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Exploration and Practice of Online Teaching Activities for Higher Education

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Abstract

Against the backdrop of deepening integration between internet technology and higher education, which is driving the transformation of pedagogical paradigms toward "smart education", online teaching has become an integral and component of instructional practice. Nevertheless, it continues to face challenges such as uniformity in format and insufficient interactivity. To address these issues, this paper adopts a systematic, whole-process perspective, structured around three key phases: pre-class preparation, in-class implementation, and post-class evaluation. It elaborates on strategies for constructing a professional hardware environment and resource system, designing diversified student-centered learning activities alongside a shift in the teacher's role, and establishing a multidimensional feedback-integrated evaluation system. Through a coherent analysis of the closed-loop process encompassing "pre-class, in-class, and post-class" stages, this study provides a systematic strategic reference for advancing online teaching from widespread implementation to enhanced quality and efficacy.

Keywords

Online Teaching, Higher Education, Quality and Efficacy Improvement, Student-Centered Approach

1. Introduction

In the context of continuous empowerment of education by internet technology, the construction of educational informatization is deepening gradually. And the transformation of teaching from the traditional classroom model to the new form of "smart education" is driving by the deep integration of technology and education (Cixian Lu & Yuejiao Guan, 2024). Especially during the outbreak of the novel coronavirus epidemic in 2020, it is verified and accelerated on an unprecedented scale with the emergency practice of "stopping classes but continuing teaching and learning", making online teaching rise from a temporary alternative solution to an indispensable part of the education system (Jinzhu Ye &

Yong Tan, 2023). Taking this as an opportunity, “Internet + Education” has given rise to diversified and refined online teaching models, and has increasingly solidified as the “new normal” of education. In this transformation wave, the large-scale, regular and in-depth development of online education in higher education has been the most remarkable. This is due to its unique basic conditions: the teaching subjects (teachers and students) generally have strong autonomy and information literacy, which are highly compatible with the new teaching model; at the same time, the long-term accumulated digital infrastructure and gradually improved policy systems have provided a solid guarantee. Therefore, online teaching has become one of the key teaching forms for higher education to adapt to the digital landscape and face the future (Junzhi Fang, Kaixuan Chen, & Junying Chen, 2024).

Currently, platforms such as MOOCs, Rain Classroom, SmartTree, Superstar Learning Platform, Tencent Meeting, and DingTalk have established a wide service ecosystem, which supporting an expanding group of online learners and playing a core role in ensuring teaching progress and basic quality. However, it must also be noted that, due to the relatively late start and rapid development of online teaching, there are still significant challenges in practice. The uneven information technology integration ability of teachers and the differences in students' adaptability have jointly led to problems such as single form, superficial technology application, insufficient interaction, and differentiated effects in some courses. These problems restrict the full realization of the “student-centered” teaching concept (Xin Li, 2024). Therefore, focus on the basic form of online teaching that has been widely practiced, we will deeply explore how to more effectively integrate modern information technology, optimize the entire teaching process from three consecutive stages of pre-class preparation, in-class implementation, and post-class evaluation, thereby improving the quality of online teaching and promoting its evolution from “wide implementation” to the higher-level goal of “improving quality and efficiency”.

2. Systematic Construction of Pre-class Preparation for Online Teaching

Pre-class preparation is a fundamental step in ensuring the quality of online teaching, and it requires systematic planning and meticulous arrangement from three aspects of teaching environment, technical platform and resources, and teacher presentation.

2.1 Build a Professional and Interactive Hardware Teaching Environment

A stable, reliable, and high-interactivity hardware environment are the primary physical condition for ensuring the smoothness and sense of presence in online teaching (Chunliang Ren, 2025). Its construction needs to systematically consider three elements of space, equipment, and network.

Firstly, in the selection and arrangement of the teaching space, basic requirements such as sound insulation, sufficient lighting, and a clean background should be met, such as a study room or a private and quiet office. The background layout should be both professional and controllable. For instance, using a physical bookshelf as a teaching background can create an academic atmosphere, and using a pure color background (especially a green screen) makes it easier to dynamically combine the teacher's image and digital courseware, enhancing the professionalism and flexibility of visual presentation.

Secondly, to achieve efficient multitasking management and immersive interaction, a professional configuration scheme with a multi-screen core, including the teacher's main screen, monitoring screen of students, extension screen, and handwriting tablet, can be equipped. The main screen serves of teachers as the teaching control center, which can be used to run teaching software (such as PPT, teaching platform client) and present core teaching content, facilitating the teacher's overall grasp of online teaching. The monitoring screen of students synchronously displays the live streaming picture, allowing the teacher to monitor the audio-video quality and content output effect from the perspective of learners in real time and make timely adjustments. The extension screen is used to display lecture notes, reference materials, background data or communication software, enabling multi-threaded operations of teaching, monitoring and collaboration, and enhancing efficiency. The handwriting input device is the access to the intelligent handwriting tablet, which is crucial for realizing the natural writing interaction of traditional classroom such as writing on the blackboard, highlighting key points, and real-time annotations, and is a key device for enhancing the sense of presence in teaching.

