

Research on the Transformation Methods of Interactive Teaching Means under the Background of O2O

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Abstract

Against the era backdrop of "Internet Plus", this paper targets undergraduate teaching for art and design majors, and explores the O2O blended teaching operation model from two dimensions: teaching platform construction and teaching link reform. In terms of teaching platforms, online and offline communication platforms are separately built. In terms of teaching links, a three-stage teaching process of "pre-class knowledge transmission - in-class knowledge deepening - after-class knowledge consolidation" is implemented. For teaching evaluation, a diversified cyclic evaluation system featuring "evaluation - feedback - improvement" is established. Such measures can boost students' learning initiative and creativity, stimulate their learning interest and improve learning outcomes, and form a virtuous cycle of continuous optimization of teaching quality. This research provides references for innovative teaching models in the "Internet Plus" era.

Keywords

Internet Plus, O2O, teaching reform, flipped classroom.

1. Introduction

After China brought the pandemic under effective prevention and control measures, the emergency remote teaching period came to an end, which also triggered profound reflections, especially within the education sector. O2O teaching formats have become commonplace, and various colleges and universities have accumulated unique experience in relevant teaching models amid this period, pushing education into an urgent stage of upgrading and innovation.

2. Definition of O2O

The concept of O2O originated in the United States, covering a broad scope. Any industrial chain integrating online and offline operations can be categorized as O2O. During the pandemic, this model was widely adopted across various industries, especially in education.

Against the backdrop of the Online-to-Offline (O2O) teaching model, transformative changes have taken place in the transformation approaches of interactive teaching methods. Such transformation manifests not only in the technological upgrading of teaching tools, but also in the comprehensive optimization of teaching philosophies and the entire teaching process.

First, relying on the Internet and mobile smart devices, the O2O teaching model enables flexible online-offline interaction, allowing teachers and students to conduct teaching and learning activities anytime and anywhere. For instance, teachers can release course content via online platforms, while students can access online learning through mobile applications or websites. In addition, teachers can leverage intelligent devices to carry out in-class interactions, quizzes, assessments and other teaching activities.

Second, the O2O teaching model emphasizes students' autonomous and collaborative learning. Under this model, students are no longer passive recipients of knowledge but active

participants. They can conduct self-directed learning via online platforms or mobile devices, and communicate and collaborate with peers to enhance learning efficiency.

Furthermore, the O2O teaching model facilitates experiential learning. Supported by technologies such as Virtual Reality (VR) and Augmented Reality (AR), students can engage in experiential learning in virtual environments to boost learning interest and effectiveness. For example, in science courses, students can observe 3D cell structures through AR applications; in history courses, VR technology enables them to experience historical events firsthand.

Finally, the O2O teaching model fosters a new educational ecosystem and reshapes teacher-student relationships. In this context, teachers evolve from mere knowledge transmitters into guides and facilitators of student learning. Meanwhile, students shift from passive knowledge receivers to active explorers and learners. This innovative teaching model also promotes communication and cooperation among students, cultivating a positive learning atmosphere.

In summary, the popularization and application of the O2O teaching model bring numerous positive impacts to interactive teaching. It comprehensively improves students' learning experience and promotes the joint development and progress of teachers and students. With continuous technological advancement and application, the O2O teaching model is expected to play an increasingly important role in the field of education in the future.[1]

3. The Origin of Flipped Classroom

The "flipped classroom" originated from Woodland Park High School in Rocky Mountain, Colorado, USA. In the spring of 2007, two chemistry teachers at the school, Jon Bergmann and Aaron Sams, began using screen-recording software to record PowerPoint presentations with lecture audio, then uploaded the videos online to help absent students catch up on missed lessons. Later, the two teachers required students to watch instructional videos at home and complete assignments in class, providing targeted tutoring for students encountering learning difficulties. This teaching model was widely well-received by students.

To help more educators understand and adopt the philosophy and methods of flipped classrooms, they held an Open House for flipped classrooms at Woodland Park High School on January 30, 2012, allowing educators nationwide to observe the operation of flipped classrooms and students' learning status, which accelerated the promotion of the flipped classroom model. Additionally, the popularization of flipped classrooms was driven by the Open Educational Resources (OER) movement. Starting with the Massachusetts Institute of Technology (MIT) OpenCourseWare (OCW) initiative, a wealth of high-quality educational resources emerged, including Yale Open Courses, Khan Academy micro-videos, and TED-Ed educational videos. These resources provided solid material support for the implementation of flipped teaching and boosted its development.

