Chapter 16

Negative Effects of Artificial Intelligence On Human Creativity Ability ⚓

Sibel Aydoğan[1]

Abstract

Artificial Intelligence (AI) is increasingly integrated into creativity and innovation processes in the modern world. However, concerns have been raised regarding its effects on human creativity. The automated content generation provided by AI, its guidance in problem-solving processes, and its facilitation of artistic production may negatively impact individuals' creative thinking capacities (Carr, 2020). By generating content through big data analysis and algorithms, AI may restrict human creativity. Particularly in the fields of art, writing, and design, the widespread use of AI-based tools may diminish individuals' abilities to generate original ideas. Some studies indicate that individuals may become excessively dependent on AI suggestions, thereby relegating their own creative processes to a secondary position (Kowalski, 2021). This phenomenon may lead to a decline in people's creative problem-solving skills and a reduction in innovative thinking.

Moreover, the tendency of AI-generated content to become homogenized may result in a decrease in artistic and cultural diversity. AI systems learn from past data to produce content, which can confine creative processes within the patterns of the past (Smith & Anderson, 2022). One of the fundamental elements of creativity, individual and societal originality, may be compromised due to AI's repetitive nature.

Finally, considering AI's impact on problem-solving processes, it is suggested that individuals' critical thinking skills may deteriorate over time. The ability of AI to provide fast and accurate solutions may weaken people's habits of inquiry and reduce their capacity to develop innovative solutions (McCarthy, 2023). In this context, AI is emphasized not as a tool that supports creative processes but as a factor that may constrain them.

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1   Doç. Dr., Marmara Üniversitesi, İşletme Fakültesi, İşletme bölümü, Pazarlama Anabilim Dalı
saydogan@marmara.edu.tr, ORCID ID: 0000-0002-4870-1901

1. The Concept of Creativity and Human Creativity Ability

Creativity is defined as the capacity of individuals to generate new and original ideas, solve problems, and develop innovative solutions (Runco & Jaeger, 2012; Kaufman & Sternberg, 2010). Traditionally, human creativity has been associated with insight, experience, emotional intelligence, and conscious problem-solving processes (Sternberg & Lubart, 1995). However, advancements in artificial intelligence (AI) have reached a level where human intervention in creative processes may be reduced (McCormack & d'Inverno, 2012).

Human creativity is shaped by cognitive flexibility, experience, and sensory inputs (Amabile, 1996). Creativity serves as the foundation of innovation in various fields, including art, science, engineering, and business (Csikszentmihalyi, 1996). However, with the increasing influence of AI, the nature of creativity and human contribution is being questioned. Particularly, as AI is increasingly utilized in creative production processes, concerns have arisen regarding how individual creativity will be shaped in the future (Boden, 2009).

Creativity has become a shared research area among disciplines such as cognitive sciences, psychology, neuroscience, and education sciences. Generally, creativity refers to an individual's capacity to generate innovative solutions within a specific context. Sternberg and Lubart (1999) consider creativity as a multidimensional phenomenon, emphasizing that cognitive processes, personal traits, and environmental factors contribute to this process. Guilford (1950) defined creativity as "divergent thinking," highlighting the importance of individuals' ability to think outside the norm, generate diverse ideas, and approach problems from multiple perspectives. Torrance (1966) developed a test to evaluate creativity based on an individual's ability to generate ideas, exhibit flexibility, originality, and elaboration.

The association theory developed by Mednick (1962) posits that creative individuals are better at forming remote associations, which enhances their problem-solving ability. These theories indicate that creativity is not merely an individual trait but is also shaped by environmental and cognitive factors.

1.1. The Cognitive Foundations of Creativity

When examining the cognitive processes underlying creativity, it becomes evident that creativity is closely related to memory, problem-solving, and association mechanisms. The "geneplore model" proposed by Finke, Ward, and Smith (1992) suggests that creative processes are linked to the restructuring of mental representations.

The creative thinking process is generally associated with two fundamental thinking styles: divergent thinking and convergent thinking (Guilford, 1950). Divergent thinking involves generating multiple different ideas, while convergent thinking refers to the process of refining these ideas into the most effective solution. Baer (1993) argues that creative individuals effectively utilize both thinking styles to produce innovative solutions.

1.2. The Neuroscientific Foundations of Creativity

Recent neuroscience studies have demonstrated that creativity is associated with specific brain regions. A study conducted by Beaty, Benedek, Silvia, and Schacter (2016) revealed that creativity is linked to the prefrontal cortex, posterior cingulate cortex, and the default mode network (DMN).

