

# *Research on the Applications of Artificial Intelligence in Pedagogy*

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**Abstract:** With the development of the technology, more and more affairs are gradually replaced by artificial intelligence (AI), and a large-scale AI comes into people's lives, it not only refreshes the existence of artificial intelligence but also the number of people who use it increasing. In fact, a labor force, such as teachers, will not be replaced by AI, but at the same time it is can not be ignored that advantages are brought by AI. This paper focuses on the in-depth discussion on the work content, findings and plans during a class on the application of AI in pedagogy. Based on the development of the science and technology innovation ability and artificial intelligence, online teaching is a well-known way of learning in this contemporary society in addition to offline teaching. For teachers, teaching methods are becoming diversified; for students, it is quite significant for them to find out which learning styles they are keen on. This paper analyzes the pros and cons from the opinions of not only teachers but also students, and elaborates on the practice of AI in teaching specifically. For instance, educators are worried about the poor distraction in class of kids; also, for the young generation, they are exploring a new way of teaching that is network teaching. As for the practice, this paper refers to the class preparation, class and after class for teachers.

**Keywords:** Online Education, Offline Education, Education For Artificial Intelligence

## 1. Introduction

Since the end of the year in 2019, the COVID-19 had spread into the world, with a proliferation of thousands of cases in daily life. At that time, medical staffs who save lives and heal the wounded, students and employees are trapped at their own homes. What's more, especially in 2020, the COVID-19 has caused a strong impact on people's education and production, and also affected the normal opening time of schools and teaching organizations around the country. As for students, it can be said that nearly 80% of them will consider this a historic long winter holiday as they haven't had this kind of experience. Whatever, the government cannot be ignored. The education news for online learning (teaching) came into our sights while many students are "gloating", thus students across the country started the journey of online learning. Not only that, in July 2021, the General Office of the Further Reducing the Burden of Homework and Off-campus Training for Students in the Compulsory Education Stage, thus the policy of "Double Reduction"[1] (means that easing the burden of excessive homework and off-campus tutoring for students undergoing compulsory education) was released. Some people may ask, "what does this have to do with AI?" To speak frankly, if in the non-teaching stage, the sub-district department will come to the door at any time to check whether the training

institution has violated the operation. More specifically, other training institutions will consider some special cases, such as the students who need to have examinations for entering high schools or universities; even some institutions make a purpose for not losing the finance, they choose to adopt the multi-media teaching in order to avoid the check. To sum up, the AI teaching method (online teaching method) may be a better method, which realizes the opinion of “teaching without stopping classes” and it also combines modern information technology with traditional teaching methods. Furthermore, not only in today’s society, but also in the future, long-distance education will be a traditional teaching method. However, referring to the network teaching methods, this kind of way either includes artificial intelligence teaching or online teaching methods; there are immense differences in the essence of these two kinds of teaching methods. Taking English teaching methods as an example, this paper mainly discusses the difference between online teaching and offline teaching, and explores the way to realize the non-traditional offline teaching in the process of using AI teaching and online teaching.

## **2. The Differences between Artificial Intelligence Teaching and Online Teaching**

### **2.1. Artificial Intelligence Teaching**

Artificial intelligence teaching refers to a form of using artificial intelligence technology to help or realize the teaching activities. It can analyze students’ learning habits, behaviors and abilities through intelligence, provide the advice and resources of personal learning, evaluate students’ homework and test scores, and even simulate teachers for one-to-one tutoring. AI teaching aims to enhance educational efficiency, meet learning needs for different students and promote the equity of education. Additionally, it is essential to make scientific technology of online education, make network education technology serve for teaching, and let students enjoy a variety of educational resources.

### **2.2. Applications of Artificial Intelligence in Teaching**

#### **2.2.1. Oral English Assessment**

It may be a good choice to use AI in order to improve the ability of practical skills, such as oral English in China. Oral English can reflect the learner’s practical ability to use English, and AI teaching is also a help for all English learners in our country. At present, there are two categories of English speech assessment products in the market, like AI oral English teacher and intelligent oral English test and examination systems, which use the natural language processing and speech recognition technology to evaluate the oral English learners’ intonation, fluency, criterion and oral expression ability [2]. Compared with offline institutions and artificial intelligence teaching, AI teaching can even save some money; there is no need to pay thousands of dollars to register for online teaching for things that can be solved with a few hundred yuan.

#### **2.2.2. Improve Classroom Efficiency in the Teaching Process**

Teachers make good use of artificial intelligence to improve class efficiency. For instance, teachers can use ChatGPT to design targeted testing questions for reading materials or, in order to accurately test students’ understanding of the main idea, discourse structure and logical relations, and test students’ reading comprehension ability. Therefore, this kind of approach can greatly improve the class efficiency for teachers during the time for class [3].

