Research on Hybrid Instructional Design for High School Physics

Zhaoyi Du[1, a]

[1] Jilin City No. 13 Middle School, China

[a]zhaoyi_du@163.com

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Abstract. Modern society is a rapidly developing information society. The rapid development of online learning and the reform of school education have changed the way students learn in a certain degree. However, traditional classrooms and online learning have their irreplaceable advantages. A problem that cannot be ignored. Based on this, hybrid learning came into being, combining the advantages of traditional classroom and online learning to improve classroom teaching efficiency. Based on the physics teaching in middle school, this study designed a feasible high school physics classroom teaching design based on hybrid learning and implemented it. The research results show that combined with the hybrid learning theory in the design of high school physics teaching, students can improve their interest in learning physics and enable students to better learn, understand and apply physics knowledge.

Introduction

Because traditional school education lacks in respecting students' individualized development and cultivating students' comprehensive ability, complete online learning cannot guarantee the efficiency of students' learning. Based on this situation, mixed learning has emerged. The hybrid teaching process is a teaching process that combines the advantages of traditional classroom teaching with the advantages of online learning between traditional classroom teaching and online learning. This kind of teaching mode will select appropriate modern teaching media to assist teaching according to different students' personal situations, different teaching contents and different teaching objectives. Both remote network learning and close-range classroom teaching can guarantee the student's main status creates an open and relaxed classroom atmosphere for students' learning, stimulates students' interest in learning and promotes learning; it also respects students' individuality and cultivates students' creative thinking; and guarantees teachers to a certain extent. The dominant position, teachers can timely guide and help students, ensure that students can complete the learning tasks efficiently, improve students' self-learning ability, and make students grow into the comprehensive talents needed by the times.

Purpose and significance of the research

The purpose of this thesis is to use the second-grade students of a key high school in Yan'an as the teaching object, based on the research on the related theoretical results and applied practice of mixed learning at home and abroad. The teaching content, designed a hybrid teaching design suitable for domestic high school, and further implemented teaching in the high school physics classroom according to the mixed teaching design, investigate and analyze the actual teaching effect, and understand the high school physics teaching process based on the hybrid learning theory. Difficulties arise and clarify the value of a mixed-learning physics class. Under the background of the new era, with the support of the Internet and information technology, under the guidance of the new teaching concept, design a mixed learning classroom that can improve the efficiency of middle school students' physics learning, and study the middle school education of mixed learning theory in the future. Workers bring some inspiration.

Compared with junior high school physics, high school physics is more difficult, the content is more abstract, and there are certain requirements for students' abstract thinking ability. Most students

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reflect that "you can't understand the class, you won't do it after class, don't know how to learn, I don't know how to apply the physics knowledge I have learned, and so on. In the traditional physics teaching class, the teacher's teaching method is mainly based on the content of the textbook, which is often the experiment and the phenomenon. Talk about logic, students cannot thoroughly understand the nature of physics knowledge, the learning effect is not obvious, which will reduce students' curiosity about physics learning, limit students' thinking development, and also combat students' confidence in learning physics. Through the study of hybrid learning theory, mixed learning helps to create a flexible and open learning environment, enabling students to actively participate in the learning process, supporting the physics teaching process through various information technologies and different media such as computers and mobile phones. Bring physics into life, discover physics in life, let students discover and explore themselves, thus changing students' learning attitudes, making students interested in physics learning; changing teachers' traditional teaching ideas, turning teachers' identities into "guidance" Students, supporters, students become the main body of the classroom, let go of the hands of the students themselves, their own brains, take the initiative to learn; create an equal, orderly, open classroom atmosphere, stimulate students' creative thinking, cultivate students' cooperation, Share awareness and improve students' self-learning ability.

Definition of mixed learning

The research of mixed learning is getting more and hotter. More and more scholars have carried out research on mixed learning. However, due to different development periods and different levels of science and technology, each research scholar has different Knowledge background, different life experiences and different levels of scientific research, in the process of research and practice, will stand at different angles and put forward their own opinions on the nature of mixed learning. The final research results are also different. I have reviewed the experiences of different scholars at home and abroad on mixed learning research, and based on their own understanding, they are sorted and summarized here.

The essence of mixed learning is to combine the advantages of online learning and traditional classroom teaching to overcome their existing deficiencies. In the teaching process, combined with the actual situation, respect the individuality of students, according to different requirements, use different ways to solve the problem is to achieve the teaching objectives and improve the teaching efficiency to achieve the best learning results. The specific definition is as follows: Firstly, mixed learning is a formal teaching. Part of the learning process of students is online learning. It is realized through media means such as network technology. During this period, students can learn independently and teachers can realize remote tutoring through network technology. Supervised role; Secondly, mixed learning must have the participation of the school. This part of the study is carried out in the form of traditional classroom face-to-face teaching. The teachers mainly guide, help and support in the teaching process, and assist the teaching according to the teaching content and multimedia technology. Finally, the first two are organically integrated. In a complete teaching process, according to the actual situation of the students, different learning styles and different learning requirements are supported to support different learning styles of students, to meet different learning styles of students, and to satisfy students. Personalized needs, rational, orderly, and efficient organization and selection of various teaching elements, the "online network independent learning" and the combination of "traditional classroom teaching" is reasonable and efficient, and the ultimate goal is to achieve better teaching goals.