Neuroimaging studies indicate that the prefrontal cortex plays an active role in creative thinking and enhances cognitive flexibility in problem-solving processes (Jung et al., 2013). Specifically, the right prefrontal cortex has been found to be effective in generating metaphors and connecting remote associations (Abraham, 2013).

Furthermore, neurotransmitter systems are significant biological factors influencing creativity. For example, higher dopamine levels have been observed to enhance creative performance (Chermahini & Hommel, 2012).

1.3. Psychological Factors and Personality Traits

Psychological research has shown that creativity is linked to specific personality traits. According to the Five-Factor Personality Model developed by Costa and McCrae (1992), individuals with high "openness to experience" scores tend to be more creative.

Csikszentmihalyi (1996) identified the "flow experience" as a psychological factor that enhances creativity. This concept refers to a mental state in which an individual becomes fully immersed in an activity, losing track of time. Creative individuals enter the flow state more easily and exhibit high motivation during this process.

Additionally, stress, anxiety, and psychological pressure have been shown to negatively affect creative thinking. Amabile (1996) argues that external rewards can suppress the creative process, and intrinsic motivation is a crucial factor in fostering creativity.

Human creativity is a complex ability shaped by cognitive processes, neuroscientific mechanisms, psychological factors, and environmental influences. Academic and scientific research suggests that creativity can be

developed through both individual and environmental factors. Adopting strategies that encourage creative thinking in education can enhance individuals' capacity to generate innovative solutions, contributing to societal progress.

2. Factors That Negatively Affect Creativity in Artificial Intelligence

Artificial intelligence (AI) refers to technologies developed to assist human cognitive processes, solve problems, and enhance productivity (Russell & Norvig, 2020). However, the increasing application of AI in creative fields has sparked debates on its potential negative impact on human creativity (Boden, 2004).

While some researchers argue that AI can support creative processes, others contend that it may weaken human capacity for original thinking and innovation (Autor, 2023; Brynjolfsson & McAfee, 2017; Kaplan & Haenlein, 2019; Bostrom, 2014). Although this study focuses on the negative effects of AI on human creativity, it is also important to acknowledge research suggesting that AI can support creativity rather than harm it (Florida, 2002). Some studies argue that AI's ability to handle repetitive and time-consuming tasks may allow humans to focus more on creative processes (Smith, 2021). However, despite such optimistic perspectives, there is a broad academic consensus that AI could have detrimental effects on human creativity (Carr, 2020; Müller, 2021).

AI's impact on creative processes and its long-term effects on human innovation capacity are being increasingly examined. The following sections explore AI's negative effects on human creativity from different perspectives.

2.1. Encouraging Cognitive Laziness AI automation can disengage individuals from problem-solving and thinking processes (Carr, 2010; Kahneman, 2011; Sparrow, Liu & Wegner, 2011). People may avoid complex cognitive processes and prefer ready-made solutions over creative thinking (Nickerson, 1999). Furthermore, AI's easy access to information may promote superficial learning instead of deep understanding (Ward, 2007), limiting individuals' analytical and critical thinking abilities.

2.2. Reduction in Individual Originality and Diversity AI operates by analyzing large datasets and following established patterns, often leading to repetitive and predictable creative outputs (Boden, 2004; Shneiderman, 2007; Miller, 2019). The widespread use of AI in digital content creation may reduce artistic diversity and individuality (McLuhan, 1964). Particularly

in literature and art, increasing reliance on AI may diminish originality and diversity (Manovich, 2013).

2.3. Creative Dependency in Human-AI Collaboration

AI can be used as an assistant in creative processes. However, this collaboration may gradually transform into dependency, weakening individuals' capacity to generate original content (Smith & Anderson, 2019; Colton & Wiggins, 2012). In the production of art, music, and written content, the active role of humans is being replaced by an increasingly guiding role of AI (Boden, 2010). Particularly in the media and entertainment industries, the use of artificial intelligence is causing traditional creative processes to be replaced by algorithms (McLuhan, 1964). This situation could lead to issues in employment, intellectual property rights, and ethics.

2.4. Ethical and Ownership Issues

The ownership of content produced by AI brings about ethical and legal concerns. The degree of originality of works created by AI and the human contribution involved are subjects of debate (Floridi & Sanders, 2004; Gunkel, 2020). Furthermore, it may create economic difficulties for artists and writers (Lessig, 2004; Zittrain, 2008). Legal uncertainties persist regarding the ownership of AI-generated works, and this situation could adversely affect the creative industries (Samuelson, 2019).

2.5. Threats to Originality and Individuality

The development of AI in fields such as art, music, literature, and design may standardize creative production, thereby diminishing individuality and originality (Boden, 2004). For instance, AI-supported software and algorithms can generate new content based on data-driven predictions; however, since these contents are often combinations of past data, their level of originality is limited (Colton & Wiggins, 2012).

