International Journal of Education and Social Science Research

ISSN 2581-5148

Vol. 7, Issue.2, March-April 2024, page no. 219-225

To cite this article: Chuyen Nguyen Thi Hong, Hong Dinh Thi, Huong Ngo Thi Mai and Ngoc Ha Thuy (2024). USING AI TO DESIGN PICTURE TO SUPPORT TEACHING NATURE AND SOCIAL SUBJECT IN ELEMENTARY SCHOOL, International Journal of Education and Social Science Research (IJESSR) 7 (2): 219-225 Article No. 922, Sub Id 1445

USING AI TO DESIGN PICTURE TO SUPPORT TEACHING NATURE AND SOCIAL SUBJECT IN ELEMENTARY SCHOOL

Chuyen Nguyen Thi Hong[1], Hong Dinh Thi[2], Huong Ngo Thi Mai[3], Ngoc Ha Thuy[4]

[1]University of Education, Thai Nguyen University, 20 Luong Ngoc Quyen Street, Thai Nguyen City, Vietnam.

[2,3,4]Students at Faculty of Primary Education, Thai Nguyen University of Education, 20 Luong Ngoc Quyen Street, Thai Nguyen City, Viet Nam

DOI: https://doi.org/10.37500/IJESSR.2024.7213

ABSTRACT

This article focuses on researching the use of artificial intelligence (AI) to convert text into pictures to support the teaching of Nature and Social subject in elementary school. Qualitative research method is applied to analyze previous research documents, in order to identify research issues that have been explored by scientists about the use of AI in education and the potentials that AI brought about in the current era of digital transformation. Based on those results, the article proposes a process of using AI to convert text into pictures to support the teaching process. This process includes the following steps: i) Research the lesson's requirements; ii) Detailed descriptions of objects in paintings and photographs (including color, shape, size, etc.); iii) Use AI to create descriptive statements for paintings and photos; iv) Select AI tool to convert language into images; v) Adjust pictures and photos (if necessary). The results of this study will provide useful reference materials for elementary school teachers during the teaching process and at the same time open up potential research directions for future scientists.

KEYWORDS: Artificial intelligence, design, picture, support, teaching.

1. INTRODUCTION

Artificial intelligence (AI) is one of the computer systems inspired by the way humans use their nervous system to understand, learn, think, and take appropriate action [1]. AI has been applied in many different fields including education. It has begun to be seen as a fundamental pillar in STEM education and it plays an important role in supporting teachers in their role as facilitators and assessors of learning [2]. This is demonstrated by the ability to analyze big data about the learning process collected from students, teachers and schools [3]. AI applications have the ability to receive, store and process information as well as promote self-learning, helping teachers take into account individual differences among students, thereby improving the quality of learning and teaching [3]. AI applications have the potential to receive, store and process information. It plays a huge role in establishing and capturing the academic concepts of learners, presenting scientific material interactively, as well as contributing to achieving goals and adapting them to their needs. AI provides

a large amount of ready-made software for students to learn on their own or with the support of teachers, and these software can be used in discussions and exchanges, which is demonstrated by the development of the entire educational process [3]. Therefore, AI applications contribute to the educational process through their impact on content, teaching methods, schedules and communication. The role of AI in education is often used to: i) create differentiated teaching opportunities: design individual lessons and provide learning activities that correspond to the needs of each student [4]; ii) building an adaptive learning environment: Based on the diversity and richness of content presentation according to each student's learning method and interests [5]; iii) AI-based assessment: using AI applications in designing and adapting tests [6]; iv) Building smart digital learning materials: AI has the ability to digitize textbooks or create digital learning materials; v) Virtual Reality (VR): AI-based VR tools and applications can be integrated into teaching activities, thereby providing multi-sensory stimulation and effective support in the learning process Master your work and gain previously unimaginable depth of knowledge, while providing learners with a vivid and virtual reality perspective [6]. In the current context, there is a large amount of research on artificial intelligence and machine learning in the educational context [7]. Scientists around the world are making efforts to research the use of AI in teaching: Researching AI users' perceptions of e-learning [8]; research on the use of AI in online learning [9]; using AI to support students' self-regulated learning [10]; Research solutions to build an electronic learning system for differentiated teaching to meet students' individual needs based on the support of AI [11]; research on using AI tools in the teaching and learning process (Fitria, 2021). In particular, the author [12] researched the potential benefits and challenges of AI, especially AI that generates text into images. Holmes, Bialik, and Fadel wrote that most of that research typically focuses on (a) AI tools to assist learners, (b) AI tools used to study learning, and (c) AI tools to support administrative functions in schools [13].

