

# A Study on the Current Status and Future Direction of Writing Education Using Generative Artificial Intelligence

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## **Abstract**

*While existing artificial intelligence has provided the ability to produce scientific and realistic conclusions based on given data, generative artificial intelligence can even provide analogies and reasoning functions beyond the limits of existing artificial intelligence. Generative artificial intelligence is helping humans in various fields and has begun to be used in education, and has recently begun to be used in writing education. In this study, the current status of writing education using generative artificial intelligence is first investigated. Especially various uses of generative artificial intelligence in writing education are investigated, and limitations are also discussed. Based on this current status study, the future and development plans of writing education based on generative artificial intelligence are proposed.*

**Keywords:** *Generative Artificial Intelligence, Writing Education, Artificial Intelligence, Artificial Intelligence Ethics*

## **1. Introduction**

Currently, artificial intelligence has various effects directly or indirectly on the lives of modern people and is improving our quality of life. In particular, artificial intelligence is now being used in almost all products and services, and modern people have so much influence on our lives that it is difficult to live without the help of artificial intelligence. Meanwhile, artificial intelligence has recently evolved into another form and evolved into so-called generative artificial intelligence. Generative artificial intelligence can go beyond existing artificial intelligence to make reasoning or inference, which is the limitation of existing artificial intelligence.

Generative artificial intelligence has begun to be used in writing education. In the case of ChatGPT, a representative of generative artificial intelligence, it is a chatbot service based on a large language model, and generative artificial intelligence can be used very usefully for language education by nature[1]. Generative artificial intelligence can support writing, so it can help learners present ideas and generate sentences when writing creative, and it can also be used as a very useful tool for writing because it can give various advice such as sentence structure and expression for writing written by students[2-5].

In this paper, we discuss the current status and future directions of Korean writing education using generative artificial intelligence. Based on the existing research on Korean writing education of generative artificial intelligence, we describe limitations or disadvantages, including plagiarism problems, as well as ways to support various Korean writing education. We also discuss the future directions of writing education using generative artificial intelligence based on the direction of future technology of generative artificial intelligence.

The structure of this paper is as follows. In Chapter 2, we introduce characteristics of generative artificial intelligence and existing research on writing education, and in Chapter 3, we discuss ways to support writing education of generative artificial intelligence and its limitations. In Chapter 4, we present various directions and issues for the future of writing education based on generative artificial intelligence. Finally, we discuss conclusions in Chapter 5.

## **2. Related Works**

### **2.1. Characteristics of Generative Artificial Intelligence**

In this section, we introduce the main characteristics of generative artificial intelligence, focusing on ChatGPT, the representative of generative artificial intelligence[6].

The main features (benefits) of ChatGPT are as follows.

#### **-Understanding the context**

ChatGPT can understand the context of a user's question, so in most cases it can provide an appropriate response.

#### **-Various processing power**

ChatGPT can provide a variety of processing power. In other words, it can answer a user's question, present explanations or recommendations on a specific topic, create content appropriately, or even provide tutoring and storytelling on multiple topics.

#### **-language processing ability**

ChatGPT provides significant language processing power. For example, it can provide a considerable level of understanding and verification of grammar, vocabulary, and idiomatic expression in addition to an understanding of the entire text.

#### **-Scalability**

ChatGPT can handle large amounts of simultaneous conversations and can also be utilized in a variety of fields that require scalability.

#### **-Creativity**

ChatGPT has the ability to create new content based on data. For example, a text generation model can generate words, sentences, and texts, and an image generation model can generate photos and images.

On the other hand, ChatGPT has various limitations as follows.

**-Inaccuracy of information**

ChatGPT is reliable if the data on which it is based is accurate, but can sometimes provide inaccurate or outdated information. This is because ChatGPT is trained on a limited dataset and also does not have the ability to access real-time information.

**-Lack of personal information**

ChatGPT has no personal feelings because it is an artificial intelligence service. It is also designed to make data about individuals inaccessible and cannot be accessed except for those shared during conversations. In other words, ChatGPT is designed to respect the personal information and privacy of users.

