Observation and Enlightenment of Case Teaching in Teacher Education Classroom Teaching

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Abstract: As a comprehensive, authentic, purposeful, practical and inspiring teaching method, case teaching method effectively combines professional theory with teaching practice, shortens the gap between teaching situation and actual life situation, and creates a kind of teaching method. By observing the real situation of teaching, it is easier to quickly apply the knowledge learned from the training to life, and the training effect is more obvious. The main purpose of this paper is to observe the application of case teaching in teacher education classroom teaching, and to analyze the enlightenment. This paper mainly discusses the application principles and classroom application design related to case teaching, and also does relevant questionnaire survey experiments. Experiments show that in the survey of "whether there are students doing self-evaluation or mutual evaluation", the average is 2.64, and the mode is 3. It can be seen that in case teaching, the frequency of students participating in summary evaluation is generally the main mainly teachers.

Keywords: Case Teaching, Classroom Teaching, Case Inspiration, Traditional Classroom

1. Introduction

The case in the teaching research is the complete and true description of the whole classroom teaching situation by the teacher, and the whole process from the discovery to the solution of the teaching problem is described in combination with the experience. It is an educational case. It can be expressed in the form of a lesson plan or a diary of reflection on classroom teaching. Such teaching cases can not only be used as teaching materials for teacher education to promote teacher training and normal student education, but also be used as objects for teaching research, and can also promote teachers to actively reflect on teaching [1, 2].

In related research on case teaching, Muravev Y introduces the use of case study methods as a case study method in a classroom setting by analyzing the capabilities and limitations of the case study method in academic institutions, looking for parallels between legal translation practice and training. A comparative study of various situations of learning tools for professional communication and legal documents [3]. The Appiah-Twumasi study investigated some of the teaching methods used by science teachers and the factors that influence the choice of teaching methods [4]. Using a descriptive research survey, the results show that demonstration and observational teaching methods are the most commonly used teaching methods, while generative teaching methods are rarely used by science teachers.

The main purpose of this paper is to observe the application of case teaching in teacher education classroom teaching, and to analyze the enlightenment brought by case teaching method to classroom education. This paper mainly analyzes the application principles of case teaching, compares the case teaching method with the traditional teaching method, and analyzes the differences. After a series of preparations and relevant investigation and analysis, it was found that in the case teaching, the frequency of students participating in the summary evaluation is generally, mainly teachers.

2. Design and Research of Case Teaching in Teacher Education Classroom Teaching

2.1. Application Principles of Case Teaching

2.1.1. The Principle of Subjectivity

The application of case teaching caters to the development needs of the new era. In case teaching, emphasis is placed on respecting the dominant position of students and establishing an equal relationship between teachers and students. Teachers need to attach great importance to students' autonomous learning ability and insist on taking students as the main body.

2.1.2. The Principle of Development

Due to the different types of cases and richer forms and contents, the selection and application of cases should always be closely related to the teaching content. With the progress and development of the times, the selection of cases is integrated with the development of the times, so we must strive to keep pace with the times, and stimulate students' interest in learning to a greater extent in line with the characteristics of the discipline and the development needs of the times [5, 6].

2.1.3. The Principle of Integrity

It is the basis of case teaching activities to grasp the application process of classroom case teaching as a whole and implement case teaching in a reasonable and orderly manner. In the implementation process of case teaching, teachers need to control each implementation link from a macro perspective, including the presentation of the case, the discussion of the students, and the final summary of the teacher. In addition, in the process of teaching, teachers must overall control the presentation of case problems, the realization of teaching objectives, the enthusiasm of students to participate and the progress of classroom teaching [7, 8].

2.1.4. The Principle of Inspiration and Creation

Case teaching has certain characteristics of openness and inquiry, and it pays more attention to the cultivation of students' interest in learning and problem-solving ability. Therefore, when teaching using cases, teachers should actively guide students to think about problems actively, and inspire and encourage students to combine their own knowledge. Experience and life experience make bold analysis, speculation and judgment on problems. In this relaxed classroom learning atmosphere, students can effectively stimulate their creative thinking, develop a good creative personality, and form a thinking character that dares to innovate.

