KEY FACTORS FOR A CREATIVE ENVIRONMENT IN SAUDI ARABIAN HIGHER EDUCATION INSTITUTIONS

Mamdouh Qahl	Jazan University, Jazan, Saudi Arabia	mqahl@Jazanu.edu.sa
Osama Sohaib*	American University of Ras Al Khaimah, RAK, United Arab Emirates	Osama.Sohaib@aurak.ac.ae

* Corresponding author

ABSTRACT

Aim/Purpose	This research explores the influence of organizational-level and individual-level creativity and innovation and the technology acceptance model toward higher education creative environment that consist of (research creativity and teaching creativity).
Background	Creativity and innovation are essential pillars for higher education institutions (HEIs). The two terms are interconnected, where creativity is referring to finding better ideas to do the work, while innovation is referring to how to do and implement these creative ideas. Choosing the optimal creative process and the organizational support needed to develop it is an important goal in achieving a creative and inventive environment. For the success of the creative environment to ensure the improvement of higher education institutions, information technology as social networking sites plays a crucial part in the creative process within universities. However, assessing the creativity and innovation of Saudi higher education institutions has not been well recognized. Universities today serve as knowledge-based institutions because they are at the forefront of cutting-edge R&D and scientific innovations. Creating such a productive research environment in universities, however, necessitates a work culture that encourages employees to be more creative while also encouraging the creation of new ideas and innovations.
Methodology	A survey instrument was utilized as a quantitative method for this research to gather data from the study sample on the influencing variables employed in the research framework. Respondent data were analyzed using a disjoint two-stage method using PLS-SEM path modelling.
Contribution	The results of this research contribute to the theoretical and scientific literature by offering a model of creativity and innovation in higher education institutions.

The model proposes an optimal blend of organizational, individual, and technology variables that contribute to the development of the Higher Education Creative Environment in HEIs via creativity in teaching and research and a culture of innovation. In another way, the proposed framework especially helps to comprehend the challenges regulating establishing teaching and research creativity in HEIs via the adoption of organizational, individual, and technology enablers identified as part of this study.

Findings

According to the results, organizational factors such as organizational encouragement, freedom, and challenging work have a positive relationship with the higher education creative environment. However, realistic work pressure, a lack of organizational impediments, managerial encouragement, and work group support is insufficient to affect the creative environment in higher education in Saudi Arabia. Individual variables (creative thinking skills and expertise, for example) also have a positive impact on the higher education creative environment. In the higher education creative environment, however, the influence of intrinsic motivation is insignificant. Finally, technology factors such as social networking site adoption intention, perceived usefulness, and perceived ease of use have the potential to influence the higher education creative environment.

Recommendations for Practitioners

On the practical front, the obvious recommendation of this research is that it enables top leadership in Saudi HEIs to rethink the norms of creativity and innovation in their institutions, thereby instilling a mindset guided by a flourishing culture of creativity in the HEI environment with a specific focus on creativity practices in research and teaching domains. Furthermore, to promote the environment's creativity within Saudi Arabian HEIs, university leaders must consider the suggested Organizational, Individual, and Technology factors as key enablers of creativity and innovation, which will guide them in revisiting their strategic actions in terms of further augmenting the creative performance of their academic's staff, thereby sustaining a culture of Higher Education Creative Environment (HECE).

Recommendations for Researchers

This study addressed many organizational, individual, and technology variables that facilitate Saudi Arabian HECE accomplishment in the form of research and teaching creativity. Furthermore, fresh insights for Saudi public HEIs are revealed when the success aspects of the creative environment are considered. If academic leadership at Saudi HEIs is to encourage the creative environment in general and creativity in teaching and research, it would be suitable for them to highlight individual, organizational, and technology success elements. As a result, their HEIs will be able to produce more innovative research, products, and services that can support and meaningfully achieve national transformation initiatives, opening the path for a transition into a knowledge-based economy.

Impact on Society

In fact, this research is based on a quantitative research method, and the findings were also significant especially considering the current global crises. It is clearly understood by this process that includes organizational, individual, and technology factors as key enablers of the creative performance of academic staff, thereby sustaining a culture of HECE.

Future Research

While providing the research model, it is probable that this study overlooked any other crucial aspects influencing creativity and innovation. As a result, future research should look at additional variables that may impact HECE in Saudi Arabian HEIs. Furthermore, while this study focused on deriving HECE with a particular emphasis on research and teaching creativity as results, future

research might look at deriving other creativity outcomes (e.g., entrepreneurial creativity) within the investigated HECE dimension.

INTRODUCTION

A creative environment assists in mobilizing the factors that can promote or impede the creativity and innovation of the employees within an organization. The creativity of different workplace environments varies based on the type of industry or sector, such as for-profit, non-profit, manufacturing, R&D, and mixed settings (Hunter et al., 2007). Mathisen and Einarsen (2004) opined that supporting or hindering creativity and innovation would be based on how an organization maintains a workplace environment. People's innovative capabilities, which provide a competitive advantage, are essential for long-term growth sustainability (Muller et al., 2005; Politis, 2005). It requires a work environment that fosters creative thinking and idea generation (Amabile, 1998; Carroll, 2014; Politis, 2005). Convergent and divergent thinking are examples of cognitive strategies used by employees to address challenges (Duck, 1981). Convergent thinking seeks a single correct solution to the problem (Kneller, 1971).

In contrast, divergent thinking looks for several plausible answers to the question as a better alternative to convergent thinking. According to Leavy (2005), leaders should be able to recognize that creativity and intelligence are not identical and that many intelligent people are unable to stimulate their creativity beyond a moderate level. On the other hand, creative people are distinguished by their ability to think in divergent thinking, as seen by their originality, fluency of ideas, flexibility, ability to expound, and refinement. When employees encourage creativity to participate in problem-solving, it becomes more effective. According to Othman and Sohaib (2016), creativity is the foundation of a knowledge-based economy. Creative and innovative employees will ensure that the country is well-prepared to meet the present technological challenges that the global environment faces.

Saudi Arabia has recently attempted to diversify its economy to move away from a reliance on natural resources, focusing on increasing human capital and developing a knowledge-based economy as a cornerstone for Saudi economic planners and leaders (Yusuf & Atassi, 2016). According to Salem (2014), innovation and entrepreneurship are essential factors in Saudi Arabia's economic diversification goals, and the country has established over 65 tertiary education institutions since the mid-twentieth century. As a part of the Kingdom of Saudi Arabia's interest in research and innovation, the Research and Innovation Development Authority was established in 2021. Within Vision 2030, Saudi Arabia seeks to support research and innovation. Saudi Arabia's plan for the research and development initiative involves investing an amount equivalent to 2.5% of the country's GDP by the year 2040, to generate high-value jobs in the fields of science and technology and consolidate the kingdom's position as the largest economy in the Arab world (Cabral, 2022). The ultimate goal for Saudi Arabia is to establish itself as a top contender in research, development, and innovation on a global scale. Recently, according to Dutta et al. (2022), in the Global Innovation Index (GII) 2022, Saudi Arabia has been lagging behind other countries in terms of innovation, with a ranking of 66.

Furthermore, regarding innovation efficiency, Saudi Arabia was ranked 104th in the world. Even though Saudi Arabia invests heavily in education (ranking sixth in the world), the overall quality of education is ranked 59th, with the quality of its management schools ranked 78th. These indicators show that the educational system needs to be improved (Iqbal, 2011). In Saudi Arabia, the importance of creativity and innovation stems from the need to transition from an oil-based economy to a knowledge-based economy, as envisioned by the Saudi Arabia 2030 Vision announced in 2016. National plans to provide a variety of learning methods in the higher education sector, including improving the learning environment to stimulate creativity and innovation, are also highlighted in Vision 2030 and the National Transformation Program 2020 (Ministry of Education, 2016). Employee

creativity is critical to success in every firm, including the education sector. Supervisory and workgroup support, autonomy or freedom, availability of resources, and work demands such as challenging work or workload are some conditions that foster workplace creativity. Unfavorable conditions for creativity include cultural factors such as workplace politics and unrealistic work pressure.

Technological improvements, notably the Internet's near ubiquity, have the potential to profoundly change how businesses encourage and manage creativity and innovation (Anderson et al., 2014). This is important, considering that IT exists to manage knowledge and information, two of the most important components of creativity. New potential for supporting creativity in education has arisen with digital technologies. The instructional difficulties associated with fostering creativity via digital technologies are traditional instructional contexts and appropriate use of Information and Communication Technologies (ICT) for teaching and learning. The purpose of social networking sites (SNS) is to promote students' and teachers' creative interactions, and educational strategies and practices should ideally represent creative process characteristics (Souleles et al., 2019).

The proposed framework aims to offer new knowledge and rigor to the literature on creativity in the Saudi Arabian HEI setting. Accordingly, this research will assess the organizational, individual, and technological factors supporting achieving a creative environment for Saudi Arabian HEIs, specifically regarding research and teaching creativity. This research extends Qahl et al.'s (2019) previous research to examine how a specific set of organizational, individual, and technological factors can support achieving the Saudi Arabian HEIs' creative environment. This study aims to address the research question: What are the organizational, individual, and technological factors influencing the Saudi Arabian higher education creative environment comprising research and teaching creativity? The following is a breakdown of the paper's structure. The study's literature review is presented in the first section, and then the theoretical development and research model are presented in the second section, followed by the development of hypotheses. The methodology is discussed in the third section, and data analysis is discussed in the fourth section. The study concludes with a discussion of the implications in the fifth section.

LITERATURE REVIEW

Amabile et al. (1996) state that creativity and innovation are related terms. Creativity refers to generating novel and useful ideas in any domain, and innovation refers to successfully implementing such creative ideas in the organizational context. In this context, creativity is the deliberate process of identifying and implementing successful ideas to solve organizational problems. The creative process's outcome is influenced by external and internal factors (Leavy, 2005). Human efforts toward creativity and innovation are derived from these causes. Ideas are a significant source of innovation, and brilliant individuals are the primary source of ideas (Leavy, 2005). Innovation emerges from the original creative concept to experimentation and sharing ideas with others (Amabile, 1998; Debowski, 2006). Franken (2006) defined it as the tendency to develop or recognize ideas, alternatives, or possibilities helpful in addressing problems, interacting with others, or entertaining ourselves and others. While innovation is concerned with producing or adopting valuable ideas and their implementation, it is also concerned with using data from various sources to develop unique solutions to problems (Matthewman, 2009).

Creativity is more strongly connected to behavioral sciences (such as psychology and education). Still, innovation is more strongly connected with public administration, political science, management, and economics (Cardoso de Sousa et al., 2012). Although creativity has grown significantly across various professions, sectors, and work processes (Shalley & Gilson, 2004), it has also historically maintained organizational competitiveness (Shalley, 1995). Creative workers are valued organizational resources, particularly in firms emphasizing adaptation, variety, and change (Gilbert et al., 1996).

Consequently, various creativity models and theories have been proposed to identify the variables affecting individuals' and organizations' creative behavior. The multiple social Domains Theory (Ford,

1996), the Interactionist Theory (Woodman et al., 1993), and the Componential Theory of Creativity are three of the most significant contributions made in the field of organizational creativity (Amabile, 1988). Conversely, these theories are confined to assessing the impact of individual and organizational variables on employee creativity. A considerable amount of research has studied the circumstances necessary to foster workers' creativity in the workplace based on the aspects of the preceding theories and models. The findings point out that employees' creativity is affected by individual factors (Amabile, 1989, 1996; Eder & Sawyer, 2008; Eisenberger & Rhoades, 2001; Ganesan & Weitz, 1996; Shin & Zhou, 2003; Tierney, 1997) and organizational factors (Cummings & Oldham, 1997; Ekvall & Ryhammar, 1999; Farmer et al., 2003; Hauksdóttir, 2011; Oldham & Cummings, 1996; Othman & Sohaib, 2016; Politis, 2005; Redmond et al., 1993; J. Zhou, 2003; J. Zhou & George, 2001).

Numerous studies have attempted to elaborate on the early theories by investigating the variables impacting people's creative abilities outside the workplace. Additional characteristics revealed include family and friends (Madjar et al., 2002) and supportive family (Horng & Lee, 2009). Current creativity research has focused on applying creative processes from an operational standpoint (Rietzschel et al., 2009), indicating the necessity for an integrated framework for exercising creativity in open and continually innovative workplaces (Scharmer, 2009). As a result, managers need to establish a culture that fosters creativity, assuming responsibility for maintaining a work environment that fosters creative growth processes. Managers must also establish new ways to facilitate the translation of ideas into value-added services and solutions in this area (Coveney, 2008).