**-Long-term memory absence**

ChatGPT does not remember past conversations. Therefore, all conversations operate independently of other conversations and rarely give the same response to the same question.

**-Incomplete understanding of the question**

ChatGPT can sometimes mislead about complex questions or instructions, and as a result can provide irrelevant or incorrect answers.

## **2.2. Literature Review**

In [7], Kim approached the question of 'Can human writing continue in the age of artificial intelligence?' In this study, the following five changes that artificial intelligence will bring in writing were expected. First, as a change in the production method of writing, an ultra-fast mass production system by machinery was expected. Second, in terms of the status and value of the text, the change from the existing 'work/handmade' to 'customized products/services' was noted. Third, it was argued that all writings can eventually become data as a characteristic of writings, and fourth, humans cannot surpass writings written by artificial intelligence in terms of their creativity and completeness. Finally, fifth, as a change in the expression of writing, artificial intelligence was expected to be able to write more than humans.

In [6], Noh discussed the issue of plagiarism at the same time as the excellent performance of ChatGPT increases educational use and the possibility gradually increases. In this study, it is difficult to distinguish between artificial intelligence utilization and artificial intelligence plagiarism, and it was suggested to increase AI immunity.

In the study of [3], the possibility and limitations of ChatGPT in liberal arts writing education were discussed. In this study, it was confirmed that ChatGPT can perform well in drafting ability, idea creation, problem raising, table of contents writing, and rewriting. In addition, problems such as the accuracy and reliability of information, writing ethics, text reproduction, and errors in the correction process were pointed out in writing using ChatGPT.

In the study of [3], a study was conducted on the question, 'Can generative artificial intelligence technology replace human writing ability?' As a result of the study, generative artificial intelligence technology has generally been successful in taking notes, writing simple essays based on one-sided reasoning, writing complex essays based on two-sided reasoning, writing multiple documents, writing criticisms, and writing reflection diaries. In addition, the development of automatic writing scoring and feedback systems is expected to emerge in the future.

In [8], Oh conducted a study to explore the possibility of using ChatGPT in university liberal arts writing education and to derive implications. As a result of a survey of college students, more than half of the learners positively recognized ChatGPT as a tool for saving writing time and efficiency of the process. It was also revealed that college students participating in a survey used ChatGPT the most for the purpose of generating ideas and collecting information.

In [9], Han discussed the so-called 'outsourcing of reading' due to the emergence of generative intelligence such as ChatGPT. With the advent of ChatGPT, the outsourcing of reading is a reality that has come to us, and ChatGPT pointed out the problems in reorganizing information and delivering it in a shortened form.

### 3. The Current Status of Writing Education Using Generative Artificial Intelligence

#### 3.1. Writing Ability

When using generative artificial intelligence for writing, the most basic ability is the ability to write various articles. This writing ability can be seen as the ability to write a kind of draft in addition to the ability to provide various information to learners.

For example, when I asked ChatGPT to "write a poem about fall.", the following response is received.

On a windy day in autumn, leaves are dancing,  
Maple leaves shine like sunset, and the sky is clear and blue.  
On the trail, ivy leads a red wave,  
Autumn greets us by singing beauty.

Holding a cup of coffee with a sweet scent,  
I'd like to sit by the window and enjoy the scenery.  
Autumn soothes the mind, gives you a break,  
It's a moment of peace when you become one with nature.

#### 3.2. Review Ability

On the other hand, the generated artificial intelligence can review various types of writings written by learners. For example, when the author wrote the following poem about autumn and asked ChatGPT to evaluate the poem, the following response is

**<Poem>**

What would fall be in color?  
Autumn is blue, and above all, the sky turns blue.

Autumn is also yellow.  
Yellow ripe rice shows golden fields.

Autumn is a colorful color.  
All the mountains turn red.

Autumn is a transparent color  
My thoughts become clear and transparent

I like fall.  
You can enjoy the good weather before winter comes.

**<Response from ChatGPT>**

This poem is written at the level of 5th grade in elementary school, dealing with the beauty of autumn and the feelings of autumn.