At the same time, high-quality audio and video capture are the basis for maintaining attention of students. External high-definition cameras should be configured to obtain better picture quality and shooting angles, and directional microphones or lavalier microphones should be used to ensure clear voice and reduce environmental noise. In addition, a stable and low-latency network environment is the lifeline for real-time interaction, which should be conducted before class strict testing. This can be achieved by starting the live test room in advance, initiating text interaction in the discussion area, or trying out high-definition video clips, etc., to comprehensively evaluate network bandwidth and stability, ensuring no lag or delay during the teaching process.

2.2 Select Suitable Teaching Platforms and Integrate High-quality Digital Resources

The choice of teaching mode determines the integration strategy of the platform and resources. A structured virtual learning space and resource system based on the course objectives actively should be constructed by teachers (Fangfang Yang, 2024). Therefore, teachers must first clearly define the basic teaching modes, including “recorded lectures + online Q&A”, the mixed “introduction of high-quality platform resources + live lectures and Q&A”, and the synchronous “full live interaction”. Regardless of which mode, the core lies in the fact that teachers need to establish a systematic online teaching resource system and operate a virtual classroom space.

Therefore, the suitable teaching platforms should be selected, such as Yuelian Classroom, Superstar Learning Platform, etc., which deeply integrate the teaching process management platform, and tools like Tencent Meeting, DingTalk, etc., which emphasize real-time communication. When choosing, it is necessary to comprehensively consider the immediacy and refinement of the interaction tools (bullet screens, voting, group discussions), and the real-time feedback of learning situation data (attendance rate, correct rate of exercises, video viewing progress), which are conducive to diverse teacher-student interaction and help teachers accurately grasp the learning situation, thereby dynamically adjusting the teaching rhythm and content.

Therefore, in the construction and integration of digital teaching resources, teachers should play a dual role. First, as the “selector” and “integrator” of resources, teachers need to aggregate high-quality open resources, which can be selected and introduced from authoritative platforms such as China University MOOC (Aike Course), Zhihui Shu, etc., and screen and introduce high-quality videos, courseware, exercise libraries and electronic textbooks that are highly compatible with this course as beneficial supplements to the course content. Second, as the “creator” of resources, they need to independently create contextualized resources. The tools like QuickTime for screen recording, Adobe Premiere for video editing, or directly the recording function of PPT can be actively used to independently create micro-videos, animations and other rich media resources, which are closely integrated with the course, thereby expanding the depth and breadth of teaching content and effectively stimulating students' learning interest.

2.3 Optimize the Visual and Auditory Presentation Effects of Teachers

In digital media, the image and expression of teachers themselves are the key teaching content, which need to be carefully designed and managed to transcend physical distance and establish emotional connections (Jun Zhang & Wenbo Cai, 2024).

Firstly, in terms of static visual presentation, teachers should pay attention to the appropriateness of their personal image and the aesthetic appeal of the composition of the picture, conveying professionalism and rigor. They should dress formally and neatly, and have proper grooming. When appearing on screen, teachers can choose to stand or sit according to their personal habits and the nature of the course, but they must pay attention to maintaining an upright posture and ensuring uniform facial lighting and balanced picture composition. A neat and professional visual image helps to quickly establish the authority of the teacher and enables students to focus on the teaching content. Secondly, in terms of dynamic teaching expression, to adapt to the characteristics of screen transmission, language and non-verbal expressions of teachers need to be adjusted specifically. For example, the average speaking speed can be moderately increased to about 1.2 times that of the offline classroom to maintain the rhythm and information density, avoiding the distraction of students due to media loss. In non-verbal expression, it is necessary to consciously strengthen and design. During teaching, practice looking directly at the camera to simulate “eye contact”; the emotions and key points can be conveyed and emphasized through rich intonation, appropriate facial expressions and gestures, and body language, thus creating a strong teaching “presence” and shortening the psychological distance between teachers and students. In addition, online teaching requires teachers to have a high sense of self-discipline regarding the camera. Any trivial behaviors that may distract attention of students or disrupt the seriousness of the class should be strictly avoided, such as frequent drinking, yawning, adjusting clothing or fiddling with school supplies, etc. All behaviors should be based on maintaining the continuity of teaching and ensuring immersive learning experience of students.