### 2.2.3. Online Teaching

Online teaching means the teaching mode that transfers from traditional teaching methods to online teaching through information technology. There are some characteristics of online teaching, such as all kinds of resources, its flexibility and all sorts of choices [4], make learners able to take courses at any time and anywhere. What's more, online teaching includes other forms like video speeches, online discussions, submitting of the electronic homework and the virtual laboratory.

## 3. Methods for Online Teaching Based on the Development of AI

Based on the current development of the AI, schools and teachers can upgrade the presentation and expression of course content, and create a multi-interactive space with the help of online education technology. Through the online education technology, it provides the eminent educational resources, and creates a good teaching environment, thus the efficiency of learning and teaching can be massively improved [5].

### 3.1. Preparation Stage of Online Teaching before Class

Before the formal online teaching begins, teachers need to prepare related resources for the class.

Firstly, for preparing the class, one of the most important things is the PPT during classes. It is necessary for educators to show the teaching objectives of the class to the students in order to make them cooperate with teachers. In addition, on the basis of the goals of the class, it is more convenient for the young students to understand that importing course-related videos in the PPT is more convenient. For instance, guide videos, courseware used in the class, and in-class test questions and exercises related to the class.

Secondly, teachers should pay attention to the way of class. Unlike offline teaching, students who are not always seen by teachers during online classes, and especially students who don't have strong abilities of self-control. Making sure that students who need to focus on the whole class during online teaching, teachers should share some rules on the screen with them before class begins. For example, (1) listen and watch carefully; (2) read and speak loudly; (3) take notes with a pen and a notebook. Moreover, based on the condition that students are low-skilled with information technology, teachers can explain the use of live broadcast software and guide students to prepare the lecture before the online live broadcast class [6]. More importantly, each teacher should work out the so-called lecture ideas before each class, which takes into account students' concentration. For example, in the case of determining the knowledge point that the class will talk about, use the knowledge to string together a story, the purpose is to improve the attractiveness of students and make them better engage in the class.

Finally, teachers should remind them what they need to prepare before class, like the notebooks to take notes during the class time and notice that teachers will check their own notes after class.

### 3.2. Online Classroom Teaching Stage

The online classroom is quite different from the offline classroom, a large number of teachers are struggling with the efficiency of online teaching. As a result, teachers should take some steps to guide them to learn effectively during online classes.

First of all, the interaction between teachers and students in the course of class should not be less. In class, teachers can choose students randomly after finishing a knowledge assessment, in order to realize the mastery of students. For instance, after teachers have explained the use of by/at/on transportation, with the example questions in the courseware, choose anyone of the students to answer; this kind of form can make sure that everyone listens to teachers carefully and keeps up with the

rhythm of the teacher's class, so as to improve the learning efficiency and effect. If most of the students can't grasp it in time, the teacher should increase the use of knowledge points in the practice after class. Furthermore, the explanation of unfamiliar knowledge points should be increased in the future class, that is "snowball" learning, so that students will be more skilled and impressed by this point.

Secondly, encouraging students is also one of the factors that includes online teaching. Later in the class, encouraging students to answer questions about knowledge that they are not good at, encouraging them to be leaders in their studies and in the class, and demonstrating personal understanding can also boost students' confidence. This kind of method is equivalent to a collective learning of many people, and learning the mode of collective learning can set up its own communication and exchange environment for language learning, and promote the situational application and real-time expression of learning content especially during the class time.

Finally, in order to reflect the degree of students' absorption in class, "going-out" examination is one of the better ways to test the degree of absorption in class. The content of the examination covers all of the knowledge points that have been told during the class. Teachers should determine the arrangement of the content of the class before class, and write the test reasonably. It should also be added that teachers should spend an amount of time finishing all the "going-out" examinations and send them to each student's feedback on the same day. If the accuracy rate of the test is not 80%, the teacher should carry out after-class tutoring for the students, such as reciting and writing the notes learned on the day, in order to ensure the mastery of the basics and curb the occurrence of the vicious circle. If the correct rate is up to the standard, the teacher should ask them to carry out improvements training in addition, and assign some extended question types on the basis of the standard. However, the two types of students have the same requirements to sort out the wrong questions, mark the reasons for the mistakes, and then submit them for the teacher's daily supervision, which is of great help for what to teach today.

#### **4. Advantages and Disadvantages to Teaching Methods brought by Artificial Intelligence**

Whatever, people are all aware of the pros brought by AI, but there are some risks that can't be avoided. Just because of this, this paper integrates AI teaching and online teaching, and compares with offline teaching, and analyzes the two groups of teachers and students who benefit most.

##### **4.1. Advantages and Disadvantages of Online Teaching**

For teachers, a small precise for imparting knowledge to students is the interaction between students and teachers. If AI replaces teachers, the final effect will not be as good as the teachers themselves, and the cost of it will gradually get immersed. Online teaching can't allow teachers and students to teach face-to-face, which undoubtedly causes certain obstacles to teachers' teaching emotions [7].

