Teaching Design Strategies and Practices from the Perspective of Innovation in Universities

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Abstract: This study aims to explore teaching design strategies and practices from the perspective of innovation in universities. Through the analysis of the current teaching situation in universities, combined with innovative teaching theories and practical cases, the study finds that innovative teaching design can not only effectively improve teaching effectiveness, but also better meet the personalized development needs of students. The study adopts a qualitative research method, collects data through in-depth interviews, analyzes and summarizes specific strategies and implementation paths for innovative teaching design. This study not only provides theoretical support for teaching reform in universities, but also provides practical guidance for practical teaching, which has important theoretical and practical significance.

1. Introduction

In the rapidly developing social context, higher education is facing new challenges and opportunities. The progress of information technology and the advancement of globalization have gradually made traditional teaching models more limited and unable to meet the diverse and personalized development needs of students. The learning methods and needs of students have undergone significant changes, and the indoctrination teaching model is no longer suitable for autonomous learning in the new era. Knowledge updates are accelerating, and teachers need to enhance their professional competence to respond to cutting-edge developments in the discipline. The popularization of information technology poses a challenge to traditional education models, and how to use information technology to improve teaching effectiveness urgently needs to be addressed. Innovation is crucial in teaching design and is the key to promoting educational reform and improving teaching quality. Innovating teaching design can stimulate students' interest, enhance teaching interactivity and effectiveness, and promote their comprehensive progress. Therefore, studying teaching design strategies and practices from the perspective of innovation in universities has important theoretical and practical significance.

2. Current Situation of Teaching Design in Universities

2.1 Characteristics of the Current Teaching Design Mode

Currently, the teaching design model in universities mainly relies on traditional lecture-based teaching method. This method is teacher-centered and transmits knowledge through classroom teaching, while students mainly focus on listening and taking notes. The characteristic of this teaching model is structured and systematic, which facilitates teachers to control teaching progress and content, ensuring the achievement of teaching objectives. Meanwhile, traditional teaching often emphasizes the systematization and completeness of knowledge, emphasizing the transmission of subject knowledge and the construction of theoretical systems. In addition, owing to the information technology, some universities have gradually introduced multimedia teaching methods, using computers, networks, and multimedia resources to enrich classroom teaching content and improve the intuitiveness and interactivity of teaching.

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2.2 Existing Problems and Challenges

Despite the advantages of traditional teaching design models, many problems and challenges have emerged in the current educational environment and changing student needs. Firstly, the traditional teaching model overly emphasizes the leading role of teachers and overlooks the subjective role of students. This leads to students being in a passive state of receiving knowledge in class, lacking opportunities for active participation and exploration, which is not conducive to cultivating students' innovative and self-learning abilities. Secondly, the teaching content and methods are relatively single, which cannot fully meet the diverse learning needs of students. Each student has different interests, abilities, and learning styles, but traditional teaching often overlooks these differences, resulting in some students having difficulty keeping up with the teaching progress and poor learning outcomes. In addition, the widespread application of information technology has enriched teaching methods to a certain extent, but it has also brought new challenges. Teachers often lack systematic training and guidance when using multimedia and online resources, resulting in the application of information technology becoming mere formality and failing to truly improve teaching quality.

In addition, the evaluation methods in traditional teaching models also have limitations. Currently, universities generally use exam scores as the main criterion for evaluating learning outcomes, but this single evaluation method is difficult to fully reflect students' comprehensive and practical application abilities.

3. Theoretical Foundation and Relationship

The theoretical foundation of innovative teaching design includes constructivist theory, multiple intelligence theory, and self-directed learning theory. Constructivist theory holds that knowledge is actively constructed by learners through interaction with the environment, emphasizing students' exploration and active participation to achieve a deeper understanding of knowledge. The theory of multiple intelligences points out that human intelligence is multidimensional, and teaching design should consider the diverse intelligences of students, providing diverse learning resources and activities. The theory of self-directed learning emphasizes students' initiative and autonomy in learning, encouraging them to self-manage the learning process .

