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THE USE OF DIDACTIC CONDITIONS TO IMPROVE LECTURING USING PRESENTATIONS

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Abstract

In the article it is shown that the wide introduction of information technologies in the educational process leads to significant changes in the forms of the organization of training, new forms (webinars, Internet conferences, forums, etc.) appear, but at the same time traditional ones are being modernized, including a lecture, which is still one of the leading forms of organization of education in the university. The theoretical and experimental substantiation of the didactic conditions for improving the lecture is given: optimization of the combination of the teacher's words and presentations in the structure of the lecture; strengthening of the stimulating potential of the combination of the teacher's words and presentations in the structure of the lecture due to the fact that the interaction of the teacher and students at the lectures is carried out taking into account the structure of the motivational basis of the student's educational activity. It is established that developing effect of the lecture is observed during the use of the third variant of combining the teacher's word and presentation, which involves conducting a problem lecture, in the structure of which slides are used in all three phases - updating, reporting new knowledge, summarizing. Also, the hypothesis was confirmed that the reliance on the structure of the motivational basis of activity makes it possible to significantly enhance the stimulating and developing functions of the modern lecture.

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Keywords: Lecture, lecturer's speech, presentations, didactic conditions. .

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1. Introduction

One of the most common areas for improving the lecture is the use of presentations in its structure. Presentations, unlike traditional means of visualization, have much greater opportunities to support the learning process. In particular, with their help one can not only illustrate this or that phenomenon, or create a problem situation, raise a problematic issue, etc. But the main thing is that there are no well-founded answers to the question about under what didactic conditions the slides at the lecture give a greater effect, what are the optimal options for applying slides to the lecture.

2. Problem Statement

What are the didactic conditions for optimizing the combination of the teacher's words and presentation slides in the structure of the lecture, which help to increase its effectiveness?.

3. Research Questions

To substantiate the role and place of the lecture in the modern educational process; identify didactic conditions that enhance the effectiveness of combining the teacher's words and using presentations in the structure of the lecture; carry out an experimental test of the selected didactic conditions.

4. Purpose of the Study

The purpose of the study is to test the effectiveness of the didactic conditions for improving lecturing using presentations..

5. Research Methods

Theoretical (analysis, synthesis, modelling, generalization) and empirical (pedagogical experiment, observation) methods of research were applied in the study

6. Findings

The modern stage of the development of society is characterized by the informatization of all spheres of life, the replacement of technology, as well as the dynamic development of information resources. Currently in Russia, as in other developed countries around the world, computer forms of education are being actively introduced into the system of higher education, such as distance learning, virtual learning, based on network technologies. The learning process is accompanied by the integration of information technologies that ensure equitable acquisition and transfer of knowledge, free and practically unlimited access to educational resources and have a significant impact on the teaching methodology, content, methods and tools of learning (Kirilova, 2008; Robert, 2012).

There are significant changes in the organizational forms of learning, new forms appear (webinars, Internet conferences, forums, etc.), but at the same time traditional ones are being modernized, including lecturing, which continues to be one of the leading organizational forms of learning at university - in accordance with the GEF requirement, no more than 40% of the total number of study hours per subject is allocated to the lecture form of organization of learning. In this regard, let us cite the reflections of the well-

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known lecturer Robotova, who notes that ‘a modern student is increasingly working with 'silent' sources of information. Obviously, soon people will experience a shortage of a real interlocutor, and under these circumstances, the lecturer thinking aloud, initiating the listener's thinking on the information, will be perceived as a blessing. That is why lecturing will remain an important phenomenon and event of university education’ (Robotova, 2007). We also believe that informatization of education does not mean refusal of lecturing as an organizational form of learning in higher institutes. The point is that it is necessary to look for ways to update this classical organizational form of learning, taking into account new realities and making it possible to optimize its combination with other forms. Therefore, the subject and main task of our study is to substantiate the didactic conditions for improving lecturing under the circumstance of the informatization of education.

