The Impact of ICT on Fostering Creativity in Business Education Pre-service Teachers: A Comprehensive Literature Review

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Abstract

Creativity is a global issue in higher education in the 21st century since it has shifted teaching and learning into learner-centered approaches meant for skills development. Studies show that 21st century skills foster creativity through technology and change how teaching can be approached in higher education. Since the workforce demands that students be able to apply their creativity, higher education must recognize its critical role in helping students get ready for it. Despite the benefits of creativity to students, literature shows that there is a profound gap between the knowledge and skills that students learn in higher education and the knowledge and skills they need in 21st century community and workplaces. Hence, this study explores the impact of information and communication technology (ICT) on fostering creativity in Business Education pre-service teachers as well as suggests the strategies that could assist students to develop creative skills. The study followed the systematic literature review method PRISMA in selecting studies to be included and excluded in the synthesis of the study. The process commenced by identifying the problem and screening studies to include and exclude in the study. Only 30 studies conducted between 2013 and 2023 were screened for inclusion. Based on the literature and the two-tier model of creativity, it was identified that creativity empowers learning through interactive learning tools; can be used for personalized learning; can also be used for global collaboration; and cultivates innovative minds. The paper also suggests strategies that can effectively foster creativity, such as pedagogical training and support, professional development, mentorship programs, resource accessibility, an ICT-infused curriculum, cross-disciplinary collaboration, and technology-enhanced assessment.

Keywords: *Collaboration, Creativity, Higher Education, Information And Communication Technology, Pre-Service Teachers, 21st Century Skills.*

INTRODUCTION

Creativity is a global issue in higher education in the 21st century since it has shifted teaching and learning into learner-centered approaches meant for skills development (Deng et al., 2020; Huang et al., 2017; Liu & Chang, 2017; Xiong et al., 2020). Since the workforce demands that students be able to apply their creativity, higher education must recognize its critical role in helping students get ready for it (Soriano de Alencar et al., 2017). Creativity comprises the knowledge and skills that pre-service teachers need in the workplace which must be developed by higher education (Beaird et al., 2018; Huang et al., 2017). This is because teaching Business Education successfully requires creative thinking, a skill demanded in the 21st century. Studies show that this can be achieved by integrating information and communication technology (ICT) in the Business Education curriculum because it has tools and processes that can foster creativity (Nikolopoulou, 2018). ICT also fosters changes on how the teaching of Business Education can be approached, especially in higher education, in order to present the creativity-related content (Pathak, 2023).

However, studies identified a gap between the knowledge and skills that higher education offers and the knowledge and skills that pre-service teachers need in the 21st century workplace (Charaya et al., 2017). This gap still exists because teaching is still carried out largely by means of traditional teaching methods, which limit students' participation and promotion of critical thinking skills. This implies that students' individual activities, discussions and discoveries are not practiced in class. So, it is argued by Faizuddin (2017), Mathevula and Uwizeyimana (2014), and Ratheeswari (2018) that the development of these skills can be achieved through ICT integration because it has the potential to foster creativity, as indicated earlier. However, the problem is that creativity has not been developed well among students, as higher education lacks the culture of nurturing

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creativity (Hong et al., 2022; Huang et al., 2017). It has also been found that the environment in higher education has not been active in integrating creative elements into the curriculum and teaching practices of instructors (Kushiator et al., 2020). On that basis, this study evaluates the impact of ICT on fostering creativity in Business Education pre-service teachers. It also suggests strategies that instructors can use to assist Business Education pre-service teachers to develop creative skills that they will use in future. The growth of knowledge and skills will be at risk if higher education today fails to improve the creativity of the teaching process and the education of its instructors and students.

Research Questions

The study is guided by the following research questions:

What impact does ICT have on the creativity of Business Education pre-service teachers?

Which strategies are effective in assisting Business Education pre-service teachers to develop their creative skills?

