Feasibility Of Using AI Supervision System to Improve Teaching Quality

Junbo Wang

Glasgow College, University of Electronic Science and Technology of China, Chengdu, Sichuan, China

2618072w@student.gla.ac.uk

Abstract. In Chinese educational circles, improving the quality of high school teachers' classroom content has become a hot topic of current research, but there are still shortcomings in how to use AI technology to achieve this purpose. This article analyzes the current situation of high school education in China and the possibility of applying an AI supervision system in practical teaching. The analysis of this article shows that the AI system is very effective in actual teaching, and teachers can greatly improve the teaching quality after using this system, and students' concentration and learning efficiency will be significantly improved. Based on this, this paper puts forward the following suggestions, hoping that relevant departments can support the popularization of AI supervision systems in high schools, and teachers can make reasonable use of this system to adjust the teaching methods of students and themselves. Finally, it is also hoped that the AI system itself can continue to improve to complete classroom supervision more efficiently.

Keywords: AI supervision; education; student concentration; teaching quality.

1. Introduction

In modern education, students spend most of their time in the campus classroom, and their concentration in class is an important factor in achieving good learning results and learning outcomes. However, in the current environment, students are faced with more and more distracting temptations, such as social media and games on mobile phones. Therefore, how to improve students' attention in class has become an important issue in the field of education. However, the current environment of Chinese high schools does not allow teachers to conduct detailed concentration analysis and management for each student. In the current digital age, the application of artificial intelligence technology in the field of education is increasingly common. AI technology is widely used in personalized learning, intelligent education assistance, student assessment, and other aspects, which has brought many innovations to education. Therefore, the introduction of AI monitoring systems into the daily teaching of high schools will bring good changes to teachers and students as well as the education community. Current research on the use of AI monitoring systems in teaching has mostly focused on the accuracy of the AI technology itself, rather than analyzing its effectiveness in the classroom and its impact on the participants of the teaching system. Based on existing syllabus discussions on Chinese high school teaching, analysis of students' attention in the classroom, and papers on the principles of AI supervision systems, this paper can discuss the effect of AI systems from the technical level is divorced from the actual application scenario. Only by analyzing the possible impact of the AI supervision system on all parties can we accurately judge whether the system can improve the teaching quality to the greatest extent. In the end, it is expected that the AI supervision system will have a positive effect on high school education, and several feasible recommendations are drawn.

2. Current Situation Analyzing of Senior High School Teaching Management in China

2.1. The Inadequacy of Existing Education Policies

Chinese high school education and learning are mainly divided into two parts: classroom teaching by teachers and self-study by students after class. According to the Survey Report data, the average daily study time of high school students is 9.68 hours [1]. Since the concentration of students in class is directly proportional to the knowledge students can obtain and the final grades, based on the school study time, the degree of interaction and participation of students in the teacher's classroom is very important in teaching activities. The teacher's teaching style, teaching quality, and the overall atmosphere of teaching will affect the student's performance in class and the frequency of participating in class interaction, thus affecting the student's learning efficiency and final course score [2]. If students can concentrate on learning for up to 10 hours a day, their learning efficiency and results will be greatly improved. However, since the new curriculum reform in China in recent years, teachers have focused their teaching objectives mainly on curriculum innovation, teaching mode, teaching media, teaching evaluation, teaching concept, teaching content, teaching objectives, teachers' professional development, students' learning styles, etc., and paid less attention to discipline management in students' learning [3]. Some teachers also adhere to the old-fashioned educational philosophy that only focuses on the completion of teaching tasks in class and ignores the acceptance of students in the course they teach. This level of acceptance is reflected in the concentration of students in class because students will only stay focused on the content they are interested in for a long time, otherwise, they will be distracted to do other things in class.