As the study of the experience in the development of lecturing has shown, most often it amounts to the fact that modern lecturing has a combination of the lecturer’s speech and presentation slides. Some use slides during the entire lecture and, all the main material of the lecture is reflected on the slides accordingly. Others use slides only in separate stages of the lecture - the beginning, the main part or in the conclusion. As for the purposes of using slides in the lecture, they are also different. In some cases, it is to raise interest during the lecture, increase motivation. In other cases, the slide show is there to illustrate various theoretical positions. In the third case, the task of fixing the students' attention on the main outline in the presented material is solved. Some lecturers use slides simply to facilitate their work and instead of scientifically justifying the content of the lecture topic, they reduce it to the point that students outline what is presented on the slides. The list of options for using slides during a lecture can be continued. But the main thing is not this, but the fact that there are no reasonable answers to the question under what didactic conditions do the slides at the lecture give a better result, what are the optimal options for using slides in combination with the lecturer’s speech in a modern lecture?

Hence, the first didactic condition for improving lecturing under the circumstance of the informatization of education is the optimal combination of the lecturer’s speech and presentations in the structure of the lecture. The choice of the optimal option requires a special pilot study, in which the following options for this combination should be checked. The first option is a problem-based lecture, in the structure of which computer slides are used at the actualization phase. The stage of communication of new knowledge - without the use of slides (slide+speech). The second option is a problem-based lecture, in the structure of which slides are used only at the stage of communication of new knowledge. Actualization and generalization of knowledge is the speech of the lecturer (speech+slide). The third option is a problem-based lecture, in the structure of which slides are applied at all three phases - actualization, communication of new knowledge, generalizing and summarizing (slide+slide). We emphasize that in order to obtain objective data it is expedient to carry out a pilot test of these options on the same content of the studied material, but in three different options of the combination of the lecturer’s speech and presentation (Ibragimov, Ibragimova, & Gainutdinov, 2014).

In the conditions of the informatization of education, lecturing is designed not only to disclose the content of a particular issue on a scientific basis, but also to awaken the students' interest in cognition, to motivate them for self-development and independent work (Zagvyazinskiy, 2014). Therefore, the implementation of the function of encouraging to learn at a lecture today is brought to the forefront. In this regard, in our study, the strengthening of the motivational potential of the combination of the lecturer’s

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speech and presentations in the structure of the lecture is considered as the second didactic condition for the improvement of lecturing.

The implementation of this condition requires the use of mechanisms for implementing the principle of motivational support of the learning process. The drawback of the traditional approach to the learning process in the lecture is the statement that the activity of the teacher must inevitably cause the self-evident student's relevant activity. It can often be heard at the lectures, the lecturer's expression: 'When I speak, you must listen!' But students rarely follow this requirement. Why does this happen? Researchers attribute this to the fact that the traditional learning process is built from the logic 'teacher actions to student actions'. The traditional structure of the lecture provides such actions of the teacher: ask, explain, consolidate - and the corresponding activities of the students: respond, listen, comply. These actions do not have what is called the educational activity, the inclusion in which is a necessary condition for the overall development of the individual. With this approach, when going from the activities of the teacher, the patterns of educational activity are not taken into account, and thus, the necessary conditions for the development of students are not created. 'Create your own self - that's what should be inspected in every situation of the learning process, in every act of the educational activity .... The interaction between the teacher and students is largely determined by the nature of the student's learning activity, not the teacher's' (Grebenyuk, & Grebenyuk, 2000). Therefore, considering the interaction between the teacher and students at the lecture, one should not approach from the requirements of pedagogical actions, but to build these actions according to the pattern of structuring educational activity. Here the task is to identify the motivational basis of the student activities, for it is cemented into the whole educational activity. The motivational basis of educational activity is a certain sequence of motivational states that constantly induce activity in general, supporting its continuity and stability.

Studies (Grebenyuk, & Grebenyuk, 2000) show that the structure of the motivational basis of educational activity includes an interrelated sequence of the following elements: focusing students on the learning situation - understanding the meaning of the forthcoming activity - conscious choice of the motive - goal-setting - striving for the goal (implementation of learning activities) - the pursuit of success (awareness of confidence in the correctness of their actions) - self-assessment of the process and the results of the activity (emotional attitude towards the activity).

Providing a motivational basis for learning requires the use of special methods of motivation. To ensure that they serve as an effective pedagogical tool, they need to be systematized in a certain way. The classifications of motivational methods known in the literature are most often built on the basis of their relation with the content of the educational material, with various systems of teaching methods, visual and technical means of teaching, etc. At the heart of our systematization of methods of motivation lies the mutual activity of the teacher and students, unfolding in accordance with the structure of the motivational basis of activity. Here we rely on the fundamental position of psychology that motivation as a personality trait is formed during activity.