Creativity is essential in today's public-sector enterprises (McLean, 2005). Rangarajan (2008) stated that the public sector, unlike private-sector enterprises, has long overlooked research in the domains of creativity. According to Grell (2013), one of the primary reasons is how public-sector organizations operate, in that rigid regulations regulate them and have limited opportunities for supporting creative processes. Nonetheless, there has been a recent movement in the patterns and perspectives on creativity as a process. As a result, numerous public-sector organizations are promoting creative themes. Creativity has been pushed as a strategy in governmental and non-governmental organizations to enhance productivity, adaptability, and process efficiency, enabling organizational transformation and innovation (Mack et al., 2008). Many researchers have investigated creativity in private institutions (Amabile, 1988, 1997; Amabile & Gryskiewicz, 1989; Eder & Sawyer, 2008; Foss et al., 2013; George & Zhou, 2001; Oldham & Cummings, 1996), whereas few researchers have investigated creativity in public institutions (Benito et al., 2008; Berman & Kim, 2010; Coveney, 2008; Heinzen, 1990; Hui & Lau, 2010; Lauring & Selmer, 2013; Loewenberger et al., 2014; West & Berman, 1997). The majority of these studies were conducted in Western countries, including the United States (Benito et al., 2008; Coveney, 2008; Heinzen, 1990; Lauring & Selmer, 2013; Loewenberger et al., 2014; West & Berman, 1997), with fewer in Asia (Berman & Kim, 2010; Heinzen, 1990; Iqbal, 2011; Kim & Yoon, 2015; C. H. Park et al., 2014; West & Berman, 1997; Yamada, 1991). As a consequence, it is obvious that a few studies have looked at the variables impacting creativity in public-sector institutions, notably in the context of academics' creativity practices in HEIs (Azeem et al., 2019).

Some scholars have looked at creativity and innovation in Saudi Arabia. For example, the Saudi Architectural firms (ElMelegy et al., 2016), organizational creativity barriers from a marketing perspective (Sadi & Al-Dubaisi, 2008), higher education research (Alfantookh & Bakry, 2013), innovation relations with economic growth (Esmail & Hemdan, 2018), determinants of innovation adoption (Alsheddi et al., 2019), responsible innovation (Hadj et al., 2020), innovative e-government model for the business sector (Alghamdi & Beloff, 2016), enhancing creativity and innovation in the educational system among gifted students (Aichouni et al., 2015), leadership (Al Ghamdi, 2016; Alshathri, 2020; Shafee, 2016), higher education (Aichouni et al., 2015; Al Ghamdi, 2016; Alfantookh & Bakry, 2013; Alshathri, 2020; Touahmia et al., 2017; Yusuf & Atassi, 2016) and frugal and reverse innovation (Alshammari, 2019). In addition, analyzing contemporary organizational creativity literature provides an in-depth scientific viewpoint controlling individual and organizational creativity and

innovative behavior. For example, Amabile (1983) highlights the need to research individual and group creativity (Woodman et al., 1993). As a result, it is critical to make the most of crucial aspects that play a part in building a collaborative work atmosphere that fosters creative working connections in Saudi Arabian HEIs.

Recent creativity literature created in the setting of higher education institutions focuses on encouraging students' creative abilities as well as evaluating creativity in the course delivery environment and faculty research (Cavagnaro & Fasihuddin, 2016; Egan et al., 2017; Kandiko, 2012; Nonaka, 1991; Zacher & Johnson, 2015). Moreover, since HEIs confront growing demands from both inside and outside their organizations, creative solutions are seen as the best way to meet rising and dynamic requirements (Buller, 2015; Christensen & Eyring, 2011; Crow & Dabars, 2015). Although much talk has been on creativity, few studies have been conducted on academic staff in HEIs (Buller, 2015; Christensen & Eyring, 2011; Crow & Dabars, 2015; McGee, 2015). In research concentrating on higher education and innovation, several aspects of academic institutions, such as curriculum development, teaching, and learning technology have been reviewed (Hannan & Silver, 2000; Hoffman & Spangehl, 2011; Schneckenberg, 2009; Zhu & Engels, 2014). Several studies in the business sector have identified several critical characteristics that enhance individual and organizational levels of creativity (Amabile & Pratt, 2016; Woodman et al., 1993), but there need to be more studies on the factors that drive creativity in HEIs.

Many researchers have recently studied creativity in the Saudi Arabian higher education context (Aichouni et al., 2015; Al Ghamdi, 2016; Alfantookh & Bakry, 2013; Alshathri, 2020; Touahmia et al., 2017; Yusuf & Atassi, 2016), and as a result, many creativity and innovation practices have been adopted by the Saudi Arabian higher education sector. However, those creativity principles and practices were developed from the perspective of students (Aichouni et al., 2015; Al-Zahrani, 2015; Ghernaout et al., 2018; Touahmia et al., 2017), and as a result, there are insufficient studies on creativity and innovation from the perspective of academic staff. According to Abdulla and Banik (2020), many universities in the Kingdom primarily focus on teaching and have little interest in scientific research. As a result, further study is needed to discover the antecedent elements and their link to employee creativity at Saudi public-sector HEIs.

However, prior research revealed that the Technology Acceptance Model (TAM), which includes Adoption Intention (AI), Perceived Ease-of-Use (PEU), and Perceived Usefulness (PU), played an important influence in social media adoption (Chai & Fan, 2017). In other words, three elements influence social media usability: adoption intention (AI), perceived utility (PU), and perceived ease of use (PEU). These elements are also included in TAM. The extent to which they utilize SNSs on a regular basis and suggest them to other users may boost their creative output. This research focused on the influence of higher education institutions on individual and organizational levels of creativity and innovation, as well as the implementation of TAM by academic staff. As a result, this study investigated their role in fostering a creative atmosphere in Saudi Arabian HEIs.

Technological advances, especially those driven by pervasive penetration technologies, have the potential to fundamentally alter how businesses foster and manage creativity. Yet, there has been an inadequate study to evaluate the impact of these technologies on creativity and innovation. We also do not know much about how other types of social media (including Linkedin, Facebook, and WhatsApp) affect creativity and innovation (Anderson et al., 2014). Considering that information and knowledge are important components of creativity, IT exists to manage them. According to Dewett (2003), information technology plays an important role in achieving creativity in organizational processes. With the introduction of digital technology, new avenues for encouraging creativity in education have emerged. Integrating suitable Information and Communication Technologies (ICT) into conventional teaching and learning techniques would aid in the promotion of creativity. To that purpose, social networking sites (SNS) encourage creative interactions between students and professors. As a result, these digital strategies and efforts should ideally represent aspects of the creative processes (Souleles et al., 2019). Many researchers have evaluated a variety of digital technologies that aid

in the development of new ideas and concepts, as well as the promotion of collaborative communications enabled by the use of innovative tools and enhanced learning platforms (Blair-Early, 2010; Budge, 2012; Chang & Zhu, 2011; Corso & Robinson, 2013; Hsiao et al., 2014; Idota et al., 2011; Loukis et al., 2017; Mount & Martinez, 2014; Thakur & Singh, 2012; Tillander, 2011). Although prior research revealed that the Technology Acceptance Model (TAM), which includes Adoption Intention (AI), Perceived Ease-of-Use (PEU), and Perceived Usefulness (PU), played an important influence in social media adoption (Chai & Fan, 2017). In other words, three elements influence social media usability: adoption intention (AI), perceived utility (PU), and perceived ease of use (PEU). These elements are also included in TAM. The extent to which they utilize SNSs regularly and suggest them to other users may boost their creative output.

Moreover, if the user feels that SNSs are effective, beneficial, and simple, this may improve the user's creative work. However, the literature indicates that insufficient studies empirically investigated the potential influences of technology factors such as social networking site adoption intention, perceived ease-of-use, and perceived usefulness in the context of a creative higher education environment. This research focused on the influence of higher education institutions on individual and organizational levels of creativity and innovation, as well as the implementation of TAM by academic staff. As a result, this study investigated their role in fostering a creative atmosphere in Saudi Arabian HEIs.

THEORETICAL BACKGROUND AND RESEARCH MODEL

COMPONENTIAL THEORY OF CREATIVITY AND INNOVATION

Due to the rarity of experimental studies, Amabile (1983) developed the componential theory of individual creativity that examined the social and environmental effects on creativity. The theory assumes that all people with ordinary abilities in specific fields will produce at least moderately creative work, influencing the degree and frequency of creative performance (Amabile, 1997). Indeed, according to the theory, creativity occurs when the skills of individuals overlap with their highest internal interest and are apparent at the higher level of all three elements: domain-relevant skills, creativity-relevant skills, and intrinsic task motivation (Amabile, 1997). There are three main components of individual (or small team) creativity:

1) Domain-relevant skills: Amabile (1988, p. 130) defined domain-relevant skills as the critical skills that should progress any performance. This component is seen as the collection of cognitive pathways for a given problem to be solved or a task to be completed. This component includes factual knowledge, technical skills, and special talents in the domain in question.

2) Creativity-relevant skills: Amabile (1988) explained that creativity-relevant skills are "something extra for creative performance and include a cognitive style favorable to taking new perspectives on problems, an application of heuristics for the exploration of new cognitive pathways, and a working conducive to the persistent, energetic pursuit of one's work" (p. 130). The author added that knowledge of heuristics for creating new ideas and a work style conducive to creativity are creativity-relevant skills. This component relies "on personality characteristics, training such as different types of creativity training programs or even on experience with idea generation" (p. 130).

3) Intrinsic task motivation: Amabile (1988) stressed "that task motivation makes the difference between what an individual can do and what one will do" (p. 133). Furthermore, task motivation seems to be highly dependent on the work environment; depending on the work environment, it can differ from one domain to another and from one task to another within one domain. Task motivation involves two elements: the basic attitude of the individual towards the task, and the perceptions of the individual regarding his or her reasons for understanding the task in a given instance.

In 1988, Amabile extended the above theory to cover both creativity and innovation in the work context, in addition to the former theory of individual creativity, and because of the magnitude of external influences on creativity. Three studies with different participants were conducted by Amabile (1988). In the first study, 120 R&D scientists working for one of 20 different organizations were interviewed. The second study consisted of 16 marketing and development staff working for one of the largest national banks, while the third study consisted of 25 chief railway employees. The author developed another model based on the results: the componential theory of organizational creativity and innovation. The components of individual creativity stayed the same, but others were added (related to the workplace). Amabile (1996) stated that the theory of organizational creativity and innovation attempts to discover factors associated with creativity in the work environment. Amabile (1997) revealed that the key elements of the componential theory combine employees' creativity with the organizational work context. The theory's basic prediction is that work environment factors impact individuals' creativity. In addition, the theory suggests that the creativity developed by individuals and teams within the organization is considered a principal basis for innovation. The most critical feature of the theory is the affirmation that by influencing individual factors, the work environment influences creativity. Despite this, the work environment may influence all the individual components; the effect on intrinsic task motivation is depicted as the most immediate and direct. The three components of the organizational work environment, according to Amabile et al. (1996), are:

1) Organizational motivation to innovate "is a basic orientation of the organization toward innovation, as well as supports for creativity and innovation throughout the organization" (p. 1156).
2) Resources "refers to everything the organization has available to aid work in a domain targeted for innovation (e.g., sufficient time for producing novel work in the domain, and the availability of training)" (p. 1156).
3) Management practices "refers to the allowance of freedom or autonomy in the conduct of work, provision of challenging, exciting work, specification of clear overall strategic goals, and formation of work teams by drawing together individuals with diverse skills and perspectives" (p. 1156).

TECHNOLOGY ACCEPTANCE MODEL (TAM)

TAM is an information system theory proposed by Venkatesh and Davis (2000), which states that people are more likely to use technology if they believe it is useful and easy to use. Two significant factors indicate the acceptability of technology (technology acceptance intention). TAM is determined by perceived usefulness and perceived ease of use. Perceived Usefulness refers to how much a person believes that utilizing a system improves his or her performance, whereas Perceived Ease of Use refers to how easy a system is to use (Ogbonnaya, 2019). As a result, usefulness in the context of SNSs relates to how much "an individual believes that using SNSs would boost his/her communication, collaboration, and information exchange" (Sánchez et al., 2014, p. 140). The benefits that can be obtained from a specific innovation or technology influence an individual's decision to adopt and use it, according to the Technology Adoption Model (TAM). Users are more likely to adopt new technology if they believe it will benefit them. Among other things, social networking sites promote interactivity, collaboration, information sharing, and earning (Mazman & Usluel, 2010; Wasko & Faraj, 2005; Yu et al., 2010).

On the other hand, TAM defines ease of use as "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989, p. 320). According to Mazman and Usluel (2010), combining an individual's technical abilities and skills in the diverse parts of SNSs is a critical component that promotes adoption; the better the mastery of the skills, the higher the perceived ease of use. An individual who can utilize and control the features and content of a social networking site easily and rapidly is more likely to use it (Mazman & Usluel, 2010). Davis (1989) was the first to develop TAM, and it has since been used in Information Systems research on technology acceptance

across a wide range of fields (Surendran, 2012). Davis (1989) developed the technology acceptance model (TAM), which is based on the behavior intention model and presents three concepts: adoption intention (AI), perceived ease of use (PEU), and perceived usefulness (PU), all of which influence users' attitudes and acceptance of technology (Davis, 1989).

The rationale for using the Technology Acceptance Model (TAM) in this study

This section includes references to pertinent publications that support the use of this theory in carrying out this investigation. As a result, while creating and implementing new technology, user acceptance is always an important initial step (Al-Emran et al., 2018). Investing in cutting-edge technology takes significant time, money, and energy (Birch & Burnett, 2009). TAM is "both parsimonious and theoretically justified," which implies it can explain and forecast individual behavior across a wide spectrum of end-user technology applications and prospective consumers (Davis et al., 1989, p. 985). Moreover, the TAM may account for up to 40% of the difference in people's intentions to embrace a certain technology (Venkatesh & Bala, 2008). According to Williamson and Muckle (2018), assessing students' acceptance of new technology is critical to improving instructional practices. As the use of information systems and the ubiquity of new technologies grows, it is becoming more important to identify what factors contribute most to their broad acceptance (Chow et al., 2012; Panicker, 2020; S. Y. Park, 2009; Scherer et al., 2019). The broad usage of SNS benefits institutions and technology developers as well. If a product is well welcomed and extensively utilized, it may be adopted by other institutions, increasing the overall efficiency of universities. Various information systems models and theories have been developed to explain why people accept and utilize new technology. A good example of such a framework is the TAM (Davis, 1989).

