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Retraction

Retracted: Exploring Strategies for Quality Assurance in Online-Offline Hybrid Teaching under the Background of Smart Cities

Security and Communication Networks

This article has been retracted by Hindawi, as publisher, following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of systematic manipulation of the publication and peer-review process. We cannot, therefore, vouch for the reliability or integrity of this article.

Please note that this notice is intended solely to alert readers that the peer-review process of this article has been compromised.

Wiley and Hindawi regret that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our Research Integrity and Research Publishing teams and anonymous and name external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] X. Jin, C. Zhang, and J. Su, "Exploring Strategies for Quality Assurance in Online-Offline Hybrid Teaching under the Background of Smart Cities," *Security and Communication Networks*, vol. 2022, Article ID 5459212, 5 pages, 2022.

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Research Article

Exploring Strategies for Quality Assurance in Online-Offline Hybrid Teaching under the Background of Smart Cities

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The development of smart city construction and IT education and training are closely related and promote each other. The construction of a smart city is based on the application of information technology and IT education, and training is an important part of the construction of a smart city. Effective teaching needs the support of appropriate and scientific teaching strategies. Compared with the traditional offline classroom, the spatio-temporal structure of online and online hybrid teaching is significantly different. Therefore, we aim to explore the reform of our teaching and take online teaching as an example. Starting from the essence of online and offline blended teaching, this paper clarifies the differences between online and offline blended teaching and traditional course teaching and online network teaching, puts forward feasible strategies for the main problems existing in blended teaching, and provides new ideas for the implementation of online and offline blended teaching.

1. Introduction

In the context of the information and data era, "Internet + education" has become a major trend in the education sector, and based on this concept, offline-online hybrid teaching came into being in the midst of this trend. However, after the COVID-19 epidemic was gradually and effectively controlled, people paid more attention to online-offline hybrid teaching, which pushed online-offline hybrid teaching to the top of public opinion in all sectors.

According to the analysis of the attention index of major resource websites, many scholars have devoted themselves to the research of this topic. They mainly focus on the effective connection between online and offline blended teaching, considering how to ensure the quality of hybrid teaching and investigating the factors influencing the hybrid teaching model and the deep integration of various subjects with hybrid teaching. Unlike the traditional classroom teaching model, the hybrid teaching model goes beyond blackboard and chalk and is based on the support of information technology, which allows students to learn more freely. The

teaching quality evaluation system can directly reflect the quality of teaching effect, so the evaluation of teaching quality is an important means to monitor the quality of teaching and guarantee teaching implementation. The teaching quality evaluation system should combine diagnostic evaluation, formative evaluation, and summative evaluation. At the same time, the evaluation system should follow the principles of differentiation, double subjects, whole process, and transparency [1], in order to provide a basis for teachers to continuously diagnose and improve their teaching. The process of hybrid teaching quality evaluation includes curriculum development evaluation, teaching implementation evaluation, and teaching effect evaluation [2].

Therefore, it is of significance to study the differences between online and offline blended teaching and traditional course teaching, and online network teaching. We also propose some feasible and reliable strategies for solving the main problems existing in blended teaching. In addition, our finding provides new ideas for the implementation of online and offline blended teaching.

2. Recognition of Online-Offline Hybrid Teaching

The online-offline hybrid teaching always follows the core idea of being "student-centered." It refers to the combination of online information-based classroom learning and offline teaching with the help of online platforms and the combination of students' enthusiasm and initiative in online information-based learning and teachers' guidance in offline teaching. The model fully applies the concept of "student-centered and teacher-led" to the whole process of hybrid classroom teaching. There are a variety of hybrid teaching models, and most scholars believe that they include MOOC, APP, flipped classrooms, and other common forms of information-based teaching.

According to the Education Informatization 2.0 Action Plan (No. 1) released by the Ministry of Education in September 2018, it is clearly pointed out that knowledge education resources need to be informatized. The teaching method is not the conventional classroom in which the students listen to what the teacher lectures, but it focuses on teaching as a process of interaction between the teachers and students, utilizing the knowledge for interactive teaching and learning and increasing students' participation in learning in the class. At the same time, the central role in the classroom has been changed from teacher to student, and the learning style is no longer the predetermined collective blind learning, but a learning style focusing on individual development and teamwork. Moreover, the assessment method for students changes from summative assessment to formative assessment. Instead of focusing on the determination of final grades, the hybrid teaching model assesses the students' knowledge mastery and ability development in the teaching process.

