Benito-Santos, Dorn, Gómez, Palfinger,Sánchez and Wandl-Vogt (2021), "Playing design: a case study on applying gamification to construct a serious game with youngsters at social risk", *Journal on Computing Cultural Heritage*, Vol. 14 No. 2, pp. 1-19.

Boateng, K.A. (2009), "ICT-driven interactions: on the dynamics of mediated control", Doctoral dissertation, London School of Economics and Political Science.

Boateng, K.A. (2020), "Underlying forces of organisational control on administrative behavioural theoretical insights", *Strategy and Behaviors in the Digital Economy*, IntechOpen, New York.

Cadogan, J.W. and Lee, N. (2022), "A miracle of measurement or accidental constructivism? How PLS subverts the realist search for truth", *European Journal of Marketing*, Vol. ahead-of-print No. ahead-of-print, doi: 10.1108/EJM-08-2020-0637.

Cancino del Castillo, C., Paz Lillo, A.L., Ramaprasad, A. and Syn, T. (2018), "Technological innovation for sustainable growth: an ontological perspective", *Journal of Cleaner Production*, Vol. 179, pp. 31-41.

Chang, W.J., Liao, S.H. and Wu, T.T. (2017), "Relationships among organizational culture, knowledge sharing, and innovation capability: a case of the automobile industry in Taiwan", *Knowledge Management Research and Practice*, Vol. 15 No. 3, pp. 471-490.

Chen, I.J. and Paulraj, A. (2004), "Towards a theory of supply chain management: the constructs and measurements", *Journal of Operations Management*, Vol. 22 No. 2, pp. 119-150.

Cohen, J. (1992), "Statistical power analysis", *Current Directions in Psychological Science*, Vol. 1 No. 3, pp. 98-101.

Cronbach (1951), "Coefficient alpha and the internal structure of tests", *Psychometrika*, Vol. 16 No. 3, pp. 297-334.

Cunningham, S.J., Scott, L., Hutchison, J., Ross, J. and Martin, D. (2018), "Applying self-processing biases in education: improving learning through ownership", *Journal of Applied Research in Memory and Cognition*, Vol. 7 No. 3, pp. 342-351.

Dasgupta, M., Sahay, A. and Gupta, R.K. (2009), "The role of knowledge management in innovation", *Journal of Information and Knowledge Management*, Vol. 8 No. 04, pp. 317-330.

Davidson and MacKinnon (1993), *Estimation and Inference in Econometrics*, Oxford University Press, New York.

Deshpande, R. and Webster, F.E. Jr (1989), "Organizational culture and marketing: defining the research agenda", *Journal of Marketing*, Vol. 53 No. 1, pp. 3-15.

Deterding, S., Dixon, D., Khaled, R. and Nacke, L. (2011), "From game design elements to gamefulness: defining 'gamification'", *Proceedings of the 15th international academic MindTrek conference: Envisioning future media environments*, New York, pp. 9-15.

Dicheva, D., Dichev, C., Agre, G. and Angelova, G. (2015), "Gamification in education: a systematic mapping study", *Journal of Educational Technology and Society*, Vol. 18 No. 3, pp. 75-88.

Elia, S., Giuffrida, M., Mariani, M.M. and Bresciani, S. (2021), "Resources and digital export: an RBV perspective on the role of digital technologies and capabilities in cross-border e-commerce", *Journal of Business Research*, Vol. 132, pp. 158-169.

Eppmann, R., Bekk, M. and Klein, K. (2018), "Gameful experience in gamification: construction and validation of a gameful experience scale [GAMEX]", *Journal of Interactive Marketing*, Vol. 43, pp. 98-115.

Falahat, M., Knight, G. and Alon, I. (2018), "Orientations and capabilities of born global firms from emerging markets", *International Marketing Review*, Vol. 35 No. 6, pp. 936-957.

Falahat, M., Ramayah, T., Soto-Acosta, P. and Lee, Y.Y. (2020), "SMEs internationalization: the role of product innovation, market intelligence, pricing and marketing communication capabilities as drivers of SMEs' international performance", *Technological Forecasting and Social Change*, Vol. 152, pp. 119-908.