Contextualizing Creativity

In order to ground our discussion on the impact of ICT on Business Education pre-service teachers' creativity, it is appropriate to conceptualize Business Education and creativity as the basis for understanding their relevance in this study. Scholars have made many attempts at defining creativity in different contexts. It is defined as one of the essential components of 21st century education (Jaenudin, 2023). This means that to develop creativity in students responds to 21st century skills development. Some psychologists have characterized the creativity skill as having distinguished elements such as the flexibility of thinking, the originality of ideas, the ability to think differently, and the ability to solve problems. All these components or elements need to be incorporated in the teaching of Business Education as a way of fostering creativity. Creativity could be described as the use of original concepts or originality to create something new (Kushiator et al., 2020). This study modified the definition of creativity provided by Malhotra et al. (2013), who stated that creativity is the capacity to generate novel concepts that are valuable in some way and unexpected yet understandable for students. This definition works well with the adapted theoretical framework selected for this study.

Theoretical Framework

The study is framed by the two-tier model of creative thinking developed by Runco and Chand (1995), as displayed in Figure 1.
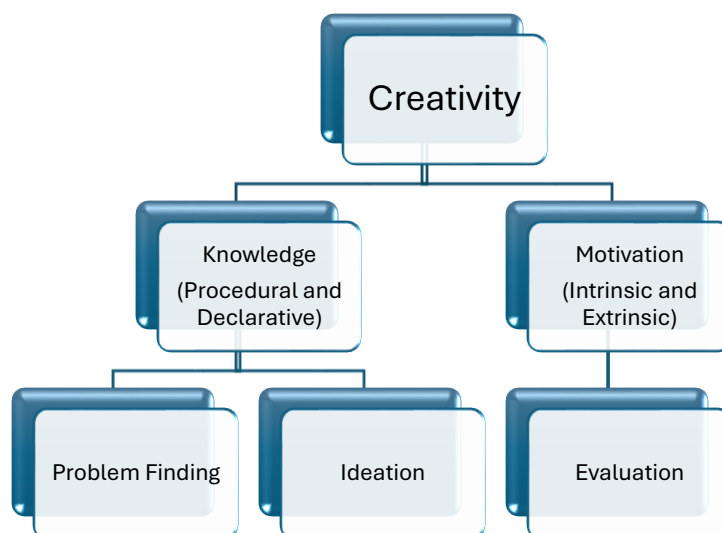

Figure 1. *Two-tier model of creative thinking* (Adapted from Runco and Chand, 1995)

According to Runco and Chand (1995), creativity incorporates two types of knowledge: declarative and procedural. Declarative knowledge is knowledge that facilitates creative thinking by providing factual information, whereas procedural knowledge can assist with developing strategies to explore and evaluate ideas (Brophy, 1998; Sternberg, 2003). Several studies have shown that creative thinking is linked to knowledge, motivation, problem finding, ideation and evaluation (Collins & Amabile, 1999; Runco & Chand, 1995); hence, a person's ability to define a problem is affected by their existing knowledge. As illustrated in Figure 1, the two-tier model of creative thinking shows that there is a relationship between those factors. The first tier represents a set of skills needed for creative thinking: problem finding, which is the ability to define a problem; ideation, symbolizing the ability to generate multiple unique ideas quickly; and, lastly, evaluation, which refers to the ability to critically analyze the ideas. All these skills are the result of knowledge acquisition.

The knowledge base is represented by the second tier, which is made up of declarative (the remembered facts) and procedural (the know-how) knowledge. Furthermore, Runco and Chand (1995) contended that motivation – which can be both intrinsic (fulfilling personal objectives) and extrinsic (arising from outside forces such as incentives or requirements) – affects creative thinking. The connections between the different components explain the interrelationships in terms of a multidirectional flow, which is the capacity to identify a problem that sparks inspiration. These fresh ideas can then stimulate the pursuit of other issues, and upon realizing these ideas, the individual becomes motivated (Runco & Chand, 1995). When the individual is inspired, they will generate more and more ideas, and when they are successful in action, their motivation grows even more. If the individual is motivated, they will produce an endless number of ideas; if these are implemented successfully, their motivation will increase, and they will produce even more ideas. According to this paradigm, creativity occurs when people are inspired to learn, when information is successful, when people are driven to create new ideas, and when motivation is put into practice.