In recent year, many teachers have used AI to design images, videos, and teaching support. However, there are still few scientific articles discussing the use of AI to design teaching support materials. This is a recommended research gap for interested educators. This article aims to research the process of using AI to convert text into images, supporting the teaching of Nature and Social subject in elementary school.

2. METHOD

The article uses qualitative methods, reading and analyzing documents to overview research issues related to using AI in teaching as well as in designing teaching support materials. From there, we propose a process for designing pictures with the support of AI.

3. RESULTS AND DISCUSSION

3.1. The principle proposes a process for using artificial intelligence to design pictures to support teaching Nature and Social subject

- Ensuring the goals of the general education program in Nature and Social subject in elementary school:

The general education program is considered the focus, regulating all teaching processes for students. Therefore, pictures created from artificial intelligence must show the required content to be met according to the regulations of the subject curriculum. In addition, images created from artificial intelligence need to reflect educational requirements that textbooks cannot meet, replacing images that are unclear and not vivid. These images also need to be suitable for the actual local conditions, helping to increase the vividness and application of the learning content.

- Ensuring aesthetics, visualization and science:
Pictures for teaching need to have aesthetics, colors, easy-to-see images, and truly reflect objects, objects, and phenomena in the surrounding natural and social environment. Visually appealing design has the ability to stimulate students' interest and increase their ability to concentrate. At the same time, pictures need to be accurate, comply with scientific principles, provide complete information, avoid misunderstandings and distortions during the teaching process, thereby helping to build solid and reliable knowledge.

- Ensure the development of students' learning abilities
Teaching support pictures and photos are designed to contribute to the formation and development of students' scientific capacity. Therefore, pictures help learners have the opportunity to develop scientific cognitive capacity, the capacity to understand the surrounding natural and social environment, and the capacity to apply the knowledge and skills they have learned.

3.2.The process of using AI to design images to support teaching of Natural and Social subject
To use AI to design paintings and photos to support teaching Nature and Social subject, you need to follow the following process:

Step 1: Research the lesson objectives
Research the lesson objectives to determine the behavioral expressions that learners need to form through the lesson. On that basis, consider and select which behaviors need the support of pictures and photos during the teaching process. From there, decide to design pictures and photos to support that learning activity.

For example: When teaching the content "Earth and the sky" (Nature and Society 1), we have determined that the requirements that students need to fulfill are: Describe the sky during the day and at night based on based on actual observation or through the use of pictures, photos, or videos. In this content, students need to observe images of the sky at different times. Therefore, designing images and images to support this content is appropriate.

Step 2: Describe in detail the objects (color, shape, size, etc.) of the pictures
Detailed description of the objects that will appear in the painting or photo is a very important step. Because the quality of the image, the accuracy of the characteristics of the depicted object depends on

the content of the description. The more detailed and specific the description is, the more realistic, scientific and aesthetic the resulting paintings and photos will be.

A detailed description of the object may include the following contents:

- Theme of the painting: Determine the main theme or idea of the painting.
- Detailed description: Describe in detail the specific elements you want in the picture. You can mention materials, style, color, light, space, subject matter, or any other special element you want to represent in the painting.
- Emotion: Determine the emotion you want to convey through the picture. Such as a happy painting, romantic or abstract art, or any other emotion you want to express.

Step 3. Use AI to create image description commands

To increase order generation performance quickly, we have conducted research and recommended the use of simple AI applications such as Poe, ChatGPT and Google. However, using Google to support creating image description commands may encounter some difficulties as follows:

- Because of limitations in parsing and interpreting descriptions from natural language, it is not possible to automatically produce commands based on simple descriptions.
- As a result of the differences in context and grammar that exist between English and mother tongue, translation from mother tongue to English can result in errors in meaning and expression being made.

Therefore, we recommend using AI chatbots like Poe and ChatGPT to assist in the command generation process. When using Poe or ChatGPT, we recommend that you interact with the AI by discussing issues related to the content of the command to be generated. This helps the AI have a better overview of the images to describe, thereby creating detailed commands that suit the user's wishes. You can easily ask both of these apps to create a command by using the following terminology: "Please describe me a command (prompt) in English, image description + [content of the image that you desire]".

For example: To create a command that describes a picture of the countryside at night, we decided to use ChatGPT. The conversation process from broad issues to the specific content of the picture is as follows: starting with the topic of teaching profession, continuing with the subject Nature and Social 1, focusing on the topic of Earth and sky, and then make specific requests about the command.