Fernández-Ruano, Frías-Jamilena, Polo-Peña and Peco-Torres (2022), "The use of gamification in environmental interpretation and its effect on customer-based destination brand equity: the moderating role of psychological distance", *Journal of Destination Marketing Management*, Vol. 23, 100677.

Filieri, R. and Mariani, M. (2021), "The role of cultural values in consumers' evaluation of online review helpfulness: a big data approach", *International Marketing Review*, Vol. 38 No. 6, pp. 1267-1288.

Filsecker, M. and Hickey, D.T. (2014), "A multilevel analysis of the effects of external rewards on elementary students' motivation, engagement and learning in an educational game", *Computers and Education*, Vol. 75, pp. 136-148.

Finkin (2016), "Beclouded work in historical perspective", *Comparative Labor Law Policy Journal*, Vol. 37 No. 3, pp. 16-12.

Flatla, Gutwin, Nacke, Bateman and Mandryk (2011), "Calibration games: making calibration tasks enjoyable by adding motivating game elements", *Paper presented at the Proceedings of the 24th annual ACM symposium on User Interface Software and Technology*.

Geffen, C.A. and Rothenberg, S. (2000), "Suppliers and environmental innovation: the automotive paint process", *International Journal of Operations and Production Management*, Vol. 20 No. 2, pp. 166-186.

Georgsdottir, A.S. and Getz, I. (2004), "How flexibility facilitates innovation and ways to manage it in organizations", *Creativity and Innovation Management*, Vol. 13 No. 3, pp. 166-175.

Gimenez-Fernandez, E., Abril, C., Breuer, H. and Gudiksen, S. (2021), "Gamification approaches for open innovation implementation: a conceptual framework", *Creativity and Innovation Management*, Vol. 30 No. 3, pp. 455-474.

Glaser, S.R., Zamanou, S. and Hacker, K. (1987), "Measuring and interpreting organizational culture", *Management Communication Quarterly*, Vol. 1 No. 2, pp. 173-198.

Greenfield, T. (2013), "Conversations between Thomas Greenfield and Peter Ribbins", *Educational Management: Major Themes in Education*, pp. 1-95.

Guide, V.D.R. and Ketokivi, M. (2015), "Notes from the editors: restructuring the journal of operations management", *Journal of Operations Management*, Vol. 38 No. 1, pp. 5-10.

Gustavs, J. and Clegg, S. (2005), "Working the knowledge game? Universities and corporate organizations in partnership", *Management Learning*, Vol. 36 No. 1, pp. 9-30.

Hamari, J. and Lehdonvirta, V. (2010), "Game design as marketing: how game mechanics create demand for virtual goods", *International Journal of Business Science and Applied Management*, Vol. 5 No. 1, pp. 14-29.

Helzer, E.G. and Kim, S.H. (2019), "Creativity for workplace well-being", *Academy of Management Perspectives*, Vol. 33 No. 2, pp. 134-147.

Henseler, J., Dijkstra, T.K., Sarstedt, M., Ringle, C.M., Diamantopoulos, A., Straub, D.W., Ketchen, D.J. Jr, Hair, J.F., Tomas, G., Hult, M. and Calantone, R.J. (2014), "Common beliefs and reality about PLS: comments on Rönkkö and Evermann (2013)", *Organizational Research Methods*, Vol. 17 No. 2, pp. 182-209.

Hermundsdottir, F. and Aspelund, A. (2021), "Sustainability innovations and firm competitiveness: a review", *Journal of Cleaner Production*, Vol. 280, 124715.

Hervas-Oliver, Sempere-Ripoll, Boronat-Moll and Rojas-Alvarado (2018), "On the joint effect of technological and management innovations on performance: increasing or diminishing returns?", *Technology Analysis Strategic Management*, Vol. 30 No. 5, pp. 569-581.

Hong, P., Kwon, H.B. and Roh, J.J. (2009), "Implementation of strategic green orientation in supply chain: an empirical study of manufacturing firms", *European Journal of Innovation Management*, Vol. 12 No. 4, pp. 512-532.

Hunt, S.D. and Morgan, R.M. (1995), "The comparative advantage theory of competition", *Journal of Marketing*, Vol. 59 No. 2, pp. 1-15.

Hunt, S.D. (2000), *A General Theory of Competition: Resources, Competences, Productivity, Economic Growth*, Sage Publications, New York.

