Preliminary Study on AI + Flip Classroom

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Abstract: Originated in 2007 in a mountain school in Rocky Mountain, Colorado, the "flip classroom" of a chemistry teacher at Forest Park High School opened a wave of reform of teaching methods in the context of new technologies. Originated from the "AI" at the summer seminar of Dartmouth College in 1956, it created a global high-tech revolution and brought new changes to the economy and society. This article aims to explore the basic ideas of the reform of the reversing classroom teaching methods in colleges and universities under the background of AI, and explore ways to improve the effectiveness of the reform of college teaching.

1. "Flip Classroom"

1.1 Origin of Flip Classroom

At woodland Park high school, a mountain school in the Rocky mountains of Colorado, like other schools' problem that some students miss normal regular, fixed-time school activities due to illness leave and other reasons. Also, students will spend some time on their way between home and school to attend classes. They will inevitably be late. All of this will cause some students to miss some of the teachers 'lectures and can not keep up with the progress of their studies. Jonathan. boerman and Aaron. Sams, chemistry teachers, began to study how to solve this problem. They tried to use screen recording software to record the playback of the PPT and the teacher's speech sound and upload the video to the Internet. So that students who are absent from the classroom or who want to revisit the classroom can make up for classes. This was in 2007.

What is more groundbreaking is that two teachers gradually based on students watching video at home and listening to lectures, saving classroom time to provide questions and answers for students who have difficulties in completing their homework or doing experiments. This is the reversal of the Flip classroom. The prototype. Soon, these online teaching videos were accepted by more students and widely disseminated.

"Flip classroom has changed our teaching practice. We will no longer spend 30-60 minutes explaining it for students. We may never go back to the traditional way of teaching. "This is a deep feeling for the partner. Since then, "flipping classroom" has gone to the front of the historical stage.

1.2 Advantages of "flipping classroom"

1.6.1.   "Flip" allows students to control their own learning

Using the teaching method of reversing the classroom, students can use learning materials such as teaching videos to freely and rationally arrange and control the pace of learning. They can watch video in a relaxed atmosphere without having to pay as much attention as in the classroom. Worry about missing lessons and not keeping pace. Really do at any time, anywhere, casual learning.

1.6.2.   "Flip" increases the interaction in learning

One of the biggest benefits of flipping classroom is that it improves classroom interaction: teachers and students, students and students, can interact with each other at any time. The role of the

teacher is changed from the presenter of content to the instructor of learning, so that the teacher has time to exchange questions and questions with the students and carry out individualized guidance for the students. Teachers can even communicate with parents so that parents can master their students 'learning.

1.3 Misunderstanding of Flip Classroom

1.3.1. Flip classroom is an online video. In fact, in addition to learning materials such as teaching videos, flipping classroom is important for face-to-face interactive discussions and meaningful learning activities between teachers and students.

1.3.2. Flip classroom video to replace the teacher. In fact, the video is to present the teacher's teaching process to the students in advance. As a guide of student learning activities, teachers participate in students 'interactive discussions and questions.

1.3.3. Flip classroom is an online course. In fact, teachers should participate in students 'learning activities and summarize and improve students' learning conditions.

1.3.4. Flip classroom is a student's disorderly learning. In fact, reversing the classroom changes the order of traditional teaching and learning, allowing students to learn first, with questions and doubts to focus on learning with the teacher.

1.3.5. Flip classroom so that the entire class of students staring at the computer screen. In fact, flipping classroom can enable students to learn video and other materials in advance at any time, anywhere, and any way.

1.3.6. Flip classroom is the student learning in isolation. In fact, there are teachers in the process of flipping classroom teaching. Today's information technology has realized that "where the students are, the teachers are."

1.4 What's a Flip Classroom

1.4.1. It is a means to increase the interaction and personalized communication time between students and teachers.

1.4.2. It is an environment where students are responsible for their own learning.

1.4.3. Teacher is the "coach" around the students, not the "saint" on the podium.

1.4.4. It is a mixture of direct explanation and constructivist learning.

1.4.5. It was a student classroom that was absent but was not left behind.

1.4.6. Preserved the content of the classroom is be used for review or remedial classes.

1.4.7. It is a classroom where students actively learn.

1.4.8. It is a classroom where students receive personalized education.

1.5 Flip the definition of classroom

The Flip classroom is a teaching form in which teachers provide teaching videos and other learning materials. Students study in advance with questions and return to the classroom to communicate, discuss, answer questions and complete homework face-to-face. It changed the traditional "teaching before learning" is "learning before teaching."

Teachers become the guides of learning rather than the transmitters of content, and students become the active researchers of knowledge rather than the passive recipients. See table 1.