2.1.5. Principles of Emotional Interaction

The process of case implementation is also a process of communication between teachers and students. Through the communication of language and emotion, it can promote the formation of a good teacher-student relationship and the realization of teaching goals. After showing the case, teachers need to use guidance, encouragement, pointing and other methods to drive the classroom atmosphere, and attract students to actively participate in the analysis and discussion of the case, so as to ensure the smooth implementation of case teaching and achieve the desired effect, so as to improve the effect of classroom teaching in an all-round way [9, 10].

2.2. The Applicability of the Implementation of Ed.M Case Teaching Method

(1) Applicable to the form of vocational education. Because the cases in the classroom are the epitome of real events, with strong complexity and problems, if the students' experience background is missing, it will inevitably cause the students to not feel deeply, then the Ed.M case teaching method will be difficult to do. Master of Education is usually in a complex environment, and social development constantly puts forward new requirements for education. From the perspective of application practice, the case teaching method has achieved good results in the fields of management, law and medical vocational education.

(2) Applicable to students with a certain foundation. The case teaching method builds a bridge between theory and practice for students through the complex situation of the case itself, aiming to break through the inherent way to deal with the unpredictable real life. However, experience provides the necessary capabilities for case study, and students' original knowledge base and experience background become the incentives to promote the learning of new knowledge and capabilities. This method emphasizes students' initiative and requires students to actively participate in classroom

analysis and discussion. Therefore, students' knowledge and theories are a necessary condition for their participation in discussions. Similarly, students also need to master good communication and debating skills, to articulate their views within a limited time, and to be able to face up to different opinions.

(3) It is suitable for teachers with innovative spirit. The questions involved in the case usually do not have fixed answers, and are characterized by openness and diversity. Compared with teachers in traditional teaching, the case teaching method has higher requirements for teachers and requires more awareness of exploration and innovation. Case teaching is both a method and an art. The preparation of case teaching plan is the innovation of teachers' teaching, and each successful case teaching classroom is the artistic expression of teachers' skills. The case-based teaching method has played an important role in improving teachers' educational wisdom and teaching creation, and has also opened up the way of constructing teachers' personal theory [11, 12].

2.3. Comparison of Case Teaching Method and Traditional Teaching Method

The details are shown in Table 1:

Table 1: Comparison between case teaching method and traditional teaching method

	traditional teaching	case teaching
teacher-student role	The classroom is teacher-centered, and the teacher is the master of the classroom and the imparter of knowledge	The classroom is student-centered, and the teacher is the organizer and guide
Teaching content	theoretical knowledge of the preparation system	According to the teaching objectives, take the case as the carrier, set the corresponding problem situation, and infiltrate the theory and practice.
teaching objectives	impart theoretical knowledge	Improve students' analytical, decision-making and problem-solving skills
learning method	Independent learning - passive acceptance	Active exploration—cooperative learning
teaching methods	Lecture	Class discussions and other forms of supplementary instruction
instructional medium	Simplification	diversification
teaching situation	isolated, theoretical teaching situations	Dynamic, simulated teaching situations
Information transfer	single delivery	three-dimensional interaction
Teaching Evaluation	Outcome evaluation	Diversity evaluation, process evaluation, developmental evaluation and other evaluation methods

2.4. Case Teaching under Adaptive Learning

The input of the ability tracking model for ability achievement is student behavior information, and the output is the predicted value of ability point achievement. Let the ability point corresponding to the learning behavior of students at each historical moment t be $k_t \in \{1,...,N\}$, At the same time, it is necessary to record the positive and negative tendency of learning behavior $c_t \in \{0,1\}$, the positive and negative learning behavior and negative in the domain model to define the learning object, for example, answering the question correctly, downloading the courseware is positive, represented by 1, answering the question incorrectly, and failing the homework is negative, represented by 0. To predict the performance of the learning behavior at the next time point, the achievement of the ability point k_{t+1} corresponding to the learning behavior c_{t+1} is regarded as a Bernoulli variable. The goal of the ability point tracking model is to find the Bernoulli at each moment. parameters of the distribution.

$$p_{t+1} = P(c_{t+1} = 1 \mid k_{1:t+1}, c_{1:t})$$
$$c_{t+1} \sim bernoulli(p_{t+1})$$

(1)

The model consists of three parts: student state encoder, ability index encoder and ability state

queryer.