Hunter and Werbach (2012), *For the Win*, Wharton Digital Press, Vol. 2, available at: https://vr-entertain.com/wpcontent/uploads (accessed February 2022).

Huotari, K. and Hamari, J. (2017), "A definition for gamification: anchoring gamification in the service marketing literature", *Electronic Markets*, Vol. 27 No. 1, pp. 21-31.

Jabagi, N., Croteau, A.M., Audebrand, L.K. and Marsan, J. (2019), "Gig-workers' motivation: thinking beyond carrots and sticks", *Journal of Managerial Psychology*, Vol. 34 No. 4, pp. 192-213.

Jaworski, B.J. and Kohli, A.K. (1993), "Market orientation: antecedents and consequences", *Journal of Marketing*, Vol. 57 No. 3, pp. 53-70.

Jayawardena, N. (2020), "The e-learning persuasion through gamification: an elaboration likelihood model perspective", *Young Consumers*, Vol. 22 No. 3, pp. 480-502.

Johns, R. and Shaw, J. (2006), "Real-time immersive design collaboration: conceptualising, prototyping and experiencing design ideas", *Journal of Design Research*, Vol. 5 No. 2, pp. 172-187.

Jones, R. and Rowley, J. (2011), "Entrepreneurial marketing in small businesses: a conceptual exploration", *International Small Business Journal*, Vol. 29 No. 1, pp. 25-36.

Jyoti, J. and Rani, A. (2017), "High performance work system and organisational performance: role of knowledge management", *Personnel Review*, Vol. 46 No. 8, pp. 1770-1795.

Kafai, Y.B. and Burke, Q. (2015), "Constructionist gaming: understanding the benefits of making games for learning", *Educational Psychologist*, Vol. 50 No. 4, pp. 313-334.

Kelle, S., Klemke, R. and Specht, M. (2011), "Design patterns for learning games", *International Journal of Technology Enhanced Learning*, Vol. 3 No. 6, pp. 555-569.

Kim, K. and Lim, G. (2022), "International dynamic marketing capabilities of emerging-market small business on E-commerce", *Journal of Theoretical and Applied Electronic Commerce Research*, Vol. 17 No. 1, pp. 199-211.

Kim, S.Y., Kim, S.M., Chang, H., Kim, B.W., Lee, Y.S., Chang, H.S. and Park, C.S. (2019), "Safety of tyrosine kinase inhibitors in patients with differentiated thyroid cancer: real-world use of lenvatinib and sorafenib in Korea", *Frontiers in Endocrinology*, Vol. 10, pp. 1-384.

Klewitz, J. and Hansen, E.G. (2014), "Sustainability-oriented innovation of SMEs: a systematic review", *Journal of Cleaner Production*, Vol. 65, pp. 57-75.

Ko, C.H., Hsieh, T.J., Wang, P.W., Lin, W.C., Yen, C.F., Chen, C.S. and Yen, J.Y. (2015), "Altered gray matter density and disrupted functional connectivity of the amygdala in adults with Internet gaming disorder", *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, Vol. 57, pp. 185-192.

Kotlar, J., De Massis, A., Frattini, F., Bianchi, M. and Fang, H. (2013), "Technology acquisition in family and nonfamily firms: a longitudinal analysis of Spanish manufacturing firms", *Journal of Product Innovation Management*, Vol. 30 No. 6, pp. 1073-1088.

Krath, J., Schürmann, L. and Von Korflesch, H.F. (2021), "Revealing the theoretical basis of gamification: a systematic review and analysis of theory in research on gamification, serious games and game-based learning", *Computers in Human Behavior*, Vol. 125, 106963.

Kuratko, D.F., Hornsby, J.S. and McKelvie, A. (2021), "Entrepreneurial mindset in corporate entrepreneurship: forms, impediments, and actions for research", *Journal of Small Business Management*, Vol. 16 No. 1, pp. 1-23.

Lam, L., Nguyen, P., Le, N. and Tran, K. (2021), "The relation among organizational culture, knowledge management, and innovation capability: its implication for open innovation", *Journal of Open Innovation: Technology, Market, and Complexity*, Vol. 7 No. 1, pp. 1-66.