RESEARCH METHODOLOGY

This study followed the systematic literature review protocol PRISMA, developed by Page et al. (2021). To find studies relevant to the current study, four systematic techniques were performed (identification, screening, eligibility and inclusion), as seen in Figure 2.
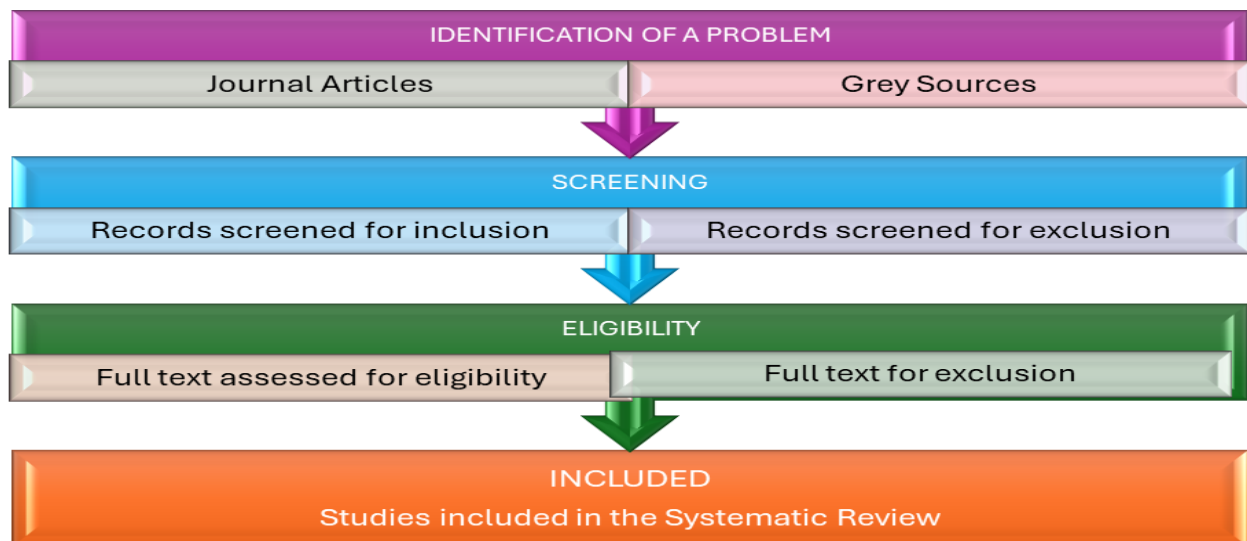
Figure 2. *PRISMA diagram for this study* (Adapted from Page et al., 2021)

This study followed the PRISMA model developed by Page et al. (2021) because this systematic literature review method aims to minimize bias by developing research questions that will guide the study. This section presents and summarizes the process of selecting studies that contributed to a synthesis that will allow institutions of higher learning to devise strategies that will help instructors develop creative skills in Business Education pre-service teachers. The process commenced with identifying the problem and developing research questions that

helped in searching for research articles and general Internet sources called grey literature. This was followed by the first screening, which included journal articles published in English between 2013 and 2023. The second screening was then performed on these studies for eligibility, that is, reading the abstract and entire article to ensure that articles on factors fostering creativity are included and irrelevant ones are excluded. Thirty articles were selected for this study because of their nature and quality in the field of education and relevance to the phenomenon of pre-service teachers' creative teaching. Lastly, themes were identified from these studies and are discussed in response to the two research questions developed for this study.

DISCUSSION OF THE FINDINGS

The findings of this study are two-fold. The first aspect relates to the discussions on themes on the importance of ICT and its application in Business Education teachers' teaching practices. Secondly, the study intends to awaken teachers' practices by recommending effective strategies that can be adapted to foster creativity in students.