2.2. The Insufficient Teacher's Correction of Students' Concentration in Class

At present, it is difficult for Chinese high school teachers to effectively manage student's attention in class. Based on the large number of students in Chinese high school classes, there may be 50 students in a class and only one teacher. In the face of so many students, it is almost impossible for teachers to pay attention to the classroom performance of each student in daily teaching, and it is difficult to treat them equally and be impartial so that they cannot reasonably adjust their teaching rhythm and teaching methods. Some teachers even regard this situation as the reason that they cannot supervise students, so they completely give up the supervision of students' concentration and only manage students who break class discipline. Discipline management is to control and restrain students' words and behaviors, and the absolute quiet state of the self-study classroom is a sign that the discipline management meets the requirements. Thought it would make an example for others and raise the class's overall motivation. Most teachers believe that discipline management is to control and restrain students' words and deeds, and the absolute quiet state of a self-study classroom is the symbol of meeting the requirements of discipline management [3]. In daily teaching, teachers do not have enough basis to discipline students. They can only take disciplinary corrective measures such as seat changes for students based on the general feeling, which cannot solve the problem well. It is precisely because of the lack of monitoring systems that can effectively analyze the individual students, teachers are confused in their daily teaching. At the same time, due to the inability to systematically collect data on students' concentration in class, there is no specific guidance and regulation on the management of students' concentration in China's senior high school syllabus, which also leads to teachers having no reference basis and having to fight on their own, resulting in uneven levels of students' quality.

2.3. Dissatisfaction of Students with the Existing Supervision System

There is widespread dissatisfaction among Chinese high school students with current measures to monitor attention in class. Most students hope to establish an effective supervision system in class, to better manage their learning behaviors and improve their learning performance on the one hand and create a good teaching atmosphere to stimulate the learning interest of classmates around them since

they cannot generally reasonably judge the correctness of their behaviors, and Chinese high school students are generally opposed to teachers' unreasonable and groundless reprimands and adjustment of teaching methods. Many students are obedient when reprimanded. Once they are out of the teachers' vision, their rebellious psychology in adolescence and their insubordination will lead them to conduct behaviors contrary to teachers' regular guidance, such as deliberately creating chaos in the classroom [4]. The dissemination of teachers' negative evaluation among students, etc., thus affecting the overall concentration of the teaching group. As for the cameras installed in the classroom, students generally said that they would ignore their existence in daily life, and they believed that teachers would not have much energy to check and identify the monitoring of many classes, and the deterrent power of cameras would naturally return to zero.

3. Feasibility Analysis of AI Supervision System

3.1. The Technical Feasibility of AI Regulatory System

In the current Chinese high school hardware and software constraints, an AI supervision system is one of the best options. In the use of actual teaching scenarios, the AI supervision system mainly consists of three parts: high-definition cameras, AI analysis systems, and feedback systems that teachers and students can access. The main operation logic of this system is as follows: the camera captures students' head movements, body movements, and facial expressions in class, judges' students' concentration level in class through AI analysis, and automatically generates each student's concentration schedule according to the class progress after the judgment is completed, and finally summarizes and feedback the chart information to teachers and students in each class [5]. The AI system does not give specific solutions, which requires teachers to make corrections to their lessons based on the data provided by the AI. In the early process, the AI system will receive no less than 3,000 learning cases of pictures for each kind of student response to improve the accuracy of the overall judgment [6]. The AI looks at the student's head Angle, facial expressions, and body movements to determine whether the student is paying attention in class. In the current classroom teaching, AI monitoring systems have shown surprising reliability. In the experiment, for small classes with no more than ten students, the AI monitoring system can continuously label the class behavior of each student and display the class status of students in real time with an accuracy of up to 85 percent [7]. Students' concentration also improved significantly. In another case, different from the previous state where concentration decreased with class time, students' concentration continued to rise with time after the application of the AI supervision system. Over a semester, or four months of actual use, the student's final exam scores improved by 5% overall compared to before using the AI supervision system [8]. This data is sufficient to demonstrate the effectiveness of AI monitoring systems. These practical experimental results effectively prove the feasibility of AI supervision systems in technology and practical teaching scenarios. Teachers can rest assured that the system can be used for teaching management and improve class quality.