Lazzarotti, V. and Manzini, R. (2009), "Different modes of open innovation: a theoretical framework and an empirical study", *International Journal of Innovation Management*, Vol. 13 No. 04, pp. 615-636.

Lee, J.J., Matamoros, E., Kern, R., Marks, J., de Luna, C. and Jordan-Cooley, W. (2013), "Greenify: fostering sustainable communities via gamification", *CHI'13 Extended Abstracts on Human Factors in Computing Systems*, pp. 1497-1502.

Lehdonvirta, V., Kässi, O., Hjorth, I., Barnard, H. and Graham, M. (2019), "The global platform economy: a new offshoring institution enabling emerging-economy microproviders", *Journal of Management*, Vol. 45 No. 2, pp. 567-599.

Lim, D. and Rubasundram, G.A. (2018), "Disruption in teaching & learning: experiential learning and gamification in practice", *Electronic Journal of Business and Management*, Vol. 1 No. 1, pp. 87-93.

Lin, P.M., Peng, K.L., Au, W.C. and Baum, T. (2021), "Food-delivery workers in the sharing economy: supply-side human resource transformation", *International Journal of Hospitality and Tourism Administration*, Vol. 1, pp. 1-26.

Manzano-León, Camacho-Lazarraga, Guerrero, Guerrero-Puerta, Aguilar-Parra, Trigueros and Alias (2021), "Between level up and game over: a systematic literature review of gamification in education", *Sustainability*, Vol. 13 No. 4, pp. 22-47.

Mardani, A., Kannan, D., Hooker, R.E., Ozkul, S., Alrasheedi, M. and Tirkolaee, E.B. (2020), "Evaluation of green and sustainable supply chain management using structural equation modelling: a systematic review of the state of the art literature and recommendations for future research", *Journal of Cleaner Production*, Vol. 249, 119383.

Mariani, M.M., Borghi, M. and Okumus, F. (2020), "Unravelling the effects of cultural differences in the online appraisal of hospitality and tourism services", *International Journal of Hospitality Management*, Vol. 90, 102606.

Marston, H.R., Freeman, S., Bishop, K.A. and Beech, C.L. (2016), "A scoping review of digital gaming research involving older adults aged 85 and older", *Games for Health Journal*, Vol. 5 No. 3, pp. 157-174.

McCosh, Smart, Barrar and Lloyd (1998), "Proven methods for innovation management: an executive wish list", *Creativity Innovation Management*, Vol. 7 No. 4, pp. 175-192.

Mikalef and Gupta (2021), "Artificial intelligence capability: conceptualization, measurement calibration, and empirical study on its impact on organizational creativity and firm performance", *Information Management*, Vol. 58 No. 3, 103434.

Miller and Floricel (2007), "Games of Innovation: a new theoretical perspective", *International Journal of Innovation Management*, Vol. 11 No. 1, pp. 1-35.

Morganti, L., Pallavicini, F., Cadel, E., Candelieri, A., Archetti, F. and Mantovani, F. (2017), "Gaming for Earth: serious games and gamification to engage consumers in pro-environmental behaviours for energy efficiency", *Energy Research and Social Science*, Vol. 29, pp. 95-102.

Mustafa, J., Sandström, K., Ericsson, N. and Rizvanovic, L. (2019), "Analyzing availability and QoS of service-oriented cloud for industrial IoT applications", paper presented at the *2019 24th IEEE International Conference on Emerging Technologies and Factory Automation (ETFA)*.

Myhill, K., Richards, J. and Sang, K. (2021), "Job quality, fair work and gig work: the lived experience of gig workers", *The International Journal of Human Resource Management*, Vol. 32 No. 19, pp. 4110-4135.

Negruşa, A.L., Toader, V., Sofică, A., Tutunea, M.F. and Rus, R.V. (2015), "Exploring gamification techniques and applications for sustainable tourism", *Sustainability*, Vol. 7 No. 8, pp. 11160-11189.

Ngugi, R.W. and Kilika, J.M. (2018), "TMT cognition, first mover advantages and firm entreprenuerial performance: a review of literature", *International Business Research*, Vol. 11 No. 6, pp. 110-126.