3. Implementation of Classroom Activities in Online Teaching: Strategies and Paths

The in-class implementation stage is the core part of online teaching, and its effectiveness directly determines the depth of knowledge construction and the degree of achievement of teaching goals. To achieve the transformation from “knowledge” to “ability”, teachers need to systematically design and meticulously implement student-centered learning activities to overcome the challenges brought by the separation of time and space and stimulate students' subjectivity, interactivity, and creativity.

3.1 Logical Starting Point for Learner Characteristics Analysis and Teaching Activity Design

Scientific teaching activity design begins with a profound understanding of the teaching objects. The object of contemporary online teaching are mostly “00s” college students. They are digital natives and have distinct characteristics such as independent thinking, confident openness, and high acceptance of technology, making them quickly adapted to various online platforms. However, due to differences in personal abilities, knowledge foundation, and learning motivation, some students may have problems such as insufficient autonomous learning ability, decreased concentration, lack of self-discipline, and low task completion rate in the online environment (Yajuan Liu & Ronghua Cong, 2025; Qiuyue Niu & Yingying Zhao, 2023). To address this contradiction, the design of teaching activities must be based on precise understanding of the own characteristics of learners and the characteristics of the course itself. The core principle is consisted of two aspects. On the one hand, teaching activity design should serve as a scaffold for students to showcase their uniqueness and make creative contributions. By providing opportunities for them to try, create, and share, and fully affirming their innovative viewpoints, it effectively enhances their learning confidence and intrinsic motivation. On the other hand, activities should become an important channel for teachers to obtain dynamic learning situations and optimize teaching. By observing performance and feedback of students in the activities, teachers can continuously evaluate the match between the teaching setup and the existing experiences of students, thereby maximizing the efficiency of “learning by doing” and “doing by learning”, and forming an iterative closed loop based on evidence.

3.2 Multifaceted Learning Activity Design Centered on Students and Reconfiguration of Teacher Roles

Practical evidence shows that, compared to offline classroom activities, well-designed online teaching activities have a significant advantage in enhancing the breadth of student participation. This requires teachers to systematically design “student-centered” activity sequences, aiming to help students familiarize themselves with the online environment, build a sense of learning community identity, stimulate deep learning motivation, and ultimately guide them to complete knowledge construction.

3.2.1 Learning Activity Design Framework in Stages

The design of online learning activities should follow the basic principles of clear interaction rules, detailed support scaffolds, and clear guiding language, and be carried out in stages to form a progressive participation loop according to the teaching process. Firstly, the early stage of the classroom is the period when students integrate and get started, focusing on establishing a sense of security and a sense of community. Various methods such as issuing course welcome letters, organizing ice-breaking activities,

conducting group building, creating problem scenarios, and signing learning contracts can be used to reduce anxiety and clarify learning expectations. Secondly, the middle stage lies in the exploration and construction of students, focusing on promoting deep interaction and thinking collisions. Various diverse strategies such as bullet screen interaction, random questioning, contributions, brainstorming, case analysis, debate competitions, role-playing, etc. can be flexibly applied to maintain cognitive engagement and promote the internalization and analysis of knowledge. Finally, the later stage of the class is the consolidation and evaluation, aiming to promote metacognition and the enhancement of achievements. Activities such as individual work creation, group project presentation, drawing mind maps, implementing self-evaluation and peer evaluation, conducting questionnaire surveys, and holding presentation and mutual evaluation meetings can be carried out to achieve the integration, application, and reflection of knowledge.

3.2 Dynamic Positioning and Core Role of Teachers

Throughout the entire process of activity implementation, teachers must adhere to the concept of "student-centered", and dynamically play the core roles of supporter, observer, guide, and facilitator. This means that teachers need to shift from being the dominant lecturer to assisting in generation, constantly monitoring the learning progress of students, listening to their explicit and implicit needs, and providing timely and precise guidance and feedback (Xue Zhu, 2022). For example, in group mutual evaluation activities, the cognitive confusion and unspoken needs of students should be accurately identified, thereby guiding them to use subject knowledge to make rational and evidence-based comments through immediate responses and demonstrations of speeches of students.

At the same time, differentiated participation management strategies need to be implied by the teachers. For actively participating students, positive reinforcement can be given through public praise and display of excellent results, and for students with low participation or "dormant" behavior, continuous attention, private timely reminders, emotional encouragement, and personalized support should be provided to guide them back to the learning activities. Compared with offline teaching, online teaching requires teachers to design more attractive and meticulous activity plans to bridge the time and space distance with the power of emotion and design. Successful implementation in class can not only effectively attract students to the online learning field, enhance the trust between teachers and students and the professional sense of achievement of teachers, but also fundamentally improve the learning enthusiasm and overall learning efficiency of students, ultimately achieving the educational goal of "student-centered".

