Journal of Social Studies (JSS), ISSN: 1858-2656 (p); 2721-4036 (e)
Vol. 20. No. 1 (2024), pp. 26-37 doi: 10.21831/jss.v20i1.70279

Creativity, Technology, and the Modern World: Artificial Intelligence (AI)

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ABSTRACT

In today's fast-paced world, various factors contribute to the development of society. One of the most significant aspects that promote individual growth is creativity. Therefore, it is crucial to acknowledge the factors that stimulate creativity in individuals. Families and educational systems should encourage creativity as it provides a strong foundation for young people's social and personal lives and helps them succeed in their future endeavors. Several characteristics can help foster creativity in adolescents. These include recognizing successful individuals, emphasizing creativity, encouraging the early development of creativity, providing a cooperative platform for growth, and highlighting the importance of creativity. Failure to recognize creativity can harm young people's personal and social lives and lead them down an unfulfilling path. Thus, raising awareness about creativity and providing the conditions for its growth is vital. This study explores the role of technology, particularly Artificial Intelligence (AI), in fostering creativity in the modern world and its impact on society by applying qualitative methods to the literature review aspect. Findings exemplify that with the continuous development of technology, it is essential in the contemporary world to consider providing a convenient atmosphere for learning and updating the new generation by offering correct patterns and accurate information.

Keywords: Artificial Intelligence (AI), Creativity, Technology

INTRODUCTION

In this study, researchers attempt to demonstrate the effect and deployment of artificial intelligence (AI) and technology and their relation to Creativity in the modern world; therefore, they continue comprehensively discussing these variables and their role in the modern world.

Creativity, as a primary factor, plays a significant role in an individual's thoughts and future life. It is directly and effectively associated with perception, health, updating, problem-solving, finding problems, and thinking at all levels, mostly assumed to be soft skills. Based on the proposed theories, the creativity factor refers to an efficient process such as innovation (artwork) that seems to be designed based on it (Kasof et al., 2007; Runco, 1995). According to Hernández-Torrano and Ibrayeva (2020), Creativity has been analyzed in multiple disciplines, most notably psychology, and sociology, although discourses in Creativity emerging from other disciplines such as theology, marketing, anthropology, and the arts can also be encountered in general, it has wide been. The theory of individual Creativity refers to factors such as 1) experimental interventions, 2) correct cognition, and 3) purposefulness. Considering this type of Creativity, this behavioral and functional reaction differs between children and teenagers. Children need the support

and attention of their parents to provide a suitable environment for their Creativity, while adolescents do not require environmental help (educational setting and society) (Buijs & Admiraal, 2012; Packer, 1994; Smith et al., 2009). Due to their few experiences, children greatly desire to create an original interaction. They need two-way relationships and remain for an external or internal response for every action they take. In other words, Creativity is directed to the two factors of creation and structure. It effectively creates new factors from the external environment; this proficiency is both production and a place for creating practical ideas and innovations. Creative thoughts and behaviors are often appropriate and depend only on individual standards, so they are labeled individual Creativity (Runco & Charles,1997). In 2023, Hermanni stated that Creativity is the power to develop all enterprises and acts. Everything concerning imagination and ingenuity is an asset and a paramount part of survival. In the decision of Green et al. (2023), Creativity as novel and valuable describes creative products, but Creativity comprises processes. This misalignment contributes to the oft-noted challenges of operationalizing Creativity. Across the board, Creativity is defined as internal attention constrained by a generative goal, which includes three standards: 1) Attention is directed internally. 2) Attentional operations are constrained to fit the parameters of a to-be-achieved goal state. 3) The goal state is generative

Figure 1: Creativity links (Left, 2016)

