VIDEO CASES AS A TOOL OF DEVELOPING PRE-SERVICE TEACHERS' SKILL TO FORMULATE A PEDAGOGICAL PROBLEM

I. Yarmakeev[1], T. Pimenova[1], A. Abdrafikova[1], N. Valiakhmetova[1], R. Akhmadullina[1]

[1]Kazan Federal University (RUSSIAN FEDERATION)

Abstract

Modernization of higher education in Russia asks for the development of pre-service teachers' skill to set a goal, identify a problem, suggest hypotheses, present arguments, predict consequences, adopt alternative points of view. The above-mentioned requirements constitute the content base of pre-service teachers' professional competence, which is understood as the skill to solve non-standard problems determined by the conditions of real pedagogical activities. How can the given requirements be achieved? Due to the application of modern educational technologies, precisely a video case technology, the authors claim. In modern practice, a video case technology is widely used in training pre-service teachers, the methodology of its use for developing their skill to formulate a pedagogical problem still remains insufficiently studied though. This circumstance, according to the authors, determines the subject of the study: development of pre-service teachers' skill to formulate a pedagogical problem on the basis of video cases. Thus, the aim of the study was to design and experimentally test the methodology of using video cases to develop pre-service teachers' skill to formulate a problem when solving pedagogical tasks. The methodological basis of the study was competency-based and contextual approaches which aim at achieving the result, which is not the sum of the learned information, but the skill of a person to professionally act in various pedagogical situations. The research methods used in this study were the analysis and systematization of theoretical sources and a pedagogical experiment. The authors theoretically justify the potential of video cases as a means of developing the skill to formulate a pedagogical problem. Video cases immerse participants in a real problem situation, which allows them to realize that there is no single correct answer, and offer optimal solutions to the situation. The main conditions for the successful implementation of this technology are defined. The main criteria for assessing the relevant skill are considered. 50 BA students participated in the experiment. 5 sub-skills were measured: problem understanding, problem description, clear problem formulation, differentiation between facts and opinions, and objective consideration of the problem. At the ascertaining stage, the skill to formulate the problem according to the above-mentioned criteria was diagnosed. In the control group, the experiment was carried out according to the traditional case study technique, and in the experimental group, a developed technique which included a triple-stage model: the selection of video materials in accordance with the topics studied, problematization of pedagogical disciplines content, the definition of didactic and methodological structures of classes, was approbated. The control stage of the experiment confirmed the authors' hypothesis that video cases develop pre-service teachers' skill to formulate a pedagogical problem, for video cases allow activating mental activity, developing the ability to analyze situations, getting deeper into the essence of the studied phenomena if compared to the traditional case study technique. The technique presented in the study can be applied to different disciplines and combined with other teaching techniques.

Keywords: Methodology of video cases application, pre-service teachers training, professional competence, skill to formulate a pedagogical problem.

1 INTRODUCTION

Modern rapidly evolving society sets certain requirements for the level of professional training of specialists. It suggests that a specialist should be able to effectively solve practical tasks, which will be an evidence of his being competent in his field of interest. For that, the modernization of higher education should provide relevant conditions for the development of such important skills on the part of the specialist as being able to set a goal, identify a problem, make hypotheses, find and justify arguments, predict consequences, adopt or not adopt alternative points of view, that is, to professionally think. Professional thinking builds up the basis of professional competence, which is understood as the ability to solve non-standard problems determined by the conditions of real

pedagogical activities. This understanding of professional competence allowed the authors to rely on the thesis that the solution of the pedagogical task can be based on the skill to identify and formulate the problem.

What technologies can develop this skill efficiently? According to the authors, video cases may be used as an effective tool of mastering professional thinking. Video cases are actively applied in modern education, although the methodology of their usage aimed at developing the skill to formulate a pedagogical problem remains unstudied. This factor determined the objective of this study: to justify that the application of video cases in pre-service teacher training programs develops their skill to identify and formulate a pedagogical problem.

The experiment, the authors conducted, allowed to empirically prove video cases to be efficient in developing the skill to formulate a pedagogical problem. In this paper, the designed and tested methodology as well as general guidelines for university faculty are presented, which can be applied to other than 'Modern Technologies of Education' discipline.