Unlike the online networked teaching model, the hybrid teaching model is focusing on the student-centered and teacher-led approach, giving full play to the teacher's role in guiding and solving problems. The hybrid teaching model is a supplement to the current online networked teaching model. The online networked teaching mode can only meet the basic personalized needs of individual learning, while the hybrid teaching mode diversifies the learning behavior and adds the color of cooperative learning on the basis of personalization. Curriculum resources are an important material basis for hybrid teaching, mainly in the form of supporting materials related to what is being learned. In addition, the supporting materials must be of high quality and diverse. They include textbooks, videos, animations, audio files, and other forms suitable for teaching and learning. High-quality curriculum resources can help teachers and students to achieve the teaching objectives more easily and to overcome the key and difficult points of teaching and learning. Moreover, the diversified curriculum resources can help enhance students' interest in learning and mobilize their initiative and motivation.

3. Some Problems in Online-Offline Hybrid Teaching

3.1. Teacher Level. Hybrid teaching is not simply a combination of online and offline teaching but the teachers' attitudes and quality determine the quality of hybrid teaching to a great extent. Teachers should break away from the conventional role of a teacher, from a "teacher" to a researcher of teaching and learning and from the role of a single function to the role of more complicated and diverse functions. Therefore, it is definitely a critical challenge for teachers to design and implement hybrid teaching, and it places higher demands on teachers' overall competencies, such as knowledge, information skills, and curriculum design skills. According to a research report published by iNACOL, four types of teaching qualities that teachers should acquire in hybrid teaching are clearly identified in the report, including forward-looking concepts, collaborative skills, the ability to adapt to reflection and innovation, and the technical ability to think in data and apply the information-based teaching tools [3]. However, data show that most teachers in China are not yet equipped with the competencies of hybrid teaching and are not competent to develop "golden lessons" [4].

3.1.1. Traditional Classroom Teaching Skills Only Available to Teachers. In the hybrid classroom, teachers should not only deal with the real classroom but also face the online teaching lens, and they should master the traditional teaching skills and be tested with the IT operation skills, which poses a great challenge to many middle-aged and veteran teachers. In addition, although some teachers can successfully carry out online teaching, they only stay in the form and do not study the online course design deeply, making the class gradually become ineffective and unable to achieve the desired teaching effect.

3.1.2. Teachers' Incomplete Knowledge of Hybrid Teaching. With the new development trend of the teaching system, hybrid teaching is a new task and challenge for teachers. At present, the online-offline hybrid teaching system is not yet fully established, which leads many teachers to have some misconceptions about the practical application of online-offline hybrid teaching and even to have a blurred understanding of this aspect. Many teachers generally believe that online-offline hybrid teaching only provides convenience for classroom teachers and adds the web-based IT dimension, misunderstanding the real meaning of current online-offline hybrid teaching and ignoring the interactive experience of students' classroom learning. In the hybrid teaching mode, online and offline teaching are interdependent and promote each other. However, some teachers fail to make a good balance between online and offline teaching, only focusing on the disadvantages of offline teaching and over-emphasizing the convenience and advancement of online teaching. It is one-sided, weakening the positive role of

offline teaching, splitting the inevitable connection between the physical and online classrooms in the process of students' knowledge acquisition, and is not conducive to improving the quality of hybrid teaching [5].

3.2. Student Level. In essence, the online-offline hybrid teaching is improving the traditional classroom teaching and enhancing the learning effect for all students in the classroom. In the teaching process, students are the main bearers, they can learn autonomously through the online platform and become the explorers of knowledge, and thus their mastery and absorption of knowledge are the basis for determining the success of a hybrid teaching classroom. However, due to the influence of the traditional classroom teaching model in China's schools in the past, students were merely the recipients of knowledge and were in a passive position. The online learning environment is more free and autonomous, and the absence of offline teachers' supervision is a major challenge for the students in front of the cameras. Students need to set their own learning goals, plan their learning activities, and monitor their learning progress, while teachers are indirectly facilitating the learning process. In addition, hybrid teaching is partially based on the "Internet," and students' learning environment, learning style, and mindset are all closely related to digitalization.