Table 1 Comparison of Flip Classroom and Traditional Classroom

Item / Type	Traditional classroom	Flip classroom
Teacher	knowledge transfer,teaching manager	learning instructor, facilitator
Student	Passive recipient of knowledge	Active researcher of knowledge
Teaching Form	Classroom Presentation+Homework	Preview+Classroom Research
Classroom Content	Teaching	Study Problem
Application	content show	study,communication,discussion
Evaluation mode	traditional test	multi-angle, multi-way

1.6 Difficulties in the Implementation of Flip Classroom

1.6.3. Students 'self-control ability

Flip classes require students to study video and other materials with questions before class. This is entirely under the student's learning motivation and self-control. Because there is no on-site restraint from schools and teachers, students have to strong self-management & control ability. As well as Family involvement, assistance and support.

1.6.4. Schedule of hours of work

The state is advocating reducing the burden on students, but various schools still use various assignments, supplementary classes, training, etc. to occupy students 'after-school learning time. The main learning tasks of students after class are to watch teaching videos and complete a small amount of targeted exercises. Each class's homework should also be completed in the eight-hour study time during the day.

1.6.5. The issue of the applicability of the discipline

Now,most of the subjects that carry out flip classroom teaching experiments abroad are science courses. Science knowledge points are clear. Many teaching contents only need to clearly teach a concept, formula, example questions, and experiments. Students can speak against each other. In the liberal arts courses such as literature and history, it will involve multidisciplinary content, and it is necessary for teachers and students to carry out ideological exchanges and emotional communication to have good teaching results. This requires liberal arts teachers to continuously enrich the content of teaching videos, causing students to think. The teaching video should summarize the basic knowledge points in the course, expound the relevant theories, allow students to consult the materials and think after class, and then conduct exchanges and discussions with teachers and classmates in the classroom to gradually deepen understanding.

1.6.6. Information technology support in the teaching process

From teachers to make teaching video, students at home watching teaching video to personalized and collaborative learning environment needs information technology support. Need faster network speed and a high level of video production team.

1.6.7. The challenge of teacher professional ability

The reform of any teaching model requires the active participation of highly qualified teachers. In the course of reversing the classroom, the effect of teaching video, the cultivation of students 'independent learning, the guidance of discussion and communication, the planning of learning time, and the organization of classroom activities all have an important influence on the teaching effect. All these require teachers to have higher organizational coordination ability, information quality ability, lively teaching ability.

2. Artificial intelligence

2.1 Origin of artificial intelligence

In the summer of 1956, a group of visionary young scientists, led by John·McKinsey, Minsky, Rochester, and Shannon, jointly studied and discussed a series of related issues related to the simulation of intelligence by machines at the Dartmouth conference. For the first time, the concept of "artificial intelligence" was proposed, marking the official birth of "artificial intelligence." Artificial intelligence(AI) is to make the behavior of a machine look like the intelligent behavior of a person. After half a century, IBM's "Deep Blue" computer defeated the world's chess champion, Alpha Go defeated the world's Go masters, attracted wide attention in the world, and was a perfect performance of artificial intelligence technology. It also allows concepts such as neuroscience and in-depth learning to enter the public's perspective.

2.2 Definition of artificial intelligence

In the first Industrial Revolution, people invented machine tools, cars, and airplanes, extending human limbs. The rise of artificial intelligence ignited the wave of intelligent revolution. We need to create machines that think like people and act like them. In general, the definition of artificial intelligence can be mostly divided into four categories, that is, machines "think like people", "act like people", "think rationally" and "act rationally." "Action" here should be understood broadly as taking action or making decisions about action, not just physical movements.

Professor Nelson of the Center for Artificial Intelligence Research at Stanford University has given such a definition: "Artificial intelligence is a discipline about knowledge-the science of how to represent knowledge and how to obtain knowledge and use it. "Professor Winston of the Massachusetts Institute of Technology believes: "Artificial intelligence is the study of how computers can do intelligent work that only humans can do in the past. "

These arguments reflect the basic ideas and basic contents of artificial intelligence disciplines. In short, artificial intelligence is a discipline that studies computers to simulate certain thinking processes and intelligent behaviors(such as learning, reasoning, thinking, planning, etc.). It mainly includes the principle of computer intelligence and the manufacture of computers similar to human brain intelligence. Enable computers to achieve higher levels of application. Specific technologies include: robots, language recognition, image recognition, natural language processing, intelligent monitoring, intelligent search and other core technologies. And all of this, to teaching, especially reversing classroom teaching will play a positive role in promoting.

3. The Influence of Artificial Intelligence on Flip Classroom

3.1 The Impact of Artificial Intelligence on Education

Under the data wave of the intelligent age, artificial intelligence and big data technology are quietly changing people's thinking paradigm and education. The combination of artificial intelligence and big data technology and education brings more opportunities, which will help to improve the science of educational decision-making, the refinement of management, the individualization of student learning, and the informatization of teaching. Intelligent education with artificial intelligence as the core will promote the individualization, precision, adaptability and universality of education.The core of big data technology is prediction, that is, the possibility of predicting things through the analysis of big data. By analyzing the data fragments of students 'learning and life, studying the students' behavior patterns, re-examining the diverse and dynamic needs in learning, and establishing a personalized education system, the educational effect of teaching according to their aptitude is realized.