Benefits of ICT in the Teaching of Business Education

Creativity is used for personalized learning

As an ICT-driven pedagogy, Business Education empowers pre-service teachers to tailor learning experiences to cater to diverse learning styles and meet individual needs, while enhancing the efficiency of instruction. This means that it enables them to learn at their own pace and place. The immersion in ICT applications can provide pre-service teachers with simulated business scenarios which have the potential to enhance practical knowledge and refine decision-making abilities in a risk-free environment. Since they need to be equipped with curiosity and confidence, they need to be able to exercise their choices and respond to opportunities and challenges. This means that they can cope with change and adversity as well as manage risk. This aligns with what Ignatova et al. (2015) and Haddad (2012) articulated that learning can be tailored to meet individual students wherever they are because it uses engaging direction instructions at individual pacing to allow application of acquired skills. In this way, personalized learning maximizes educational resources and reduces time wastage by utilizing technology and adaptive learning platforms. When using digital tools, pre-service teachers can effortlessly modify their learning materials to suit their learning style and facilitate information processing and comprehension demonstration.

Creating engaging presentations with ICT tools

Creativity provides pre-service teachers with ICT tools to create engaging presentations that capture students' interest and enhance the delivery of complex business concepts. The use of ICT also bridges geographical barriers and facilitates collaborative projects and cross-cultural exchanges, while nurturing a global mindset among pre-service teachers. According to Weng et al. (2022), this helps students experience different cultures because both pre-service teachers and instructors are encouraged to share and exchange ideas in promoting creativity. This can also help individual departments to critically analyze their own culture without bias. These exchanges promote a more inclusive awareness of educational issues through multi-cultural curricula. By embracing these opportunities, higher education can prepare pre-service teachers to navigate an interconnected world, fostering empathy, respect and appreciation for diverse cultures and perspectives. Hence, students can develop a sense of global identity when equipped with skills and knowledge that enable them to engage in cross-departmental dialogues.

Furthermore, ICT fosters collaborative creativity since it facilitates virtual brainstorming sessions, which enable pre-service teachers to collaborate on innovative ideas and co-create engaging learning experiences that lead to creative thinking. This means that more ideas are being developed, as indicated by the framework (Runco & Chand, 1995). Through procedural knowledge, brainstorming can be turned into novel ideas and creative activities put into action. When students are encouraged to think independently and creatively, they become more interested in discovering new things for themselves because they are more open to new ideas and can be keen to work with others to explore ideas. As a result, their motivation, pace of learning, levels of achievement and self-esteem increase. This concurs with Faizuddin (2017) and Runco and Chand (1995), who explained that

creativity is influenced by intrinsic and extrinsic factors. As part of motivation, these components drive creativity, self-determination and competence in students, which are linked to students' creativity.

Strategies for Fostering Creativity

Creativity can be enhanced through ICT platforms

Integration of ICT introduces interactive platforms that actively engage pre-service teachers, fostering a dynamic learning environment which is conducive to 21st century skills development that include creative thinking. This implies that the use of ICT tools can provide platforms for experimentation and exploration that can foster critical thinking and problem-solving skills in Business Education pre-service teachers. This concurs with Bereckzi and Karpati (2021) and Pathak (2023) that it nurtures changes in how teaching Business Education can be approached, especially in higher education, to present the creativity-related content. It also implies that integrating multimedia and simulation tools can enhance engagement and creativity in learning as well as nurture a dynamic learning environment conducive to skills development. This implies that such education places students at the center of their learning by giving them an opportunity to thrive and dream about their futures. Integrating ICT into the Business Education curriculum can therefore influence creativity because it uses the Internet for brainstorming and offers ample creative ideas to work on. Additionally, it can use inspirations from other creative works on the Internet, which increases students' creativity.

Professional development

This suggests that institutions of higher learning can offer professional development that will provide pre-service teachers with comprehensive training in ICT pedagogy and ensure that they are well equipped with the necessary skills that will help them to effectively integrate technology in fostering creativity. Providing pre-service teachers with professional development will provide them with comprehensive training on ICT pedagogy, ensuring that they are equipped with the necessary skills to effectively integrate technology for creativity. This is supported by Manimozahi and Srinivasan (2022), who argue that professional development promotes teachers' technical skills, helping mastery of new knowledge and assisting students' learning. This implies that it gives them leverage to exercise independent thought or make independent decisions. Furthermore, higher education can provide mentorship programs as initiatives to support pre-service teachers in navigating ICT integration challenges and fostering a culture of continuous learning. Creativity can be enhanced through ICT platforms, as these provide paths for pre-service teachers to express creativity through multimedia content creation, fostering innovative instructional materials. This supports Sinining and Ntakurutima's (2021) assertion that in order for creativity to achieve this goal, higher education must make use of its resources in ways that can foster the development of content knowledge and skills in a culture that is instilled at new levels through inquiry, collaboration, connection, integration, and synthesis.