Currently, there are many problems with the hybrid teaching model. The current system cannot effectively monitor students' learning, and it is very difficult to monitor learning as well. Students are exposed to a colorful online world and an unsupervised learning environment, and it is very challenging to stimulate the students' interest in learning. Moreover, students tend to be distracted in class and do something that is not related to learning without the teacher's permission, which affects the implementation of hybrid teaching and makes the online classroom exist for namesake only.

3.3. School Level. The fun and virtual nature of online learning can arouse students' awareness of active learning, and thus, it is necessary to support hybrid teaching in terms of policy, resources, planning, technology, and management to ensure the quality of hybrid teaching. In the philosophical position of constructivist theory, humanism and student-centeredness are emphasized and a learning environment that facilitates the construction of knowledge should built for teaching. Therefore, in the constructivist view, students' learning environment should be rich in resources and tools, such as information resources, cognitive tools, autonomous learning strategies, and assistance and guidance. Autonomous learning strategies mainly refer to students' ability to accomplish autonomous learning behaviors such as self-exploration, self-regulation, self-awareness, and self-monitoring in the learning process. Only in this way can students themselves be involved in the construction of knowledge and promote their awareness and comprehension [6].

However, most of the schools have not yet built a system for evaluating and managing online-offline hybrid teaching. Because of this, the hybrid teaching model is not comprehensive, and the quality of teaching cannot be monitored in real-time. The platform is not constructed rationally, and the functions and website modules are not designed in a comprehensive, systematic and scientific way, and the resources of the platform are fragmented and the course resources are not made of high quality. Therefore, it severely weakens the interaction effect between the teachers and students, and the teaching effect cannot be fully guaranteed.

4. Policies for Guaranteeing Online-Offline Hybrid Teaching

4.1. Improving Teachers' Professional Ability. In response to the national policy to implement "golden courses," it is necessary to develop teachers' capacity for hybrid teaching, focusing on the principles, preparation, and development strategies of teachers' hybrid teaching and providing teachers with top-down developmental motivation for hybrid teaching reform. QM (Quality Matters) in the United States, a recognized leader in online course systems, has always believed that the quality of online classroom teaching is ensured by teachers' professional development, providing teachers with assistance in technology development to help them design better classrooms, rather than expecting teachers to learn on their own, which is equivalent to letting them cross the river by feeling the stones [7].

Moreover, efforts should be made to improve the information processing literacy of the teachers to fully integrate digital information technology into the whole process of teaching and to promote the popularization of technology applications, so that education can adapt to the requirements of the development of an information-based society. Teachers should be provided with periodic training in office work, website resource search, online platforms, app classroom design, and other skills to keep up with the times. The pedagogical goal of information literacy training programs is for teachers to be able to easily and accurately search for teaching-related resources, choose different information-based teaching methods according to different teaching requirements, and access the required teaching resources. Moreover, they should be able to use cognitive tools for creating scenarios, providing learning feedback, individual instruction, and evaluation, applying skills in hybrid teaching practice, providing effective ways for teachers to realize their personal operations [8], and meeting their needs for teaching and students' needs for learning.

Under the mastery of comprehensive information technology literacy, teachers should also be provided with training courses or workshops on online-offline hybrid teaching to facilitate teachers' preparation for developing hybrid teaching, teaching design, teaching implementation, and teaching evaluation. Based on the concept of combining the theory and practice, a professional development platform of hybrid teaching should be built for teachers to create scenarios for teachers [9], so as to promote the integration of online and offline teaching with practical teaching. Teachers are not only the instructors of the hybrid teaching process but also the learners of hybrid teaching. Teachers' personal

experience can facilitate their understanding of hybrid learning. Teachers can only design a hybrid teaching classroom that matches their students' development if they see hybrid teaching from their students' perspective. A shared and exemplary training model should be adopted to provide excellent hybrid teaching cases for teachers to follow and discuss, to provide correct teaching models, to provide targeted coaching in the face of problems, and to guide them to transfer to real teaching environments, thus promoting more efficient development of teachers' professional competence.