3.2. The Benefits of AI Supervision Systems to High School Teaching

AI supervision system will mainly bring the following benefits to high school teaching: teachers can better understand students, teachers can better improve their teaching methods, students can specifically know their performance in class and make adjustments, and students' discipline and academic performance will be improved. With the aid of the AI monitoring system, teachers will achieve previously impossible analysis of the classroom performance of each student in a large class, to better understand which time points in the teaching process of students are the most focused and which time points are unable to concentrate. At the same time, teachers can also combine these data with the knowledge of students, gradually understand the inner thoughts of students, and better take care of students' emotions in teaching. Under the AI supervision system, students can improve their bad behaviors through the feedback obtained, and when they are aware of the supervision, they will consciously absolve themselves and their classmates' violations of school rules, thus creating a good

learning atmosphere and driving all students to make progress together. In this process, students' grades will certainly be greatly improved, and the adjustment in the code of conduct will be more in line with the policy of all-round development of morality, intelligence, physical fitness, and labor advocated by the Ministry of Education of China.

During the use of the AI supervision system, students express themselves more actively in class and actively participate in the tasks and interactions assigned by teachers in class. Since students know that teachers will feedback on their concentration in class to their parents, students will strive to regulate their behavior and avoid being scolded by their parents at home [9]. In the opinion survey of students, students generally reported that after realizing the AI supervision system, they consciously began to pay attention to their classroom performance, whether voluntarily or involuntarily. After this self-examination, students can learn more knowledge in class, save some time to re-study after class, and students can use this time to do what they want to do, and feel that life is much easier. Teachers also gave positive feedback after using the AI monitoring system in practice. Instead of paying attention to each student, teachers can focus on the classroom and how to design a better classroom. The AI system produced a clear and effective form of student focus, allowing teachers to better interview students and improve their classroom tasks. In the opinion survey of teachers, it received unanimous praise. Teachers believe that the system has freed their hands, and the accurate and reasonable data analysis of the AI system has helped teachers more easily complete the adjustment of classroom teaching, and also better let students improve their grades. Some teachers hope that the AI supervision system can be popularized in the whole school immediately so that teachers and students can better study and live [10].

3.3. The Problems of AI Supervision Systems

While an AI monitoring system can bring many benefits to students and teachers, it may also cause some negative effects. From the perspective of students, the AI supervision system may bring greater psychological pressure to some students. In the eyes of some students, they subconsciously notice the presence of cameras even during recess, this prolonged supervision has made the school more like a prison. With no respite from long hours of supervision, students are afraid to show their true selves in school life which gives the teacher the wrong information and leads to a misjudgment of the students' psychological state. Teachers may also rely too much on AI systems, give up their communication with students, and thus accept the analysis and suggestions given by AI indiscriminately and ignore the actual situation of classmates. Each student is an individual with a different situation, and it is easy for teachers to treat students as if they were identical data after relying on AI systems. At the same time, the AI supervision system itself may misjudge the class behavior of students. Some subtle facial expression differences may confuse AI, resulting in wrong analysis. These wrong data will affect the accuracy of the overall database and will also bring wrong adjustment measures to teachers' teaching management. Students may also be punished unjustly, leading to distrust of teachers and AI systems, and even disgust with the education system.

4. Suggestions on Applying AI Supervision System to Actual High School Teaching

4.1. Suggestions to the Relevant Department

The relevant department should strongly support the full application of AI monitoring systems on high school campuses. Based on the existing hardware and software in Chinese high schools, it is only necessary to further improve the hardware facilities to achieve the use of a wide range of AI supervision systems. If the AI supervision system is fully popularized with the support of the relevant department, it will greatly reduce the cost required by high schools so that every Chinese high school can easily apply the AI supervision system in actual teaching. At the same time, the education sector needs to organize current teachers to learn to use AI supervision systems. Candidates' understanding

and application of AI supervision systems should be added to the examination of teacher certification for future education. In terms of teaching policy, the relevant department should keep pace with The Times and include guidelines and opinions on teachers' use of AI monitoring systems in the high school syllabus. Like the current curriculum assessment in high school teaching, the relevant department needs to require schools to inspect the practices and effects of teachers' use of AI systems from time to time and select excellent cases as models for praise and publicity. For teachers who rely too much on AI systems, the relevant department needs to urge schools to criticize and correct such teachers.