These theories are closely related to education and promote each other. Innovation theory provides a new perspective for education and helps educators optimize teaching design from an innovative perspective. The progress of education also provides practical cases and data for innovative theories, promoting educational innovation [1].

In practical application, the main models of teaching design include the ADDIE model, SAM model and TPACK framework. The ADDIE model systematically optimizes teaching design through five stages. The SAM model emphasizes rapid iteration and continuous improvement. The TPACK framework integrates knowledge of technology, teaching methods, and subject content, requiring teachers to fully utilize this knowledge to achieve innovative teaching. These frameworks and models collectively support educators in designing innovative and adaptive teaching plans [2-3].

4. Research Methods

4.1 Research Subject

The research subjects of this study are three universities with different backgrounds and characteristics, including a comprehensive university, a science and engineering university, and a normal university. Each university has chosen two representative and typical courses, covering different disciplines such as humanities, science, and engineering. Specific courses include literature, history, physics, chemistry, engineering, and education.

4.2 Selected Universities and Specific Courses

The three selected universities are: As shown in Table 1:

Table 1 University type

University type	Selected courses
Comprehensive university	Literature and History
Science and engineering university	Physics and Engineering
Normal university	Chemistry and Education

These courses have high representativeness in their respective universities, and teaching design and innovative practice are more active.

4.3 Teachers and Students Participating in the Research

A total of 18 teachers participated in the research, with 6 from each university, including senior teachers, young and middle-aged teachers, and teaching management personnel. A total of 90 students participated in the research, with 15 students in each course, including undergraduate and graduate students, to ensure the breadth and representativeness of the research. As shown in Table 2:

Table 2 Research team

University type	Number of teachers	Number of students	Student level
Comprehensive university	6	30	Undergraduate and graduate students
Science and engineering university	6	30	Undergraduate and graduate students
Normal university	6	30	Undergraduate and graduate students

4.4 Implementation Process of In-depth Interviews

The implementation process of in-depth interviews includes the following steps: As shown in Table 3:

Table 3 The specific dataure description

Procedure	Description
Interview preparation	Design an interview outline that covers the current situation, problems, innovative strategies, and their effects of instructional design. Communicate fully with the interviewees and obtain their agreement.
Interview implementation	Combining face-to-face and online interviews, each interview lasts about 60 minutes, following the outline and encouraging free expression.
Interview records and organization	Record the interview content in detail, including basic information, main content, and key points, and record important content word for word.

Team members follow the interview outline to ensure the systematic and comprehensive nature of the interview, while encouraging interviewees to express themselves freely.

4.5 Data Collection and Analysis

4.5.1 Data Collection

Data collection is mainly carried out through in-depth interviews, questionnaire surveys, and literature analysis. Questionnaire survey is used to obtain basic information about the respondents and the basic situation of teaching design, while literature analysis is used to understand the current research status and related theories of teaching design in universities.

The survey results show that respondents have low satisfaction with the current teaching design, with 60% believing that innovation is insufficient. The specific data is as follows:As shown in Table 4:

Table 4 The specific data

Teaching design problems	Feedback proportion
Single teaching content	45%
Outdated teaching methods	35%
Lack of student engagement	50%
Not satisfied with the application effect of information technology	40%

4.5.2 Data Organization and Coding

In the process of data organization, the collected data is first classified and filtered to eliminate invalid and duplicate data. Using methods such as open coding, axial coding, and selective coding, the data is encoded and analyzed in detail. The specific coding process is as follows: As shown in Table 5:

Table 5 The specific coding process

Encoding stage	Methods and applications
Open coding	Identify preliminary concepts from data, such as “single teaching content” and “low student participation”.
Axial coding	Classify and integrate preliminary concepts to form broader categories such as “teaching method questions” and “student participation questions”.
Selective coding	Select core categories from the axis encoding and construct a theoretical framework around these core categories.