TAM is largely acknowledged to be one of the most promising techniques (Venkatesh & Davis, 2000). Chintalapati and Daruri (2017) argue that three elements are required for a theory to obtain universal acceptance as a valuable tool for getting insight into difficult problems: parsimony, verifiability, and generalizability. The first element is Parsimony, defined as simplicity and a guideline for creating an effective information system (Venkatesh & Davis, 1996). The second element is Verifiability, defined as having strong empirical support. The third element is Generalizability, which predicts how new technology will be utilized and accepted in various contexts. TAM has become popular among these models and theories because it has all three characteristics (Lee et al., 2003).

Moreover, King and He (2006) noted that TAM had been frequently utilized to measure the acceptability of new technologies due to its simplicity of use, flexibility, and dependability. It is also stated that TAM's widespread use improves its validity and capacity to explain phenomena (Venkatesh & Bala, 2008). Moon and Kim (2001), Y. Park et al. (2012), Teo et al. (2008), and Venkatesh and Davis (2000) are just a few of the scholars who have modified the original TAM to expand its applicability and validity across a variety of technologies. The use of social media in higher education is still in its early stages (Alshurideh et al., 2019). This implies that further research is required to identify the barriers to these platforms' general adoption and target the most critical areas for improvement. Research has been conducted to examine both social media research and the TAM application (Yousafzai et al., 2007a, 2007b).

Notwithstanding the previous literature's findings, further research is required to analyze the TAM in connection to different scenarios from multiple perspectives (Marangunić & Granić, 2015). In the world of social media, in particular, the question of what drives the usage of such platforms in academic environments remains unanswered, which may lead to misunderstanding in certain cases. Including TAM theory provides a more comprehensive understanding of the factors that influence the use of social networking sites. TAM theory suggests that users are more likely to adopt and utilize technology when they perceive it as useful and easy to use. According to research by Mazman and Usluel (2010), Wasko and Faraj (2005), and Yu et al. (2010), individuals are more inclined to embrace novel technology if they perceive it to be advantageous. Social networking platforms, among other factors, are viewed as beneficial for encouraging interaction, collaboration, and knowledge exchange.

Therefore, TAM can be applied to explain why users choose to engage with these platforms to communicate and collaborate with others. Social networking sites allow users to easily share ideas and gather feedback from a large audience, potentially leading to new and innovative ideas. While other forms of technology may facilitate communication and collaboration, social networking sites are uniquely designed for social interaction and may have a stronger impact on creativity and innovation. Yet, no research has been conducted too far to indicate a genuine relationship between technology adoption and creativity. The impact of other forms of social media (such as WhatsApp, YouTube, and Facebook) on these beliefs is also unknown (Anderson et al., 2014). This study examines how the acceptance of SNSs as technology affects the creative environment in Saudi higher education. As a result, when faculty members agree to utilize SNSs, their research and teaching creativity may enhance.

HIGHER EDUCATION CREATIVE ENVIRONMENT

Literature available on research done on creativity and innovation in higher education, especially the creative environment, is limited, so studies conducted in organizational and business settings are also cited that could afford a theoretical foundation for the study. This research will identify the factors supporting achieving a creative and innovative environment for Saudi Arabian HEIs, specifically regarding research and teaching creativity. Regarding research creativity and teaching creativity, there is no defined and single explained standard to measure the higher education creative environment. So, this research adapted and modified the KEYS instrument (Amabile (1996) to assess the environment for creativity and innovation in Saudi Arabian higher education institutions. This research will define the Higher Education Creative Environment, research creativity, and teach creativity.

Dul et al. (2011) describe the social-organizational work environment, which refers to workers' social and organizational circumstances regarding job design, teamwork, reward systems, and leadership styles. Organizational level (e.g., culture and human resource management policies), team level (e.g., group composition), and job level (e.g., complex and demanding jobs, autonomy, and supervisory support) are the three levels of the social-organizational context. Several studies were conducted to see how work environment influences affected creativity (e.g., Andriopoulos, 2001; Dul et al., 2011; Horng & Lee, 2009). For example, Andriopoulos (2001) reviewed the literature. They discovered that five factors are important in promoting organizational creativity: "organizational climate, leadership style, organizational culture, resources, and skills, and the structure and systems of an organization" (p. 835). Horng and Lee (2009) used in-depth interviews and content analysis to investigate the effect of extrinsic environmental influences on culinary creativity. The findings revealed a strong link between culinary artists' creativity and the quality of their environments. As a result, it is critical to create and maintain a physical, social, cultural, and educational environment that fosters culinary creativity. Finally, according to Dul et al. (2011), 21 elements of the work environment can foster creativity: "challenging job, teamwork, task rotation, autonomy in the job, coaching supervisor, time for thinking, creative goals, recognition of creative ideas, incentives for creative results, furniture, indoor plants/flowers, calming colors, inspiring colors, privacy, window view to nature, any window view, the quantity of light, daylight, indoor (physical) climate, sound and smell" (pp. 719–721).

Abbey and Dickson (1983) described work climate as "a relatively enduring quality of an organization's internal environment that results from the behavior and policies of members of the organization, especially its top management" (p. 362). Also, Isaksen et al. (2001) described the climate as "the recurring patterns of behavior, attitudes, and feelings that characterize life in the organization" (p. 172). The four main environmental dimensions were classified by Schneider et al. (1996): (1) the nature of interpersonal relationships, (2) the nature of the hierarchy, (3) the nature of work, and (4) the focus of support and rewards (p. 10). Isaksen et al. (2001) distinguished between the psychological and the organizational environment: the psychological environment is at the individual level, whereas the organizational environment is at the psychological level. Some scholars have shown that the environment is not limited to the internal elements of organizations; external elements should also be

considered. Cilla (2011) stressed that organizations are concentrating on recognizing that their environment and the external climate in which they strive to operate are becoming increasingly relevant for organizations. Huțu (2005, as cited in Rusu & Avasilcai, 2014, p. 53) noted that external influences, such as the political and economic environment, symbolize aspects of the organizational climate that influence the motivation of the workforce, work satisfaction and performance in addition to internal factors. Ekvall (1996) described the climate as "an attribute of the organization, a conglomerate of attitudes, feelings, and behaviors that characterizes life in the organization and exists independently of the expectations and understandings of the members of the organization", and introduced the concept of creative climate in creativity literature (p. 105).

The climate is considered an important factor that can either encourage or hinder the creativity of employees (Amabile et al., 1996). Mathisen and Einarsen (2004) pointed out that corporations have an important role in creating an environment where creativity and innovation are either supported or hindered. A creative environment seems critical regarding industry and sector types across different workplace environments, such as profit, non-profit, manufacturing, R&D, and mixed settings (Hunter et al., 2007). In identifying the climate for creativity, the same distinction was used to describe the environment for creativity; Amabile et al. (1996) found that the environment for creativity is a psychological environment at the individual level of analysis that focuses on employees' perceptions of different contextual elements in the work environment. Amabile et al. (1996, cited in Mathisen and Einarsen, 2004), showed that evaluating creative and innovative environments could be practical in diagnosing the degree to which creativity and innovation are conducive to the workplace environment of an organization. This can also be useful in assessing development efforts and recognizing relative strengths and weaknesses within and between units and working groups.

This research defines a creative higher education environment as a higher education environment that supports creativity and innovation. In other words, a higher creative education environment can be defined as a creative faculty, center, department, or unit where a great deal of research and teaching creativity is called for and where people believe that they actually produce creative work in their research and teaching.

Research creativity and teaching creativity

The literature on research creativity and teaching creativity is scarce, and neither concept has a precise definition. Amabile (1996) attempted to define creative research as a study that is original in its field and is seen as particularly novel or valuable by other researchers in the field. While the literature defines teaching creativity as "teaching creatively," Jeffrey and Craft (2004) defined it as "applying imaginative approaches to make learning more interesting and effective" (p. 1). Research creativity was the subject of a few investigations. The validity of the Remote Associates Test (RAT) for graduate student advisors was studied by Mednick (1963), who used the RAT and Miller Analogy Test scores and grade point averages to evaluate individuals on a research creativity checklist. On the other hand, the literature suggests three approaches to teaching creativity: teaching creatively, teaching for creativity, and creative teaching). The British National Advisory Committee on Creative and Cultural Education (NACCCE) distinguishes between teaching creatively and teaching for creativity in NACCCE (1999). Teaching for creativity occurs when forms of teaching are provided to foster young people's creative thinking and behavior, whereas teaching creatively occurs when teachers use imaginative approaches to make learning more interesting, exciting, and effective (p. 89). Although creative teaching is seen as a crucial component of effective teaching, it does not guarantee that students will develop their creative potential. Teaching creativity goes one step further by encouraging learners to cultivate their creative abilities. Without creative teaching, however, it is difficult to teach creativity. To have a comprehensive definition for teaching creativity, this paper combined the three concepts into one concept, as discussed above. There are many studies in the literature on teaching creativity and teaching for creativity, but there is little research on teaching creativity. The higher education creative environment is divided into two components in this paper: research creativity and teaching creativity.

Research creativity can be described as the ability of academic staff to produce new and useful research ideas or solutions that advance science in their interest. For example, applying AI to solve COVID-19 tracing. While teaching creativity can be defined as the ability of academic staff to develop new and potentially valuable teaching ideas, services, practices, or procedures that are of direct or indirect benefit to their higher education institutions. For example, teaching in a group or using studio-based learning where learners recognize the problems they want to address and design solutions to solve them. On the other hand, research innovation is the ability of academic staff to transform a new research idea into a new product or service or to improve the organization or procedure of their higher education institution's research work; for example, developing an AI tracing system for COVID-19, etc. In comparison, teaching innovation can be defined as the development and implementation of new teaching ideas by academic staff who participate in transactions within their higher education institution with others over time; for example, developing a studio-based environment that supports group, studio-based, and industry learning.

RESEARCH MODEL

This study attempts to identify the influence of organizational, individual, and technological factors on Saudi Arabian higher education institutions' creative environment. Hence, the theoretical foundations include existing models related to the componential theory of creativity and innovation as well as the technology acceptance model. The research model is represented in Figure 1, and each factor is described in Table 1. Udwadia (1990)explained that the concept of creativity focuses on one or more of three different features: (1) *process*: the nature of the thinking process or mental functions through which new insights or problem solutions are developed; (2) *person*: the creative person's distinctive personality characteristics and cognitive abilities; or (3) *product*: the identifying characteristics of a creative endeavor's output.
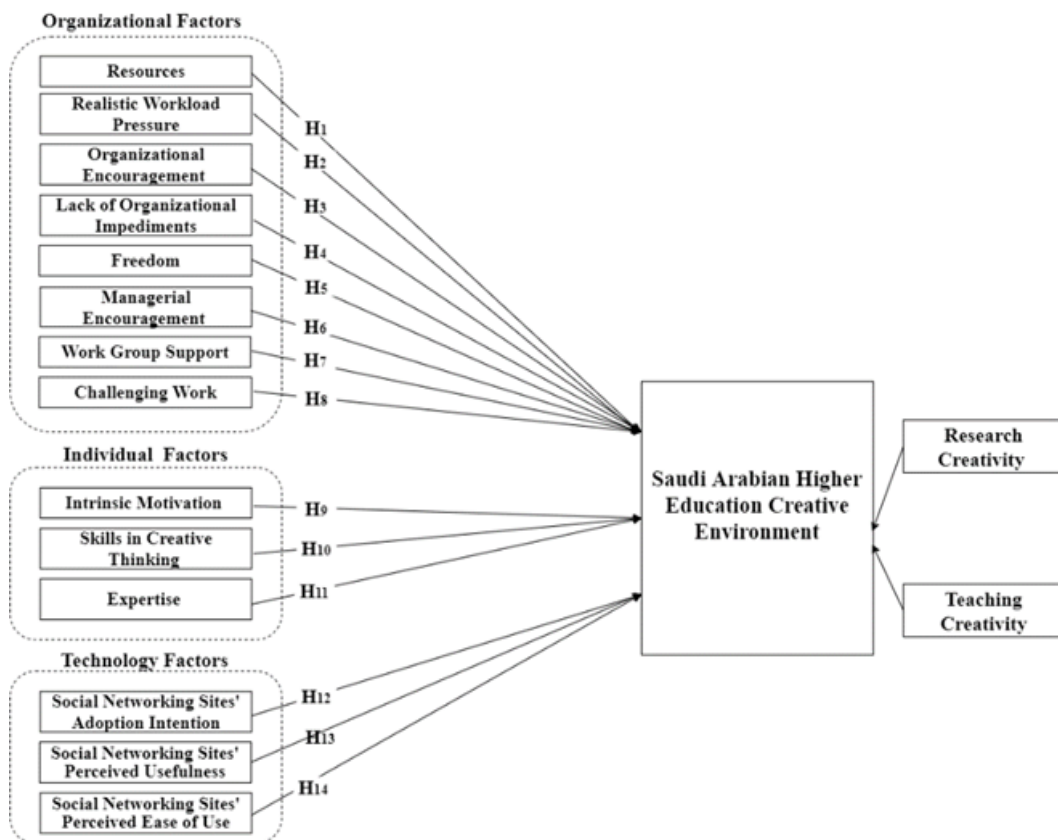