4.2. Suggestions for Teachers to Use AI Supervision System

Teachers need to carefully learn how to use AI monitoring systems and innovate their teaching models based on this system. Teachers should use the AI monitoring system as a tool to aid teaching, rather than blindly following the analysis and opinions of the system. After obtaining the data provided by the AI supervision system, teachers can re-analyze and plan the content length of each lesson according to the chart information of students' attention feedback from AI. Teachers can also re-formulate the communication policy with students' parents according to the obtained data. In school life, teachers can pay attention to some unusual data, such as the sharp decline in students' attention on a certain day, to find students' problems in time and communicate with students to understand the specific situation. Teachers can also use the data given by AI to correct their teaching style or classroom atmosphere for better teaching results. Teachers can also use the data analyzed by AI to adjust the after-school tasks assigned to students and avoid excessive homework to ensure that students are full of energy in class and their attention can be focused on classroom teaching to the maximum extent.

4.3. Suggestions for the Improvement of AI Supervision System

Although the AI supervision system under the current machine learning framework has reached a high recognition success rate, it is still unable to infer whether the expressions and actions of students represent concentration in the case of an incomplete database. Moreover, the tasks of teachers in class are not fixed, and the class behaviors performed by students at different times are also different, which can easily lead to the misjudgment of AI. The AI system needs to add the function that teachers can edit class content so that the AI can make correct judgments according to different class situations. For example, when the teacher assigns the task of completing the classroom test, the students' attention is concentrated only when they lower their heads. AI has to update different learning models in the development of technology, in this way, more subtle expressions can be inferred from the existing database whether they meet the teacher's class standards. At the same time, AI systems need to develop devices that can be worn by students to analyze their class performance through more physiological evidence such as brain waves, to improve the accuracy of AI systems.

5. Conclusion

This study found that the AI supervision system is very consistent with the current education environment of Chinese high schools, and can bring learning benefits to teachers and students, helping students to improve classroom concentration and learning efficiency. Therefore, this paper gives suggestions in different aspects. First, it suggests that Chinese high schools gradually improve relevant facilities and strive to popularize AI supervision systems with the help of relevant departments as soon as possible. Secondly, it is suggested that teachers can actively learn the use of the system and make reasonable and effective use of the data provided by the system to make up for the deficiencies in teaching management and improve the supervision of students. Finally, this article also suggests that the AI system should continue to improve and upgrade, expand the database, and improve the recognition accuracy, to avoid misleading teachers. The main contribution of this article is to integrate AI into the teaching environment based on existing scientific research, and put forward

new theoretical analysis and teaching suggestions, which is conducive to educators discovering the potential of AI supervision technology in teaching applications and doing more research. The current research lacks cases in which suggestions are applied to actual teaching scenarios. Future research needs to make up for this shortcoming and use specific cases to give more comprehensive consideration to the rationality of suggestions and make amendments and supplements.

References

[1] Gao M R. Study on the causes and countermeasures of self-study discipline management problems in high school students. Advances in Education, 2023, 13: 2421.

[2] Xie N J. How to do a good job in the management of high school class teachers under the background of New Curriculum Reform. Education and Teaching Forum, 2013, (20): 17-18.

[3] Zhang M X. Research on classroom management problems and countermeasures in rural ordinary high schools under the background of New Curriculum Reform. Nanchang: East China University of Technology, 2022.

[4] Trabelsi Z, Alnajjar F, Parambil M M A, Gochoo M, Ali L. Real-time attention monitoring system for classroom: A deep learning approach for student's behavior recognition. Big Data Cogn. Computer, 2023, 7: 48.

[5] Ling X, Yang J, Liang J, Zhu H, Sun H. A deep-learning based method for analysis of students' attention in offline class. Electronics 2022, 11: 2663.

[6] Cebrián G, Palau R, Mogas J. The smart classroom as a means to the development of ESD methodologies. Sustainability, 2020, 12: 3010.

[7] Yan W. Research on the current situation and countermeasures of classroom learning environment of ordinary high school students. Taiyuan: Shanxi Normal University, 2019.

[8] Bender W N, Smith J K. Classroom behavior of children and adolescents with learning disabilities: A meta-analysis. J. Learn. Disabil, 1990, 23: 298–305.

[9] Carini R M, Kuh G D, Klein S P. Student engagement and student learning: Testing the linkages. Res. High Education, 2006, 47: 1–32.

[10] Francis J, Balogh Z, Reichel J, Magdin M, Koprda Š, Molnár G. Application experiences using IoT devices in education. Appl. Science, 2020, 10: 7286.