

# Future Education Trend Learned From the Covid-19 Pandemic: Take 《Artificial Intelligence》 Online Course As an Example

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**Abstract**—COVID-19 Pandemic facilitates the development of online courses on a large scale. As a supplementary teaching in a special period, online courses play a gratifying role in enabling students to learn repeatedly and master effectively. However, it cannot be ignored that there are still some problems, and we need to find better solutions. This article takes the "Artificial Intelligence" course as an example, through a set of data analysis, puts forward the improvement plan of the network course, and discusses the "before and after class" teaching mode in blended learning. Through this way we could have a glimpse of the future education, which makes full use of online courses and uses online courses as an icing on the cake for traditional classrooms.

**Keywords-component:** COVID-19; Online Course; Artificial Intelligence; Blended Learning; Future Education

## I. INTRODUCTION

COVID-19 Pandemic is forcing people in many industries around the world to reevaluate existing models and develop new forms of business under the premise of adapting to the current form, such as education [1]. At the same time, online teaching supported by the integration of a variety of new technologies has been valued, which has also promoted the accelerated realization of Blended learning and the innovation of teaching models. Therefore, the spread of education has not been stopped by pressing the pause button. On the contrary, it has greatly increased as the COVID-19 gradually subsided.

The online teaching covering teachers and students across the country has undergone a process of continuous summarization, continuous adjustment and continuous improvement in practice, showing the characteristics of being free from time and space constraints, providing rich learning resources and interactive communication channels [2].

In order to win the battle of preventing, controlling and blocking COVID-19, educators have to improve their teaching level and can not relax the development of online education.

This article takes the "Artificial Intelligence (AI)" online course constructed by our team as an example. First, it points out the advantages and disadvantages of online teaching through course selection and data analysis, and shows our improvement plan; second, introduce the new model of "pre-class-in-class-after-class" teaching cycle that we conceived for the Blended learning; Finally, we look forward to the future education trends, in order to urge us to find a teaching method that is more suitable for ourselves and more popular with students in the future teaching path.

## II. TAKE THE 《ARTIFICIAL INTELLIGENCE》 COURSE AS AN EXAMPLE TO SEE THE LENGTH AND SHORTNESS OF ONLINE TEACHING

### A. Reasons for choosing to teach AI courses

The epidemic has no emotions but people do. In order to combat the epidemic, all parties in the society work together to use more emerging technologies to avoid close contact between people. As the focus of attention in various fields in recent years, AI has demonstrated its advantages in this epidemic with the application of various types of robots [3]. For example, the Claypot Rice Robot at the Third Hospital of Ezhou City, Hubei Province provided medical staff with 36 portions of Claypot Rice in 15 minutes. Another example is the 5G robot in the square cabin hospital has realized automatic disinfection and cleaning and provides medical assistant services.



Figure 1. 5G robot

Another example is the cherry blossoms in Wuhan University during the epidemic. Although people do not leave the house, the aerial video captured by the drone can still enjoy cherry blossoms through the cloud.

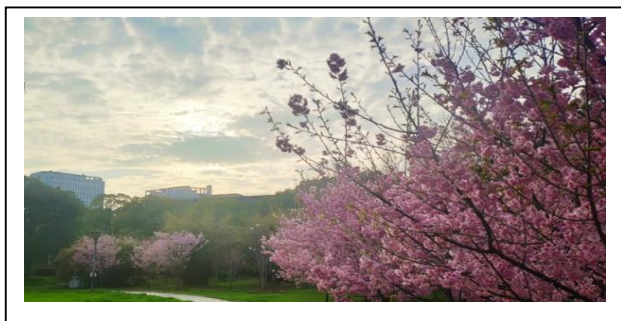


Figure 2. Drone aerial photography Wuhan University Sakura

Therefore, combining the current background [4], it is particularly important to pass on the principles, practical applications, and algorithm analysis of AI to students through online courses.

### B. Intuitive understanding of online courses

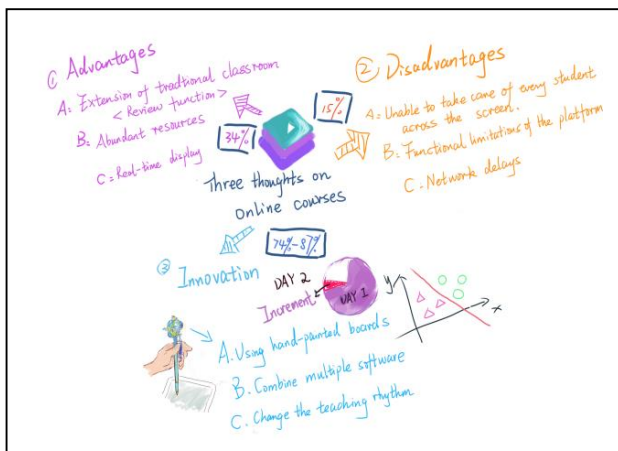


Figure 3. manuscripts of reflections in the online classroom

1) **Intuitive advantages:** You can interact with students in the form of voice calls and submission manuscripts, students can check and fill gaps through the review function, and teachers can provide rich resources in real time.