With the development of Internet, digital knowledge technology and mobile communication technology, people's access to knowledge is changing. In the past, the knowledge transfer method changed from a single teacher to a multi-directional interaction between teachers and students. The way students learn knowledge tends to be diversified and autonomous, not only limited to campus and classroom. At the same time, the role of teachers is also undergoing a transformation. From the knowledge of students to the designers and mentors of student learning activities, a new type of learning partnership has been formed between teachers and students.

3.2 Artificial intelligence supports flipping classes

Flip classroom before class, during class, after class and other links, artificial intelligence can replace teachers to play a relevant role, helping teachers to complete such work as: speech recognition, intelligent response, automatic reading, intelligent analysis and so on. This will reduce the teacher's mechanical workload and give teachers more time to think and plan the overall arrangement of teaching content. To support the effect of flipping classroom. See Figure 1.
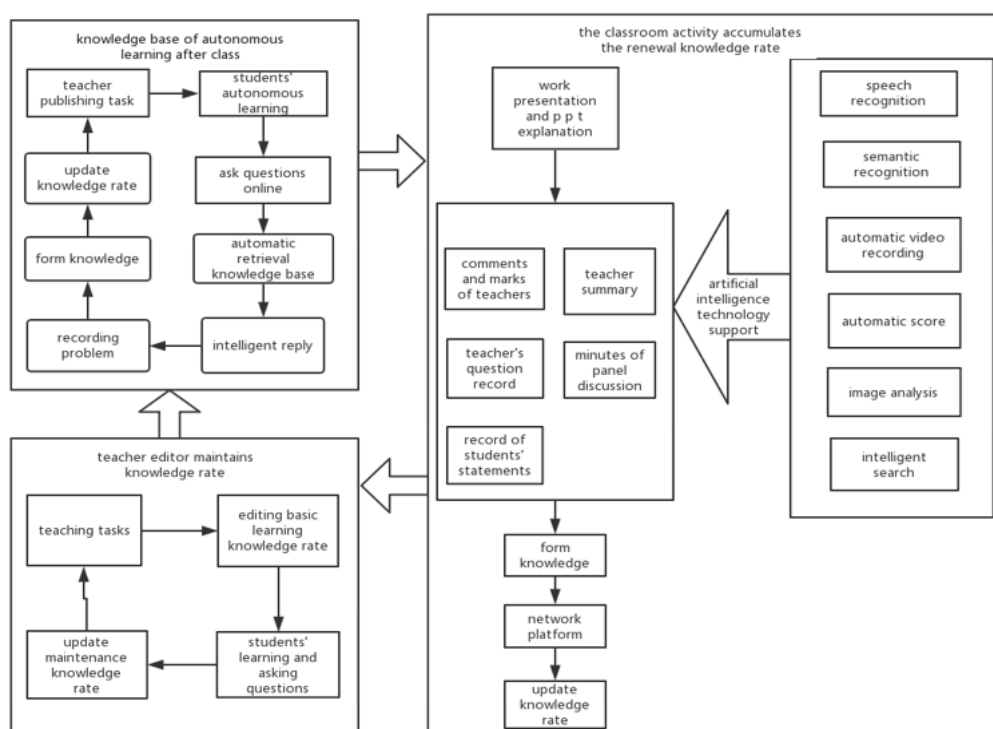
Figure 1. Artificial intelligence supports the various aspects of flip classroom

Artificial intelligence can also "paint" each student, understand the student's daily life schedule, learning habits, interest expertise, knowledge mastery, etc., so that teachers have targeted personalized training, and truly achieve "teaching according to material". Then promote the connotation of education quality development.

With the rapid development of artificial intelligence technology, there will be more and more things that machines can do instead of people. In the course of teacher teaching, the scope of artificial intelligence participation will also increase, and the precise services provided to teachers will be better and better. The quality of education will also be higher and higher, all of which will require the hard work of science and technology workers and educators.

References

[1] Flipped Classrooms: An Agenda for Innovative Marketing Education in the Digital Era[J] . Teegan Green. Marketing Education Review . 2015 (3)

[2] Flipping the College Classroom for Enhanced Student Learning 1[J] . Barkley,A. NACTA Journal . 2015 (3)

[3] The Flipped Classroom: Fertile Ground for Nursing Education Research[J] . Jean S. Bernard. International Journal of Nursing Education Schola . 2015 (1)

[4] Making Heads or Tails of Classroom Flipping[J] . Tracey S. Hodges,Nancy Dubinski Weber. Kappa Delta Pi Record . 2015 (2)

[5] Flip learning[M]. China Youth Press.(USA) Jonathan.2015

[6] Flip classroom of Khan College[M]. Zhejiang People's Press.Khan.2014

[7] Flip classroom and the MOOC teaching[M]. China Youth Press. Bergman.2014

[8] Liru Hu:Flip Classroom and Learning:Analy of Flip[J] , Distance Education,2016