Figure 1. Research model

Table 1. Brief explanation of model factors and constructs

Factors	Brief Description	Literature Sources
Organizational Factors	**Resources:** Things an organization is in possession of that support the completion of domain-specific work aimed at achieving innovation. **Organizational Encouragement:** An approach to maintaining an organizational culture that promotes creativity through a structured mechanism for the creation and sharing of new ideas, a system of reward & recognition for being creative, and a shared vision. **Realistic Work Pressure:** Absence of unrealistic expectations and extreme time pressures for achieving productivity and the tasks that distract creative work. **Freedom:** An autonomy to decide what to do and how to do it and being able to do work in one's own way. **Lack of Organizational Impediments:** A workplace culture that doesn't hinder creativity caused by insider workplace politics, criticism of new ideas, unhealthy internal competition, risk-averse attitude, and encouragement of the status quo at work. **Managerial Encouragement:** A supervisor who demonstrates supportive workplace behavior by encouraging goal setting, valuing staff contribution, and showing confidence in the workgroups. **Workgroup Support:** A group of multi-skilled individuals who effectively communicate & cooperate, exhibit interpersonal trust, constructively evaluate the work of each other and demonstrate work-related commitment. **Challenging Work:** An individual's feeling to demonstrate hard-working behavior towards undertaking challenging responsibilities and tasks.	(Amabile, 1996; Amabile et al., 1996; ElMelegy et al., 2016; Galende & de la Fuente, 2003; Gorondutse & John, 2018; Haas, 2006; Koseoglu et al., 2017; Mumford et al., 2010; Rasulzada & Dackert, 2009; Tseng & Liu, 2011; J. Zhou & Shalley, 2003; Q. Zhou et al., 2012)
Individual Factors	**Intrinsic Motivation:** An inherent satisfaction-based desire and passion of an individual to complete a particular task that is challenging yet interesting. **Skills in Creative Thinking:** A set of cognitive abilities of an individual that drive innovative thoughts and behavior. **Expertise:** The capability of an individual to perform a specific task in an efficient and innovative manner.	(Alblooshi, 2018; Amabile, 1988, 1997, 2013; Basadur et al., 1982; Binsawad et al., 2019; Ganesan & Weitz, 1996; Hennessey & Amabile, 2010; Huang et al., 2014; Mumford et al., 2002; Parjanen, 2012; Park et al., 2014; Ryan & Deci, 2017; Shalley & Gilson, 2004)

Factors	Brief Description	Literature Sources
Technology Factors	**Social Networking Sites' Adoption Intention:** An individual's desire or intent to utilize social media platforms & tools and recommend the same to coworkers. **Social Networking Sites' Perceived Usefulness:** A subjective cognitive understanding of an individual about social media as a useful, beneficial, and effective tool or platform for the purpose of communication, information-sharing, and performing other tasks. **Social Networking Sites' Perceived Ease of Use:** A subjective cognitive understanding of an individual on social media as an easy-to-operate and user-friendly tool.	(Chai & Fan, 2017)
Higher Education Creative Environment	**Higher Education Creative Environment:** A creativity-led work arrangement at a center, department, or faculty of a higher education institution where the individuals believe that the research & teaching work produced by them is novel and innovative in nature. **Research Creativity (RC):** An ability of academic staff to produce novel research ideas that add new knowledge to their field of interest. **Teaching Creativity (TC):** An ability of academic staff to develop novel and potentially valuable teaching methods, procedures, or practices that bring direct or indirect benefits to their institutions.	(Abbey & Dickson, 1983; Amabile & Conti, 1999; Amabile et al., 1996, 2004; ElMelegy et al., 2016; Glisson, 2007; Hunter et al., 2007; Isaksen et al., 2001; Mathisen & Einarsen, 2004; Politis & Politis, 2010; Schneider et al., 1996; Tseng & Liu, 2011)

In addition, Barron and Harrington (1981) argued that, for many reasons, the employed definitions of creativity vary in several aspects. First, if the act or person is to be called creative, some definitions require socially worthy products. Other researchers view creativity as internally valuable itself; thus, there is no need to produce anything of demonstrable social value. Dreams can also be creative, unexpressed thoughts, or simply a child's imaginative expressiveness or curiosity. Second, in terms of the level of achievement known as creative, definitions may vary: the difficulty of the problem found or solved (e.g., the product's elegance or beauty or the essence of the influence). The third kind of distinction is between creativity as achievement, creativity as ability, and creativity as attitude or disposition. In addition, creativity can be demonstrated in various areas, such as fine arts, architecture, psychology, sociology, economics, science, engineering, and management (Sadi & Al-Dubaisi, 2008).

Udwadia (1990, p. 66) asserted that the concept is defined differently in terms of defining innovation in the workplace: (1) implementation of work or manufacturing technologies new to the enterprise, (2) changes in organizational structure or management practices, and (3) market introduction of the fruits of in-house research and development activities. Innovation was classified by Armbruster et al. (2008) into two types:

1) Intra-organizational innovations that take place in corporations or businesses. This type of innovation may concern specific departments or functions or may affect the organization's overall structure and strategy (e.g., teamwork execution, quality circles, continuous processes of change, or ISO 9000 certification of an organization).

2) Inter-organizational innovations are consisting of new organizational structures or processes outside the boundaries of the organization. These encompass new organizational frameworks, such as client R&D collaboration, just-in-time supplier or client transactions, or supplier supply chain management activities. Innovation is defined in this thesis as "the successful implementation of creative ideas within an organization" (Amabile, 1996, p. 1).

HYPOTHESES DEVELOPMENT

As previously stated, the primary focus of the prior study was to assess the impact of various variables on creativity and innovation in the Saudi HEI environment. In particular, the suggested model seeks to evaluate the effectiveness of organizational, individual, and technology variables in deriving creativity, particularly in the research and teaching domains, within the context of Saudi Arabian HEIs.

ORGANIZATIONAL FACTORS

Resources: Organizational resources are one of the major factors of organizational creativity (Galende & de la Fuente, 2003). Amabile et al. (1996) describe resources as "everything that the organization has available to aid work in a domain targeted for innovation (e.g., sufficient time for producing novel work in the domain and the availability of training)" (p. 1156). Companies must balance tactical investment in existing companies with strategic investment in new businesses (Muller et al., 2005). Resources can alter this balance. They provide both financial and non-financial resources available at the work desk or in the range of employees that are readily accessible. Employees need tools, stationery, furniture, and enough space to perform their duties. When leaders equip their employees with ample tools to experiment, they help their organization address challenging issues related to the welfare of students, teachers, parents, and the society of the institution (McNamara et al., 1999). Therefore, we hypothesize that:

> H1: Resources positively affect Saudi Arabia's higher education creative environment.

Realistic work pressure: Realistic workload pressure can affect creativity negatively or positively through the differentiation of two distinct forms of pressure. Excessive workload pressure will have a negative influence due to employees needing more time to be creative; therefore, employees with high workload pressure will be forced to use simple and efficient, less creative strategies (Mumford et al., 2010). On the other hand, challenges can positively influence creativity and drive employees to produce new ideas, and motivate the creative staff to be more creative (Byron et al., 2010; Epstein et al., 2013). Rasulzada and Dackert (2009) reported that they do not feel workload pressure when people feel adequately resourced. Instead, they assume that they will manage the workload if they have access to work resources. Gorondutse and John (2018) stated that significant workload pressure effects indicate that the variables are necessary for educators to encourage creativity. These findings asserted that workload pressure could inhibit an educator's daily practice of creativity, even though their personality and job skills show an interest in creativity, especially in Malaysia's private higher education institutions (PHEIs) (Gorondutse & John, 2018). Therefore, we hypothesize that:

> H2: Realistic work pressure positively affects Saudi Arabia's higher education creative environment.

Organizational encouragement: Organizational encouragement can be defined as the organizational strategies and culture that support creativity and innovation (Amabile et al., 1996). According to J. Zhou and Shalley (2003), organizations should reward, support, and recognize creative thoughts and innovative problem-solving techniques that encourage creativity and innovation. In addition to this, organizations should have a mechanism for developing creative ideas. Amabile (1996) produced many examples of organizational encouragement of creativity: (1) encouraging risk-taking and the generation of ideas, valuing innovation from the highest to the lowest management levels, (2) equal and supportive assessment of new ideas, (3) creativity reward and recognition, and (4) collaborative ideas followed in an organization and decision-making and participatory management. Therefore, we hypothesize that:

> H3: Organizational encouragement positively affects Saudi Arabia's higher education creative environment.

Lack of organizational impediments: Organizational impediments such as the harsh criticism of new ideas, internal political problems, avoidance of risk, destructive internal competition, and over-emphasis on the status quo are barriers to creativity (Amabile et al., 1996; Isaksen & Akkermans, 2011). Some research has indicated that organizational creativity can also be obstructed by formal and rigid management structures (Shalley & Gilson, 2004; Tseng & Liu, 2011). There are several studies that have investigated the variables that could impede the creativity of employers, such as conservatism and internal strife (Amabile & Conti, 1999), bureaucracy (Hirst et al., 2011), controlling supervision (Oldham & Cummings, 1996), and lack of resources (Andriopoulos, 2001). Therefore, according to ElMelegy et al. (2016), reducing organizational impediments and developing well-coordinated mechanisms for identifying and rewarding creative behaviors are among the practices that leaders should adopt to foster creativity. Organizations should establish policies and procedures to address these challenges and enable employees to take chances and create a psychologically healthy environment that allows staff to believe that they will not be blamed or disciplined for disrupting the status quo (Edmondson, 1999). Thus, we hypothesize that:

> H4: Lack of organizational impediments positively affects Saudi Arabia's higher education creative environment.

Freedom: Freedom is a critical factor that promotes creativity through management practices (Amabile & Gryskiewicz, 1989). Freedom refers to a sense of control over one's work, such as deciding what work to do or how to do it (Amabile et al., 1996). Previous studies have shown that employees will be more creative if they are given the freedom to carry out their work (Mathisen, 2011; Moultrie & Young, 2009; J. Zhou, 1998). In preparation, employees have freedom, a way to do the task and innovate. It gives a sense of ownership and control of their task (Gorgoglione & Garavelli, 2006). Freedom of planning is embedded in the promotion of new ideas within the organization (Adams, 2005; Amabile et al., 1996; Gardner, 1994; Johansson, 2004). Employees need to be given an opportunity to cultivate creativity to come up with their own solutions to the problem in planning as well as during the work itself, particularly for those who are very passionate in that area or field, as it encourages the creative process (Sternberg, 2003). Management needs to evaluate all sources of potential opportunities intentionally (Drucker, 2002) and must promote work experimentation in order to turn the challenge into an opportunity (Goh & Richards, 1997). This can be achieved by authority and empowerment of the right kind. Autonomy is created with highly integrated internal motivation (Choi, 2007). Therefore, we hypothesize that:

> H5: Freedom positively affects Saudi Arabia's higher education creative environment.

Managerial encouragement: Amabile et al. (1996) describe management encouragement as a "supervisor who serves as a good work model, sets goals appropriately, supports the work group, values individual contributions, and shows confidence in the work group" (p. 1156). Managerial encouragement is also considered a factor that supports the employees' creativity. Managerial encouragement practices incorporate the practical support of endeavors to initiate new and improved approaches of execution (Bessant & Tidd, 2007), the acknowledgment of innovative achievements, and the continuous recognition of novel ideas to support group members' passion (Amabile, 1998). Koseoglu et al. (2017) argue that the creativity of managers is an important component of effective leadership that can be related to the self-concept and creativity of subordinates. In order to encourage creativity, leadership must play an energetic role in encouraging, supporting, and helping creativity (Shalley & Gilson, 2004). According to Amabile et al. (1996), managerial encouragement is a primary determinant of organizational creativity. Managers should enforce team dynamics and organizational maneuvering, take advantage of opportunities and risk-taking, enable new ideas to be pursued, consider individual initiatives, and offer constructive feedback to encourage an employee to consider new ways of working and enhance their innovative performance (Hunter et al., 2007; Shalley & Gilson, 2004; J. Zhou, 2008). Therefore, we hypothesize that:

H6: Managerial encouragement positively affects Saudi Arabia's higher education creative environment.

Work group support: Amabile et al. (1996) define work group support as "a diversely skilled work group in which people communicate well, are open to new ideas, constructively challenge each other's work, trust and help each other, and feel committed to the work they are doing" (p. 1156). In terms of work group support, most projects are carried out by teams of professionals in current knowledge-work-intensive companies that aim to be both productive and creative in the implementation of new products, services, processes, or new methods of conducting business (Amabile et al., 2004). According to Hennessey and Amabile (2010), the majority of creative work is achieved by more than one person when they cooperate. In general, co-worker support increases individual creative self-efficacy and the degree to which individuals recognize their creative role in the workplace (Tierney & Farmer, 2011). Therefore, managers must understand that peers affect the creativity of employees (Shalley & Gilson, 2004). McLean (2005) pointed out that autonomy and independence are also worthy of staff who stand out as highly creative. In addition, Shalley (1995) has shown that people appear to be more creative when they are free to concentrate on task activities. Support for the work group represents the social aspects of work groups. Perceived support for the workgroup has been shown to improve creativity (Amabile et al., 1996). Therefore, we hypothesize that:

H7: Work group support positively affects Saudi Arabia's higher education creative environment.

