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A Study on Practical Method to Enhancing the Creativity Effectiveness for Media Contents Education by Using Artificial Intelligence and Metaverse

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Abstract

We studied to aim for exploring practical approaches to enhance the effectiveness of creativity education by using artificial intelligence and the metaverse in the field of media contents. Recognizing the need for educational innovation to adapt to the accelerating changes driven by the advancements in artificial intelligence and the metaverse, and considering the increasing importance of fostering creativity as a key competitive advantage for future talents, we focused on research implementing creativity education in the media contents domain. To achieve this, we conducted this study during a semester-long media contents course utilizing artificial intelligence and the metaverse in real classroom setting. We involved in this study collecting feedback and opinions from students to investigate and identify effective strategies for enhancing the impact of creativity education. As a result, we proposed the utility of media contents class using artificial intelligence and the metaverse in enhancing students' creativity. By elucidating which teaching methods are most effective, we contributed to derive beneficial outcomes for media contents creative education.

Key Words: Creativity, Education, Media Contents, Artificial Intelligence, Metaverse

I. Introduction

Artificial intelligence(AI) and the metaverse are transforming the world into a society of superintelligence, hyperconnectivity, and hyperrealism. In the field of education, key technologies related to these advancements are being applied in various ways. AI and the metaverse are providing diverse educational services that feel realistic and are conveniently accessible anytime, anywhere. With the acceleration of the development of AI and the metaverse, educational innovation to adapt to these changes is essential.

Many in the education sector suggest that utilizing AI and the metaverse for education, especially to enhance the core competitiveness of future talents, such as creativity, can be even more effective. Therefore, exploring concrete ways to leverage AI and the metaverse for creative education in media contents, including videos and advertising, and integrating them practically into creative lessons is crucial. This research aims to identify and

develop practical strategies for utilizing AI and the metaverse to enhance the effectiveness of creative education in media contents, contributing to the advancement of creative teaching methodologies.

II. Study Background

1. Prospects of AI Based Educational Environment

Globally, AI market is expected to reach a staggering 2,436.8 trillion won by 2030, demonstrating an annual growth rate of 36.6%. AI is anticipated to innovatively enhance efficiency across all processes in the industrial ecosystem, with global companies already developing and applying AI to their services [1]. In the Korea domestic market, the AI sector recorded a revenue of 2.6123 trillion won in 2023, marking a 17.2% growth compared to the previous year. The domestic AI market is projected to continue its growth with an average annual growth rate of 14.9% over the next five years, reaching a scale of 4.4636 trillion won by 2027. The integration of digital and industrial technologies in the AI ecosystem, driven by accelerated AI adoption across various industries, is expected to propel the growth of the domestic AI market [2]. The emergence of large-scale natural language based generative AI, such as ChatGPT, has significantly impacted the field of education. Collaboration between AI and the education sector has become an inevitable aspect. Minister Lee Ju-ho of the Ministry of Education emphasized, "AI education is a crucial area for transitioning to digital education." He further stated, "We will actively utilize AI in school lessons to facilitate personalized learning for students. Teachers will be actively supported to foster students' creative thinking and contribute to educational innovation".

Consequently, the utilization of AI in education is becoming not just an option but a necessity for the future.

2. Prospects of Metaverse Based Educational Environment

The global metaverse market has entered an unprecedented growth trajectory, extending beyond the gaming industry to rapidly expand into education and various industries. According to a report released on October 27, 2023, by the market research firm Research and Markets, the global metaverse market is expected to grow at an annual rate of 48.0%, reaching a scale of $1.3034 trillion (approximately 1770 trillion won) by 2030. Research and Markets anticipate that the metaverse, beyond entertainment, is expanding its application areas into education and collaboration fields, as it encompasses virtual classrooms, meeting spaces, and workspaces. With the rapid proliferation of generative artificial intelligence, the metaverse environment is expected to enhance digital humans and digital contents, making it easier to create. This development is anticipated to increase the utilization of the metaverse in the field of creators [3]. Indeed, as artificial intelligence advances, the metaverse is also expected to undergo further sophistication, and with the market expanding to be easily accessible for everyone, its utility in the field of education is projected to broaden.