4.5.3 Data Analysis

Data analysis mainly adopts qualitative analysis methods, combined with theoretical frameworks and research questions, to conduct in-depth analysis of the data. The analysis process includes the following steps: As shown in Table 6:

Table 6 The analysis process

Analysis type	Description
Content analysis	Analyze verbatim interviews and extract key themes such as the dependency and innovation needs of instructional design.
Theme analysis	Deeply explore key themes and compare common and individual issues across different universities and courses.
Narrative analysis	Based on specific cases, analyze the actual effects of innovative teaching strategies, such as the impact of project-based learning.

4.5.4 Data Validation and Feedback

Table 7 Verify the analysis results

Procedure	Operation process
Result verification	Ensure the scientificity and accuracy of data analysis through internal team discussions and expert reviews.
Feedback inquiry	Provide preliminary analysis results to some respondents and collect their feedback to validate and deepen research conclusions.
Result correction	Based on the feedback received, adjust and improve the analysis results to enhance the effectiveness and reliability of the research.

After the data analysis is completed, verify and provide feedback on the analysis results. Firstly, conduct internal discussions and evaluations of the analysis results to ensure their scientific and reliable nature. Secondly, feedback the preliminary results to some respondents and seek their opinions and suggestions. Based on feedback, further revise and improve the results.As shown in Table 7.

4.6 Specific Data Analysis

4.6.1 Single Teaching Content

Data shows that 45% of respondents believe that the current teaching content is too single, lacking diversity and flexibility. Specifically, the course content mainly focuses on theoretical lectures, with fewer practical activities. The teaching cases are outdated and fail to reflect the latest cutting-edge disciplines. Through interview records, it was found that teachers often tend to choose traditional teaching content in curriculum design, lacking timely updates on new knowledge and technologies. Students have reported that this single teaching content is difficult to stimulate their interest and motivation in learning.

4.6.2 Outdated Teaching Methods

Data shows that 35% of respondents believe that the current teaching methods are outdated and have not effectively stimulated students' learning enthusiasm. Specifically, teacher-lecturing methods are mainly used, with less emphasis on interactive teaching and exploratory learning. The teaching methods are single and the application of information technology is insufficient. Through interview records and questionnaire surveys, it was found that teachers lack innovation in teaching methods and mainly rely on traditional classroom teaching methods. Although some courses have introduced multimedia teaching, the actual application effect is limited and has not truly improved teaching effectiveness.

4.6.3 Low Student Participation

Data shows that 50% of respondents believe that student engagement is low and classroom interaction is insufficient. Specifically, students are in a passive state of receiving knowledge in the classroom, lacking active participation and exploration. There are fewer classroom discussions and interactive activities, and students have limited opportunities to speak up. Through interviews and observations, it was found that only teachers often speak in the classroom without much opportunity for students to participate in discussions and interactions. Some teachers have expressed that due to the tight course schedule and heavy workload, it is difficult to arrange more interactive activities.

4.6.4 Unsatisfactory Application Effects of Information Technology

Data shows that 40% of respondents are dissatisfied with the effectiveness of information technology applications. Specifically, the application of information technology is superficial and lacks systematic training and guidance. Although some courses utilize multimedia and online resources, the teaching effectiveness has not significantly improved. Through interview records, it was found that teachers generally have insufficient training in the application of information technology. Some teachers have stated that although the school provides multimedia devices and network resources, there is a lack of effective usage guidance in actual teaching, resulting in unsatisfactory teaching outcomes.

5. Teaching Design Strategies

5.1 Innovate Teaching Objectives and Content Design

The goal of innovating teaching not only emphasizes the transmission of knowledge and skills, but also emphasizes the cultivation of students' comprehensive qualities, such as innovative thinking, problem-solving ability, and teamwork spirit. To achieve these goals, teachers should set specific goals based on the characteristics of the subject and future social needs, such as enhancing critical thinking through practical case teaching, or enhancing cooperation and communication skills through team projects. The design of teaching content should focus on timeliness and foresight, selecting content that introduces the latest technology and theories, while ensuring practicality and fun, such as experiencing historical events through virtual reality (VR) technology or conducting scientific experiments using gamified learning platforms to stimulate students' interest and exploration potential [4].