2) **Intuitive disadvantages:** unable to take care of every student across the screen, functional limitations of the platform, and network delays, etc.

### C. Data analysis and online teaching optimization

After the live broadcast, through the feedback of students and surrounding teachers, we counted a set of data: **34%, 15%, 74% -87%**, and carried out analysis and research around these three sets of data.

- **"34%" highlights the advantages of live broadcasting.**

1) This set of data means that after the live broadcast, without notice and mandatory requirements, 34% of the students independently use the review function and learn through the software platform to deepen their understanding of the content that is not enough. As an extension of the traditional classroom, the online courses give students the advantage of reviewing knowledge points and strengthening repeatedly, and also provides rich resource support.

2) The novel form of online interaction can attract students' attention, and then generate interest in learning knowledge. After the class, a student left a message as follows: "This is very efficient and can ask questions at any time without affecting the progress of the class." We owe it to the real-time interactivity of voice interaction and message board, as well as the additional benefits brought by review—Active learning.

- **"15%" exposed the disadvantage of live broadcasting.**

This set of data means that most of the students contacted me after the live broadcast, including students who were actively motivated to seek homework and actively discuss issues, as well as students who raised ideas for the live broadcast. But at the same time, 15% of the students did not have feedback. How much they mastered the courses and what the problem was, we have no idea. These all reflect the disadvantage of live broadcasting: unable to take care of every student across the screen, unable to grasp the dynamic direction of everyone.

- **"74% -87%" prompts us to constantly innovate.**

The Book of Changes reveals that after the change things evolve smoothly, and thus they continue for a long time. Therefore, "change" is very important, and "change" of online courses is innovation. Since there is no sign-in and mandatory requirements for online lecture courses, in order to test the popularity of this course and the stability of the number of viewers, we give the following test formula (1):

$$\text{Stability} = \frac{\text{The number of people remaining after 80\% of the course}}{\text{Total people}} \quad (1)$$

**Note:** The total number here is the total number when it is basically stable, excluding the number of people who enter the course lasting less than 20S-30S.

This set of data means that the stability has increased from 74% on the first day to 87% on the second day, and we attribute the **13% improvement rate** to "change". After the broadcast on the first day, we got in touch with the students and asked the relevant teachers for their suggestions, and then implemented innovation and improvement. This includes breaking the inherent limitations of the platform, using hand-painted boards, combining a variety of software to innovate teaching models, and at the same time adjusting the teaching process and grasping the teaching rhythm. Only then has the stability improved, which really adds icing on the cake for the traditional classroom.

### III. TRADITIONAL CLASSROOM COMBINED WITH ONLINE COURSES TO EXPLORE THE FUTURE EDUCATION MODEL

The above data fully demonstrates the advantages of online courses. Combining it with traditional classrooms to form Blended learning is the trend of higher education in the future. Blended learning is a teaching mode that combines traditional face-to-face teaching and online communication using appropriate communication technology [5]. Based on this, we propose a novel virtuous cycle of "before and after class" teaching mode to meet the following **"three requirements"**:

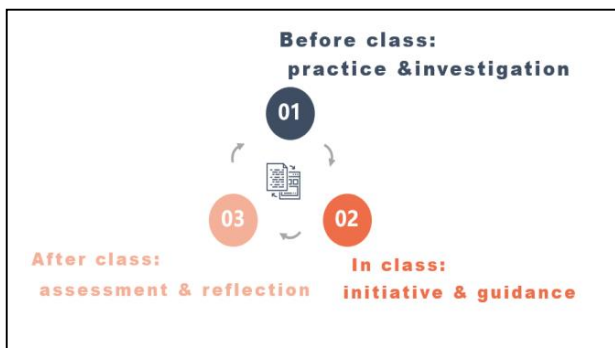


Figure 4. cycle of "before and after class"

#### A. We are required to innovate the lecture content before class

In order to better enable students to break through the confusion of formula derivation and the bottleneck of complicated concepts, we have conceived a fun learning method. Through the software platform, three interlocking and progressive difficulty courseware are set for students through the software platform. At the same time, after distributing the questionnaire in the class group, collect and sort out the students' understanding of the content of the class, and then adjust the teaching progress.