2   METHODOLOGY, MATERIALS AND METHODS

The methodological basis of the study was:

- competency-based approach; its main meaning is the orientation towards the result achievement, which is not the sum of the learned information, but the ability of the person to act in various situations;

- contextual-based approach according to which knowledge, abilities, skills are given not as a subject which has to be used by a student, but it is a way of solving practically-oriented professional tasks;

- problem-based learning approach, according to which education is considered as a system of consistent, interrelated actions of the teacher and students to acquire professional knowledge, skills, and skills based on solving problem situations.

Also, the authors relied on the researches of Russian and foreign educationalists:

- who studied processes of the development of a student ability to professionally think ([1], [2])
- who practiced problem-based learning ([3], [4], [5], [6], [7], [8], [9])
- who utilized case study technology in the educational process ([10], [11]), [12], [13]).

The following methods of research were used in the work: analysis of theoretical sources, generalization, systematization, pedagogical experiment, analysis of products of the activity of students, quantitative analysis of data.

Let us give some theoretical theses which are important for the study of the topic.

The ability to see and formulate a problem is one of the qualities characterizing a person's thinking, and at the same time, it is the starting point of solving a pedagogical problem.

It is important to specify the content of the following concepts such as 'problem', 'problem thinking', 'problem situation'. A problem is usually understood to be one or more questions formulated and arisen in the course of knowledge. A problem is any kind of theoretical or practical situation that does not have a solution appropriate to the circumstances, which is an incentive for reflection. The basis of the solution of the pedagogical problem situation is the ability to see the problem. The ability to see the problem is an integrative characteristic that defines a person's way of thinking. It is being developed for a long time in a variety of activities. Many scientists claim that seeing and formulating the problem is often more important and more difficult than solving it [3]. Misstated problems can lead to very general or obvious conclusions. Based on such statements, it would be impossible to carry out an analysis. In the context of the pedagogical activity, the vision and formulation of the problem depend on the extent of the teacher perceiving the situation as problematic. This depends on the subjective attitude of the teacher towards it and the importance of the situation for him. The situation becomes problematic when its characteristics are reflected and assessed by the subject in terms of its goals and values [1].

The following algorithm of actions aimed at developing the ability to see and formulate the problem has been developed in the practice of a problem-based learning approach. It includes: 1) getting familiarized with the situation; 2) extracting and recording its essential elements (signs, features, characteristics,); 3) determining the actual (existing) state of the situation; 4) identifying the desired and actual (existing) state of the situation and specifying the contradiction; 5) formulating the problem as a difference (mismatch) between the actual (existing) and desired state of the situation [4].

The level of the development of the considered skill can be estimated by two parameters: depth and completeness. The depth is characterized by the identification of contradictions that underlie the basis of a pedagogical problem situation, the identification of the main and accompanying contradictions. Completeness is expressed in dismembering the pedagogical problem situation into the following components: conditions of the situation, peculiarities of students, peculiarities of teacher-student relations, teacher personality [1].

How can one develop the skill to formulate a pedagogical problem? In our opinion, the case study is the most productive technology for mastering the skill in question. The technology allows immersing participants in a real problem situation, which is typical for their future or present professional activity. At the same time, unlike the problem situation, the case does not offer students a problem in an open forum, and participants of the educational process have to extract it from the information contained in the description of the case. Its uniqueness consists in the fact that in the process of its implementation, there is not given one correct answer. It is necessary to reasonably and conclusively propose optimal solutions to the situation [14].

The main requirements for a case in terms of forming the necessary skill are the presence of a problem in the content of the case, proximity to solving real practical problems, an exciting plot, etc. Among the existing types of cases that are most productive to develop the ability to see and formulate a problem is the educational video case. It is a game or a documentary video with a large presentation of the educational situation and with methodological recommendations for its application. What is the advantage of this type of case compared to the traditional way of presenting it? First of all, the ability to visualize a problem situation. The visual nature of the presentation of educational information significantly increases its perception, allows it to intensify mental activity and to get deeper into the essence of the studied phenomena. Secondly, the video provides an opportunity to present the situation, the reaction of the characters, the development of the plot in a short period and, as a result of the choice based on a decision, to formulate conclusions. Thirdly, the use of a video allows to effectively combine them with other interactive practices. Also, this technology can have a positive result due to the possibility of emotional immersion in the problem, availability of a form and students' interest in watching films.