Accessibility to diverse ICT resources and tools

Higher education must also ensure accessibility to diverse ICT resources and tools that will enable pre-service teachers to explore and experiment with innovative technological solutions. Henriksen et al. (2020) indicated that creativity is situated alongside technology as a key component of education futures. This implies that it has the potential for enhancing creativity because it can provide tools and processes according to students' abilities as well as across curricula. Higher education can also ensure that there is resource accessibility to diverse ICT resources and tools, which will enable pre-service teachers to explore and experiment with innovative technological solutions. Then, more products and services can be offered, and more problems solved with the limited resources available.

Use of an ICT-infused curriculum

The study suggests that higher education can use an ICT-infused curriculum as it does not only enrich students' experience but can also equip them with skills necessary for future academic and professional success. This is because it has the potential to prepare them to survive in the increasingly digital world where jobs require them to be proficient in technology use. Besides, it can allow them to connect to people and resources around the world and hence broaden their perspectives and understanding of the subject matter. Effective teaching is

difficult without integrating some elements of creative and technological practices that support 21st century students. Therefore, the study further suggests the use of an ICT-infused curriculum, which can enable seamless integration of ICT into the Business Education curriculum by aligning the learning objectives with innovative technological applications as a way of fostering creative thinking in students. This is supported by Gaspar and Mabic (2015) and Henricksen et al (2020), who claimed that creativity is regarded as a driving force toward the creation of knowledge demanded in the 21st century. So, it is important to encourage higher education as the key site in the development of a creative mindset and promote the creative use of technology.

Cross-disciplinary collaboration

Cross-disciplinary collaboration can be used to encourage collaboration between Business Education and the Technology department to foster interdisciplinary innovation in pedagogy. As a result, creativity can be increased as more ideas can be created and put into practice. Higher education should thus create awareness and understanding of what creativity is and what it means to pre-service teachers in the future. Emphasizing this could help in the development of forms of creativity for students in the appropriate field of study to create quality employees demanded in the workplace. This will help pre-service teachers to be devoted to creative instructions as curricula will be designed in such a way that activities are arranged in a manner that influences idea development, helping them to reflect on their performance and even providing students' feedback. It will also emphasize teamwork in the organization, as networking is encouraged and there will be open discussions contributing to new ideas. This concurs with Runco and Chand (1995) that when people are motivated, new ideas are developed, and so is the growth of creativity. Cross-disciplinary collaboration also has the potential to remove the physical barriers between departments, as stated by Courville (2011). As indicated earlier, adoption of cross-disciplinary collaboration in higher education can bridge geographical barriers and facilitate collaborative projects between departments and cross-cultural exchanges, while nurturing a global mindset among pre-service teachers.

If higher education can continue to cultivate a culture of innovation in Business Education, it can empower pre-service teachers to embrace ICT as a catalyst for creativity and educational excellence. This will help in keeping students highly competitive and relevant and contribute to solving the socio-economic issues of their countries. This concurs with Ayob et al. (2013) and Ibrahim (2023), who explained that cross-building also helps students grow and increases their learning experiences because of unique perspectives and methodologies brought from various disciplines leading to understanding a more complex issues. This also supports and enhances the development of creative innovative teaching.

CONCLUSION

The integration of ICT in teaching has been proven to be a significant catalyst in fostering creativity among Business Education pre-service teachers. It has been found to play a multifaceted role in enhancing teaching and learning, which shows a total movement from traditional methods to dynamic, interactive and engaging methods. It gives these pre-service teachers opportunity to explore innovative teaching strategies that will engage students with real-world problems. However, if the integration is not successful, the potential benefits of ICT on creativity will remain untapped. With the right support systems, these technologies can significantly contribute to shaping innovative and creative educators, better prepared to inspire the next generation of learners. On the other hand, further empirical research is needed to explore the long-term impact of ICT on creativity and to address any challenges related to its effective use in higher education.

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