(1) Input

The input needs to be transformed by the Q matrix to convert the learning behavior based on the learning object into the increase or decrease based on the ability point. The model accepts two parts of input, one is the student behavior information at the current time, and performs One-hot encoding. The rules are as follows.

$$
\begin{aligned}
x_t &= \{0,1\}^{2N} \\
x_t^k &= 1 \, if \, c_t = 0 \\
x_t^{k+N} &= 1 \, if \, c_t = 1
\end{aligned}
\tag{2}
$$

Among them, N is the number of ability points, and k is the ability point corresponding to the learning behavior at time t. The other input is the ability point kt+1 corresponding to the predicted behavior performance. Similarly, one-hot encoding is used to represent it, a vector with a length of 2N, in which the kt+1th value is 1, and the rest are 0.

(2) Student state encoder

The input recurrent neural network first calculates a hidden state vector, which can be regarded as a continuous encoding of information related to students' historical behavior data, and the variables are connected through a simple network.

$$
\begin{aligned}
h_t &= RNN(x_t) \\
SS_t &= w_{h,ss} \times h_t + b_{h,ss}
\end{aligned}
\tag{3}
$$

Among them, the recurrent neural network can be used to process the sequence data with different series before and after. In order to solve the problem of gradient divergence and explosion caused by the too long history window information of the basic RNN, the long short-term memory unit LSTM is selected here to train the students' state interest. To avoid overfitting, the output layer uses dropout regularization.

3. An Experimental Research on Case Teaching in Teacher Education Classroom Teaching

3.1. Case-based Deep Learning Implementation Case

3.1.1 Preparation before class

The pre-class preparation of case teaching corresponds to the case selection and preparation in the prediction stage of deep learning in the process model, including teacher preparation and student preparation.

1) Preparations for teachers

First, teachers select appropriate research study case materials based on pre-assessment of students. Because students already have certain thinking skills and learning experience, students can compare their previous practical learning experience with the experience of research study cases. This is in line with the idea that deep learning requires learners to integrate old and new knowledge information.

Secondly, the teacher worked out the major and difficult points of the class, teaching plans, etc., and also made plans in advance for students' homework, classroom time arrangements, and writing on the blackboard. In addition, the teacher also registered a Baidu cloud disk for placing case materials and handing in homework. In this class, students are required to download the materials to their mobile phones or print them out for reading and thinking in advance.

2) Preparation of students

First, the students downloaded the case materials uploaded by the teacher on the Baidu cloud disk, browsed the cases, and determined the type of the case; then read it carefully, fully grasped the case information, and found the right angle of entry. When analyzing and thinking about the case, you should read other related materials, so you can learn more about the theoretical background of the case, and enter the problem situation of the "research study" topic described in the case more quickly,

analyze and think, and come to a personal point of view.

Secondly, set up a study group in advance, consisting of 4-6 people, to share the data and information about "research study" collected by individuals, and exchange views and opinions on case materials. This form of group study can enhance students' understanding and understanding of cases, brainstorm and inspire each other, so as to transcend individual limitations and improve learning efficiency.

It can be seen that case teachers select suitable cases that are suitable for the existing learning ability and learning interests of the research subjects before class, and students do a good job of reading and analyzing case materials before class.

3.1.2 Classroom implementation

The classroom implementation of case teaching is mainly case analysis and discussion, which corresponds to the process stage of deep learning activities.

3.1.3 Consolidation after class

The after-school consolidation of case teaching corresponds to the application and creation of deep learning. After the classroom teaching, in order to consolidate and extend the students' knowledge and understanding of the "research-based learning" learning principle, the teacher uploads case materials on the cloud disk, allowing students to read and analyze by themselves after class, to verify the theory and theory learned in the classroom principles and deepen conceptual understanding. Moreover, in the process of reading cases, students adopt the ideas and methods of case analysis summarized by teachers in the classroom, which will help to further improve the ability of case analysis and problem-solving.