Depending on the purpose of training, video cases may differ in the content and organization of the material presented in them: they may be case-problems, case-solutions, case-judgments, case-rules. Concerning the topic of our study, case problems are the most valuable. Such videos describe the multiple difficulties faced by the plot hero. These difficulties are significant for both the plot hero and the one who analyzes the material presented. The causes and relationships between plot events are not explicitly indicated. Working with such a case begins with an attempt to formulate a problem and further aims to get deeper into the understanding of the situation.

The algorithm of working with the video case to develop the skill to formulate the problem involves the following steps: 1) familiarization with the video material, the situation described in it and its peculiarities; 2) identification of facts indicating the problem; 3) establishing a contradiction and highlighting the main problem; 4) identification of factors and personalities that can influence the development of the situation; 5) building a hierarchy of problems (highlighting primary and secondary problems); 6) formulation of the main problem to be solved.

When using video cases, it is important to take into consideration the fact that this type of case contains an irrelevant large amount of information, and the linearity of reproduction makes it difficult to compare significant details and aspects. Therefore, good video cases should consist of short fragments (not more than 3 minutes long) and consider an option of switching fast between them [11].

The experimental base of our study consisted of 50 BA students of Kazan (Volga Region) Federal University studying in the profile 'Pedagogical education'. They formed one control group and one experimental group. The experiment took place in the process of studying the discipline 'Modern Technologies of Education' during one semester. The experiment comprised 4 stages. The purpose of the experiment was to test the methodology of using video cases to form students' skill to formulate a pedagogical problem when they analyze pedagogical situations.

At the initial stage, our attention was focused on those difficulties that accompany the process of identifying pedagogical problems. The main difficulty, according to Kashapov [1], arises from the following fact: the formulation of the pedagogical problem is the result of the problem detection process, which, in its turn, is based on understanding the causes of the appearance of the pedagogical problem, and one of the main reasons of failing to understand these causes is the insensitivity to contradictions. Thus taking into consideration this thesis, we offered students the task

to identify the contradictions presented in different pedagogical problem situations. After detecting the contradictions students were to formulate pedagogical problems in a written form. The work was carried out individually. The answers were analyzed by experts.

The main difficulties students experienced while fulfilling the task were as follows:

- the formulation of contradiction(s) was vague
- the students did not consider the proposed situation to be a problem situation
- the students did not identify the problem as pedagogical, i.e. they thought the problem to be intrapersonal, or related it to interpersonal relations
- the students did not understand the depth of the problem and paid attention to the external signs of its manifestation
- the students failed to recognize causal relations in the situation and demonstrated their inability to separate the cause of the conflict from the specific incident that triggered the problem situation.

The skill to formulate a problem is viewed as a complex one consisting of simpler sub-skills, which are measured according to the following four criteria: depth of understanding a problem; a detailed description of a problem; allocation of the main idea; clear articulation of one's position [15]. This standpoint was taken into account at the reporting stage of the experiment when the students' skill to formulate a pedagogical problem was estimated. Each sub-skill was assessed separately. The assessment was based on the experts' opinion: if the sub-skill was manifested, the student got one point, if not, he was given zero point. The maximum the student could get was 4 points for one sub-skill. All the scores were summed, and the mean value was calculated for the entire group of subjects. The results showed no significant differences in the control and experimental groups.

In our study, we used task-based situations for developing professional thinking. For that, task-based situations should be filled with pedagogical content [16]. This type of task was chosen by us because it can be easily presented in video cases. The task-based situation traditionally includes philosophical ideas, excerpts from fiction and pedagogical literature, a list of issues for discussion and reflection. We supplemented it by two more tasks: students needed to determine the contradictions that lie in the situation and to formulate the pedagogical problem.