Challenging work: Challenging work can be described as "a sense of having to work hard on challenging tasks and important projects" (Amabile et al., 1996, p. 1166). Amabile and Kramer (2007) state that challenging work can improve organizational creativity. In addition, employees' intrinsic motivation can be promoted by challenging work with supportive supervision (Amabile, 1997; Haas, 2006; Q. Zhou et al., 2012). In addition, several researchers have considered that challenging work affects employees' creativity. For example, Amabile (1997) claimed that one of the most important predictors of creativity is a positive sense of challenge in an organization; matching workers to positions appreciated by the organization will stretch their abilities. Udwadia (1990) shared the same point of view, who stated that challenge would promote creativity. Shalley and Gilson (2004) noted that when jobs are complex and challenging, staff should concentrate on making their jobs more persistent and more likely to explore alternatives, contributing to creative outcomes. Therefore, we hypothesize that:

H8: Challenging work positively affects Saudi Arabia's higher education creative environment.

INDIVIDUAL FACTORS

Intrinsic Motivation is defined as an individual's passion and desire to complete a task or work because it is both tough and attractive (Binsawad et al., 2019). Creativity is boosted when individuals are enthusiastic about the task they are given, and this may be produced externally (referred to as external motivation via perks and advantages) or intrinsically. The latter implies that individuals like executing the activity and are not influenced by outside factors or inspiration (Amabile, 2013). According to Shalley and Gilson (2004), creativity requires a certain level of intrinsic, positive strength that allows incumbents to deal with creative work-related obstacles. Using non-traditional methods, Shin and Zhou (2003) revealed that creatively driven workers have a stronger inclination to explore creative problem-solving options and so are more resourceful; hence, they demonstrate a high level of creativity.

Furthermore, Ganesan and Weitz (1996) observed that intrinsic motivation encourages workplace risk-taking and creativity. Internal motivation reflects a high appraisal and respect for the individual regarding his passion and commitment (Ryan & Deci, 2017). Various meta-analyses related to research have indicated a considerably direct relationship between internal task-related desire and creative output, as noted in publications like Liu et al. (2016). Hence, the following is hypothesized:

H9: Intrinsic motivation significantly impacts the Saudi Arabian higher education creative environment (research creativity and teaching creativity).

Skills in Creative Thinking: Amabile and Pratt (2016) defined the concept as the many types of perception, cognition, and thinking capacities included in the creative thinking competencies. These abilities enable individuals to explore topics from different perspectives and analyze them comprehensively and thoroughly, among other advantages. In this respect, Basadur et al. (1982) conducted an empirical study and discovered that the necessary training linked to creative idea production considerably improves workers' divergent thinking skills.

According to Hennessey and Amabile (2010), research and ideas in the creativity area overlap features with personality studies about creativity-relevant skills since both domains focus on individuality. Furthermore, research has shown that cognitive style is connected to perceptions of general and creativity-related effectiveness (Alblooshi, 2018). Training is often required for creativity-related skills (Amabile, 1988). The training instructs employees on proposing new thoughts and ideas entrenched in their job description (Shalley & Gilson, 2004). According to Çekmecelioğlu and Günsel (2013), innovative thinking includes the intellectual and perceptual style, such as the fluidity with which an idea develops and diverse thinking.

Nickerson (1999) made several key assumptions about creativity. For example, he considers creativity and creative thinking to be complementary concepts. In this sense, he stated that their existence in an individual as a package means that an exceptionally creative person is also a skilled critical, and complete thinker. Such thinking produces fresh or original ideas, creative strategies, and new points of view. Critical and in-depth thinking evaluates the value of creative thought and the conditions that must be satisfied for an idea to be acceptable or possibly practical. Furthermore, creative skills are critical to creativity-related performance (Choi, 2004). Therefore, the following is hypothesized:

H10: Skills in creative thinking have a significant positive impact on the Saudi Arabian higher education creative environment (research creativity and teaching creativity).

Expertise: Binsawad et al. (2019) define expertise as the ability to carry out a task operationally and effectively. Furthermore, Park et al. (2014) define proficiency as workers' actual or factual know-how and domain-related knowledge, which is required for creativity (Amabile, 1998). According to Mumford et al. (2002), personal involvement in knowledge development is a fundamental component of creativity. It boosts creativity in various ways; for example, individuals with a high degree of domain-related expertise have greater levels of creativity than employees with insufficient domain knowledge (Huang et al., 2014). According to Parjanen (2012), most respondents mentioned their competency rather than their external competencies, with fifteen interviewees emphasizing the former attributes and just five interviewers emphasizing the latter. Another research found that creative problem-solving on a group basis inside businesses necessitates rationally linking prior experiences and know-how with present crucial concerns (Hargadon & Sutton, 1997; Hargadon & Bechky, 2006). Mumford et al. (2002) claimed that expertise effectively adopts creative individuals' leadership roles. Hence, the following is hypothesized:

H11: Expertise has a significant positive impact on the Saudi Arabian higher education creative environment (research creativity and teaching creativity).

TECHNOLOGY FACTORS

Social Networking Sites' Adoption Intention: It may be defined as the consumer's willingness to use different social and digital media techniques and tools and provide favorable word of mouth about them (Chai & Fan, 2017, p. 35). In this context, Chai and Fan (2017) provided a theory-based model for studying social media's effect on incumbent design education. They discovered a link between social media usability and the dimension of creative expression. In particular, perceived ease of use has a significant direct influence on user perception of usefulness. They also discovered that social media adoption intention is directly and substantially associated with creative manifestation. In

contrast, social media usability is directly but insignificantly associated with broadening and inversely related to surrounding or context. Furthermore, they discovered that learning via social media does not help students improve their creativity. In fact, their overconsumption or usage stops people from gaining inspiration from real-world scenarios. Sarmah et al. (2018) investigated the relationship between the primary co-creation intention variables in the context of creativity through social media use. Researchers employed a survey technique to gather data from 346 hotel guests, followed by a multivariate data analysis. They revealed that their creativity or innovation-related skills, social media attitudes about co-creative service innovation (CCSI), subjective norms, and perception of behavioral control all directly influenced their intention to adopt and co-create. Furthermore, the co-creation purpose was discovered to influence the relationship between components such as customer or user creativity, social media behavior or predisposition towards co-creative service innovation, and the desire to embrace the social media or technology. Hence, we hypothesize:

> H12: Social networking sites' adoption intention has a significant positive impact on the Saudi Arabian higher education creative environment (research creativity and teaching creativity).

Social Networking Sites' Perceived Usefulness: It relates to the user's understanding of the effectiveness of SNS tools in terms of encouraging open and useful communication and boosting task-related creativity for both teachers and students, among other advantages (Chai & Fan, 2017, p. 35). Zhang et al. (2020) investigated the process of increasing creativity in an energy firm via the use of new media. The researchers used the theory of social and digital media influence and the acceptance model relating to technology (TAM) to determine the relationship between creative self-confidence and perceived usefulness of information acquisition and perceived efficacy of communication regarding the use of novel media. The researchers gathered information from 20,161 Chinese workers in the energy industry. They discovered that workers' media use is closely tied to their self-confidence in their ability to utilize media as well as its perceived usefulness, which influences the connection between self-efficacy (associated with creativity) and innovative media use. Furthermore, the use of novel or advanced media by management or leaders increases the perceived value of the new medium. On the contrary, it weakens the link between usefulness as perceived by users and the degree of their sophisticated media consumption. Hence, we hypothesize:

> H13: Social Networking Sites' Perceived Usefulness has a significant positive impact on the Saudi Arabian higher education creative environment (research creativity and teaching creativity).

Social Networking Sites' Perceived Ease-of-Use: It is the customers' perceptual knowledge or assumption that the social media tools will effectively suit their demands (Chai & Fan, 2017, p. 35). Pacauskas and Rajala (2017) evaluated the impact of the Internet in general, and IT in particular, on consumer productivity and efficiency in terms of creativity. The authors integrated ideas about the stream and perceptual capacity with the creative performance assessment of information technology users in their complete examination of the most recent body of work. Individuals' creativity-related performance in various contexts was shown to be influenced by perceived impediments. Obstacles connected to work or assignments, in particular, have the ability to encourage creativity when the consumer is fully integrated into the activity. They also discovered that, since the obstacles of creative work are tough to handle, information technology may aid and support users' creative process activity and help develop one's creative-related performance. As a result, the ease of use of information systems (IS) in particular affects the creativity-oriented performance of information technology users. They also discovered the greatest correlation between creativity and a reported flow sensation. Consequently, they proposed that information systems (ISs) be built to aid rather than impede the flow experience. Hence, we hypothesize:

> H14: Social Networking Sites' Perceived Ease-of-Use has a significant positive impact on the Saudi Arabian higher education creative environment (research creativity and teaching creativity).

APPROACH

The data collection method is an online survey that summarizes numerical or quantitative trends of the opinions and attitudes of the population based on examining a sample of this population (Creswell, 2003). Babbie (2013) states that "surveys are particularly useful in describing the characteristics of a large population because they make large samples feasible" (p. 7). The research questionnaire was developed after thoroughly evaluating the literature on organizational creativity and technology acceptance of social networking sites. The research model assumes that, in higher education, the creative environment is influenced by organizational, individual, and technological factors, as shown in Figure 1. The questionnaire included 64 items on a 5-point Likert scale (1=strongly disagree, 5=strongly agree). The online questionnaire survey was distributed to academic staff who worked in three Saudi Arabian public universities (Jazan University, King Khaled University, and King Abdul Aziz University). The survey was posted online to participants through the Qualtrics website, whose URL was embedded in an email for participants, calling for their survey participation. Participating in the survey was voluntary, and participants were free to withdraw from the study at any time without penalty or consequence. Overall, participants were fully informed and empowered to make their own decisions about whether or not to participate in the survey. The survey was originally performed in English but also included a translated Arabic edition by a certified Arabic translation company. The researchers used a parallel translation method to ensure the equivalence of a questionnaire across different languages and cultures. The process involves translating the questionnaire into the target language and then back-translating it to the original language to check for discrepancies and ensure accuracy.

Participants were asked to complete a 5-point Likert scale closed-ended questionnaire (1=strongly disagree to 5=strongly agree). The appendix shows all adopted items used in the study. The 5-point Likert scale is regarded as one of the most robust ways of measuring responses widely utilized in survey design. Some approaches were used to achieve a high response rate for the survey. First, the survey was designed with a maximum completion duration of 15 minutes in mind. Second, the processes described by Sekaran (2003) were utilized, such as doing the survey as concisely as feasible, providing a cover sheet with this information, and introducing the participants to the research objectives and the significance of the survey to the study. The survey was categorized into five sections: the first section is the demographic information containing eight items on demographic details that identify participants, such as institution name, job level, faculty name, gender, nationality, educational level, age group, and years of experience. The second section is the organizational factors including the eight aspects of the organizational work environment of the work environment items adapted from the KEYS instrument developed by Amabile (1996). Each of the eight factors has four items. The third section is the individual factors that include individual creativity components. The individual creativity section has ten items developed by Binsawad et al. (2019). The fourth section is the technology factors that include ten items that Chai and Fan (2017) developed. The final section is higher education creative environment: this section consisted of two concepts (research creativity and teaching creativity). Each concept has six items developed by Amabile (1996). These six items were adapted and modified to measure and evaluate research creativity and teaching creativity.

After the data was obtained, certain statistical processes were used to gather and analyze the data acquired. The higher education creative environment (HECE) was treated as the higher-order construct in this study, based on two lower-order constructs, namely research creativity (RC) and teaching creativity (TC). Thus, the respondents' data were analyzed using a disjoint two-stage approach using PLS-SEM path modeling. The major objectives of the data analysis section were to examine the data to see whether there was a tendency or dispersion, to analyze data reliability and validity in confirming the data's adequacy, and to evaluate the hypotheses of this study's developed model (Sekaran, 2003). For variance-based structural equation modeling (SEM), a statistical approach for data analysis was adopted.

SEM uses theory testing to test theoretical models to understand better the concurrently displayed relationships among various independent and dependent variables. The partial least squares (PLS-SEM) methodology is one of the most well-known analysis techniques. It is a preferred investigation method in data frameworks and business research due to its flexibility. This approach is appropriate for prediction-oriented research since it does not necessitate a large population or ordinariness. It works without distributional suppositions and with ostensible, ordinal, and interval-scaled variables (Haenlein & Kaplan, 2004; Hair Jr et al., 2014).

The quantitative analysis of this study was conducted in three stages: Descriptive Data Analysis, Measurement Scale Analysis, and Structural Equation Modeling (SEM).