First, poetry begins by expressing autumn in various colors. The blue sky is mentioned as one of the characteristics of autumn, and the blue sky symbolizes the clear and clear weather of autumn. Yellow represents the golden field of ripe rice, and symbolizes the rich harvest of autumn. The colorful mountains depict the beautifully colored autumn leaves, and the transparent color represents the moment when thoughts become clear and transparent in autumn.

In the last part of the poem, the poet feels that autumn is a special season, indicating that he likes it. Emphasizing enjoying the autumn weather before winter, it expresses a positive mind about autumn.

The poem is evaluated as a delicate expression of the beauty of autumn and feelings about autumn. It deals with various aspects of autumn from the perspective of a young poet, and expresses affection and expectation for autumn.

**3.3. Writing Summary Ability**

On the other hand, generative artificial intelligence has the ability to summarize and organize already written texts. It can organize and summarize not only humanities writings but also scientific forms of writings. When I asked ChatGPT to summarize what I wrote about online education, the following response is received.

Online education began with the advent of the Internet in the 1990s. Online education has developed in various forms, including web-based education, but it has been recognized as an auxiliary education for education in existing classrooms and has not established itself as the mainstream of education. This is because online education has the characteristic of being non-face-to-face and not real-time education. In other words, many people thought that online education could not replace face-to-face education. However, since the Corona pandemic, the technology of online education has developed enough to overcome various shortcomings, and people's perceptions have changed a lot, so I now think that online education is no different from face-to-face education.

<Summary from ChatGPT>

Online education began with the advent of the Internet in the 1990s, but in the early days, it was mainly considered auxiliary education, and there was a strong perception that face-to-face education could not be replaced. However, after the COVID pandemic, perceptions changed as online education technology developed, and it is now considered that online education is no different from face-to-face education

### 3.4. Automatic Scoring Ability

Automatic scoring of generative artificial intelligence has sufficient potential and is already being used in a limited range. The automatic evaluation of narrative questions based on generative artificial intelligence is already expanding its scope, showing sufficient performance not only for essays on a wide range of topics but also for scoring scientific writing that asks for realistic concepts[10]. In other words, the generated artificial intelligence-based automatic scoring system can provide fast feedback to learners, works correctly under simple evaluation criteria, and shows reliable scoring ability for relatively simple texts or scientific fact-based documents.

However, as pointed out in [11], descriptive automatic evaluation based on generative artificial intelligence has problems such as ①limitations in natural language processing of current artificial intelligence technology, ②reliability issues in scoring, ③trust issues of human users, and ④ ethical limitations in high-level tests.

### 3.5. Limitations of Writing Eduation using Generative Artificial Intelligence

#### -Limitations of Creative Writing

Generative artificial intelligence is very difficult to write creative at the human level due to the nature of artificial intelligence. This is due to the limitation that existing artificial intelligence is forced to draw a certain level of conclusions or infer through learning based on the collected data. In other words, no matter how large amounts of data are learned, the current level of artificial intelligence has limitations in exerting the imagination and originality that humans can do.

#### -Incorrect reasoning and bias issues

Generative artificial intelligence provides various capabilities beyond existing artificial intelligence, but the limitation is that it relies on data to learn. In other words, if the data based on the generated artificial intelligence is inaccurate or the data itself is insufficient, the generated artificial intelligence has no choice but to make inaccurate inferences.

#### -Misunderstanding of the question

Since generative artificial intelligence is basically a response-type or interactive model that receives questions through prompts and provides responses to questions, the question itself must be very sophisticated and specific to accurately obtain the desired type of response. In other words, if the question is ambiguous or also too simple, the response to it must also contain ambiguous or too comprehensive content.

#### -Lack of emotional expression

On the other hand, there are clear limitations in expressing various emotions at the human level because the writing of generative artificial intelligence presents a clear factual basis or also an objective form of writing. Generative artificial intelligence at the current level shows limitations in such metaphorical expression, which has the advantage of being able to clearly provide context for the text, but does not provide the pleasure of reading and interpreting it in various ways.