Such a systematization allows for faster implementation of motivational support throughout the lecture. Their nomenclature can be supplemented or partially changed depending on the features of the subject, the profession, the capabilities of the pedagogical tools used, and so on. But the sequence of motivational methods must always correspond to the structure of the motivational basis of the student's activity. Depending on the teaching method used in the lecture, the sequence of motivational methods,

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while remaining relevant to the structure of the motivational basis of students' activities, will have a qualitative distinctiveness.

The new requirements for lecturing objectively encourage to reconsider the views on it as a form of organizing learning (Ibragimov, Ibragimova, & Gainutdinov, 2014).

At the first sub-stage of the formative experiment, the main task was to test the effectiveness of the first didactic condition for improving lecturing - the optimal combination of the lecturer's speech and presentations. The experiment was conducted in the course of studying the discipline "Theory and methodology of teaching law" with one group of third-year students (25 people). The structure of the discipline includes two modules, diagnostics on pre-prepared tests were carried out after studying each module respectively. In the process of studying the first module, the first method of combining the lecturer's speech and presentations was used, and in the process of studying the second module, the second method of combining was used. For data processing, the number of correct answers to the test questions was recorded. Data on the results of testing students' learning capabilities are given in Table 1.

Table 01. The number of correct answers according to the results of testing students during the first sub-stage of the formative experiment

Sequence number of students in the group list	**Correct answers when using the 1st method of combination, x_i**	**Correct answers when using the 2nd method of combination, y_i**	**Sign ($x_i - y_i$)**
1	10	9	+
2	9	9	0
3	12	10	+
4	11	11	0
5	10	8	+
6	13	11	+
7	12	13	-
8	11	10	+
9	10	10	0
10	14	12	+
11	9	8	-
12	10	9	+
13	11	8	+
14	11	12	-
15	8	7	+
16	12	10	+
17	13	12	+
18	9	10	-
19	11	9	+
20	10	8	+
21	12	10	+
22	11	10	+
23	14	12	+
24	10	9	+
25	13	12	-

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The summary results table of this sub-stage of the forming stage of the experiment has the form (Table 2).

Table 02. Summary data for assessing the reliability of the test results after the first sub-stage of the forming stage of the experiment (by the signs)

Number of frequencies with a sign			Number of pairs	Level of reliability
«+»	«-»	«0»		
17	5	3	22	95%

As can be seen from table 02, the number of frequencies with the "+" sign is 17, and with the "-" sign - 5. This means that when using the first method of combining the lecturer's speech and presentation in the lectures, students show higher test results, meaning they give significantly more correct answers than in the case of the second method of combining the lecturer's speech and presentations in the structure of the lecture. The reliability of difference was determined by using the corresponding table, from which it follows that when the number of pairs is 22, at 5% of significance level there can be 5 minuses. Since we have a minus number of 5, the result is reliable at 5% of significance level.

However, how objective is the difference in the presented data? To clarify this issue and to determine the reliability of the differences in the results of the rapid survey, the chi-squared test was used. The methodology for applying this test is shown above. Therefore, the obtained results are presented here (Table 3).

Table 03. Evaluation results

Method	"Yes" rating	"No" rating	Total
1. The first method of combining the lecturer's speech and presentation	23 (A)	2 (B)	25 (A+B)
2. The second method of combining the lecturer's speech and presentation	21 (C)	4 (D)	25 (C+D)
Total	44 (A+C)	6 (B+D)	50 (A+B+C+D)

From the table it turns out that the supporters of the first method are somewhat larger. In order to check whether such an estimate is statistically reliable or not, a chi-squared test is used. Chi-square is calculated by the formula:

$X^2= (A-B-1)^2/A+B$,

Where A – the largest number of the four-field chart;

B – the smallest number of the chart.

In our example:

$X^2=(23-2-1)^2/23+2=400/25=16,0$.

For the degree of freedom, the number of columns minus one is assumed here. In this case it will be 2-1 = 1.

Comparing the value of chi^2 obtained in the table, we find that it is greater than the critical value for the significance levels of 95% (3.84) and 99% (6.63). This means that the difference is reliable at both levels of probability.