4. Construction of a Multi-Dimensional Evaluation System for Online Teaching Post-Class

Post-class evaluation is a crucial part of the teaching cycle, and its scientificity directly affects the determination of teaching quality and the direction of improvement. The traditional teaching evaluation system mostly takes a single perspective from the teacher and relies on limited indicators such as learning attitude, attendance, and answering questions, giving priority to outcome-based evaluation, which is difficult to fully and dynamically reflect the entire learning process of students. The rise of online

teaching provides an opportunity to solve this problem. Its technical characteristics naturally support the recording and analysis of the entire learning behavior, promoting the transformation of the evaluation system from the traditional single and result-oriented model to a comprehensive evaluation that covers multiple entities and focuses on the process. This system is mainly carried out from three core dimensions of teachers, students, and school supervision. They are jointly forming a three-dimensional and dynamic evaluation network, aiming to comprehensively and objectively reflect the real state of teaching and learning, and to more accurately assess teaching effectiveness and drive teaching optimization.

4.1 Teacher Dimension: Dynamic Diagnosis and Precise Intervention Based on the Entire Learning Data

As the organizer and implementer of teaching activities, the evaluation role of teachers has been deepened with the empowerment of data (Yinglei Xu, 2022). The online teaching platform can automatically and continuously record the learning traces throughout the pre-class, in-class, and post-class periods of students. This enables teachers to rely on the timeline to systematically sort out and analyze dynamic data such as participation rate, interaction frequency, study duration, correct answer rate, task completion number, and knowledge point completion status. By integrating these process data, teachers can construct continuous formative evaluation, thereby going beyond experience-based judgment and effectively assessing each student's classroom engagement level, knowledge mastery, and individualized learning habits. This data-driven evaluation method enables teachers to promptly identify problems and adjust teaching strategies, providing personalized feedback and support to students, truly achieving “tailored teaching based on individual needs and time considerations”.

4.2 Student Dimension: Feedback Evaluation Based on Personal Experience and Teaching Feedback

Students are the main body of teaching activities and the core service recipients. Incorporating them into the evaluation system is an inevitable requirement for practicing the “student-centered” concept. Student evaluation mainly relies on their own sense of participation and satisfaction in online teaching activities to provide feedback on the rationality of teaching activity design and implementation effects. Through the evaluation of whether the teaching activities truly achieved logical clarity, effective interaction, and sufficient support, teachers can obtain the most direct first-hand feedback information. This voice from learners is an important benchmark for evaluating whether online teaching has successfully achieved the goal of “student-centered” (Mengyu Liu & Pin Nie, 2025). The evaluation and suggestions from students can reverse and act on the optimization and improvement of teaching activities, forming a “teaching-feedback-improvement” virtuous cycle, thereby continuously enhancing the adaptability and effectiveness of teaching activities.

4.3 Supervisory Dimension: Systematic Evaluation and Quality Assurance Based on Professional Standards

School teaching supervision represents the external professional and institutional perspective and assumes the responsibility of quality supervision and guarantee. The evaluation of supervision focuses on conducting systematic and comprehensive professional scrutiny of online teaching activities. The basis mainly includes the design logic, implementation process, achievement effect, and resource

utilization of teaching activities by the instructor. Through the comprehensive assessment of teaching plans, classroom recordings, student outcomes, and platform data, supervision aims to evaluate whether teaching activities have achieved logical consistency, clear hierarchy, and the organic unity of cultivating students' higher-order thinking abilities. Supervision evaluation is not only the supervision and assessment of individual work of teachers but also a systematic guarantee at the macro level to maintain teaching standards, promote excellent experiences, and promote the overall improvement of online teaching quality in the school.

In summary, the multi-dimensional post-class evaluation system constructed by online teaching integrates the data-based diagnosis of teachers, the subjective feedback of students, and the professional examination of supervision. The three complement each other, jointly promoting teaching evaluation from a single score determination to a comprehensive support system that promotes student learning development, teacher teaching improvement, and continuous improvement of course quality.

5. Conclusion

During the process of digital transformation in higher education, online teaching has become a key path to achieve the goals of student cultivation. This article systematically explores the construction and optimization strategies of the three phases of before class, during class, and after class, and clarifies the internal logic and practical framework of online teaching moving from “wide implementation” to “improvement and efficiency enhancement”. Professional preparation before class lays the foundation for teaching, the design of student-centered activities and the transformation of roles of teachers during class promote deep learning, and the multi-dimensional evaluation system after class enables continuous improvement. The synergy of these strategies ensures the effective improvement of teaching quality. These strategies jointly promote the formation of a more flexible, individualized, and efficient online education ecosystem, truly implementing the educational concept centered on student development.

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