3. Preliminary Research Analysis

Research on the utilization of AI and the metaverse in education began in 2020 and has gained momentum with the widespread adoption of generative AI, such as ChatGPT, and the advancement of the metaverse. UNESCO emphasized the need for careful consideration and creativity in using ChatGPT in higher education. Recommendations included creating opportunities for discussing the impact of ChatGPT, introducing clear guidelines, connecting ChatGPT usage with learning outcomes, reviewing evaluations of all forms to ensure suitability, and updating policies related to academic integrity. It highlighted the importance of educational institutions focusing on building the capacity to understand and manage ChatGPT effectively [4]. Researcher

Min-young Han conducted a study on developing a chatbot-based AI education program to enhance students' attitudes and computational thinking towards AI technology [5]. Da-ye Yang and Seon-gwan Han developed an AI-based art integration education program, applying it to elementary school class and confirming a significant improvement in creativity among elementary students [6]. Ji-min Park and Hye-young Jung presented research results demonstrating the effectiveness of a project-based AI education program using flipped learning in enhancing AI ethical awareness and creative problem-solving skills [7]. Jong-kyu Kim emphasized the need to actively utilize generative AI in education while ensuring that students remain the active agents, fostering continuous thinking abilities and development [8]. Jong-hee Jeon presented a study on the current status and strategies for university education in response to ChatGPT, discussing its key features, related issues, domestic and international responses, and strategies for handling ChatGPT in higher education [9]. Chang-hyun Moon and Dong-hyun Kwon explored educational approache s for animation production using generative AI, emphasizing the importance of education on generative AI utilization and prompt command creation [10].

In-suk Kim proposed the utilization of metaverse platforms in university projects through a case study, suggesting that metaverse platforms are beneficial for creative education [11]. Ha-na Lee verified the utility of metaverse as an educational tool for enhancing creativity in space design university education [12]. Seung-ho Lee reported positive outcomes from applying problem-based learning(PBL) in university courses within the metaverse, highlighting the activation of collaboration and participation-based, self-directed learning contributing to enhanced creativity [13].

In summary, the continuous expansion of the AI and metaverse markets is expected, leading to an increasing demand for education that cultivates the skills to harness these technologies. The growth in research activities indicates a rising awareness of the importance of developing competencies in utilizing AI and the metaverse in educational contexts.

III. Experiments

1. Research Questions

As explored in the theoretical background, the need for utilizing AI and the metaverse in education is expected to increase in the future. Particularly, in the field of media contents education, where the development of generative artificial intelligence enables the creation of creative contents, the importance of incorporating these technologies is anticipated to be further reinforced. In this study, we aim to explore practical strategies for enhancing creativity in media contents education. The following research Qustions are formulated and investigated:

Research Question 1: Does the use of   AI and the metaverse in media contents education contribute to fostering creativity?

Research Question 2: What are the effective practical teaching methods for improving creativity in the field of media contents education utilizing AI and the metaverse?

Through this research, we seek to validate whether the utilization of AI and the metaverse in media contents education contributes to enhancing creativity. Additionally, the study aims to derive effective practical teaching approaches for media contents education to improve creativity by utilizing AI and metaverse.

2. Research Methods

In this study, we selected AI and metaverse programs that can be utilized for creativity education and applied them in media contents class. To derive effective practical education methods, we conducted a survey targeting students who participated in class using various teaching methods. The collected data were analyzed to uncover insights into enhancing creativity in media contents education through the utilization of AI and the metaverse.

3. Research Tools and Research Design

1) Research Tools

For artificial intelligence tools, we conducted a preliminary review to select generative artificial intelligence suitable for producing creative outputs in the media contents field. The selected tools were utilized for various purposes.

ChatGPT: Assisting in media contents planning and scriptwriting through generative AI.

PlaygroundAI: Aiding in the generation of background images for media contents.

VideoStew: Providing assistance in video production aligned with the contents planning.