2.6. Weakening of Cognitive Processes that Support Human Creativity

The assumption of creative tasks by AI can lead to the deterioration of individuals' problem-solving, critical thinking, and innovative idea generation skills (Carr, 2020). For example, AI models that automatically produce content may lead individuals to turn to pre-made content rather than formulating their own ideas (Müller, 2021).

2.7. Commercialization and Homogenization of Creativity

The widespread use of AI can accelerate production processes in art and design, but it may also lead to the creation of content that conforms to specific patterns in order to increase its marketability (Elgammal et al., 2017). This may result in the prominence of repetitive and commercially viable content, rather than originality, in art and design (Manovich, 2018).

2.8. Decreased Human Involvement and the Passivization of Creativity

The integration of AI into creative processes may lead to the increasing passivization of human creativity. For example, software that generates content automatically may reduce individuals' direct participation in creative processes, resulting in creative experiences becoming superficial (Boden, 2018).

2.9. Loss of Depth and Meaning in Art and Cultural Production

Content produced by AI is often data-driven and superficial, lacking human experience and emotions (Chollet, 2019). This may lead to a reduction in the depth of meaning in artistic production and the mechanization of cultural values (Guzdial et al., 2022).

3. Examples from Different Fields

To better understand and concretize the negative effects of artificial intelligence on human creativity, it will be useful to provide examples from different fields. Below are some of the negative examples categorized by industry.

Academic and Literary Content Production: AI-based text generation systems weaken originality by influencing academic and creative writing (Bender et al., 2021). Systems like ChatGPT can automate the production of knowledge, making the creative process mechanical (Marcus & Davis, 2019). In particular, the production of academic work using AI could negatively affect scientific creativity and lead to new debates regarding research ethics (Floridi, 2021).

The Impact of AI on Advertising and Marketing: AI-supported advertising and content production have changed creative decision-making processes in the marketing industry (Davenport & Ronanki, 2018). Advertisement strategies driven by algorithms have led to a decrease in original marketing campaigns (Huang & Rust, 2021). This situation may reduce the role of creative professionals in marketing and advertising and

lead to the widespread use of standardized content (Kaplan & Haenlein, 2019).

Standardization in Literature and Content Production: AI-supported writing tools such as GPT-4 and Jasper AI can generate novels and poems. However, these tools follow existing patterns rather than creative thinking, relying on large datasets. For instance, in a Japanese literary competition held in 2021, a science fiction novel written by AI was noted for being "devoid of creativity" (Sugimoto et al., 2021).

Decreased Innovation in Fashion and Design Industries: AI-supported fashion design platforms, such as Google's DeepFashion AI, often produce designs that repeat past trends, thus reducing individuality (Kim & Park, 2019).

Homogenization in Art and Visual Design: In AI-supported art production, the originality and human contribution are questioned (Elgammal et al., 2017). For example, paintings and music produced by AI change the role of the artist and lead to the mechanization of the creative process (McCormack et al., 2019). AI-supported art production platforms (such as DeepDream, DALL☐E, and MidJourney) create works by imitating specific artistic styles. In 2022, when an artwork created by AI won first place at the Colorado State Fair, artists argued that creativity was under threat (Vincent, 2022).

Loss of Originality in Music Production: AI systems like Aiva and Jukebox (OpenAI) can compose music without human intervention. However, these systems can stifle innovation by generating new songs based on the analysis of previous compositions (Hertzmann, 2020). The growing adoption of AI-generated music and visual art increasingly complicates competition for artists and threatens artistic originality (Boden, 2010).

Use of Artificial Intelligence in Film and Scriptwriting: Production companies such as Netflix and Warner Bros. are testing AI-supported script analysis systems. However, these systems may limit creativity by repeating successful formulas (Shaw, 2020).

Conclusion and Recommendations

The role of AI in creative processes should be addressed in a balanced way, and policies should be developed to preserve human creative potential. Educational systems must be restructured to promote critical thinking and creative problem-solving skills. Furthermore, ethical and legal regulations should be clarified regarding AI-supported content production (Brynjolfsson

et al., 2018). The use of AI as a supportive tool in creative processes should be regulated in such a way that it does not hinder human creativity.

The effects of artificial intelligence on human creativity are a subject that needs to be addressed from both positive and negative perspectives. However, the existing literature reveals that AI has developed various mechanisms that threaten human creativity. The following recommendations can be made to mitigate these negative effects:

- AI should only be integrated into human creative processes as a supportive tool,

- Emphasis should be placed on critical thinking and problem-solving skills in creativity education,

- Ethical guidelines should be established to preserve human creativity in fields such as art, design, and literature.

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