More than 400 responses were received, while incomplete surveys were removed, hence 386 surveys were utilized for data analysis. All participants were asked to respond to all measures, such as the organizational factors and the assessment of the higher education institution's creative environment. Data collection was performed from January 2020 to April 2020. The descriptive analysis shows that 58% of the participants were male and 42% were female, and 1% preferred not to say; 70.2% were 26–35 years, followed by 23.1% aged 36–45 years. Then, 6.0% were 46 and above, followed by 0.8% aged 18–25. Of the respondents, 51% hold a master's degree, followed by 42% doctoral degree and 7.3% bachelor's degree; 49% of participants have more than 5 years of work experience, followed by 21% between 2–3 years; 19.2% of the participants had work experience of 4–5 years, followed by one year which was 12% of the total respondents. Of the participants, 65.3% are lecturers, followed by 23% who are professors (either assistants, associates, or full professors). The remaining 12.2% were classified as holding 'other' staff positions (such as teaching assistants). Other departments represent 40% of responses, followed by education, IT and engineering, and business faculties, which represent 24.4%, 19.2%, and 16.3%, respectively. This shows that the survey includes a reasonable number of staff from various university departments. The majority of the participants are Saudis at 91.2%, and 9% of the participants are non-Saudi. From the institution's point of view, almost half of the respondents (47%) were at King Abdul Aziz University. The percentages of Jazan University, King Khaled University, and Others were 28.5%, 22%, and 2.6% respectively. This shows participation from all Saudi Arabian public universities. Table 2 shows the participant profiles.

Table 2. Participant profiles

		Frequency	Percentage (%)
Gender	Male	222	57.5
	Female	160	41.5
	Prefer not to say	4	1.0
	Total	386	100.0
Age:	18-25	3	0.8
	26-35	271	70.2
	36-45	89	23.1
	46 and above	23	6.0
	Total	386	100.0
Education	Doctoral Degree	162	42.0
	Master's Degree	196	50.8
	Bachelor's Degree	28	7.3
	Total	386	100.0
Work Experience	1 Year	45	11.7
	2-3 Years	79	20.5
	4-5 Years	74	19.2
	More than 5 Years	188	48.7
	Total	386	100.0

		Frequency	Percentage (%)
Job Level	Professor	87	22.5
	Lecturer	252	65.3
	Others	47	12.2
	Total	386	100.0
Faculty	IT and Engineering	74	19.2
	Business	63	16.3
	Education	94	24.4
	Others	155	40.2
	Total	386	100.0
Nationality	Saudi	352	91.2
	Non-Saudi	34	8.8
	Total	386	100.0
Institution	Jazan University	110	28.5
	King Khaled University	85	22.0
	King Abdulaziz University	181	46.9
	Others	10	2.6
	Total	386	100.0

DATA ANALYSIS

The descriptive data for the study's descriptive data analysis were compiled using the SPSS software (Version 25). This step must be completed before doing multivariate data analysis. SmartPLS estimates our research model using partial least squares structural equation modeling (PLS-SEM) (Ringle et al., 2015). PLS-SEM is particularly well suited to models with many latent variables since it avoids estimation problems and incorrect results (Henseler et al., 2009). Also, PLS path modeling results include latent variable scores required to provide diagnostic information about the Higher Education Creative Environment formed through Research Creativity and Teaching Creativity.

MEASUREMENT MODEL ANALYSIS

Previously validated survey instruments were used to ensure appropriate and representative measurements. Factor loading refers to "the extent to which each item in the correlation matrix correlates with the principal component. Factor loadings can range from −1.0 to +1.0, with higher absolute values indicating a higher correlation of the item with the underlying factor" (Pett et al., 2003, p. 299). Factor loadings show how well an item represents its underlying parent construct. All the items in the study were assessed for factor loading, and none of the items in the present study had factors loading less than 0.50 (Hair et al., 2016). Vinzi et al. (2010) suggest that factor loading over 0.7 is desirable. However, in social sciences research, scholars frequently have weaker outer loadings (less than 0.70). Instead of removing items with loadings less than the threshold, it is significantly important that the researcher evaluates the effects of the removal of the item on composite reliability, content, and convergent validity. Hair et al. (2016) have suggested that items with outer loadings between 0.40 to 0.70 may be removed only if their deletion can increase composite reliability or Average Variance Extracted (AVE) over the recommended value.

Furthermore, evaluation of the confidence interval of the loadings in the present study revealed that none of the outer loadings in the items include a zero. Hence, no items were removed in the study from further analysis. Cronbach's Alpha ranged between 0.723 and 0.860, whereas Composite Reliability statistics ranged between 0.798 and 0.902 which is well above the required threshold of 0.70 (Hair et al., 2011). Hence, construct reliability is established. The results of AVE in the current study ranged between 0.512 and 0.716. Hence, it can be concluded that convergent validity is established for all the constructs in the study. Table 3 shows the constructs' reliability and validity. In addition, we use the Fornell and Larcker (1981) criterion to test the discriminant validity of the latent variables

in the PLS model. According to the Fornell and Larcker (1981) criterion, discriminant validity is established when the square root of AVE for a construct is greater than its correlation with all other constructs.

Table 3. Construct reliability and validity

Factors	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (Ave)
01. RSS	0.792	0.866	0.618
02. RWP	0.740	0.834	0.560
03. OE	0.855	0.902	0.698
04. LOI	0.723	0.798	0.512
05. FRDM	0.741	0.825	0.557
06. ME	0.844	0.896	0.684
07. WGS	0.829	0.886	0.661
08. CW	0.808	0.875	0.638
09. IMOT	0.736	0.849	0.653
10. SCT	0.769	0.852	0.592
11. EXP	0.813	0.883	0.716
12. SNSAI	0.793	0.865	0.616
13. SNSPU	0.706	0.836	0.630
14. SNSPEU	0.785	0.875	0.702
15. RC	0.853	0.890	0.576
16. TC	0.860	0.896	0.593

Now RSS- Resources. RSVP: Reahuic Workload Pressures. OF Organizational Encouragement LOI: Lack of Organizational Impediments. FRDM: Freedom. ME: Managerial Encouragement WOS: Work Group Sumer. (IV: Challenging Work. DIOT: Intrinsic Motivation. SC: Skills in Creative Thinking. EXP: Expertise. SNSAL Social Networking Sites' Adoption Intention. SNSPU: Social Networking Sites Perceived Usefulness. SNSPEU: Social Networking Sites' Perceived Ease of Use. RC: Research Creativity. TC: Teacher Creativity

The square root of AVE (in bold and italics) was found to be greater than its correlation with other constructs (see Table 4), hence, providing strong support for the establishment of discriminant validity. The table summarizes the Fornell and Larcker (1981) criterion to establish discriminant validity.

When estimating data from a composite model population, the PLS method requires almost no bias, regardless of whether the measurement model is reflective or formative (Sarstedt et al., 2016). Henseler and Sarstedt (2013) show that goodness-of-fit (GoF) indices for partial least squares path modeling are inappropriate for model validation.

Table 4. Discriminant validity of constructs

FACTORS	01. RSS	02. RWP	03. OE	04. LOI	05. FRDM	06. ME	07. WGS	08. CW	09. IMOT	10. SCT	11. EXP	12. SNSAI	13. SNSPU	14. SNSPEU	15. RC	16. TC
01. RSS	*0.786*															
02. RWP	0.473	*0.749*														
03. OE	0.549	0.412	*0.835*													
04. LOI	0.354	0.306	0.435	*0.716*												
05. FRDM	0.348	0.4	0.468	0.281	*0.746*											
06. ME	0.453	0.396	0.643	0.387	0.436	*0.827*										
07. WGS	0.421	0.351	0.557	0.367	0.463	0.627	*0.813*									
08. CW	0.357	0.277	0.438	0.251	0.375	0.45	0.51	*0.799*								
09. IMOT	0.466	0.357	0.462	0.272	0.386	0.481	0.468	0.408	*0.808*							
10. SCT	0.143	0.202	0.089	0.102	0.219	0.186	0.246	0.267	0.359	*0.77*						
11. EXP	0.276	0.293	0.339	0.159	0.322	0.382	0.402	0.436	0.323	0.449	*0.846*					
12. SNSAI	0.187	0.177	0.265	0.178	0.257	0.355	0.349	0.651	0.203	0.127	0.21	*0.785*				
13. SNSPU	0.228	0.182	0.236	0.113	0.158	0.331	0.262	0.22	0.535	0.179	0.178	0.308	*0.794*			
14. SNSPEU	0.306	0.253	0.349	0.173	0.246	0.348	0.396	0.324	0.282	0.087	0.262	0.383	0.359	*0.838*		
15. RC	0.402	0.307	0.474	0.277	0.389	0.442	0.453	0.489	0.336	0.26	0.389	0.291	0.183	0.433	*0.759*	
16. TC	0.42	0.262	0.485	0.221	0.386	0.382	0.474	0.47	0.374	0.228	0.428	0.267	0.186	0.665	0.606	*0.77*

Note: **Bold** and *Italics* represent the Square-root of AVE

Note: RSS: Resources. RWP: Realistic Workload Pressures. OE: Organizational Encouragement. WI: Lack of Organizational Impediments. FROM: Freedom.

ME: Managerial Encouragement WGS: Work Group Support. CW: Challenging Work. INIOT: Intrinsic Motivation. SCT: Skills in Creative Thinking.

EXP: Expertise. SNSAI: Social Networking Sites' Adoption Intention. SNSPU: Social Networking Sites' Perceived Usefulness. SNSPEU: Social Networking Sites' Perceived Ease of Use.

RC: Research Creativity. TC: Teacher Creativity.

VALIDATING HIGHER ORDER CONSTRUCT

Higher Education Creative Environment (HECE) was the higher-order construct (HOC) in the study based on two lower-order constructs (LOC), namely Research Creativity and Teaching Creativity which are reflective in nature. In contrast, the majority of the constructs in this research were lower-level or first-order reflective concepts. These comprised Organizational Factors, Individual Factors, and Technological Factors, and a total of fourteen hypotheses were developed for inferential evaluations. To establish the higher-order construct validity Outer Weights, Outer Loadings, and VIF must be considered. The outer weights were found to be significant (Hair et al., 2016). Furthermore, outer loadings were found greater than 0.50 for each of the lower-order constructs (Sarstedt et al., 2019). Finally, VIF values were assessed to check collinearity; all VIF values are less than the recommended value of 5 (Hair et al., 2016). Since all criteria are met, the HOC validity was established.

Table 5. Higher-order construct validity

HOC	LOC	Outer Weight	T Statistics	P Values	Outer Loadings	VIF
HECE	RC	0.282	4.748	0.000	0.769	1.580
	TC	0.804	16.716	0.000	0.975	1.580

GOODNESS OF FIT

To ascertain the goodness of fit, the coefficient of determination (R^2), effect size (F^2), and the predictive relevance measure (Q2) were assessed in the present study. The results of the analysis reveal an R^2 value of 0.653 for HECE. This shows that a 65.3% variance in HECE can be attributed to organizational factors (resources, realistic workload pressures, organizational encouragement, managerial encouragement, lack of organizational impediments, freedom, work group support, and challenging work). Individual Factors (intrinsic motivation, skills in creative thinking, and expertise), and Technological Factors (Social Networking Sites' Adoption Intention, Social Networking Sites' Perceived Ease of Use, and Social Networking Sites' Perceived Usefulness). Based on the recommended 0.10 cutoff value (Falk & Miller, 1992), results indicated that our model obtained acceptable R^2 statistics for HECE.

In the present study, the influence of HECE is assessed through several predictor variables. According to Hair et al. (2013), it is recommended that the f^2 effect size shall also be presented. The f^2 effect size statistic specifies if removing an independent variable from the model can substantially impact the dependent variable (Hair et al., 2013). The analysis results of the f^2 statistic show that, in the context of the present study, the removal of challenging work (CW) and Social Networking Sites' Perceived Ease of Use (SNSPEU) will have a significant influence on the R^2 value of HECE. The effect size and its significance are presented in Table 6.

Table 6. Effect size for independent variables

Items -> Factors	Coefficient	(SD)	T Statistics	P Values
01. RSS -> HECE	0.019	0.019	1.035	0.301
02. RWP -> HECE	0.011	0.012	0.935	0.350
03. OE -> HECE	0.034	0.021	1.643	0.100
04. LOI -> HECE	0.000	0.003	0.057	0.954
05. FRDM -> HECE	0.019	0.016	1.190	0.234
06. ME -> HECE	0.002	0.007	0.309	0.757
07. WGS -> HECE	0.002	0.007	0.333	0.739

Items -> Factors	Coefficient	(SD)	T Statistics	P Values
08. CW -> HECE	0.075	0.036	2.101	0.036
09. IMOT -> HECE	0.001	0.006	0.192	0.848
10. SCT -> HECE	0.013	0.014	0.987	0.324
11. EXP -> HECE	0.023	0.017	1.328	0.184
12. SNSAI -> HECE	0.032	0.020	1.591	0.112
13. SNSPU -> HECE	0.021	0.015	1.392	0.164
14. SNSPEU -> HECE	0.564	0.114	4.947	0.000

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The effect size (Q^2) for the predictive relevance of HECE was 0.485. The statistic indicates that the independent variables have a medium effect in producing the Q^2, showing a medium predictive relevance (Hair et al., 2016).