4.2. Developing Students' Hybrid Learning Skills. According to the document "Core Literacy for Student Development in China" issued by the research group of Beijing Normal University, it is proposed that contemporary students should have the ability to learn and develop independently. They should be able to organize and manage their daily learning life effectively. Learning how to study requires not only a sense of active learning but also an awareness of information, the ability to adapt to the trend of "Internet+," and the ability to survive with information in the digital world. In the classroom of online-offline hybrid teaching, most of the learning relies on students' autonomy [10].

According to the research, in the hybrid teaching model, students' self-regulation ability directly affects their learning effectiveness. The higher the student's ability to self-regulate learning, the higher his or her satisfaction with learning. A high level of learning satisfaction represents a good quality of instructional interaction and positive student learning outcomes [11]. Self-regulated learning (SRL) is the ability of learners to proactively motivate themselves and actively use learning strategies that work for them. First, teachers should make clear to students the importance of classroom activities to draw their attention. Second, teachers should guide students to recognize the true meaning of learning objectives, which are to acquire knowledge and skills for themselves rather than for their ranking. Finally, in the process of hybrid teaching, students should be taught basic learning strategies, such as metacognitive strategies, cognitive strategies, and resource management strategies. Teachers should provide opportunities for students to use the learning strategies. Through practice, teachers should not only enable students to become proficient in these learning strategies but also help each student develop appropriate and effective learning strategies for themselves. The advantages of the hybrid classroom can only be fully utilized if the self-regulation ability of students is continuously strengthened.

4.3. Building a Hybrid Teaching Quality Evaluation System. The main elements of the curriculum development evaluation include course objectives, content, teaching and learning platform, course design, teaching and learning environment, course resources, and other key elements of the teaching and learning process. It examines the basic aspects of the implementation of hybrid teaching and ensures the preparation for teaching. The main elements of the

evaluation of teaching implementation are teacher-student online sessions and teacher-student offline sessions. It examines the interaction between the teachers and students in the teaching process. Effective interaction can enhance the relationship between the teachers and students, facilitate teachers' communication, and promote deeper inquiry in the classroom. The main elements of the evaluation of teaching effectiveness are the objectives, forms, contents and quality of the process assessment, and the objectives, forms, contents, and quality of the result assessment, which are judged comprehensively in two dimensions, namely, process and result.

Cognitive tools mainly refer to the media that facilitate the process of knowledge reception, such as computers or the Internet in the information age. In the process of hybrid teaching, firstly, teachers need to post the teaching contents on the platform before the class starts and instruct students to actively participate in an online preview so that they can have a general picture of what they will learn. At the same time, the online platform will record the students' learning situation for teachers to frame the focus of the offline classroom teaching [12], which will help to solve the difficulties that the students have in their online learning so that the offline classroom can be carried out more smoothly. Secondly, after the completion of an online preview, classroom learning should be shifted to the traditional offline classroom [13–15]. The offline classroom should follow the concept of a new curriculum reform, with students as the center and teachers as the guide and facilitator. Moreover, the offline classroom can adopt various learning formats, such as group communication and collaboration, animation presentation, realistic scenario simulation, and hands-on activities. In this way, students' interest in learning can be mobilized through teacher-student interaction and student-student interaction, and their practical skills and creativity can be cultivated [6]. Finally, after students have overcome the key and difficult points in the offline classroom, review and consolidation can deepen the students' comprehension of new knowledge. In this regard, teachers should combine online preview and offline learning to summarize all the difficult points that students have during the whole process and incorporate them into the postclass consolidation system to ensure the quality of teaching.

5. Conclusion

In conclusion, it is one of the new strategies for many schools to build an appropriate online learning platform to ensure the quality of online-offline hybrid teaching. In addition, colleges and universities also need to build appropriate online learning platforms based on the learning analysis, classroom content, and curriculum resources, and offer different courses for different grades and disciplines. They should not blindly copy the best learning platform without considering its appropriateness for the students. Moreover, the interaction between knowledge and environment should be utilized to fully mobilize students' motivation, initiative and creativity, and to help them solve practical problems. Students should be critiqued as objects of knowledge

inculcation. Schools should offer digital courses corresponding to the hybrid learning platform, emphasize the cultivation of digital learning and innovation capabilities, and train digital learning skills so that students can finally attain the ability to effectively access, evaluate, and use the information and have an awareness of cybersecurity [16].

Data Availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest

The authors declare no conflicts of interest with respect to the research, authorship, and/or publication of this article.

Acknowledgments

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