Instructional design based on hybrid learning

Based on the "Design Framework of Hybrid Learning Curriculum", the students, teachers, curriculum, environment, activities, resources, media and other elements are analyzed and integrated in a certain order in the instructional design. The processes followed by the instructional design are respectively: Front-end analysis, activity and resource analysis, and teaching evaluation design to

carry out teaching implementation, improve classroom teaching efficiency, and achieve teaching goals. First of all, in the front-end analysis, focus on each student, analyze the actual situation of the students, and regard the students as the center of learning. Re-analyze and locate the roles of the teachers in the process of mixed learning. The structured course content is analyzed according to the method of knowledge classification, taking into account the environment in which the students are located. Secondly, based on the comprehensive analysis of the above factors, the activities and resources are designed. Finally, combined with the formative evaluation and summary Sexual evaluation, design evaluation of teaching, fully integrate technology and classroom, so that students get good learning results.

Different teaching media have different advantages. Different knowledge points need the support of different teaching media. Different learning activities also need the assistance of different teaching media. In the process of designing teaching resources, the choice of teaching media should be based on the requirements of teaching objectives, based on the principle of combination, paying attention to the advantages of the media, aiming at achieving better teaching results, taking into account the actual environment of students and the use of media. Factors such as expenses incurred, select appropriate teaching media for different types of knowledge points and different forms of teaching activities, based on the theory of "the relationship between different types of knowledge and teaching media" and "the relationship between different learning activities and teaching media."

Teaching implementation based on hybrid learning

The subject of this teaching implementation is a high school student in a high school, with a total of 70 students, most of whom are aged 15-16. High school students have passed the transitional stage between junior high school and high school. After experiencing high school, the knowledge reserve has increased. The students' thinking has become independent and stable, and their personalities have become more and more stable. Physiology and psychology have matured compared with junior high school. Can be brave in expressing self, learning purpose is strong, have a certain sense of learning, and clarify their student identity. Most students can learn independently without interference, and they can be more comprehensive in analyzing problems, and the abstract thinking ability has a certain development. When facing problems, they will analyze the core of the problem and understand the nature of the problem. Hypothetical and deductive methods can be used. On the other hand, after investigation, it is found that most of the classes have more children with only one child, are easy to be self-centered, have self-righteous emotions, and lack team awareness and sharing spirit in learning activities. In the case of incomplete understanding of knowledge, it is easy to form a misconception. The physical content of high school is complex and abstract, and it has high requirements for students. The traditional teaching of physics classroom teaching will affect the cultivation of their open thinking. High school students already have a certain degree of self-control. They need a learner-centered, free, open and equal learning atmosphere to fully develop their creativity, selectivity and independence.

The original knowledge and experience of the learner will also have an impact on the new learning process. Before the teaching of the new course "Electrical Field Strength", the analysis of the academic situation will be carried out. It is found that the students have a simple understanding of electricity through the junior high school. Understand, and in the previous lesson, students have studied Coulomb's law, and have certain pre-concepts for the content to be learned, such as: the concept of positive and negative charges, the calculation of interaction between charges, the concept of point charge, etc. These are the foundations for teaching. Through the implementation of the mixed learning curriculum, most students hope to continue to use this learning mode in the future. Only a few students have no expectations for hybrid physics learning. This shows that the mixed learning curriculum has gained certain recognition, and most students have Can have a greater gain in the mixed learning class and feel a different learning experience. Mixed learning classrooms are more attractive to students than traditional classrooms, allowing students to feel the joy of learning physics, helping students to learn physics better, and most students are willing to continue to accept this new

learning model. This laid a good foundation for the development of the back-mixed learning classroom.

Summary of evaluation results

Through the overall analysis of the evaluation results, we can find that from the online self-learning of pre-class students, to the face-to-face teaching in the classroom, and the online detection and feedback after the class, under the guidance of the teachers, most students can consciously log in to the physics. Learning platform, conducting online learning before class, completing learning tasks, and secondly, in the course of classroom teaching, due to previous online learning, students have a certain understanding of the content they have learned, but due to the limited ability of students, they cannot be completely Understanding knowledge can be said to enter the classroom with problems, so that students can have more targeted learning knowledge in the classroom learning process, so that to a certain extent, students' learning efficiency can be improved, and online teaching The resources are very rich, and the content that students can't fully understand through the textbook can be supplemented by online teaching resources. Various forms of resources such as pictures, texts, videos, audio, etc. can help students learn, which can greatly enhance students' knowledge. In addition, online learning before and after class is arranged by the students themselves. The teacher is only guiding and supervising. In this process, the students truly become masters of learning, and learn to be themselves by arranging, planning, reflecting, and summarizing their own learning process. Responsible, learn how to learn better, in general, the implementation of the electric field strength mixed classroom teaching is relatively successful, compared with a single traditional classroom, has certain advantages, can help learn better learning physics.

Conclusion

The mixed learning curriculum can help students better master the knowledge, change the traditional learning concept, and have more innovative consciousness, which will greatly improve the students' learning effect. In the future research, it is necessary to further expand the mixed learning. It is applied to more grades and disciplines, and it is really effective in helping middle school students to learn better. In fact, with the advent of the information age, hybrid learning has become an important trend in the development of the education industry. Physical education workers should be well prepared to deal with this educational reform. From the perspective of teachers, everyone should be upgraded. The information literacy of educators, learn to use modern information technology reasonably in teaching, establish a sense of lifelong learning, and constantly innovate; teachers in the design process of mixed learning courses, improve the quality of the evaluation system, will form a evaluation Throughout the teaching process, combined with summative evaluation, aiming to obtain real, comprehensive and reliable evaluation results; the school can improve the open and practical online learning platform for students, and create a learning environment suitable for students to carry out mixed learning courses. Focus on cultivating teachers' information technology application skills, so that mixed learning can help more students learn.

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