The impact of the artificial intelligence (AI) Art Generator in pre-service art teacher training

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Abstract—The use of Artificial Intelligence (AI) is common in education recently. As pre-service teachers' attitudes and behaviors towards the use of AI potentially influence the learning process and outcomes of their future students, it is necessary to know the impact of AI in pre-service teachers' training. This study aims to explore pre-service art teachers' attitudes toward using the current AI art generator and their perceptions of using it in their future careers. 45 Pre-service art teachers with no AI art generator experience participated and were distributed into eight groups. They used the AI art generator to draw pictures by selecting and revising keywords. They could discuss keywords within their groups. In the first round, the participants need to draw a similar picture as the trainer displayed. In the second round, participants could draw any picture they liked according to their own opinions. After class, participants filled out an online questionnaire concerning their experience of using the AI art generator and their opinions of using it in their future careers, including keywords they used and the times of keyword revision. Half of the groups thought that the AI art generator did not create the pictures they wanted according to the keywords they provided, and the times at which the keywords changed in these groups were much higher than in the other groups. Participants who thought the AI generated the pictures they wanted showed a much higher preference for using AI in the future. The majority of pre-service art teachers were interested in AI art generators. They believed that AI tools could help them prepare course materials, provide inspiration, and benefit their interactions with students in the future. However, they found that it took a lot of time to revise keywords, which represents the necessity to enhance their information literacy and ability to use educational technology. It also places new demands on our current education to adapt to the AI era.

Keywords—*pre-service teacher, AI art generator, picture creation, teacher training*

I. Introduction

In recent years, the ability to adapt and use the latest educational technology has become an important requirement for teachers [1]. Artificial Intelligence (AI) has been a common topic in teaching and learning these two years. It could change the way we teach, think, and interact in the classroom [2, 3]. As pre-service teachers, their attitudes and behaviors toward the use of AI potentially influence the learning process and outcomes of their future students [4]. Preparing teachers for AI-powered education is a major challenge in integrating AI into the classroom of the future [1]. Therefore, it is necessary to know the impact of the use of AI in pre-service teachers' training. Some studies have also found that teachers' negative attitudes towards new technologies may be due to unfamiliarity or lack of knowledge about how to use them. [5, 6]. This study explores the experiences of pre-service art teachers who had not previously used AI to draw pictures using an AI art generator, and their perceptions of its use in their future careers.

II. Method

A. Participants

A total of 45 pre-service art teachers (average age 20) from a Normal University in south-eastern China participated in this study. All participants had no prior experience with AI art generators before training and were divided into eight groups throughout training. During the training, these participants were divided into eight different groups.

B. Procedure

The trainer first introduced a current AI art generator called 'Wonder', which was developed by Baidu company. The trainer then gave an example of drawing a picture of the seaside under sunlight by selecting and revising keywords. Afterward, the participants tried to draw pictures by using the same AI art generator. They could discuss and revise the keywords with their group members until they drew satisfactory pictures. This study consisted of two rounds. In both rounds, participants were required to keep track of the number of keyword changes and the last keyword used. In the first round, participants had to draw a picture that was similar to the one shown by the trainer. In the second round, participants were free to draw any picture they liked.

C. Data Collection and Analysis

This study used an online questionnaire with rating and open-ended questions to collect participants' experiences of using the AI art generator, including questions concerning their attitude toward the AI art generator, the final keywords they used, the times of keyword revision, their satisfaction levels with the AI-generated images (rate on five scales from very unsatisfied to very satisfied), as well as their opinions regarding the potential use of the AI art generator in their future careers. This study used the descriptive statistics method to represent the participants' experience using the AI art generator. Participants' future preferences for using AI and the number of keyword revisions were compared based on their satisfaction with the AI-generated images.