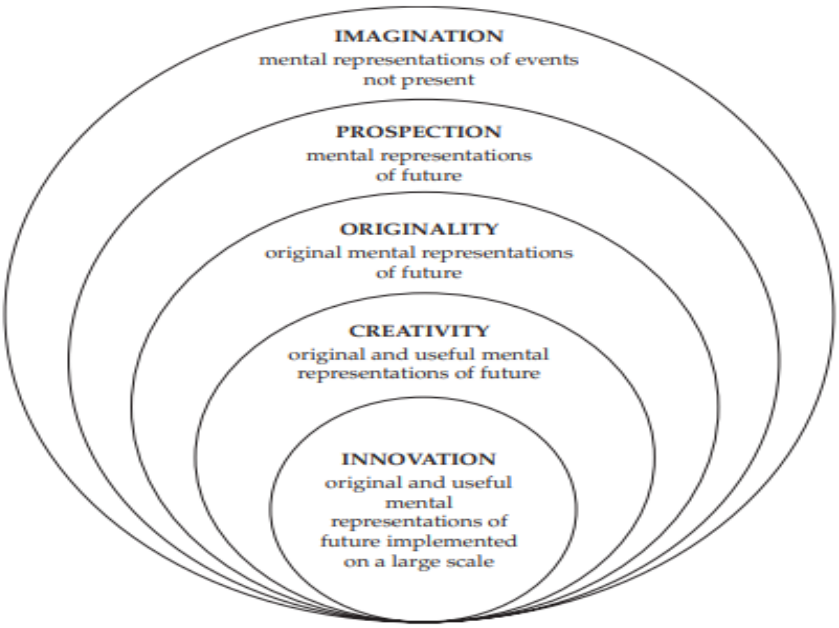

Figure 1 emphasizes the interconnectedness of innovation, creativity, originality, foresight, and imagination in enhancing one's mindset and attaining better outcomes. Everyone needs to undergo this process to advance themselves and have a better attitude and performance. To accomplish this, one must consider various internal and external factors.

LITERATUR REVIEW

Age and creativity

Klonoski (2012) studied how people from different cultures and occupations perceive creativity as they age. The study found that the perception of creativity varies with age and occupation and changes qualitatively over time. In another study by Wu et al. (2005), it was found that knowledge plays a crucial

role in enhancing one's performance in knowledge-rich creative tasks. In contrast, functional fixedness can occur in knowledge-lean tasks. Different individuals have different thinking styles, which their education may influence. Alpaugh et al. (1976) found that creative activities decline with age. The studies also identified the methods and conditions that foster creativity and discussed their implications for education, teachers, and older adults.

Start of Creativity

The history and evolution of creativity are extensive and diverse, spanning across cultures, disciplines, and eras. Creativity is the capability to develop unique and valuable ideas, solutions, or expressions, and it has played a crucial role in human development and progress. However, providing a comprehensive account of the history of creativity takes time and effort. Here are some critical points related to creativity: 1. Prehistoric Creativity: Early humans demonstrated creativity in various ways, such as developing tools and hunting strategies and creating cave paintings. These expressions suggest a capacity for abstract thinking and symbolic representation. 2. Ancient Civilizations: Ancient cultures, such as the Egyptians, Greeks, and Romans, valued creativity in art, literature, and philosophy. The Greeks, for instance, celebrated the Muses, goddesses of the arts, as sources of inspiration. 3. The Renaissance (14th–17th centuries): The Renaissance was a period of intense creativity in Europe, characterized by a renewed interest in classical knowledge, exploration of new ideas, and advancements in art, science, and literature. Thinkers like Leonardo da Vinci epitomized the polymathic nature of Renaissance creativity. 4. The Age of Enlightenment (17th–18th centuries): This era emphasized reason, science, and individualism. Intellectuals of the Enlightenment, such as Voltaire and Rousseau, shaped modern thought through their creative ideas. 5. Industrial Revolution (18th–19th centuries): The Industrial Revolution brought significant technological innovations. While it was driven by scientific and engineering creativity, it also spurred artistic and literary movements to respond to the changing social and economic landscape. 6. During the 20th Century and Beyond, the 20th century witnessed unprecedented scientific, technological, artistic, and musical innovations. From breakthroughs in physics (e.g., Einstein's theory of relativity) to the explosion of creativity in music (e.g., jazz, rock, electronic music) and art (e.g., abstract expressionism, pop art), the century was marked by diversity and experimentation. 7. Cognitive Psychology and Creativity Research: In the latter half of the 20th century, psychologists studied creativity as a cognitive process. Pioneers like Guilford and Torrance developed theories and tests to understand and measure creative thinking. 8. Digital Age and Globalization: The digital age has transformed the nature of creativity, making information more accessible and enabling collaborative and distributed forms of creation. Globalization has also led to the exchange of creative ideas across cultures. 9. Interdisciplinary Creativity: Contemporary creativity often thrives at the intersection of disciplines. The convergence of technology, science, art, and design has given rise to bioengineering, interactive media, and digital arts. 10. Creativity Today: In the 21st century, creativity remains a crucial driver of innovation and cultural development. Creative industries, including technology, entertainment, and design (TED), continue to shape our world. Creativity has been a dynamic and evolving force, adapting to society's changing needs and contexts. It continues to be a subject of study and fascination, contributing to the richness of human experience (Acomi et al., 2023; Gauntlett, 2013; Mehrad & Mehrad, 2023).