At the formative stage of the study, we tested the devised methodology in the experimental group. The methodology involved two logical steps:

1. A critical analysis of the syllabus of 'Modern Technologies of Education' course for choosing:

a) relevant topics for discussion

b) reading materials

c) video cases with pedagogical problems

d) effective teaching methods which can be utilized in the classroom (e.g. 'Thinking Hats', 'Boundary Examination', 'Brainstorming', 'Card Sorting', 'Storytelling', etc.).

Table 1 presents sample topics studied in 'Modern Technologies of Education' course, and a brief description of video cases with the input pedagogical problems.

Table 1. 'Modern Technologies of Education' course topics and a brief description of video cases with the input pedagogical problems.

Sample topics studied in 'Modern Technologies of Education' course	Sample video clip names & a brief description of video cases with the input pedagogical problems
1. Technology of an individual behavior formation	'Nosedive', the first episode of the third series of 'Black Mirror' Series. In a society where the personal social rating strongly affects life and it is assigned according to the assessment of all others with whom the person comes into contact, there lives a girl who wants to improve her rating. Several random incidents on the way to the target reduce her rating, which causes the frustration of her wish but leads to her personal freedom.
	The documentary of the Russian Business

	Channel (RBC) 'Digital Dictatorship: Social Rating System is introduced in China.' The main purpose of the Social Credit System in China is "to build a harmonious socialist society." To develop honesty, the main value of society, every Chinese citizen will be assigned a rating by the system. Citizens will be awarded points for useful social activities and for being law abiding. The points will be deducted for misbehavior. Citizens' behavior is under the system control.
The pedagogical problem of the video case:	
Questioning the possibilities and expediency of technologizing the educational process and behavior of the person as a whole, if we consider him to be the subject of activity.	
2. Technology for diagnosing the level of education of the individual	F. Koppola's movie 'The Godfather.' A set of video clips illustrating positive and negative examples of the motives and actions of the main character - Don Vito Corleone. Positive motives and actions: protection of poor and humiliated compatriots, close intra-family relations, adoption of an orphan. Negative motives and actions: threats, killings, bribery of politicians, etc.
The pedagogical problem of the video case:	
If there exist criteria for internal (motives, beliefs, plans) and external (judgments, assessments, actions) moral development, not related to each other in any way, sometimes even contradicting each other, then can we determine the level of the moral development of the individual as a whole?	
3. Technology for educating gifted children	The movie 'Art School Confidential.' A young talented student is an artist, who prefers to go to prison on false charges to gain recognition as a creator. In an interview to the press, his teacher remarks: 'Can we judge an artist by his actions in his personal life? Is he an anti-Semite, or a tyrant, or, as in this matter, a murderer? Is art devalued in this case?'
The pedagogical problem of the video case:	
What should education of gifted schoolchildren primarily be directed at: should we disclose their abilities and assist their self-realization, or should we raise them as ordinary children, drawing their attention to universal human values and positive qualities of the individual?	

2. Activities:

Depending on the content, the task-based situation was performed individually and/ or in group. The work plan offered:

- roadmap with the description of the task and stages of work

- description of methodical techniques for searching, formulating the problem and solving the problem
- video case

- diagram of analysis of making up decisions [17]

- techniques of a group or individual reflection.

The topic was announced either in advance (in this case, students had to study supplementary reading materials), or at the beginning of class.

Sample lesson

Topic: Technologies for raising a leader: perspectives and concerns

The problem: How to raise a leader who can build up good relationships with team members for effective task solving?

Equipment: Video cases from the movie 'Ender's Game.' Here are some examples of the quotes that underlie the pedagogical problem from one video clip:

- The organizer of a leadership program: 'Weirdos and ugly ducklings will be recruited in the team to show their wit together with the smart leader'

- The main hero, who was appointed the future leader: 'If anyone can instill smart thought, share. I don't have to think for all of you.'

Procedure:

Students were divided into groups of 4-5 people; each group received a video case with a task.

Students got the roadmap which detailed stages of work before watching the video clip.