STRUCTURAL MODEL TESTING

The structural model was tested by analyzing the significance of the paths between variables using a t-test calculated with the bootstrapping technique at a 5% significance level to test the proposed hypotheses. The significance of the path coefficients is evaluated using a nonparametric bootstrapping technique (5,000 subsamples) (Henseler et al., 2009); the path estimates are shown in Figure 2. For each proposed hypothesis, Table 6 shows the path co-efficient mean, standard deviation, statistics, and p-value. For two-tailed tests, the recommended t-values are t >1.96 at p 0.05, t > 2.576 at p 0.01, and t > 3.29 at p 0.001.

HYPOTHESES TESTING

A number of different hypotheses were proposed in the study to ascertain the impact of Organizational Factors (resources, realistic workload pressures, organizational encouragement, managerial encouragement, lack of organizational impediments, freedom, work group support, and challenging work), Individual Factors (intrinsic motivation, skills in creative thinking, and expertise), and Technological Factors (Social Networking Sites' Adoption Intention, Social Networking Sites' Perceived Ease of Use, and Social Networking Sites' Perceived Usefulness) on Saudi Arabian Higher Education Creative Environment (Research creativity and teaching creativity).

The results are summarized in Table 7 and the structural model (Figure 2). The table shows that, for hypotheses H2, H4, H6, H7, and H9, the relationship is not significant. On the other hand, all other hypotheses are accepted if the p-value is less than 0.05.

Table 7. Summary of hypotheses testing results

Hypothesis	Model Constructs	Coefficient	(SD)	T Statistics	P Values	Results
H1. RSS -> HECE	Organizational Factors	0.108	0.048	2.246	0.025	**Supported**
H2. RWP -> HECE		-0.076	0.039	1.960	0.050	**Not Supported**
H3. OE -> HECE		0.167	0.050	3.343	0.001	**Supported**
H4. LOI -> HECE		-0.009	0.033	0.285	0.776	**Not Supported**
H5. FRDM -> HECE		0.100	0.040	2.505	0.012	**Supported**
H6. ME -> HECE		-0.043	0.049	0.871	0.384	**Not Supported**
H7. WGS -> HECE		0.043	0.048	0.886	0.376	**Not Supported**
H8. CW -> HECE		0.257	0.058	4.438	0.000	**Supported**
H9. IMOT -> HECE	Individual Factors	0.031	0.052	0.587	0.557	**Not Supported**
H10. SCT -> HECE		0.081	0.039	2.073	0.038	**Supported**
H11. EXP -> HECE		0.112	0.040	2.830	0.005	**Supported**
H12. SNSAI -> HECE	Technology Factors	-0.153	0.049	3.136	0.002	**Supported**
H13. SNSPU -> 1HECE		-0.111	0.041	2.718	0.007	**Supported**
H14. SNSPEU -> HECE		0.530	0.046	11.569	0.000	**Supported**

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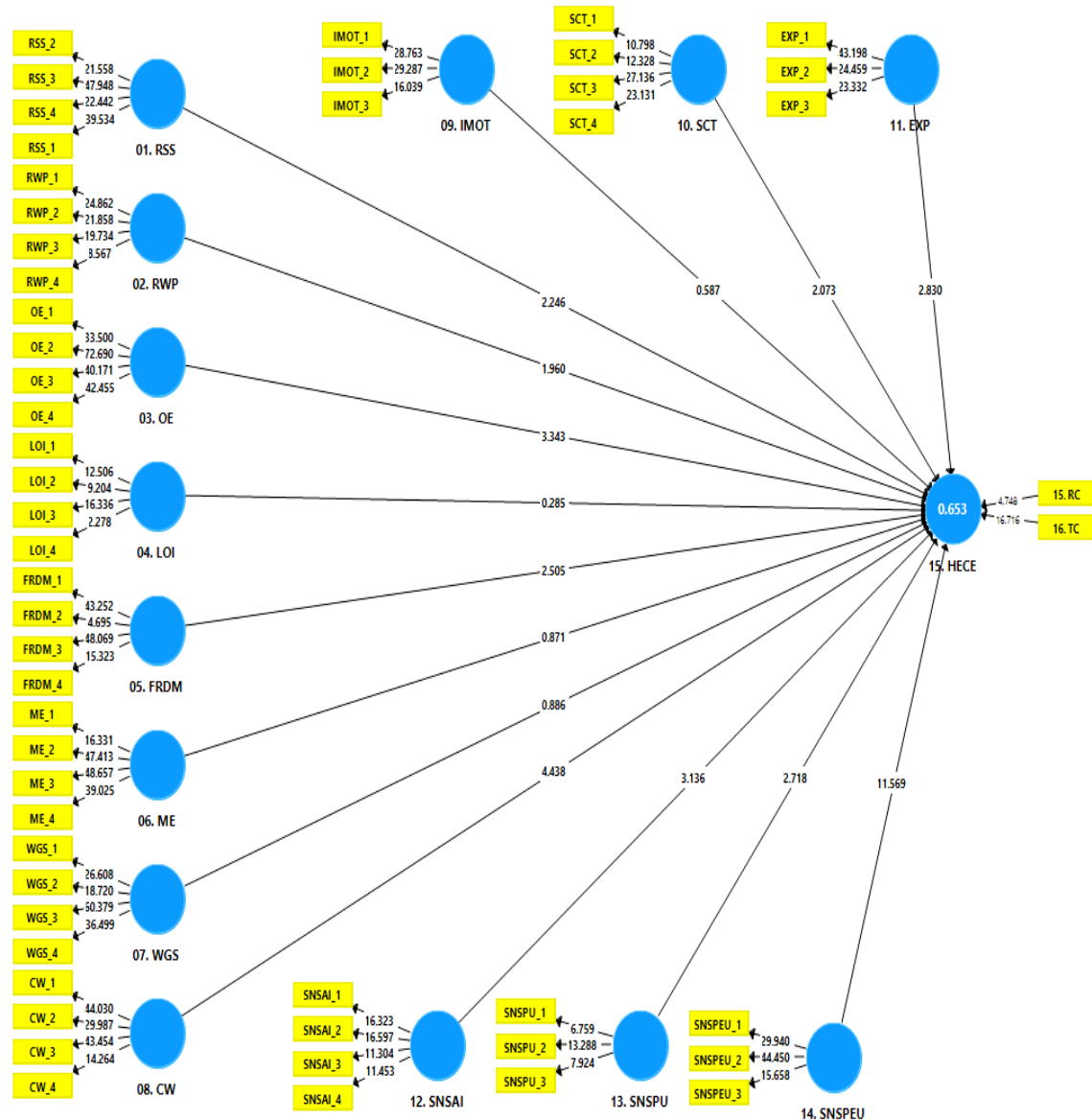
Figure 2. Structural model with t-statistics

DISCUSSION AND CONCLUSION

This paper investigated how organizational, individual, and technological factors facilitate the creation, promotion, and sustenance of creativity and innovation in HEIs. It focused on achieving innovation goals as set in the Saudi Arabian Vision 2030. According to recent literature studies such as Abdulla and Banik (2020), Alblooshi (2018), Kruyen and van Genugten (2017), Patalong (2016), and others, public-sector organizations in developing countries have begun to adopt creativity as a strategy to maximize indigenous human capital and promote socioeconomic development. However, most of the creativity research has been undertaken in Western countries, with a special emphasis on private-sector firms. There have been relatively few studies in Arab nations that looked at the variables that affect creativity at the organizational and worker levels. One such example of an Arab country is the UAE's state of Dubai, which implemented various creative projects and transformed its economy and society. The path testing, as shown in Figure. 2, illustrates the effects of organizational, individual, and technological factors on higher education institutions' creative environment (research

creativity and teaching creativity). The current study has explored literature to unearth those key factors supporting higher education institutions' creative environment, focusing on the organizational, individual, and technological factors. The control of these fourteen factors will enable the academic staff and leaders to achieve a creative environment that can add a competitive advantage to their institutions. In terms of describing the study's results, the study was founded on fourteen hypotheses that were constructed to answer the underlying research question(s). These hypotheses were used in quantitative data analysis to analyze the relationships between the major elements in this investigation. The quantitative data were properly evaluated, and the findings were appropriately reported.

Some of the innovation organizational factors, such as 'resources,' 'organizational encouragement,' 'freedom,' and 'challenging work,' as described in the path testing in Figure 2, have a major influence on Saudi HECE. The findings revealed that the resources had a strong positive influence on enhancing research and teaching creativity within the Saudi HEI environment. This emphasizes that task creativity requires large incubation resources; hence the function of organizational resources is crucial in promoting academic staff creativity at Saudi HEIs. This, when viewed and aligned with previous studies, such as Galende and de la Fuente (2003) and Amabile (1988, 1996), also highlighted that organizational resources were considered one of the crucial factors of organizational creativity, so institutions should put in place the right resources for their staff in order to support creativity in work processes and activities. Also, the survey data indicated statistically significant associations between organizational encouragement and employee creativity in HEI environments. This suggests that when institutions encourage their faculty members, they will produce more creative work. These results agree with Amabile (1996) and J. Zhou and Shalley (2003). The studies further revealed that in order to reach particular degrees of creativity in teaching and research, a high degree of freedom was necessary. The findings are in agreement with the studies, i.e., Adams (2005), Amabile et al. (1996), Amabile and Gryskiewicz (1989), Gardner (1994), Gorgoglione and Garavelli (2006), Johansson (2004), Mathisen (2011), Mathisen and Einarsen (2004), Moultrie and Young (2009), and J. Zhou (1998). Furthermore, the findings revealed that challenging work considerably positively affects academic staff creativity in the Saudi HEI environment. This suggests that the more challenges academic staff face, the more driven they are to generate creative ideas. These findings are also consistent with previous research, such as Amabile (1997), Amabile and Kramer (2007), Haas (2006), Loewenberger (2013), Shalley and Gilson (2004), Udwadia (1990), J. Zhou and Shalley (2003), and Q. Zhou et al. (2012), which established 'challenging work' as an important factor supporting creativity and innovation.

However, the research results revealed a negligible association between HECE and the other four innovative organizational factors (e.g. realistic work pressure, lack of organizational impediments, managerial encouragement, and workgroup support). Previous studies suggested that realistic work pressure might impact creativity, either favorably or adversely. Excessive workload pressure will have a negative impact since employees will not have enough time to think creatively. As a result, employees under a lot of pressure will be urged to use simplistic and conventional tactics that lack creativity (Mumford et al., 2010). In this respect, excessive expectations, strict deadlines, or environmental distractions contribute to workload pressure and, as a result, impede creativity (Joo et al., 2013). Gorondutse and John (2018) asserted in support of this argument, specifically in the context of Malaysian private higher education institutions (PHEI), that significant workload pressure affected the creativity of academic staff. As such, it can inhibit their daily practice of creativity even if their personality shows an interest in being creative. Researchers such as Byron et al. (2010) and Epstein et al. (2013), on the other hand, concluded that challenges were a kind of pressure that might positively affect creativity and inspire people to produce new ideas, inspiring them to be more creative.

Nonetheless, the quantitative findings of this study reveal that actual workload pressure has little influence on Saudi HECE (research & teaching creativity). Similarly, the research results showed an insignificant relationship between a lack of organizational impediments and HECE, which was deemed unimportant by survey participants. However, Hypothesis 4 revealed that a lack of organizational

impediments significantly influenced Saudi Arabian HECE via research and teaching creativity. Prior research highlighting the positive influence of a lack of organizational impediments on staff creativity included Amabile and Conti (1999), Amabile et al. (1996), Andriopoulos (2001), Edmondson (1999), ElMelegy et al. (2016), Hirst et al. (2011), Isaksen and Akkermans (2011), Oldham and Cummings (1996), Shalley and Gilson (2004), and Tseng and Liu (2011). Furthermore, the survey findings revealed an insignificant association between managerial encouragement and the creative environment of academic staff.

However, the research indicated that managerial encouragement is essential to creativity and innovation. These studies on 'managerial encouragement' are consistent with Hunter et al. (2007), Shalley and Gilson (2004), and J. Zhou (2008), who suggested that managers, to improve the innovation of their academic staff, should promote team dynamics, support new initiatives, encourage risk-taking, offer constructive feedback, and seize opportunities. As a result, university administrators should give practical assistance to employees by encouraging more unique and creative working methods, constantly recognizing original ideas, and celebrating their innovative successes to keep them engaged. Finally, the survey data revealed that work group support had minor impacts on HECE, and it was therefore not deemed a factor impacting staff creativity in HEIs. Previous studies, however, such as Amabile et al. (1996, 2004), Diliello et al. (2011), Farmer et al. (2003), Hennessey and Amabile (2010), and Tierney and Farmer (2011), claimed that work group support positively influenced the creativity of staff in organizations. Keeping the findings in mind, university administrators at all levels must recognize the potential of work group support when it comes to increasing the creative performance of academic staff, which is determined mainly by the degree to which they fulfill their creative responsibilities at work.

Individual creativity factors such as expertise, skills in creative thinking, and intrinsic motivation are considered the basis for any creative and innovative work. The survey findings revealed an insignificant association between Intrinsic Motivation and the creative environment of academic staff. However, some research indicated that Intrinsic Motivation is an important component of creativity and innovation. These results are consistent with those of prior research such as Amabile (2013), Cerasoli et al. (2014), de Jesus et al. (2013), Ganesan and Weitz (1996), Liu et al. (2016), Ryan and Deci (2017), Shalley and Gilson (2004), Shin and Zhou (2003), and Tierney et al. (1999). As a result, Saudi HEIs must develop a creative environment that promotes the creativity of their academic staff.