Taking the <Artificial Intelligence> course as an example, we will upload the existing literature before the class as an extension of the student's learning, not just the information that they can find through the search engine themselves. This includes the textbooks and published papers that developed by our team, as well as the latest viewpoints, in order to stimulate students' curiosity for exploring AI, divergent their thinking, and look forward to the course.

#### B. We are required to be good at guiding students to think in class

We guide students to take tasks and drive interest-based learning to open the level of learning, and build a conceptual framework between knowledge points from shallow to deep. The establishment of the instructor's own logic can better build the thinking support for the students, let them master the transfer learning thinking, fill the thinking shelf with physical objects, and then improve their own knowledge system.

We usually establish discussion groups to achieve teamwork, and at the same time provide students with more online learning materials, and build a learning library as a supplement. In addition, according to the key points and difficulties of each module, record and explain videos in advance to show them.

Taking the <Artificial Intelligence> course as an example again, we will give students a sense of identity hypothesis while studying, such as:

- **Suppose the student is a philosopher.**

Explore the application of AI and the development of twists and turns with a philosopher's mentality, and use this to motivate them to be steady in their careers. Here we will compare a towering tree to the growth of AI, in order to warn students that if they want to tower, they must thrive and take root in the present.

- **Suppose the student is an artist.**

Using the artist's hand to draw the AI classifier map together, by introducing common vehicle classification examples in life, assist him to learn to draw Classifiers, Perceptrons and Support Vector Machines to deepen his impression. The following is a graphic demonstration of a support vector machine.

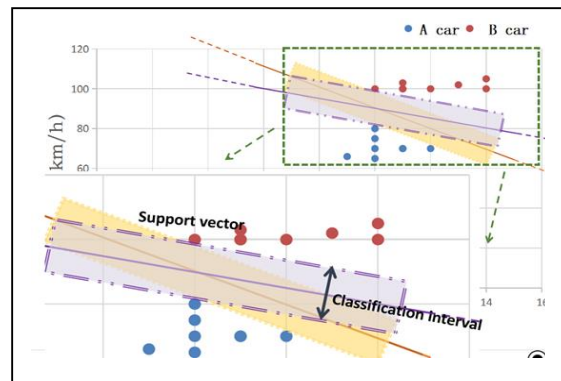


Figure 5. Support Vector Machine drawing demo

- **Suppose the student is a scientist.**

Open the blind box of deep learning as a scientist, and then build a basic understanding of the convolutional neural network [6] architecture based on the multi-layer perceptron, and understand the current popular algorithms: Generative Adversarial Networks and Reinforcement learning. We found that after arranging courses in this way, students will be more interested in the principles and implementation mechanisms of AlphaGo.

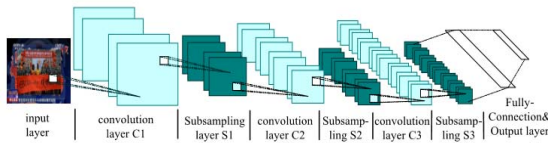


Figure 6. Convolutional neural network architecture

*C. We are required to actively interact with students after class*

After the class, we will upload assignments or test papers for students to master theoretical knowledge. We will correct all the students' homework, give different comments for each person, and collect common problems, individual errors, and share them with everyone in the classroom. At the same time, in the problem-solving communication with the trainees, I also found a lot of insightful unique problem-solving methods. I have to say that I also gained a lot from the students to make myself grow, so as to improve the quality of teaching.

Taking the <Artificial Intelligence> course again as an example, we will arrange some objective questions that are close to the course content and gradually increase in difficulty, or subjective questions that need to be done manually. On the one hand, interesting simple topics give students a sense of accomplishment; on the other hand, the increased difficulty topics give students a sense of challenge. Therefore, they will gain more knowledge and learning skills through the course. The following is an example of a simple judgment question:

True or False :

The generative adversarial network consists of two parts: the generative network and the discriminant network. ( )

Figure 7. Simple judgment problem example

#### IV. LOOK INTO THE FUTURE

In summary, the "traditional classroom + online course" model has certain feasibility. However, the development of blended learning is inseparable from our continuous polishing of our own skills. This study found that only by continuously consolidating basic capabilities and improving scientific research level can we find more practical teaching solutions.

Online courses are an extension of traditional classrooms. The exploration of future education models should balance the relationship between the two, and make implementation plans for special situations and different environments in order to execute the plan, so that we can achieve raise strengths and avoid weaknesses, add icing on the cake.

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