Noorbehbahani, F., Salehi, F. and Zadeh, R.J. (2019), "A systematic mapping study on gamification applied to e-marketing", *Journal of Research in Interactive Marketing*, Vol. 13 No. 3, pp. 392-410.

Nour, M.M., Rouf, A.S. and Allman-Farinelli, M. (2018), "Exploring young adult perspectives on the use of gamification and social media in a smartphone platform for improving vegetable intake", *Appetite*, Vol. 120, pp. 547-556.

Oldham, G.R. and Cummings, A. (1996), "Employee creativity: personal and contextual factors at work", *Academy of Management Journal*, Vol. 39 No. 3, pp. 607-634.

Ouariachi, T., Li, C.Y. and Elving, W.J. (2020), "Gamification approaches for education and engagement on pro-environmental behaviors: searching for best practices", *Sustainability*, Vol. 12 No. 11, p. 4565.

Papa, A., Mazzucchelli, A., Ballestra, L.V. and Usai, A. (2021), "The open innovation journey along heterogeneous modes of knowledge-intensive marketing collaborations: a cross-sectional study of innovative firms in Europe", *International Marketing Review*, Vol. 39 No. 3, pp. 602-625.

Pereira, V., Behl, A., Jayawardena, N., Laker, B., Dwivedi, Y.K. and Bhardwaj, S. (2022), "The art of gamifying digital gig workers: a theoretical assessment of evaluating engagement and motivation", *Production Planning and Control*, pp. 1-17.

Perryer, C., Celestine, N.A., Scott-Ladd, B. and Leighton, C. (2016), "Enhancing workplace motivation through gamification: transferrable lessons from pedagogy", *The International Journal of Management Education*, Vol. 14 No. 3, pp. 327-335.

Pesare, E., Roselli, T., Corriero, N. and Rossano, V. (2016), "Game-based learning and gamification to promote engagement and motivation in medical learning contexts", *Smart Learning Environments*, Vol. 3 No. 1, pp. 1-21.

Peters, B.G. (2021), *Administrative Traditions: Understanding the Roots of Contemporary Administrative Behavior*, Oxford University Press.

Podsakoff, MacKenzie, Lee and Podsakoff (2003), "Common method biases in behavioral research: a critical review of the literature and recommended remedies", *Journal of Applied Psychology*, Vol. 88 No. 5, p. 879.

Prentice, C. and Nguyen, M. (2020), "Engaging and retaining customers with AI and employee service", *Journal of Retailing and Consumer Services*, Vol. 56, 102186.

Primasari, C.H. (2022), "Strategy for achieving IT-business alignment in gaming industry in Indonesia", *Procedia Computer Science*, Vol. 197, pp. 469-476.

Roth, S., Schneckenberg, D. and Tsai, C.W. (2015), "The ludic drive as innovation driver: introduction to the gamification of innovation", *Creativity and Innovation Management*, Vol. 24 No. 2, pp. 300-306.

Rust, R.T. and Zahorik, A.J. (1993), "Customer satisfaction, customer retention, and market share", *Journal of Retailing*, Vol. 69 No. 2, pp. 193-215.

Ryan, R.M. and Deci, E.L. (2000), "Intrinsic and extrinsic motivations: classic definitions and new directions", *Contemporary Educational Psychology*, Vol. 25 No. 1, pp. 54-67.

Sciarelli, M., Cosimato, S., Landi, G. and Iandolo, F. (2021), "Socially responsible investment strategies for the transition towards sustainable development: the importance of integrating and communicating ESG", *The TQM Journal*, Vol. 33 No. 7, pp. 39-56.

Seuring, S. and Müller, M. (2008), "From a literature review to a conceptual framework for sustainable supply chain management", *Journal of Cleaner Production*, Vol. 16 No. 15, pp. 1699-1710.

Severo, E.A., de Guimarães, J.C.F., Dorion, E.C.H. and Nodari, C.H. (2015), "Cleaner production, environmental sustainability and organizational performance: an empirical study in the Brazilian Metal-Mechanic industry", *Journal of Cleaner Production*, Vol. 96, pp. 118-125.

Shalley, C.E., Zhou, J. and Oldham, G.R. (2004), "The effects of personal and contextual characteristics on creativity: where should we go from here?", *Journal of Management*, Vol. 30 No. 6, pp. 933-958.