The command obtained from this process is as follows: “Craft a captivating description of a painting depicting the nighttime sky in a rural village in Vietnam, where the velvety darkness is adorned with a tapestry of shimmering stars. The moonlight casts a gentle glow on the peaceful landscape, illuminating the silhouettes of humble houses and swaying fields, while the distant sound of nature adds a serene symphony to the tranquil scene.”

Step 4: Choose the AI tool that converts language into images

After creating a command, the next process requires an artificial intelligence tool to convert the command into a corresponding image or image, that is, an application is needed that is capable of converting information from language to form. nonverbal.

International Journal of Education and Social Science Research

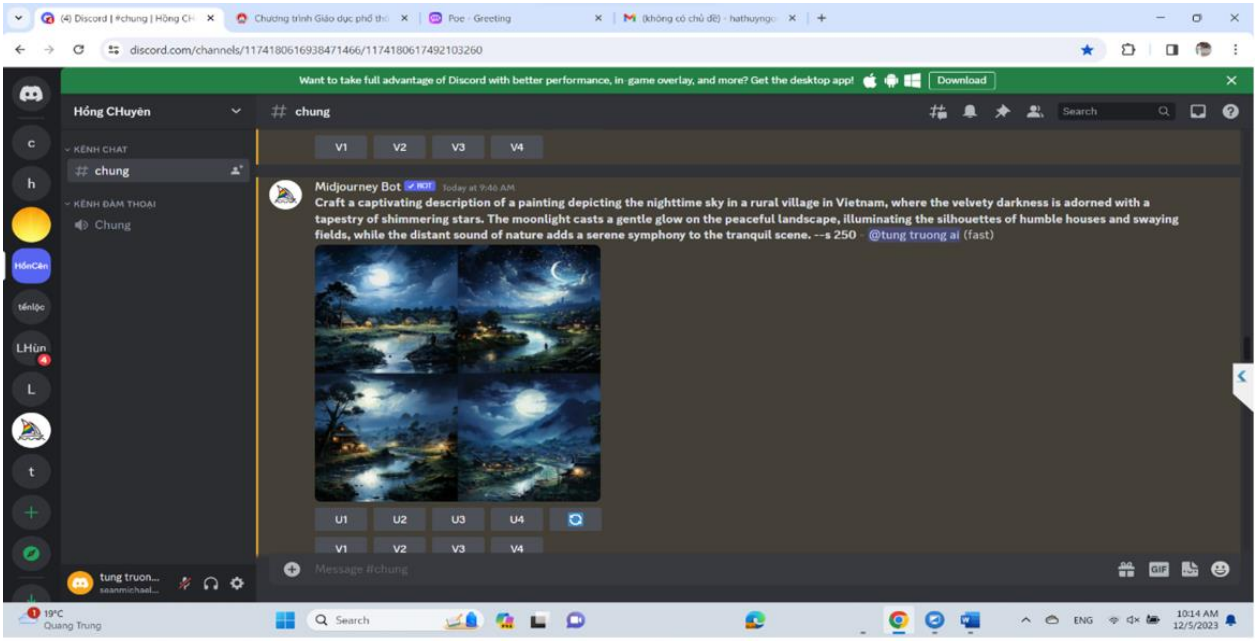
ISSN 2581-5148

Vol. 7, Issue.2, March-April 2024, p no. 219-225

Choose a tool to turn language into images: There are many tools capable of translating from language to images such as: Midjourney (integrated into Discord application), Canva, Bing, DeepArt, AI Painter. However, each tool has its own advantages and disadvantages. For Can va, there is a limit on the number of words in the command and a limit on the style of image expression. Bing has a limit on the number of images it can create per day. Most applications require payment to fully use photo creation functionality. After carefully considering the pros and cons of the app, we recommend using the Midjourney tool (integrated into the Discord app). This AI tool has outstanding advantages such as the ability to create vivid images and diverse styles, providing high resolution and no limit on the length or shortness of commands.

To use the Midjourney app (integrated into the Discord app) to convert commands to images, you can follow these steps:

- Open the Discord app and navigate to Midjourney Bot on the left side of the app screen.
- In the chat box at the bottom of the application screen, enter the keyword "/imagine/" followed by the command describing the picture you want to create: “Craft a captivating description of a painting depicting the nighttime sky in a rural village in Vietnam, where the velvety darkness is adorned with a tapestry of shimmering stars. The moonlight casts a gentle glow on the peaceful landscape, illuminating the silhouettes of humble houses and swaying fields, while the distant sound of nature adds a serene symphony to the tranquil scene”.