4. Definition and Characteristics of Flipped Classroom

Traditional teaching consists of two phases: knowledge transmission and knowledge internalization. Knowledge transmission is completed through in-class lectures delivered by teachers, while knowledge internalization relies on students finishing homework, operations or practical tasks after class. The flipped classroom reverses this structure: knowledge transmission is accomplished after class with the aid of information technology, and knowledge internalization takes place in the classroom with support from teachers and peers. This reversal reshapes all links of in-class learning. A comparative analysis of core elements between traditional classrooms and flipped classrooms is presented below.[2]

4.1. Transformation of Teachers' Roles

The flipped classroom transforms teachers from traditional knowledge lecturers into facilitators and instructors of learning. While teachers are no longer the central hub of knowledge interaction and application, they remain primary promoters of student learning, offering timely support when students require guidance. In this sense, teachers serve as scaffolding that helps students access, utilize, process information, and apply knowledge to real-life scenarios with ease.

Alongside this role shift, teachers face the challenge of developing new teaching competencies. In flipped classrooms, students stand at the center of learning, constructing knowledge by completing authentic tasks through hands-on participation. This requires teachers to adopt novel teaching strategies that facilitate student learning without restricting their independent choices. Teachers promote student growth and development through well-designed teaching activities. After each unit of study, teachers assess students' knowledge mastery and deliver timely feedback to help students identify their learning status. Real-time evaluation also enables teachers to adjust in-class activities promptly to optimize learning outcomes.

4.2. Redistribution of In-Class Time

The second core feature of flipped classrooms lies in reducing teachers' lecturing time and allocating more class hours to student-centered learning activities. Such activities should be rooted in real-life contexts and enable students to complete learning tasks through interactive collaboration. By shifting lecture content to after-class sessions, the model retains full coverage of fundamental knowledge while enhancing in-class student interaction, ultimately deepening students' comprehension of knowledge. Moreover, when teachers adopt performance-based assessment, in-class interactions become more effective. Guided by teachers' evaluative feedback, students can objectively assess their own learning progress and better regulate their learning trajectories.

Learning is one of humanity's most valuable activities, and time serves as the fundamental element of all learning endeavors. Sufficient time and efficient learning are key to improving academic performance. The flipped classroom maximizes pre-class preparation time to extend the overall time allocated for teaching and learning. Its core lies in teachers' deliberate planning of in-class hours to maximize classroom efficiency.

4.3. Transformation of Students' Roles

Advancements in technology have ushered education into a new era where students can independently expand their knowledge boundaries. Educators can leverage technical tools such as wikis and blogs to provide students with abundant learning resources, while students can acquire required knowledge from online resources. Within technology-enabled personalized learning, students become self-paced learners, with autonomy over when, where, what, and how much to learn. Nevertheless, students do not study entirely independently in flipped classrooms. Flipped classrooms are dynamic environments that demand high levels of student engagement. Within technology-supported collaborative learning spaces, students engage in repeated interactions with peers and teachers based on learning content to expand and develop in-depth knowledge. Thus, flipped classrooms are spaces for constructing profound knowledge, with students as the central protagonists.

5. Current Status of Flipped Classroom Teaching Experiments

At present, the flipped classroom has gained widespread popularity among numerous schools in the United States. Two major factors have driven the broad adoption of this teaching model. First, only 69% of American students successfully graduate after completing high school. Out of the annual cohort of 1.2 million students, an average of 7,200 drop out every single day. Second,

online instructional videos have been extensively integrated into teaching. In 2007, 15% of viewers used online educational videos for learning, and this figure rose to 30% by 2010. Online courses cover not only liberal arts disciplines such as history but also extend to subjects including mathematics, physics and economics. According to incomplete statistics, by early 2012, teaching reform experiments featuring the flipped classroom had been launched in more than 30 cities across 20 states within two countries.