Naver Clova: Supporting voice dubbing for scenarios.

StudioDID: Used for creating videos with personalized avatars.

Metaverse tools included the Zepeto Metaverse platform, Zepeto Buildit, and Zepeto Studio. These tools were chosen for their ability to facilitate the creation of various creative outputs in line with the characteristics of media contents.

2) Research Design

The research was conducted from September 5, 2023, to December 12, 2023, over the course of the second semester. It involved a practical implementation with a total of 40 participants during media contents production class.

The first half of the semester, spanning 7 weeks, focused on utilizing generative AI for individual and team-based contents creation tasks, with results presented and followed by survey. The second half, also 7 weeks long, involved the use of the Zepeto Metaverse for diverse teaching methods. Participants completed tasks using Zepeto Buildit and Zepeto Studio to produce contents in individual and team-based Zepeto worlds. Similar to the first half, results were presented, and survey was conducted.

Teaching methods employed in the study included lecture-centered instruction, student-directed learning, team-based projects, flipped learning, and a mix of lectures and PBL. Education on using generative AI and the Zepeto Metaverse was provided before practical assignments to ensure participants had the necessary skills for real-world applications. Individual and team-based assignments followed the instructional sessions.

IV. Results

1. Does the Utilization of AI and Metaverse in Media Contents Education Contribute to Creativity Enhancement?

A survey was conducted to inquire whether the utilization of AI and the metaverse in media contents education had a positive impact on creativity. After implementing education utilizing AI and the metaverse in

media contents class, a survey was administered to students to assess the effectiveness of these technologies in enhancing creativity.

Creativity aspects were measured on a 5-point scale, considering the five elements of creativity from the Craft model: originality, flexibility, elaboration, fluency, and sensitivity [14-16]. The survey results are presented in Table 1.

The survey results targeting students who participated in practical class during one semester indicate the effectiveness of creativity education through the utilizing of generative AI in media contents class, as shown in Table 1.

The effectiveness was evaluated in terms of producing original contents (4.12), generating flexible creative ideas (4.35), elaborating contents creation (4.50), fluent associative thinking ability (4.53), and highly sensitive problem-solving skills (4.80).

In terms of utility, the results showed high ratings for producing original contents (4.15), generating flexible creative ideas (4.20), elaborating contents creation (4.35), fluent associative thinking ability (4.21), and highly sensitive problem-solving skills (4.56).

Utilizing generative AI in media contents class received positive evaluations for both effectiveness and utility in the context of creativity education. Particularly, the high rating for highly sensitive problem-solving skills during assignments demonstrated effectiveness and utility dimensions.

On the other hand, the effectiveness of creativity education through metaverse-based media contents class was evaluated as follows: producing original contents (4.15), generating flexible creative ideas (4.20), elaborating contents creation (4.10), fluent associative thinking ability (4.21), and highly sensitive problem-solving skills (4.25). Regarding utility, the ratings were as follows: producing original contents (4.17), generating flexible creative ideas (4.24), elaborating contents creation (4.15), fluent associative thinking ability (4.20), and highly sensitive problem-solving skills (4.37).

In comparison to generative AI, utilizing metaverse in media contents class received slightly lower but positive evaluations in terms of effectiveness and utility in creativity education. High ratings were observed for highly sensitive problem-solving skills in the context of effectiveness and utility.

Overall, the effectiveness of creativity education using both AI and metaverse was rated at 4.45, and the utility was rated at 4.52. These results indicate a positive response and highlight the perceived importance of incorporating AI and metaverse in creativity education within media contents class.

Table1: Effectiveness of Education Utilizing AI & Metaverse for Creativity in Media Contents Area.