For students, they focus largely on the way of teaching, which is very novel, especially in terms of functions. The increment is strong, especially in both diversity and functions. For instance, the interactive annotations used in online teaching, may not only increase students' memory and reading and writing skills in the limited time.

However, there are still some negative impacts that are unavoidable. Adults may not be able to manage themselves, let alone teenagers. There are many teenagers who are crazy about playing computer games in a situation for online teaching especially the development of the technology. Not only that, it is a common phenomenon to leave one's position and lie in bed for class, which not only fails to teach anything, but also destroys oneself. Furthermore, sometimes there are some unexpected situations, such as a delayed network, which means it will lead to students' efficiency in paying attention to the class.

During the online education, teachers have the same difficulties with students, emotional communication is also mentioned above. Online teaching can't directly control the students' situation like offline studying. Through the online teaching, they conduct teaching activities through electronic devices like computers and smartphones, which is lacking face-to-face communication. Therefore, teachers can not effectively and intuitively understand students' mastery of the situation by giving emotional explanations on computers and mobile phones, which affects the teaching result [8].

#### **4.2. Advantages and Disadvantages of Offline Teaching**

Students have difficulties that teachers can find them immediately in an offline condition. Similarly, in the process of offline education, teachers can remind the students who are not attentive at the first time if students are distracted in class. Thus, it can improve the class efficiency, and they can have emotional communication with students and fully understand them.

From the perspective of students, it is not denied that it is easier to get into the state of learning when returning to the offline environment compared with online classes. What's more, in terms of attendance, students are more able to follow a fixed curriculum schedule to attend classes on time, and pay more attention to their classes. In addition, some after-school activities are more active in participating, and they can learn and progress together with their classmates, and they can communicate with their classmates to establish a sharing relationship.

Above are the information provided by teachers and students. In summary, individuals prefer offline teaching. With the development of the scientific technology, also more and more people are inclined to AI learning. This paper demonstrates the pros of AI learning from the following four aspects: firstly, it is the personalized customization. It can provide personalized learning contents and plans; for example, teachers can use learning management systems (LMS) to organize and manage teaching activities for teachers, this kind of system can provide a range of frameworks that can help teachers track student progress, provide feedback, separate assignments, and manage discussion boards [9]. Secondly, it is available used. Learners can study at any time and anywhere, with high flexibility; thirdly, it is the timely feedback. It can quickly give the accurate feedback on learners' respond and behaviors, help them correct the mistake right away; fourthly, abundant resources. AI integrates a large number of multimedia resources, such as audio, video, interactive exercises, in order to make learning more lively and interesting.

#### **4.3. The Impact of Online Teaching**

Online teaching promotes the quality of education and enables children from urban and rural areas to enjoy the same resources. Also, AI cannot replace schools in principle. If replaced, the unemployment rate will increase rapidly and the consequences will be unimaginable. For online learning, as mentioned above, the lack of interactivity is a serious problem not only for teachers but also for students. A good teaching atmosphere is also one of the factors of individualized teaching. During online teaching, everyone has to use electronic devices and may be distracted by external factors and neglect the class. In order to drive the interaction on the Internet, the interaction between students and courseware, and the interaction between teachers and students and classmates. Students click on the online courseware and send e-mails on the Internet about hard problems, and the teaching assistants take turns to solve the difficult points of students in time [10].

### **5. Conclusion**

The development of AI has enriched people's lives and it seems to pave a way for the development. In fact, we should fundamentally explore whether it is suitable and whether it meets our own needs. Based on the above content, whether it is online teaching or offline teaching, AI and teachers should

maximize specialization. To rejuvenate the country through science and education and enhance the country with talents as a driving force, to provide students with the best quality and most advanced learning intelligent machines; also, subject leaders, backbone teachers and special-grade teachers should play a leading role in the field of teaching, and guide all teachers to achieve high-quality teaching quality. In addition, we should develop more excellent teachers, such as uploading class videos for students to watch, and train more teacher talents. It is best to put them into action. Ordinary teachers should learn and imitate the class style of excellent teachers, strengthen their self-ability and supervision, and actively learn knowledge and skills to promote the development of education.

The way of teaching in the future is still unknown, but in order to reduce the concerns of parents, teachers should do their best to minimize the side effects as online teaching models are gradually introduced to the public. To ensure the quality and efficiency of the classroom, teachers should improve their control over students and allow more students to participate in the class. It is the responsibility of educators to seize these opportunities and promote the innovative development of education. However, this requires us to have a deep understanding of AI in order to fully harness its potential in education. In the future, we look forward to seeing more research on how AI can change pedagogy to provide more insights and strategies to advance pedagogy to better meet the needs of society and students.

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