Impact of Technology- Modern World

Technology tools, especially learning, education, and creativity, have become critical in modern-day actions. This research study focuses on AI technology, which most scholars and students use in their research, creativity, and education. Applying AI accurately can be helpful for all individuals but misusing it

can weaken individual research. Education and research should rely on more than just apps, especially AI. Consequently, AI is essential for all educational systems, students, scholars, and researchers to have accurate methods of applying and awarding advantages and disadvantages that must be present and introduced. However, using technology and applying new tools in the concept of the study is valuable and should be taught precisely to the students. Having correct knowledge and ideas can be helpful for everyone. The role of technology in our modern world is significant, and the speed and direction of its evolution can lead to many potential threats, as stated by Zawierucha (2020). However, we continue to improve and implement these technologies to create a more comfortable and secure future reality while removing some aspects of that security. AI is the latest invention of humanity, and if we maintain control over the development of new technologies, we need not fear them. Educating the public on the proper use of these technologies and accepting that the speed of human development has been increasing over the years is essential.

Factors and Creative: Technology (AI Tools)

Runco's 2005 study has suggested that drawing effectively allows teenagers and adults to express their thoughts and ideas with minimal effort to create something innovative. The family environment has a significant impact on shaping creativity and how it is presented. The researcher believes that the conditions and background that promote creativity during childhood can significantly impact people's productivity and creativity in adulthood. Therefore, parents and society should pay attention to children's needs, which can substantially affect their creative process, attitude, and behavior. Families and teachers are responsible for supporting children in expressing and creating creative thinking, even if it differs from expected. Today, technology, particularly AI, is crucial in fostering creativity among individuals of all ages, from children to adults. According to Marrone et al. (2022), creativity is one of the most essential skills that students should possess. AI significantly contributes to acquiring knowledge, a vital component of computer science and education. In recent years, technology has made significant advancements, introducing new creative tools that have sparked debates on the importance of creativity in our lives. One of the essential contributors to this field is AI, which has succeeded in various applications through deep learning approaches. Many consider using such technologies as a natural extension of current artistic trends.

In the research by McMahan et al. (2017), Mazzone and Elgammal (2019), Pearson et al. (2019), Oktradiksa et al. (2021); Wu et al. (2021); Kim and Kim (2022), Dwivedi et al. (2023), George and Wooden (2023), Crawford et al. (2023), Oravec (2023), and Yawer et al. (2023) on the use of AI tools in education, it was explained that the effectiveness of AI in the education system depends on various factors. AI can automate grading, provide real-time feedback, then support students outside traditional classroom hours. AI can also identify students at risk of falling behind, analyze educational data for curriculum development, and detect emotional cues in students. AI-driven platforms can streamline administrative tasks, allowing educators to focus on teaching while also being able to detect distress and provide emotional support. AI-powered systems can detect emotional cues, aiding educators, and counselors in identifying students experiencing distress. They can provide early intervention, support, and nonjudgmental space for students to express themselves. AI-driven chatbots and virtual counselors can track moods and emotions, providing insights into emotional well-being and stress management strategies. AI can offer personalized self-care recommendations, predict high-stress periods, and provide emotional support to students. It can also use virtual reality to simulate therapeutic environments, access mental health resources, and analyze written content to identify signs of distress or emotional struggles, enabling educators and counselors to provide help. AI can help students with emotional challenges connect and share experiences, promoting a sense of community. It can guide them through mindfulness exercises and deep breathing techniques. However,

it is important to note that AI should not replace human interactions and professional counseling. It should work with trained mental health professionals to provide adequate support.

AI-driven writing tools have been shown to improve students' writing proficiency and self-efficacy, providing timely feedback, and improving skills. The integration of AI raises ethical concerns, as teachers must guide students in fostering critical thinking and creativity. Clear guidelines and education about AI's limitations are also essential. However, challenges like contextual understanding, bias, and ethical use require further research. Balancing human guidance and AI can enhance learning experiences. AI has become a significant area of interest in higher education, particularly in writing academic essays. These tools offer various functionalities to support the writing process, improving students' productivity, quality, and learning experiences. Studies have shown that AI-based grammar and style checkers, like Grammarly, can improve students' writing skills. AI language models like ChatGPT can also assist in content generation, but students still need to refine and expand on the generated content. Ethical considerations are crucial, as students need proper education and guidance to avoid plagiarism and ensure academic integrity. AI-powered peer review systems have been implemented to improve students' writing skills, while AI-driven Automated Essay Evaluation systems are reliable for formative assessment. However, ethical considerations, proper education, and refinement of AI-generated content usage are essential for responsible and effective integration in higher education settings. The study highlights the positive reception of AI-powered writing tools in academic essay writing, with most participants aware of their benefits.