3.2. Classroom Implementation Stage

3.2.1. Presentation of the Case

As the first step in the implementation of case teaching in the classroom, the presentation of cases plays an important role in the smooth development of teaching work. In case teaching, the commonly used case presentation forms mainly include written materials, oral description, multimedia and situational interpretation.

(1) Present the case in the form of written materials

(2) Present the case as a verbal description

(3) Present the case in the form of multimedia

(4) Present the case with situational interpretation

All in all, although there are many ways to present cases, the ultimate purpose is to focus students' attention, improve students' interest in learning the case content, enable students to better participate in classroom case teaching, master relevant sports knowledge principles, and stimulate students' enthusiasm. Learning interest.

3.2.2. Create a Problem Situation

Successful case teaching is inseparable from the creation of scenarios for the presented cases. Cases contain multiple problems and solutions to problems. Problems should be proposed on the basis of stimulating students' curiosity and active thinking.

3.2.3. Case Analysis

(1) Types of case studies

Mainly include: comprehensive analysis, thematic analysis, guided analysis, combined analysis. Among them, comprehensive analysis is to point out the key points of the problem as the basic point, and needs to be supplemented by quantitative and qualitative analysis to demonstrate the final conclusion; thematic analysis is to focus on a certain aspect of the case or a certain problem to conduct in-depth analysis; guided analysis is to advance The problems encountered in the expected discussion are the starting point, and the participants make relevant preparations and ask questions appropriately, so as to deepen the analysis of the case; combined analysis is to use relevant materials, data, personal experience, etc. Analysis of case content.

(2) Individual and group analysis cases of students

Individual and group analysis of cases refers to the part in which students conduct case analysis under the guidance of physical education teachers, and is also an important part of students' creative learning. Physical education teachers effectively guide students to deeply think and analyze the cases. Through this link, students can not only deepen their understanding of the knowledge principles contained in the cases shown, but also use their existing knowledge and learning experience to solve the problems in the cases. Actively think and analyze effectively to prepare for the case discussion that follows.

3.2.4. Case Discussion

Case discussion is the main link in the implementation of case teaching in the physical education classroom, and it is also a complete embodiment of the interactive learning between teachers and students and students.

(1) Notes on case discussion

Students can fully demonstrate their knowledge and creative thinking by discussing the cases shown. Generally speaking, individual speeches, group discussions or collective debates are used.

(2) Students discuss cases in groups

Students discussing cases in groups can not only broaden students' thinking, but also mobilize students to actively participate in case discussions. The different views and ideas of each group member can strengthen the spirit of unity and cooperation of the group members through discussion, analysis, joint discussion and complement each other in the group.

3.2.5. Case Summary

After the students' group discussion session, teachers and students can summarize the case, which can effectively gather opinions, deepen students' understanding and thinking about the content of the case, and better grasp the effective method to solve the case problem.

(1) Student Summary

Students summarizing the case means that after the case discussion session, each group assigns a student to explain the group's point of view, and accepts questions and questions from other groups, so as to help students fully grasp the knowledge principles of the case through the case summary, and broaden the students' knowledge. while inspiring thinking.

(2) Teacher summary

The teacher's summary of the case is carried out after the group student representatives summarize and answer questions. Teachers are required to summarize and analyze the students' viewpoints, analyze and evaluate the students' viewpoints and problems in the case in a targeted manner, and point out that the students ignore and understand. Incomplete questions, and finally actively encourage students to discuss and summarize the content of the case.

4. Experiment Analysis of Case Teaching in Teacher Education Classroom Teaching

4.1. Advantages in the Implementation of Case Teaching

To create a good atmosphere and organize students to discuss the implementation requirements of case teaching, its procedures mainly include three parts: preliminary preparation of case teaching, organizing students' case analysis and discussion, and teaching summary and evaluation. The analysis of injury adjustment in the familiarity of teachers with case teaching is shown in Table 2 below.