However, both creative thinking skills and expertise substantially influence the creative environment of Saudi HEIs. Based on the results, if Saudi HEIs want to achieve the highest degree of creativity, they must concentrate on developing and improving the creative thinking skills of their academic staff. Concerning the results' compatibility with earlier research, they are consistent with Amabile (1988), Amabile and Pratt (2016), Basadur et al. (1982), George and Zhou (2001), Hennessey and Amabile (2010), Nickerson (1999), and Tierney et al. (1999). It is recommended that academic staff at HEIs improve their creative thinking skills via creative problem-solving, brainstorming, and collaborative learning activities, increasing their creative intellect, especially in research and teaching. Similarly, the findings statistically verified high relationships between academic staff expertise and creativity in the HEI environment. The more experienced the faculty members, the better their cognitive capacities for handling complex challenges and generating creative performance in HEIs. These findings are consistent with those of Amabile (1998), Hargadon and Sutton (1997), Hargadon and Bechky (2006), Huang et al. (2014), Mumford et al. (2002), and Parjanen (2012), who identified 'expertise' as an essential individual component encouraging creativity in the workplace.

Acceptance of social networking sites may boost employee creativity. All three technology factors (i.e., social networking sites' adoption intention, social networking sites' perceived ease-of-use, and social networking sites' perceived usefulness) are important to achieve HECE. The study results statistically supported the relationships between social networking sites' adoption intention and Saudi HECE. In other words, these findings indicate that a desire to maximize the use of social networking sites leads to specific levels of creative performance among academic staff in Saudi HEIs. These

findings are consistent with previous research, such as Chai and Fan (2017), Sarmah et al. (2018), and Zolkepli and Kamarulzaman (2015), which highlighted the effectiveness of social networking sites as important technological tools for supporting organizational creativity and innovation.

Furthermore, the results reveal that social networking sites' perceived usefulness considerably positively influences Saudi HECE. An academic staff member's perspective or belief regarding social media platforms as successful and beneficial tools would result in creative research and teaching performance in Saudi HEIs. When compared to previous research, our results are consistent with those of Chai and Fan (2017), Hidayat and Rohana (2019), and Zhang et al. (2020). Finally, social networking sites' perceived ease of use has a considerable positive influence on Saudi HECE. This suggests that academic staff members using social media as a user-friendly platform/tool to satisfy their professional demands will promote innovation in the Saudi HEI setting. Prior research, such as Chai and Fan (2017), Pacauskas and Rajala (2017), and Siregar et al. (2017), supports these results.

In Saudi higher education, there is a growing interest in fostering creativity and innovation in research and teaching. Several factors can influence the culture of innovation at both the individual and organizational levels. Creativity-related skills can facilitate the development of new ideas and innovative solutions. The Technology Acceptance Model (TAM) can also play a role in adopting and using technology in higher education. TAM suggests that perceived usefulness and ease of use are key factors influencing the acceptance and adoption of technology. Therefore, to foster a creative environment in Saudi higher education, it is important to consider the technology tools supporting research and teaching creativity.

Furthermore, it is essential to note that the Saudi higher education system is undergoing a major transformation through the Vision 2030 plan, which emphasizes the importance of innovation and creativity in advancing the country's economic and social development. As a result, there is a growing emphasis on developing a culture of innovation and creativity in higher education that can contribute to achieving Vision 2030 goals.

Fostering creativity and innovation in Saudi higher education requires attention to organizational- and individual-level factors and the adoption and use of technology tools to support research and teaching creativity. The ongoing transformation of the Saudi higher education system presents an opportunity to promote a culture of innovation and creativity that can have far-reaching benefits for the country's future.

In conclusion, this study investigated the factors that affected research and teaching creativity in Saudi Arabian higher education. The study model included possible creativity-deriving components that were explicitly discovered at the organizational, individual, and technical levels, with some of the factors having a solid theoretical foundation from the Componential Theory and Technology Acceptance Model.

IMPLICATIONS

This study has some theoretical and practical implications. This research contributes to the theoretical and scholarly literature by offering a model of creativity and innovation in Saudi Arabian HEIs. The model proposes an optimal combining of organizational, individual, and technology variables contributing to promoting the Higher Education Creative Environment in Saudi HEIs via creativity in teaching and research and a culture of innovation. In addition, the present study has supplemented and enriched Amabile's (1988) theory by examining the influence of its variables collectively with other identified creativity-deriving variables to produce a creative environment in Saudi HEIs.

Practically, this study enables top leadership in Saudi HEIs to rethink the norms of creativity and innovation in their institutions, thereby instilling a mindset guided by a flourishing culture of creativity in the HEI environment, explicitly focusing on creativity practices in research and teaching domains. While Saudi economic planners and leaders work to diversify and strengthen the Saudi Arabian

economy in general, and to promote creativity and innovation in HEIs in particular, this research provides them with a thorough understanding of the critical drivers of creativity and innovation, particularly in the context of Saudi HEIs, which are currently being eyed as powerhouses of R&D excellence and knowledge innovation, and whose role is critical in creating new socio-economic opportunities to achieve the transformation from a natural resource-dependent economy to a knowledge-based economy, in line with the 2030 Vision. By paying special attention to and adopting the indicated 'Key Success Factors,' Saudi HEIs, especially public HEIs, would be better equipped to strategically realign their present academic, R&D, and entrepreneurial programs following the creative demands of the HEI sector.

LIMITATIONS

Lastly, as with any other research, this research has some limitations. First, because the study only collected data from public HEIs in Saudi Arabia, the findings may need to be more generalizable and applicable to other nations and cultures. Second, although the number of quantitative data samples employed in this study was enough and statistically significant, a larger sample size of survey participants would have improved the reliability and validity of the results. Finally, even if the research model were presented, it is possible that certain important factors that affect creativity and innovation were ignored. Therefore, other factors affecting HECE in Saudi Arabian HEIs should be investigated in further studies. The research employed a cross-sectional design, meaning that the data was collected at a single time. This limits the ability to draw causal inferences or to track changes over time. In future studies, the study's sample size should be based on the number of departments surveyed rather than the number of survey respondents. Another limitation is that the study uses a cross-sectional design, which limits the ability to establish causal relationships between the variables. The research focused on creativity and innovation within the context of higher education institutions in Saudi Arabia, specifically in teaching and research. Other types of creativity and innovation, such as those related to entrepreneurship or community engagement, were not explored. Finally, the study does not explore the potential negative impacts of creativity and innovation, such as potential ethical concerns or unintended consequences of innovative practices.

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APPENDIX. QUESTIONNAIRE

Organizational Factors
The section comprises 32 questions that measure the effect of organizational factors such as resources, realistic work pressure, organizational encouragement, lack of organizational impediments, freedom, managerial encouragement, work group support, and challenging work on creativity and innovation in your university.

Resources (RSS):		(Amabile, 1996; Amabile et al., 1996; ElMelegy et al., 2016; Galende & de la Fuente, 2003)
1	Generally, I can get the Resources I need for my work.	
2	The Budget for my project(s) is generally adequate.	
3	I am able to easily get the Materials I need to do my work.	
4	The Information I need for my work is easily obtainable.	
Realistic Work Pressure (RWP):		
1	I have Sufficient Time to do my project(s)	
2	There are not too many Distractions from project work in this organization.	
3	There are realistic Expectations for what people can achieve in this organization.	
4	I do Not feel a sense of Time Pressure in my work.	
Organizational Encouragement (OE):		
1	People are encouraged to Solve Problems creatively in this organization.	
2	This organization has a good Mechanism for encouraging and developing creative Ideas.	
3	People are Rewarded for Creative work in this organization.	
4	Overall, the people in this organization have a Shared Vision of where we are going and what we are trying to do.	
Lack of organizational impediments (LOI):		
1	There is no Destructive Competition within this organization.	
2	People are Not Critical of New Ideas in this organization.	
3	Top management is Willing to Take Risks in this organization.	
4	Procedures and structures are Not too Formal in this organization.	
Freedom (FRdM):		
1	I have the freedom to decide how I am going to Carry Out My Projects.	
2	I feel little Pressure to meet someone else's specifications in how I do my work.	
3	I have the freedom to Decide What Project(s) I am going to do.	
4	In my daily work environment, I feel a Sense of Control over my own work and my own ideas.	

Managerial Encouragement (ME):		
1	My supervisor clearly Sets overall Goals for me.	
2	My supervisor Values individual Contributions to project(s)	
3	My supervisor is Open to new Ideas.	
4	My supervisor Supports my work Group within the organization.	
Work Group Support (WGS):		
1	There is a feeling of Trust among the people I work with most closely.	
2	Within my work group, we Challenge each other's Ideas in a constructive way.	
3	People in my work group are Open to new Ideas.	
4	There is a good Blend of Skills in my work group.	
Challenging Work (CW):		
1	I feel that I am working on Important Projects.	
2	The Tasks in my work are Challenging.	
3	The tasks in my work call out the Best in Me.	
4	The Organization has an urgent Need for successful completion of the work I am now doing.	
Individual Factors		
The section comprises of ten questions that measure the effect of individual factors such as intrinsic motivation, skills in creative thinking, and expertise on creativity and innovation in your university.		
Intrinsic Motivation (IMOT):		(Alblooshi, 2018; Amabile, 1988, 1997, 2013; Basadur et al., 1982; Binsawad et al., 2019)
1	We have useful resources to work effectively.	
2	I am affected by the work environment to be engaged in the creative process.	
3	I enjoy challenges in my work.	
Skills in Creative Thinking (SCT):		
1	I am good at generating novel ideas.	
2	Brainstorming sessions help me to connect ideas generation into solution.	
3	When facing a problem, I try different ways to solve it.	
4	When facing a problem, I use logical rules to solve it.	
Expertise (EXP):		
1	I know what our organization wants to achieve.	
2	I have the acquired expertise in my particular field.	
3	I can solve complex problems.	

Technology Factors	
The section comprises of 10 questions that measure the effect of Technology factors (Social Networking sites' adoption intention, Perceived usefulness, and Perceived Ease of use on creativity and innovation in your university.	

Social Networking Sites' Adoption Intention (SNSAI):		(Chai & Fan, 2017)
1	In my organization, I frequently use social networking tools such as facebook.com, linkedin.com, blog, twitter, wikipedia.com, youtube.com, researchgate.com, and slideshare.com.	
2	I advise my colleagues at the university to use social media tools for learning in the future.	
3	Social media help me to capture creative inspiration.	
4	Social media help me to improve my creativity.	
Social Networking Sites' Perceived Usefulness (SNSPU):		
1	Social media help me to solve problems by communicating and collaborating with others.	
2	Social media help me to be more creative (because it provides ideas).	
3	Social media help me to use ideas.	
Social Networking Sites' Perceived Ease of Use (SNSPEU):		
1	I believe that it is easy to improve creativity through social media.	
2	I found most social media tools are easy to use.	
3	Social media tools allow me to better acquire knowledge.	

Saudi Arabian Higher Education Creative Environment	
The section comprises of 12 questions that assess creativity and innovation in your university Environment.	
Please assess creativity and innovation in your university environment in terms of research creativity (RC) and teaching creativity (TC). How do you believe that you actually produce creative work?	

Research Creativity (RC):		(Abbey & Dickson, 1983; Amabile & Conti, 1999; Amabile et al., 1996, 2004; ElMelegy et al., 2016)
1	My area of research in this organization is innovative.	
2	My area of research in this organization is creative.	
3	Overall, my current work environment is conducive to my own research creativity.	
4	A great deal of research creativity is called for in my daily work.	
5	Overall, my current work environment is conducive to the research creativity of my work group.	
6	I believe that I am currently very creative in research in my work.	

	Teaching Creativity (TC):	
1	My area of teaching in this organization is innovative.	
2	My area of teaching in this organization is creative.	
3	Overall, my current work environment is conducive to my own teaching creativity.	
4	A great deal of teaching creativity is called for in my daily work.	
5	Overall, my current work environment is conducive to the teaching creativity of my work group.	
6	I believe that I am currently very creative in teaching in my work.	

AUTHORS

Dr. Mamdouh Qahl is an assistant professor at the Department of Management, Applied College at Jazan University. Dr. Qahl earned his bachelor's degree in MIS from King Abdulaziz University in 2007. He earned a master's degree in information technology from the University of Canberra in 2012 and his Ph.D. in Information Systems from the University of Technology Sydney (UTS) in 2023. His research interests include Information Systems, Organizational Innovation, Individual Creativity, Social Networking Sites, Technology Acceptance Models, and Empirical Studies. Dr. Qahl has been publishing and reviewing ISI-quality journals and conferences, such as Australasian Conference on Information Systems, MENACIS, and ECIS.

Dr. Osama Sohaib is an Associate Professor (Business Analytics) at the School of Business - American University of Ras Al Khaimah (AURAK), UAE. He is also an Adjunct Fellow at the University of Technology Sydney (UTS), Australia. He was a full-time lecturer (Assistant Professor) at the School of Information Systems and Modelling at the University of Technology Sydney (UTS) from 2016 to 2022. He holds a Ph.D. in Information Systems from the University of Technology Sydney. His research interests include business information systems, digital business, human-centered AI, business intelligence, decision-making, and applied machine learning. His research aims to improve service effectiveness in areas such as digital business, e-services, etc., with a strong focus on technology's ethical and societal implications.