		Effectiveness			Utilization		
	Research Item	MEAN	SD	CV	MEAN	SD	CV
G	Producing original contentss	4.12	0.70	0.25	4.15	0.60	0.30
E	Generating flexible creative ideas	4.35	0.62	0.28	4.20	0.80	0.25
N	Elaborating contents creation	4.50	0.50	0.23	4.35	0.75	0.32

A I	Fluent associative thinking	4.53	0.50	0.30	4.21	0.68	0.22
	Sensitive problem-solving	4.80	0.88	0.18	4.56	0.72	0.26
M E T A V E R S E	Producing original contentss	4.15	0.60	0.25	4.17	0.52	0.23
	Generating flexible creative ideas	4.20	0.52	0.26	4.24	0.65	0.28
	Elaborating contents creation	4.10	0.70	0.15	4.15	0.55	0.31
	Fluent associative thinking	4.21	0.80	0.27	4.20	0.63	0.25
	Sensitive problem-solving	4.25	0.70	0.21	4.37	0.68	0.30
	General effectiveness for creativity in media contents education utilizing AI and metaverse						
	Media Contents Education Utilizing AI and Metaverse	4.45	0.78	0.21	4.52	0.65	0.23

2. Effective Teaching Methods in Creative Education Utilizing AI and Metaverse in the Media Contents Class

In the media contents class, various educational methods utilizing AI and metaverse were implemented, and a survey was conducted among students to assess their satisfaction and perceived necessity regarding different teaching methods for fostering creativity. The results are shown in Table 2.

Survey results targeting students who attended media contents class during one semester, using various teaching methods utilizing AI and metaverse-based education, are presented in Table 2. The satisfaction with teaching methods for creative media contents education using generative AI is reflected in the following ratings: lecturer-centered instruction (3.70), student-led learning (3.65), team project-based learning (4.40), flipped learning (4.03), and combining lectures and PBL (4.70).

Regarding the perceived necessity, the following ratings were given: lecturer-centered instruction (3.15), student-led learning (4.10), team project-based learning (4.55), flipped learning (4.10), and combining lectures and PBL (4.66).

Notably, the teaching method combining lectures and PBL received high satisfaction and necessity ratings, while lecturer-centered instruction and student-led learning received lower evaluations in both satisfaction and necessity.

Similarly, for metaverse-based creative media contents education, the satisfaction ratings for teaching methods were as follows: lecturer-centered instruction (3.89), student-led learning (3.40), team project-based learning (4.30), flipped learning (4.05), and combining lectures and PBL (4.55). The necessity ratings were: lecturer-centered instruction (4.01), student-led learning (3.54), team project-based learning (4.25), flipped learning (4.08), and combining lectures and PBL (4.62).

Again, a teaching approach combining lectures and PBL received high satisfaction and necessity ratings, while student-led learning received the lowest evaluations in both satisfaction and necessity.

In terms of overall satisfaction, the ratings for utilizing AI and metaverse in creative media contents education were 4.48, and the perceived necessity was 4.66. This indicates high satisfaction and

a deep sense of necessity among students for incorporating AI and metaverse in creative media contents education.

Table2: Effectiveness of Teaching Method utilizing AI & Metaverse for Creativity in Media Contents Class.

	Research Item	Satisfaction			Necessity		
		MEAN	SD	CV	MEAN	SD	CV
G E N A I I	Lecturer-centered instruction	3.70	0.50	0.18	3.15	0.70	0.21
	Student-led learning	3.65	0.72	0.30	4.10	0.65	0.35
	Team project-based learning	4.40	0.55	0.22	4.55	0.61	0.22
	Flipped learning	4.03	0.65	0.32	4.10	0.75	0.32
	Combining lectures and PBL	4.70	0.80	0.28	4.66	0.70	0.25
M E T A V E R S E	Lecturer-centered instruction	3.89	0.72	0.35	4.01	0.62	0.25
	Student-led learning	3.40	0.65	0.20	3.54	0.75	0.21
	Team project-based learning	4.30	0.75	0.25	4.25	0.66	0.32
	Flipped learning	4.05	0.78	0.37	4.08	0.60	0.35
	Combining lectures and PBL	4.55	0.72	0.26	4.62	0.78	0.22
	General satisfaction for creativity education utilizing AI and metaverse in media contents class						
	Media Contents Education Utilizing AI and Metaverse	4.48	0.68	0.25	4.66	0.66	0.23

V. Conclusion

We found that AI and the metaverse received high evaluations in terms of effectiveness and utility in creative media contents education in this study. We found also that it is necessary to enhance the students' utilization skills of AI & metaverse, participation and collaboration for increasing creativity effectiveness in media contents class. This can be achieved by appropriately blending the instructor's core contents lectures and PBL during the course..