Table 2: A survey of teachers' familiarity with case teaching

Familiarity	very familiar	Familiar with	generally	Not familiar with	very unfamiliar
proportion	24.36%	48.72%	21.79%	5.13%	0%

As can be seen from Figure 1, 24.36% of the teachers said they were very familiar, 48.72% of the teachers said they were familiar with the case teaching procedure, 21.79% of the teachers said they were generally familiar, and 5.13% of teachers are not very familiar, and no teachers are very unfamiliar with the case teaching process. It can be seen from the above data that most teachers know how to implement case teaching.
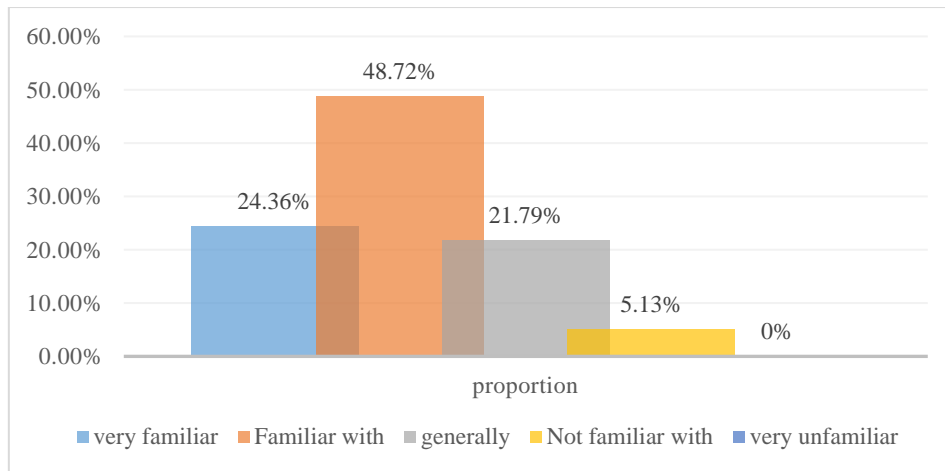
Figure 1: The teacher's familiarity with case teaching

4.2. Teaching Cases and Case Content are Close to Actual Investigation

Whether the Scratch teaching cases and case content of animation and game topics are close to the actual matrix coding search, the data analysis results are shown in Table 3 below.

Table 3: Research on whether animation and games are close to real life

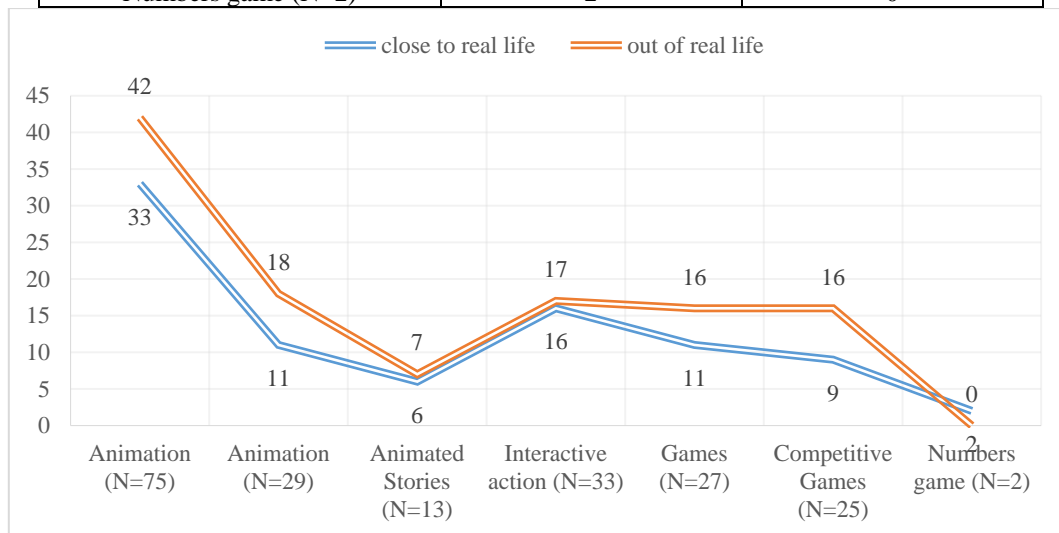|	close to real life	out of real life
Animation (N=75)	33	42
Animation (N=29)	11	18
Animated Stories (N=13)	6	7
Interactive action (N=33)	16	17
Games (N=27)	11	16
Competitive Games (N=25)	9	16
Numbers game (N=2)	2	0