Statistics collected from some U.S. schools piloting flipped classroom programs reveal that the implementation of this teaching model is primarily concentrated in primary and secondary schools, with mathematics, science and other STEM subjects as the core teaching disciplines.[3]

6. Instructional Model Design for Flipped Classrooms

The flipped classroom reverses the sequence of knowledge transmission and internalization: knowledge transfer, originally delivered in class, is shifted to pre-class sessions, while knowledge internalization, previously completed through after-class homework, is moved to in-class learning activities. Professor Robert Talbert from the Department of Mathematics and Computer Science at Franklin College applied the flipped classroom model in multiple courses (including Computer Tools for Problem Solving and Linear Algebra) and achieved remarkable teaching results. After years of teaching practice, Professor Talbert summarized an implementation framework for flipped classrooms. However, this model is more applicable to operation-oriented science courses and requires further refinement for liberal arts disciplines. Based on the connotation of flipped classrooms, constructivist learning theory and systematic instructional design theory, this paper constructs an improved flipped classroom teaching model on the basis of Robert Talbert's framework. The model consists of two core components: pre-class learning and in-class learning. Information technology and activity-based learning act as two pivotal enablers for building the learning environment within both phases. The support of information technology and smooth delivery of learning activities jointly facilitate the construction of a personalized collaborative learning ecosystem.[4]

7. Pre-Class Design Module

7.1. Production of Instructional Videos

In flipped classrooms, knowledge transmission is primarily delivered through instructional videos developed by teachers. Such videos can either be self-recorded by course instructors or selected from high-quality open educational resources online.

Since the launch of MIT's OpenCourseWare (OCW) initiative, abundant open educational resources have been developed by universities, organizations and individuals worldwide, including open courses from Harvard and Yale, Khan Academy lectures, national high-quality university courses, and Chinese university open courses. Teachers can select video resources matching their curriculum content from these open educational repositories, improving resource utilization efficiency and saving manpower and material costs. Meanwhile, students gain access to cutting-edge teaching content from world-renowned instructors. However, online open educational resources may not fully align with specific curriculum objectives and content requirements.

Self-recorded instructional videos can be perfectly tailored to teachers' preset teaching goals and content. Teachers can deliver targeted explanations based on students' actual learning conditions and even record multiple versions of videos to accommodate learning disparities across different classes. Despite these advantages, self-recording imposes higher demands on teachers' technical proficiency and time allocation.

Visual effects, interactivity and duration of instructional videos exert significant impacts on students' learning outcomes. Therefore, when producing videos, teachers need to optimize visual presentation, highlight core thematic points, design interactive strategies within the structure, and help students build comprehensive learning platforms, while taking into account students' sustained concentration span for video viewing.

When developing video courses, teachers should also consider how to motivate active student engagement during video learning. Empirical evidence indicates that most students take notes rather than focus on listening when watching instructional videos for the first time. To address this issue, teachers can provide video transcripts covering key content, allowing students to concentrate on reflecting upon the narrated knowledge.[5]

7.2. Targeted Pre-Class Exercises

After watching instructional videos, students are required to document key takeaways and unresolved questions. Meanwhile, they must complete targeted pre-class exercises assigned by teachers to consolidate newly acquired knowledge.

8. Conclusion

China has established multiple platforms for instructional video resources, including the National High-Quality University Courses Network and the National Primary and Secondary Education Teaching Network. Additional resource platforms such as Superstar Video Teaching Network, NetEase Open Courses and Micro-Course Network have accumulated massive video teaching resources, laying a solid resource foundation for the implementation of flipped classrooms. Furthermore, digital education initiatives including the e-schoolbag program promoted in Hongkou District of Shanghai and Intel's One-to-One Digital Learning Project provide hardware support for flipped classroom practice. Amid national educational informatization development, the flipped classroom teaching model will undoubtedly exert a profound influence on teaching reform across China.

References

- [1] Wan, M. K. (2018). Absence and reconstruction of information security responsibilities on O2O platforms in the "Internet Plus" era. *Science and Technology Communication*, 14.
- [2] Jiang, W. L. (2020). Research on general technology teaching model based on flipped classroom concepts. *Reading and Writing*, 24.
- [3] Wei, Y. (2021). Trends and strategic reflections on information security education in the new era - A review of information security. *Journal of China Safety Science*, 3.
- [4] Dang, C., & Sun, Q. (2021). Development of information security and management major in vocational undergraduate colleges. *China Metallurgical Education*, 6.
- [5] Wang, N. (2019). Research on flipped classroom teaching model in public security colleges. *Journal of Changchun Normal University*, 3.