AI and the metaverse are transforming various aspects of our lives, and education is no exception. Future talents are expected to possess fundamental skills in creativity, good personality, collaboration, and proficiency in utilizing AI and the metaverse. Particularly in media contents education that aim to cultivate creativity and teamwork, the utilization of AI and metaverse is crucial. In this evolving landscape, instructors are encouraged to adapt their roles and functions in the classroom to align with the demands of the new era.

References

[1]   BCC, *Global Artficial Intelligence Market Forecasting*, 2023.

[2] Korea IDC, *Koreal Artficial Intelligence Market Forecasting*, 2023.

[3] Zhihan Lv, 'Generative Artificial Intelligence in the Metaverst era,' *Cognitive Robotics.* Vol.3, No.2, pp.208-217, 2023.

[4] UNESCO "ChatGPT and Artificial Intelligence in Higher Education: Quick Start Guide," https://unesdoc.unesco.org/ark:/48223/pf0000385146, 2023.

[5] Min-young Han, "A study on AI Education Program Based on ChatBot," *Korea AI Study Association Conference*, pp.83-90, 2020.

[6] Da-Ye Yang and Sun-Kwan Han, "A Study on Effect for Creativity of Elementary Student by Art Convergence Education using AI," *AI Research*, Vol.2, No.3, pp.37-46, 2021.

[7] Ji-Min Park and Hye-Young Chung, "Effects of the Project Based AI Education Program on AI Ethical Consciousness and Creative Problem Solving Skills Using Flipped Learning," *Ewha University Curriculum Research*, Vol.25, No.5, pp.359-368, 2021.

[8] Jun, Jong Hee, "A Study on the Current Status and Strategies for ChatGPT in University Education", *Multi Culture Resarch*, Vol.12, No.4, pp.517-548, https://doi.org/10.30974/kaice, 2023.

[9] Jong-Hee Jun, "A Study on the Current Status and Strategies for ChatGPT in University Education," *Multi Culture Resarch*, Vol.12, No.4,pp.517-548, https://doi.org/10.30974/kaice, 2023.

[10] Chang-Hyun Moon and Dong-Hyun Kwon, "A Study of User-Level Understanding of Image-Generative AI and How to Apply It to Animation Production Education," *Cartoon & Animation Studies*, Vol.1, No.72, pp. 67-71, 2023.

[11] In-Sook Kim, "A Case Study on Creative Convergence Project Using Metaverse Platform," *The Journal of Education Consulting & Coaching*, Vol.6, No.3, pp.123-130, 2022.

[12] Ha-Na Lee, "Utilization of Metaverse in Spacel Design Studio for Enhancing Creativity," *Journal of Korea Space Design Study*, Vol.18, No.1, pp.429-440, 2023.

[13] Seung-Ho Lee, "A Design of Participative Problem Based Learning (PBL) Class in Metaverse," *Journal of practical engineering education*, Vol.14, No.1, pp.91-97. 2022.

[14] Kraft. U, "UNLEASHING Creativity," *Scientific American Mind*, Vol.16, No.3, pp16-23, 2005.

[15] Hyun-Ju Kim and Jin-young Lee, "A Study on the development of Creative Problem Solving Class for University Students," *The Journal of the Convergence on Culture Technology (JCCT)*, Vol.9, No.6, pp.531-538, http://dx.doi.org/10.17703/JCCT.2023.9.6.531, 2023.

[16] Soon-duck Yoo,"Research on the Evaluation Model for The Impact of AI Services," *International Journal of Internet, Broadcasting and Communication,* Vol.15, No.3, pp.191-202, http://dx.doi.org/10.7236/IJIBC.2023.15.3.191, 2023.