Figure 2: Whether the case is close to real life research

As can be seen from Figure 2, there are a total of 75 animation teaching cases, of which 33 are close to real life, and the remaining 42 are not related to real life. In addition, among the 27 game-based Scratch teaching cases, there are 11 cases where the content and plot are related to the actual life, and 16 cases are separated from the actual life. From this, it can be seen that in the animation and game Scratch teaching cases selected by teachers, the number of cases with fictional plots that are out of reality is more than the cases that are close to real life. And the Scratch case that is divorced from the reality of life is shown as unrealistic in the setting of the content and plot

4.3. Disadvantages in the Implementation of Case Teaching

Analyze whether there is a discussion outline for students in the questionnaire, so as to understand the situation of teachers providing discussion outlines. The data results are shown in Table 4 below. Among them, the average is 2.89, and the mode is 3. It can be found that in the process of organizing student discussions, it is necessary to strengthen the discussion outline for students.

Table 4: Provision of case discussion outline and student evaluation participation

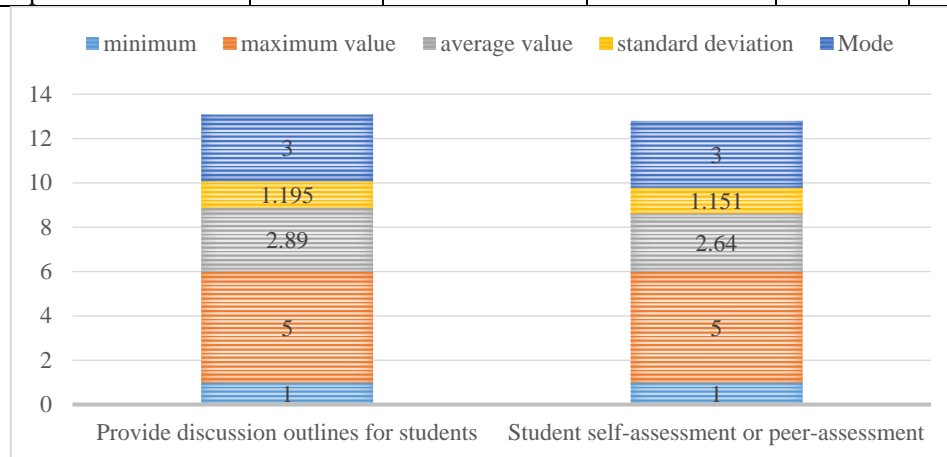| name	minimum	maximum value	average value	standard deviation	Mode
Provide discussion outlines for students	1.000	5.000	2.89	1.195	3.00
Student self-assessment or peer-assessment	1.000	5.000	2.64	1.151	3.00

Figure 3: Case discussion outline provision and student evaluation participation analysis

As can be seen from Figure 3, in the survey of "whether students conduct self-evaluation or mutual evaluation", the average value is 2.64, and the mode is 3. It can be seen that in case teaching, students participate in summary evaluation. The frequency is general, mainly by teachers. (Note: there is always an assignment of 1, often an assignment of 2, usually an assignment of 3, occasionally an assignment of 4, and never an assignment of 5).

5. Conclusions

As a new type of teaching method which is different from tradition, case teaching method is an effective method to promote the professional development of teachers, and it has also become a necessary way to strengthen the quality of education master's training. The case teaching method emphasizes the explicit tacit knowledge and innovates the traditional teaching method, so that it has the power to develop in practice. Since the case teaching method is still in the stage of exploration and development in the field of education, the theoretical research of the case teaching method still needs to be in-depth. Through in-depth analysis of existing problems, it is necessary to establish a scientific concept of treating case teaching and improve the cognition of teachers and students; improve the supporting system of case teaching, and effectively promote the smooth development of case teaching; change the existing teaching evaluation system, and adjust in time through evaluation feedback Teaching, improve the effect of case teaching; finally, update the curriculum to add case elective courses to increase the opportunities for teachers and students to contact case teaching, so as to ensure that case teaching really enters the college classroom.

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