Sheth, J.N. and Parvatiyar, A. (1995), "The evolution of relationship marketing", *International Business Review*, Vol. 4 No. 4, pp. 397-418.

Shiu, E., Pervan, S.J., Bove, L.L. and Beatty, S.E. (2011), "Reflections on discriminant validity: reexamining the Bove *et al.* (2009) findings", *Journal of Business Research*, Vol. 64 No. 5, pp. 497-500.

Simon and Latsis (1976), *Method and Appraisal in Economics*, Cambridge University Press, Cambridge, Vol. 1.

Sinha, K.K. and Van de Ven, A.H. (2005), "Designing work within and between organizations", *Organization Science*, Vol. 16 No. 4, pp. 389-408.

Son, I., Kim, J., Park, G. and Kim, S. (2018), "The impact of innovative technology exploration on firm value sustainability: the case of part supplier management", *Sustainability*, Vol. 10 No. 10, p. 3632.

Taiminen, H.M. and Karjaluoto, H. (2015), "The usage of digital marketing channels in SMEs", *Journal of Small Business and Enterprise Development*, Vol. 22 No. 4, pp. 633-651.

Teece, D.J., Pisano, G. and Shuen, A. (1997), "Dynamic capabilities and strategic management", *Strategic Management Journal*, Vol. 18 No. 7, pp. 509-533.

Urbaniec, M., Tomala, J. and Martinez, S. (2021), "Measurements and trends in technological eco-innovation: evidence from environment-related patents", *Resources*, Vol. 10 No. 7, pp. 1-68.

Vorhies, D.W. and Morgan, N.A. (2003), "A configuration theory assessment of marketing organization fit with business strategy and its relationship with marketing performance", *Journal of Marketing*, Vol. 67 No. 1, pp. 100-115.

Wachs, J. and Vedres, B. (2021), "Does crowdfunding really foster innovation? Evidence from the board game industry", *Technological Forecasting and Social Change*, Vol. 168, pp. 1-11.

Wang, Zhang, Zeng, Yang and Tang (2022), "The effect of technology innovation on corporate sustainability in Chinese renewable energy companies", *Sustainable Energy Production Consumption: System Accounting, Integrated Management, Policy Responses*, pp. 6491-6308.

Weerawardena, J. (2003), "The role of marketing capability in innovation-based competitive strategy", *Journal of Strategic Marketing*, Vol. 11 No. 1, pp. 15-35.

Wernerfelt (1984), "A resource view based of the firm", *Strategic Management Journal*, Vol. 5 No. 2, pp. 171-180.

Woodman, Sawyer and Griffin (1993), "Toward a theory of organizational creativity", *Academy of Management Review*, Vol. 18 No. 2, pp. 293-321.

Wu, X. and Mei, L. (2022), "Policy-driven open strategy: lessons from China's high-speed rail industry", *Journal of Engineering and Technology Management*, Vol. 63, pp. 101-671.

Wu, X., Liu, S. and Shukla, A. (2020), "Serious games as an engaging medium on building energy consumption: a review of trends, categories and approaches", *Sustainability*, Vol. 12 No. 20, p. 8508.

Xu, F., Tian, F., Buhalis, D., Weber, J. and Zhang, H. (2016), "Tourists as mobile gamers: gamification for tourism marketing", *Journal of Travel and Tourism Marketing*, Vol. 33 No. 8, pp. 1124-1142.

Xu, X.L., Shen, T., Zhang, X. and Chen, H.H. (2020), "The role of innovation investment and executive incentive on financial sustainability in tech-capital-labor intensive energy company: moderate effect", *Energy Reports*, Vol. 6, pp. 2667-2675.

Zhang, B., Bi, J., Yuan, Z., Ge, J., Liu, B. and Bu, M. (2008), "Why do firms engage in environmental management? An empirical study in China", *Journal of Cleaner Production*, Vol. 16 No. 10, pp. 1036-1045.

Zichermann, G. and Cunningham, C. (2011), *Gamification by Design: Implementing Game Mechanics in Web and Mobile Apps*, O'Reilly Media, Columbus.

Corresponding author
Vijay Pereira can be contacted at: vijay.pereira@neoma-bs.fr