The use of AI tools like ChatGPT-3 in learning is currently being investigated. These tools have a variety of functions, including dictating essay plans, identifying grammatical errors, tape selection strategies, and correcting curricular knowledge gaps. Using ChatGPT can be crucial for students to prevent cognitive overload and maintain learning flow. Students should be guided on using such technologies to improve their writing and thinking skills, thereby maintaining a balance between AI assistance and human creativity. AI can also be a powerful tool in college learning environments. However, critical evaluation and advice are necessary to use these tools. The rise of generative AI is increasingly witnessed in student activity with the help of ChatGPT, Bard, and other co-authoring tools, which are now integral players in academic writing. However, ethical and academic dilemmas are looking ahead, primarily related to academic fraud, which has intensified due to using such technologies. There are various viewpoints about equity and inclusion, ethical considerations of health chatbots, and the trustworthiness of online assessments. It also highlights the impact of AI in education, the challenges of artificial intelligence cooperation with humans, and the implications of accusations of cheating. The tool's reliability and the potential harm false results can cause. It also draws attention to weaknesses associated with using artificial intelligence to diagnose stress levels from vocal expressions.

Creativity of Imagination

The theory of creativity originated from Vygotsky's theory, which emphasizes the impact of formal education on the development of creativity. He suggested that individuals who continually add to the pool of knowledge develop a rich imagination that serves as a foundation for creativity (Worst, 2007). The theory is based on the belief that creative people have unique ideas that set them apart from others and drive their growth and success. Creativity and imagination are closely linked because they both involve thinking beyond reality. Creativity and imagination are products of the main structure of interactions and can be seen as an image in action. People can be creative or imaginative, and this ability can completely distinguish and advance them (Eysenck, 1994). Likewise, Eysenck presented different attitudes based on thinking and focus, classified in a specific field. According to this researcher, creative people and psychotic individuals generally exhibit excessive thought processes. According to Mason and his colleagues' research (2007), children have limited control over their thoughts, which can manifest their creativity and

performance in particular ways. Healthy individuals can exhibit positive and productive creativity based on the ideas they gather from the world around them (Ayman-Nolley, 1992). Most theories emphasize the need to develop enhanced creativity and imagery abilities. Goldstein and Winner's (2009) findings suggest that childhood imagery is directly related to creative performance in adolescence and adulthood. According to their research conducted among 11 professional actors, the actors who spent time drawing during their childhood played with different toys and were more innovative than others, using alternative words and expressing themselves more eloquently. They also strongly desired to explore their emotional states or inner world. Most actors imagined themselves in adult roles as children (around four). Kohlberg (1963) provided an efficient tool that is highly approved and used in most studies to measure creativity.

Social Creativity

Creativity takes different forms and is nurtured through various environments during childhood. One of these forms is social creativity, which encourages problem-solving among different groups and arises at different times. Social creativity appears in children's creative behavior and is further developed during adolescence and adulthood. Both environmental and individual factors influence social creativity talents. According to Piaget's research (1932), children respond differently to different types of games, depending on their level of creativity. The social environment is considered the primary source of individual differences in creativity, which leads to diversity in creativity and individual and community growth. Social creativity is a crucial factor in examining professional behaviors and is an essential individual and environmental resource in the broader scope of creativity. The importance of social creativity is attributed to its ability to solve intrapersonal problems. Social creativity in children is significant from three perspectives: 1) the influence of social creativity talents supported by family, educators, and researchers, 2) problem-solving, and 3) development activities and successes (Kurtzberg, 1998; Mouchiroud & Bernoussi, 2008; Mumford & Connelly, 1999; and Simonton, 1997). According to Eisenberg et al. (2007), children often adopt new and updated methods of behavior in society and show their initiatives to others based on these methods. Social problems require creative solutions; therefore, social abilities are considered creative (Gardner, 1983). In the study, Ribot (1906) identified various types of imaginative creativity and emphasized the spiritual analysis of imagination. Piaget suggested that one of the times when children reach social growth and express their abilities is when they have achieved an advanced process at the spiritual level, which somewhat enables them to overcome issues that have arisen. As Montuori (2020) stated, social creativity is an umbrella term that describes various approaches beyond psychology's traditional focus on the individual. It initially emerged to address social factors and issues in the study of creativity. The increased interest in social creativity has drawn attention to topics such as relational creativity, creativity in relationships and groups, and the role of the environment in fostering or inhibiting creativity. The psychology of women offers an entry point into the relevance of social creativity since an understanding of the historical, social, and psychological obstacles women face is necessary to fully comprehend women's creativity in activities that receive high recognition, such as the arts and sciences.