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Thus, based on the evaluation of the levels of learning and the degree of student satisfaction, it can be concluded that the first method of combining the lecturer's speech and presentations in lectures is more effective than the second one. This means that during lectures it is advisable to first show the presentation (in whole or in parts), and then give a detailed commentary, including explanation, disclosure of the essence of the phenomenon or process, etc. (Ibragimov, & Gainutdinov, 2017).

Having identified a more effective way of combining the lecturer's speech and presentations at the next sub-stage of the formative experiment the problem of substantiating the second didactic condition was being solved. As this condition, the first method of combining the lecturer's speech and presentation was applied, but with the addition of a new factor – the use of methods to encourage students to learn, applied in accordance with the structure of its motivational basis.

The experimental scheme here was traditional: the verifiable second didactic condition was used in the experimental group, and in the control group the first method of combining the lecturer's speech and presentations was used without including a special system of motivational methods. To assess the cognitive activity of students during the lecture, the "Thermometer" methodology was used. The essence of the methodology is that students are given (in the last minutes of the lecture or immediately after it) a short questionnaire with the request to answer the questions contained in it in accordance with the instruction. Analysis of the results of the questionnaire makes it possible to reliably determine at what intervals the lectures were interesting to the students when they had the states of need, desire, desire to listen, understand, ask a question or answer the teacher's question, etc. The student activity coefficient at the lecture is a quotient from the ratio of the time of his active work on the lecture to the total time of the lecture (the maximum value of the coefficient is 1). To conduct a qualitative analysis, a correspondence is established between the time interval at which the student was active and those methods of teaching and motivating the learning activities that were used at that moment. In order to allow students to more accurately note the time, parallel to the time scale of the lecture, another scale is given, on which certain elements of the students' activities that corresponded to the lectures correspond to certain time intervals.

As for the students' motivational states, they were recorded during the course of the lecture in the observation process. The observation was selective. For this, the levels of motivation development of learning in students of both groups were previously diagnosed by the method of "Scaling" (Grebenyuk, & Grebenyuk, 2000). Then, for focused observation, one student was selected with an appropriate level of motivation development. The lecture recorded the motivational states of these students, followed by a targeted observation.

The average results of the evaluation of the cognitive activity and the number of observed motivational states of students during the lecture are presented in the table (Table 4).

Table 04. Evaluation of the cognitive activity and the number of students' motivational states during the lecture

Group	**Student activity coefficient,**				**Number of positive motivational states, M**		
	C			**C avg.**			
	1 lvl.	**2 lvl.**	**3 lvl.**		**1 lvl.**	**2 lvl.**	**3 lvl.**
EG (25 people)	0,61	0,70	0,82	0,71	20	26	32
CG (24 people)	0,45	0,58	0,65	0,57	12	16	24

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Analysis of the data in table 5 shows that in the experimental group, the values are higher than in the control group. Thus, the average coefficient of students' activity in the experimental group at the lecture is 0.71. This means that 71% of the academic time students were active during the lecture, participated in various types of educational activities (listening, answering questions, participating in discussions, record keeping, etc.). In the control group, this value is 0.57 (57%), which indicates that the students were active during most of the lecture, but significantly lagged behind the students of the experimental group.

The same trend takes place with the students' motivational states. It is noteworthy that in the experimental group, students with different levels of motivation development for learning activities demonstrated a higher number of motivational states. So, if a student in a control group with a low level of motivation (level 1) demonstrated an average of 12 positive motivational states during the lecture, then in an experimental one, a student with a similar level of motivation showed 20 positive motivational states. The same dynamics takes place with students with other levels of motivation development.

What explains these results? Since the difference in the experimental and control groups consisted only in the organizational method of motivation for educational activity, it is this circumstance that causes discrepancies in the results. Despite effective methods being used in the control group, (creating a problem situation, posing problems, etc.), their motivating influence turned out to be lower. The reason for this lies in the fact that in the experimental group (in contrast to the control group) the teacher relied on the regularities of the motivational basis of educational activity and built the system of motivational methods accordingly. First, he focuses the students' attention by using various techniques (for example, accessing professionally relevant aspects), then communicates information that updates their need to identify new knowledge, on the basis of which he creates a problem situation, formulates the problem, and puts forth the purpose of the lecture with the involvement of students. Further throughout the lecture, the educational process is structured so that every structural element of the motivational basis of activity is maintained by adequate methods of motivation.