III. Results

A. Experiences in using AI art generator

The majority of pre-service art teachers (86%) were interested in AI art generators. The average number of keywords changed across all participating groups was four. However, only half of the groups were satisfied or very satisfied with the pictures they drew using AI art generators. The remaining groups had a neutral attitude and thought that the AI art generator did not create the exact pictures they

wanted according to the keywords they provided. These groups also had a higher average number of keyword changes compared to the other groups. (See Fig. 1).
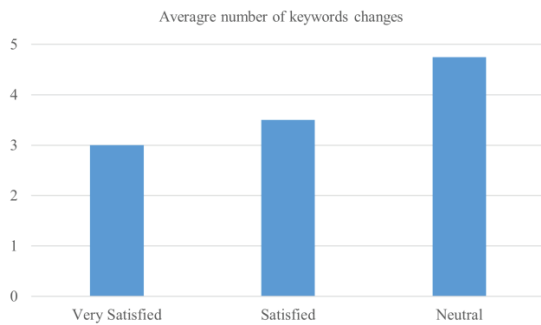

Fig. 1 The average number of keywords changes in groups with different attitudes to the pictures created

Some participants reported that they found it difficult to find appropriate keywords, so drawing pictures with the AI art generator took a lot of time to revise keywords:

"Filling in some words is easy, but figuring out which words will create the picture we want is difficult. We have to revise some specific words many times until we get the picture that looks a bit more like what we want." (Participant No. 8)

B. Attitudes to using AI art generators in the future

76% of participants reported that they would like to use AI art generators in their future learning and teaching. Participants who thought the AI had produced satisfactory images showed a much higher preference for using an AI art generator in the future than other participants (See Fig. 2).
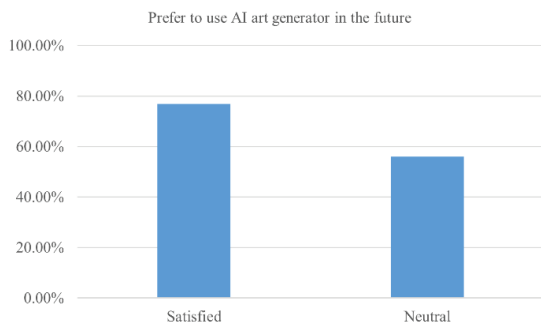

Fig. 2 The percentage of participants with different attitudes to generated pictures would like to use AI art generator in the future

The participants thought that they could use the AI Art Generator in teaching when they became art teachers in the future. They believed that AI tools could help them prepare course materials, provide inspiration, and benefit their interactions with students in the future.

"If I cannot find a suitable picture when preparing a lesson, I can use the AI art generator to draw one instead of spending a lot of time searching." (Participant No. 22)

"In class, I can use the AI art generator to associate the process of creating and painting, linking words and looking at pictures, even giving ideas for painting." (Participant No. 3)

"I can use it for imaginative interaction with students. Sometimes students have good ideas of creating a picture but lack the skill to draw it, with the AI art generator, it is much easier to draw pictures without skill, it could encourage students to imagine and present their thoughts." (Participant No. 40)

IV. Discussion and implication

In this study, pre-service art teachers with no experience of AI attempted to draw pictures using keywords and an AI art generator, and reported their perceptions of the use of AI and their perceptions of its use in their teaching. The results revealed that the skill or ability to use AI may impact pre-service teachers' preferences for using AI in their future careers. Although the majority of participants showed interest in AI art generators and had a lot of good ideas on how to use AI in their future careers, those who spent more time on revising keywords showed less preference for using AI. It is consistent with previous research that anxiety and being out of one's comfort zone negatively impact people's willingness to use new technologies [7, 8].

Since teachers' attitudes and behaviors towards AI potentially influence their students, it highlights the need to enhance teachers' information literacy and ability to use educational technology. This places new demands on pre-service teachers' training as well. Pre-service teacher training programs should pay more attention to technology adaptation and use skills to ensure that future teachers will be able to adapt to the AI era. For instance, to train the ability to select keywords for the AI art generator, it is possible to do the reverse of using the AI art generator. By showing some similar but different pictures with their keywords, pre-service teachers might more easily learn the link between keywords and pictures, thus enhancing their ability to select keywords.

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