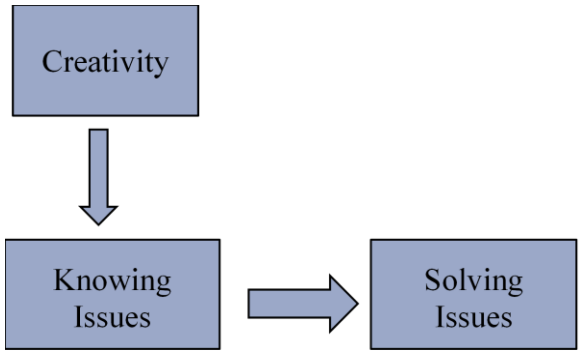

Figure 2: Piaget's theory (1932)

In Figure 2, Piaget's theory (1932) about creativity and problem-solving is depicted. This theory highlights the importance of knowledge about the environment and creativity while learning and acquiring knowledge. These factors are crucial in effectively solving problems and overcoming challenges in different eras.

Role of Creativity in Adolescence

The role of creativity during adolescence is different from that of children of other ages. During this period, creativity usually takes the form of game rules, known as behavioral creativity. These game rules are based on mutual agreement among its members, resulting in collectively agreed-upon changes. According to Piaget, this period involves collective games with bilateral interactions. Children of different age groups display various creative functions, with social creativity typically appearing between 6 and 13. Social creativity depends on the educational environment, teachers, and people in contact with adolescents. Various styles and methods influence the emergence of social creativity, such as the legal style often seen in games and relationships during adolescence. The emotional state of adolescents plays a crucial role in the emergence of creativity. Bergson believed that enjoying the process is an essential tool that brings a person to the desired destination. Physical factors and social environments also significantly influence individual differences and social creativity. It is, therefore, essential to pay attention to teenagers' emotions, especially emotional intelligence, which is crucial in learning and creativity (Hashempour & Mehrad, 2014). Providing suitable conditions for creating innovative functions can make them successful and efficient. Parenting style significantly contributes to intellectual development, according to Lautrey (1977). This style is crucial during childhood and adolescence and can significantly change a person's life conditions. The flexible parenting style has a positive relationship with performance in social tasks. Social creativity plays a significant role in individual and social life, emphasizing the importance of creativity and problem-solving.

METHODS

The study summarizes the research techniques and provides an orientation to the literature review. The researcher explains the choice of research design and its rationale for the goals of this investigation. The methodology for this investigation is presented, along with a description of the instrument used for data collection. The researcher reviewed and studied 47 related resources from Google Scholar, ResearchGate, academia, ORCID, etc. Additionally, the researcher includes a discussion of the data analysis techniques.

RESULTS AND DISCUSSION

The current study comprehensively discusses the role of creativity in modern society and the influence of technology. The researcher emphasizes that families and educational systems are responsible for encouraging creativity from an early age. The study explores how technology, especially AI tools, fosters creativity and impacts society and the modern world. It is essential to focus on: 1. Recognition of successful individuals; 2. Emphasis on creativity; 3. Early development of creativity; and 4. Cooperative platforms for growth, highlighting the importance of creativity.

Creativity involves various processes and is essential in numerous fields, including psychology, sociology, theology, marketing, anthropology, and the arts. Critical theories highlight the importance of experiential interventions, correct cognition, and purposefulness in developing creativity. Technology, particularly AI, also plays a significant role in modern creativity. The proper use of AI can enhance learning and creative expression, while misuse can hinder it. Creativity is a multifaceted and evolving concept crucial for individual and societal growth. Encouraging creativity through supportive environments and appropriate use of technology, particularly AI, can lead to significant advancements. Families, educators, and policymakers must prioritize creativity to ensure individuals' and society's future success and well-being.

CONCLUSION

Creativity is critical for individuals of all generations, and various factors influence its development, such as thinking style, family, education, society, and social support. Families and communities must create an environment that nurtures creativity in children and teenagers. The role of family, educational environment, and society significantly influences creativity. Educational institutes should embrace knowledge and modern technology, providing workshops and seminars to familiarize students with AI and technology. Educating scholars on leveraging technology to enhance their learning experience and academic performance while emphasizing academic integrity is essential. The study underscores the importance of educational institutions creating an environment that embraces modern technology, including AI. Educating students and scholars on using technology to enhance learning and academic performance while emphasizing academic integrity is crucial and is thoroughly recommended. Future research should focus on AI's role in education systems and creative design across different ages and generations to shape educational systems.

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