In the control group, the lecturer also tried to encourage students to actively engage in learning activities. But due to the fact that this activity was unsystematic, it did not make it possible to provide the same high degree of activity of students and their involvement in the educational process.

The increase in cognitive activity of students during lectures also contributed to certain qualitative shifts in the levels of motivation development for learning activity. The results of the diagnostics of students' motivation levels towards educational activity at the end of the second sub-stage of the forming stage of the experiment are given in the table (Table 5).

Table 05. Distribution of students (in%) by levels of motivation development towards educational activity

Levels of motivation Groups	**I**	**II**	**III**	**IV**
Experimental (25 people)	16,0	36,0	36,0	12,0
Control (24 people)	20,4	41,8	29,4	8,4

The data of the table show that in the experimental group the number of students with high levels of motivation (third and fourth levels) is 48.0%, and in the control group, their number is 37.8%. As we can see, the difference between students with high levels of motivation in the experimental and control group is 10.2%. As for students with low levels of motivation development, the picture is reversed: in the

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experimental group, their number (52.0%) is less than in the control group (62.2%) by 10.2%. However, the question arises: how important is this difference? Is it possible to say that the results in the experimental group are reliably higher than in the control group?

For the answer, let us turn to criterion 2. The initial calculation data will be presented in a more visible form (Table 6).

Table 06. Distribution of students by levels of motivation for learning activities (in absolute units)

Groups	**Sample**	**Levels of motivation**			
		I	**II**	**III**	**IV**
Experimental	n_1= 25	a_{11}=4	a_{12}=9	a_{13}=9	a_{14}=3
Control	n_2=24	a_{21}=5	a_{22}=10	a_{23}=7	a_{24}=2

According to the table for the significance level =0.05 and the number of degrees of freedom =c-1 = 3, we find the practical value of the criterion $T_{crit.}$=7.815. Calculating $T_{obs.}$ by the formula and we find that $T_{obs.}$=0.605, which is less than the critical value. This means that difference in the level of motivation development of the students' learning activities in the experimental and control groups is not significant. This is understandable. The fact is that the experiment under consideration was on the analyzing sub-stage for only a few months, and a relatively small number of lecture classes (24 hours) were conducted. Meanwhile, it is known that the motivation of educational activity as a personality trait is formed for a long time, as a rule, at least a year. Due to this, the dynamics of the levels of motivation development for educational activity was insignificant. However, its development in the experimental group was at a higher rate than in the students in the control group.

Qualitative analysis of changes in the motivational sphere showed that the students of the experimental group experienced changes in the composition of the motives (in particular, the role of cognitive interest increased), their orientation and dynamic properties. As a part of their motivation, motives directly related to their future professional activity, work in preschool educational institutions began to dominate.

7. Conclusion

The study made it possible to improve the integration of three didactic conditions into the improvement of modern lecturing at university and to give it the functions of motivation and development of students: a) use of the pedagogical capabilities of information and computer technologies (by including computer presentations) in combination with the lecturer’s speech; b) application of a special system of motivational methods aimed at providing a motivational basis for student learning activities in the structure of the lecture; c) overcoming the temporal and spatial gap between the lecture and other forms of organization of learning (practical work, independent work, control) due to their concentration in a single learning block.

The didactic conditions for improving lecturing developed in the study were applied at the Department of Theory and Methods of Teaching Law of the Faculty of Law. As it was shown above, the best results in the teaching process are reached by lecturers when they skillfully combine elements of problem-based learning in lectures with the timely and thoughtful use of information and computer

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technologies, combining lectures with the independent work of students in the framework of concentrated learning, that is, when attempts are made to use the respective advantages of each of these areas to activate mental activity: the development of cognitive independence and creativity - from the side of problem-based and concentrated learning, more rational and effective use of lecture time, increased interest, increased accessibility and visibility during learning - from the side of presentation material and other ICT opportunities. It is this direction of learning that meets modern requirements, creating real opportunities for activating cognitive activity of students, instilling interest in them to the learning subject, the formation of general cultural and professional competencies.

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