## **4. Future Direction of Writing Education Using Generative Artificial Intelligence**

Generative artificial intelligence is already providing various support in writing, and its availability is gradually expanding. In reality, it is difficult to reject the writing ability of such generative artificial intelligence, and rather, the need to actively use it is increasing. In this chapter, we discuss future directions of writing education using generative artificial intelligence.

#### -Changes in the roles of learners and instructors

First, the role of learners can be emphasized as 'critical learners' and 'analytical learners'. In other words, it can provide some kind of primary results, and these temporary results can never be used as they are, can be finally used after thorough verification and correction by learners. Therefore, learners must critically accept the results of generative artificial intelligence and also require thorough analysis.

On the other hand, the future use of generated artificial intelligence can also change the role of instructors. In other words, the role of the instructor as a 'guide', 'helper', or 'facilitator' of the writing class as a whole will be more emphasized. In other words, as generative artificial intelligence can help students write in large part, teachers should guide students on learning goals and learning outcomes for the entire writing in the overall context, and the role of helpers should be emphasized to help students present questions elaborately, and the overall class should be promoted through various motivations.

### -Strengthening Creative Writing

Due to the nature of artificial intelligence, learning based on collected data is inevitable, and artificial intelligence through such learning can never demonstrate creativity at the human level. In other words, high-quality creativity such as imagination and intuition is likely to remain an eternal challenge for artificial intelligence. Therefore, the role of human learners is ultimately to improve abilities that generative artificial intelligence cannot provide, that is, creative writing skills. This creative writing can only be guided through human instructors and is possible through expressions of various emotions. In the future, creative writing will remain an important topic of writing.

### -Strengthening Questioning Education

The ultimate performance of generative artificial intelligence is bound to depend on the questioning ability of the user or learner. This is because generative artificial intelligence is an interactive artificial intelligence system that responds to questions. Therefore, the ability to ask correct and specific questions in future writing is very important, and the importance of question education will be highlighted. Questioning education requires various types of education along with constant practice of users.

### -The need for ethics education in writing

Generative artificial intelligence writing can be accompanied by various ethical problems for users. In other words, the feedback provided by generative artificial intelligence and the use of reasoning as it is can cause serious ethical problems. In other words, regardless of what form of writing, the writing generated by the generated artificial intelligence is not a creation of humans themselves. Therefore, it is very necessary to establish correct ethical guidelines for the writing of generative artificial intelligence.

### -Sophistication of Automatic Scoring

Currently, automation for narrative questions is being used in a limited range. In order to further spread and trust these automatic scoring, it is necessary to learn the scoring method of human scorers while learning vast amounts of data. This learning has a clear limitation with artificial intelligence based on regulations, and it must rely on deep learning-based artificial intelligence that learns a certain pattern and scoring flow by learning vast amounts of writing data and scoring on its own.

## **5. Conclusions and Further Research Works**

Currently, generative artificial intelligence is used in various areas, and it is no longer practically possible to deny or prevent the expansion of the use of such generative artificial intelligence. Rather, it can be said that it is a more realistic option to actively recognize and accept this and use it properly, legally and ethically. Writing is no exception, and it currently supports writing to human users and learners in various ways.

Current generative artificial intelligence shows the ability to provide very objective and direct texts based on vast amounts of data and to evaluate texts written by humans at an appropriate level. Especially for elaborate questions, it can be used as a very good tool in writing education by providing very specific feedback or conclusions. However, due to the nature of artificial intelligence, it can provide inaccurate conclusions or reasoning, and shows a limitation in not being able to express metaphorically and not understand metaphorical expressions. In addition, it does not provide a high level of creative writing that uses imagination.

Generative artificial intelligence is increasing the possibility of use in many ways in the future. Metaphoric expression and understanding can be possible within a limited range, and automatic scoring for narrative questions based on vast amounts of data is expected to be possible in the future. However, a high level of creative writing is likely to remain a challenge for generative artificial intelligence. Ultimately, ethical awareness is needed above all else in the reality that writing based on generative artificial intelligence is inevitable, and ethical education is very necessary along with the establishment of ethical guidelines in the future.

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