Press Enter to get 4 pictures as follows:

International Journal of Education and Social Science Research

ISSN 2581-5148

Vol. 7, Issue.2, March-April 2024, p no. 219-225

From the four pictures created by AI, we choose the most suitable picture to use in the teaching process.

Step 5: Adjust the picture (if necessary)

Adjusting the image after AI creates it is a necessary step to ensure it accurately reflects the user's ideas and needs, while also ensuring compliance with the previously set principles. The editing process can make the painting more unique and of higher quality. If the image does not meet the requirements, the user needs to return to the order creation step to adjust the order to suit personal principles and desires and then continue with the next steps.

In the process of designing paintings and photographs to serve the teaching of Nature and Social, it is necessary to pay attention to a number of factors related to culture, people, history, and environment of each locality and each country. appropriate reflection.

4. CONCLUSION

In this research, we have developed a process for employing artificial intelligence (AI) to generate images for the purpose of assisting in the instruction of Nature and Social subject in primary school. The utilization of artificial intelligence (AI) for the purpose of producing graphics is a novel method that possesses practical relevance in the process of instruction. This is due to the fact that the production of paintings and photographs will contribute to the enhancement of digital learning resources, which will in turn serve the teaching and learning process in a more efficient manner. As technology continues to improve, we can anticipate that the application of artificial intelligence (AI) in educational settings will continue to bring about substantial advancements and the creation of learning

environments that are diverse and innovative. It is my hope that this paper will help to encourage future research on this subject, which will ultimately lead to the improvement of the efficiency with which artificial intelligence technology is utilized in the field of education.

REFERENCES

1. Stone, P., et al., *Artificial intelligence and life in 2030: the one hundred year study on artificial intelligence.* arXiv preprint arXiv:2211.06318, 2022.
2. Nguyen, T.H.C., *Exploring the Role of Artificial Intelligence-Powered Facilitator in Enhancing Digital Competencies of Primary School Teachers.* European Journal of Educational Research, 2024. 13(1): p. 219-231. https://doi.org/10.12973/eu-jer.13.1.219
3. Al Darayseh, A., *Acceptance of artificial intelligence in teaching science: Science teachers' perspective.* Computers and Education: Artificial Intelligence, 2023. 4: p. 100132. https://doi.org/https://doi.org/10.1016/j.caeai.2023.100132
4. Luckin, R. and W. Holmes, *Intelligence unleashed: An argument for AI in education.* 2016.
5. Colchester, K., et al., *A survey of artificial intelligence techniques employed for adaptive educational systems within e-learning platforms.* Journal of Artificial Intelligence and Soft Computing Research, 2017. 7(1): p. 47-64.
6. Jin, L. *Investigation on potential application of artificial intelligence in preschool children's education*. in *Journal of Physics: Conference Series*. 2019. IOP Publishing.
7. Chuyen, N.T.H., *Overview study on the use of artificial intelligence in teaching.* TNU Journal of Science and Technology, 2024. 229(04): p. 140-147. https://doi.org/https://doi.org/10.34238/tnu-jst.8541
8. Kashive, N., L. Powale, and K. Kashive, *Understanding user perception toward artificial intelligence (AI) enabled e-learning.* The International Journal of Information and Learning Technology, 2020. 38(1): p. 1-19.
9. Dogan, M.E., T. Goru Dogan, and A. Bozkurt, *The use of artificial intelligence (AI) in online learning and distance education processes: A systematic review of empirical studies.* Applied Sciences, 2023. 13(5): p. 3056.
10. Jin, S.-H., et al., *Supporting students' self-regulated learning in online learning using artificial intelligence applications.* International Journal of Educational Technology in Higher Education, 2023. 20(1): p. 37.
11. Murtaza, M., et al., *AI-based personalized e-learning systems: Issues, challenges, and solutions.* IEEE Access, 2022. 10: p. 81323-81342.
12. Vartiainen, H. and M. Tedre, *Using artificial intelligence in craft education: crafting with text-to-image generative models.* Digital Creativity, 2023. 34(1): p. 1-21. https://doi.org/10.1080/14626268.2023.2174557
13. Holmes, W., M. Bialik, and C. Fadel, *Artificial intelligence in education*. 2023, Globethics Publications. https://doi.org/10.58863/20.500.12424/4273108