Students were offered some interactive forms of work to highlight the pedagogical problem and solve it, e.g. 'Nominal Group Technique' was recommended for identifying the pedagogical problem. Nominal Group Technique (NGT) is defined as a structured method for group brainstorming that encourages contributions from everyone and facilitates quick agreement on the relative importance of issues, problems, or solutions. Team members begin by writing down their ideas, then selecting which idea they feel is best [18].

After watching the video clip and identifying the pedagogical problem in the video case, students were asked to work individually. Each student had to use a Reframing Matrix tool. The technique needs considering the issue from four points of view. In our study, students had to offer a solution to the problem from the points of view of psychologists, parents, winners of the 'Leaders of Russia' contest and employers. Then the student had to choose two or four of the most promising ideas and describe his option of solving the pedagogical problem.

The final stage of work was organized in the form of group discussion on the proposed solutions.

The students of the control group were trained according to the traditional method of analyzing pedagogical situations in a written format.

3   RESULTS

At the control stage of the experiment, a re-diagnosis of students' skill to formulate a pedagogical problem was carried out. New video cases were used, although the procedures matched with those used at the ascertaining stage.

The control stage showed the advantages in developing a skill to formulate the pedagogical problem among pre-service teachers in the experimental group compared to the control one. The mean value calculated by the criteria: depth of understanding a problem; a detailed description of a problem; allocation of the main idea; clear articulation of one's position, in the experimental group exceeded that in the control group, which is presented in Figure 1.
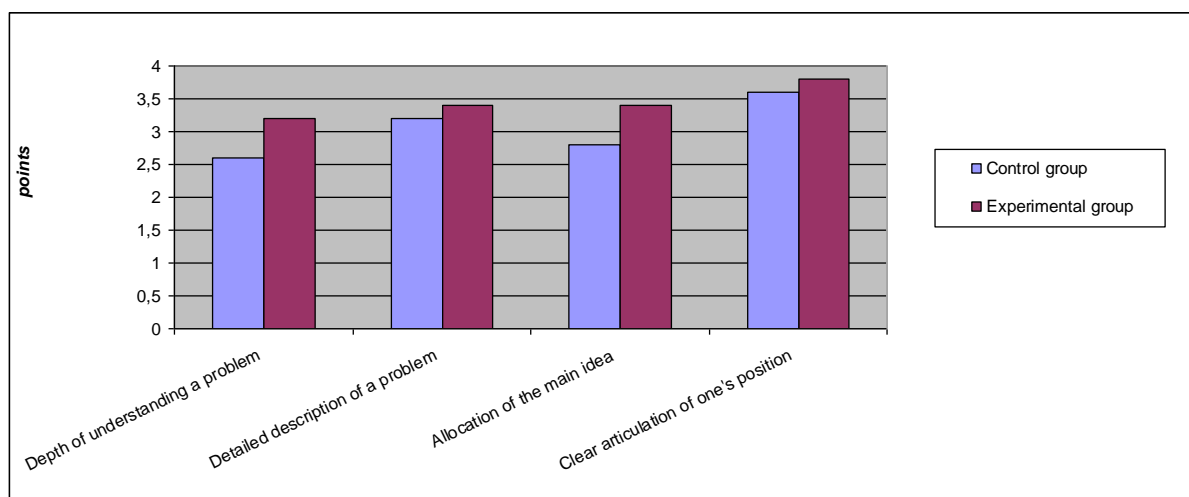
Figure 1. The mean value calculated by (depth of understanding a problem, a detailed description of a problem, allocation of the main idea, clear articulation of one's position) criteria in the experimental group and control group at the final stage of the experiment.

4 CONCLUSIONS

The study findings confirm our assumption that video cases, compared to traditional methods of presenting educational materials, are a great opportunity to immerse students in a real problem situation, create conditions for the application of interactive teaching methods, and contribute to the emotional 'entry' of students into the problem of a pedagogical task.

The study allowed us to theoretically justify and experimentally prove the effective impact of video cases on the development of students' skill to formulate a pedagogical problem.

The video case technology presented in the study can be used in different disciplines and for different content. It can be both combined with other teaching techniques and implemented independently.

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