5.2 Innovate Application of Teaching Methods

Innovative teaching methods should focus on activating students' active learning and participation. For example, project-based learning can enable students to apply theoretical knowledge, solve practical problems, and cultivate practical and innovative abilities in practical projects. Flipped classroom allows students to preview materials at home, engage in discussions and applications in class, and increase interaction and deep learning. Exploratory learning encourages students to set questions, search for solutions, and conduct experiments. Collaborative learning involves completing tasks through group collaboration, improving communication and teamwork skills. Teachers should flexibly apply and integrate these methods based on the course content and student characteristics to maximize learning effectiveness [5].

5.3 Teaching Implementation Strategies and Techniques

The selection of strategies and techniques is crucial in teaching implementation. Teachers need to clearly define learning tasks and goals, such as setting specific measurable learning outcomes, designing a market research report or developing a simple application. They can provide diverse learning resources, such as online tutorials, interactive software, and expert video lectures, to meet the needs of students with different learning styles. When guiding, teachers should monitor student progress in real-time, provide specific feedback, and use guided questions to promote deep thinking. In addition, they ought to encourage students to engage in self-directed and peer learning, such as setting up study groups and role-playing, to enhance autonomy and learning motivation.

5.4 Multivariate Evaluation of Teaching Effectiveness

The evaluation of teaching effectiveness is a key component of instructional design and requires the use of diverse methods to comprehensively evaluate students' learning outcomes. Process assessment focuses on the learning process and attitude of students, which can be conducted through classroom observation, learning logs, and progress reports. Project evaluation focuses on evaluating the quality of project completion and innovation level of students. Self-evaluation and peer evaluation encourage students to engage in self-reflection and provide peer feedback, cultivating critical thinking and self-regulation abilities. Comprehensive evaluation combines various evaluation methods such as traditional exams, portfolios, and actual performance to comprehensively know students' knowledge mastery and ability progress. This multi-perspective evaluation method helps teachers adjust teaching strategies in a timely manner to meet the learning needs of students

6. Discussion

This study delves into the teaching design strategies and practices of three different types of universities. Research has shown that traditional instructional design has limitations, such as single teaching content, outdated methods, low student engagement, and poor application of information technology. On the contrary, innovative teaching strategies such as project-based learning and flipped classroom have a positive impact on improving teaching effect and student engagement.

Through in-depth interviews and questionnaire surveys, this study confirms that teachers and students generally support innovative teaching, believing that it can enhance learning interest and effectiveness. However, teachers face challenges in implementation, including lack of training, insufficient resources, and single evaluation method.

Faced with limitations in research, such as limitations in sample and data collection, future research needs to expand the sample scope and combine multiple data collection methods such as classroom observation and teaching record analysis to improve the comprehensiveness and accuracy of the data. In addition, more innovative teaching strategies should be explored, such as the application of artificial intelligence and virtual reality technology.

For future research directions, it is recommended to delve deeper into teacher training and support systems, study the effects of different training modes, and explore diverse evaluation

methods to comprehensively evaluate the learning effectiveness and ability development of students. This will provide theoretical support and practical guidance for the reform of higher education, and promote the improvement of teaching quality.

7. Conclusion

This study explores innovative strategies for teaching design in universities, and analyzes the current situation and innovative practices through surveys of three different types of universities. Research has found that single teaching content, outdated teaching methods, low student participation, and poor application of information technology are common problems. Innovative teaching methods such as project-based learning and flipped classrooms have shown potential to improve student engagement and learning outcomes. Research suggests that universities should clarify innovation goals, enrich teaching content, adopt diverse teaching methods, and strengthen teacher-student interaction.

To support teaching innovation, it is recommended to formulate relevant policies, strengthen teacher training, increase resource investment, and establish a diversified evaluation system. Specific measures include establishing innovative teaching incentive policies, providing specialized training, building innovative teaching laboratories and teaching resource sharing platforms. Looking ahead to the future, teaching reform in universities should deepen teaching innovation, integrate information technology, pay attention to student needs, and strengthen international cooperation to improve education quality and competitiveness.

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