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Energizing Students in Class on the Basis of Positional Training Model

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Abstract

The article considers a positional training model as a way to energize students in class. The research problem is theoretically underpinned, the essence of the positional training method is revealed and its implementation is presented through description of its practical realization. Experimental data of the model efficiency are provided, having chosen the components of students' culture of thinking. Analysis of the conducted pedagogical experiment specifies primary areas for improving the implementation of complex pedagogical conditions for creating culture of thinking, regarding interrelations between its components: knowledge, abilities, motivation, thinking and emotional intelligence.

Keywords: *positional training model, activity approach in training, energizing students, culture of thinking*

Introduction

Terms of Reference

The syllabus update is a defining component of a higher education reform, and it considers searching for new ways of energizing students in class. So far, the educational process has been carried out under the conditions of different approaches of future experts' productive activity. In order to increase the pro-active position of students in class, such a variety gives a free choice to the teacher at a higher

educational institution to choose various forms, ways and training methods. At the same time, the number of new approaches enabling the introduction of effective techniques into the educational process is not too large.

Research relevance

We have provided a so-called positional training model for future university-educated experts. Positional training allows for learning according to a pro-active approach, and then the implementation mechanism of students' active position is natural and does not need any additional means, which are not always available for university students.

The purpose of the study was to show the organization in use of a new way of energizing students' activity in class through so-called positional training, and also to prove experimentally the efficiency of its application in pedagogical work.

Research Methodology

General Research Background

The model of positional training is based on the theory of activity by L. Vygotskiy (1996) and A. Leontyev (2005), and also on the concept of "culturological dialogue" by M. Bakhtin (2007).

According to L. Vygotskiy, the development of the highest mental functions of a person is a mediated process, and "cultural development of any function is such that during the daily living activity a public person develops a number of artificial stimuli and strivings. By their means the person's public behavior is directed, they become the basic means with which an individual takes control over his/her own behavioral processes" (L. Vygotskiy 1996, p. 207). Hereto it is possible to add the idea of "polyphony" by M. Bakhtin, which generally means the substantial part of an analyzed issue inside the multi-layered dialogue. A dialogue includes various transferred views regarding the same problem, and also through the same dialogue they become their cultural property "in forms in which the past is reflexed and the future is predicted" (Bakhtin 2007; p. 437).

An important condition of energizing students in class is getting to know their psychological patterns of development. It is displayed in the studies by B. Ananyev (2005), V. Krutetskiy (1972), V. Kudryavtsev (1999), N. Menchinskiy (2004), S. Rubinshteyn (1998).

Scientific research by these authors considers the issues of activity development, as well as its nature and essence, and then development levels are analyzed. Unfortunately, the researchers did not provide any particular ways, techniques or approaches in training actualization in class at a higher school.

Analysis of the national and foreign literature has allowed for defining the basic types of means through which energizing of the educational process is realized, namely: *concepts* in permanent form, *diagram images* and *symbol images*. Here the concepts dominate, as knowledge and skills representation is implemented through them during the training course, and the culture of thinking is formed. The particular feature of this category is its known “hidden consistency” through communication with other concepts, which in turn increase its “importance value”. The efficiency of mastering the concept system features increases if graphic models are used expressing interrelations between considered concepts. Therefore, we introduced semantic (basic) lecture notes in class with students. Thus, graphical schemes reflecting semantic relations between units of a mastered material act as independent units. In our opinion, the efficiency of application of the specified means will be more tangible when students master them. Therefore, together with students in class we organized their activity so that means were a subject of studying. In one case, this activity was directed to identify concepts available in discipline, in other – to construct an evident graphic scheme which would express communications between these concepts. Actually, any of the specified activity was identified in its *position* due to the attitude of the subject of training to the investigated material.

Culture of thinking development is considered through the productive organization of perception of the training material by students, expressed in *mastering* professional competence (by revealing interrelations between the phenomena), *in comparison* of new information to the already known, and also *in a particular definition, generalization, synthesis, classification* and *estimation* of training material from different points of view.

Research Sample

Pedagogical experiment on checking the model of positional training of future experts was conducted at three stages, i.e., *organizational-prognostic, substantial-procedural* (consisting of *confirmative* and *forming* stages) and *analytic-correcting*, throughout 2014–2015 in four groups of students of the Engineering and Computational Pedagogical Department, two groups of students of the Psychology Department, Donetsk National University (DonNU), and in two student groups

of the Theory and Methods of Professional Training Department at School of Education, Far Eastern Federal University (FEFU).

To carry out the pedagogical experiment, two types of groups of students were involved: an *experimental group* and a *control* one. At the beginning of the experiment, the number of students in the experimental and control groups was from 60 to 65 people, and from 50 to 60 people – at the final stage. At the confirmative stage of the experiment, an initial (entrance) level of culture of thinking development was established for the students who took part in the research. The students of the experimental group studied with the use of a technique directed at the realization of a certain complex of pedagogical conditions on the basis of the positional training model.

Instrument and Procedures

The culture of thinking level was defined as readiness of a future expert for educational activity or as his/her possibility to apply knowledge and skills with a certain level of thinking to solving various educational-professional problems. The ability to make a scientific estimation and self-estimation of the culture of thinking and practical activities, initiative and practicality, readiness for solving non-standard problems and ability to analyze training material relevance in class are the major characteristics of an expert of any profile.

It was revealed that the culture of thinking of a future expert is a set of several components: *intellectual* (knowledge), *active* (skills), *motivational* (motivations), *cognitive* (thinking) and *emotional* (emotions). The following levels of emotional intelligence correspond to these criteria and indicators: *low* (recognition), *admissible* (understanding), *sufficient* (transferring) and *high* (estimation).

We defined the culture of thinking level of a future expert according to specially developed criteria. All the criteria expressed the major signs of intellectual and informative activity: *rationality of actions, independence, flexibility of intellectual operations and orientation towards solving professional problems, and creativity*. The use of the listed signs allows for characterizing the degree of the culture development of economic thinking of future experts at training material mastering in class with the use of the positional training model.

It is difficult to present the culture of thinking level of future experts in a quantitative aspect. Therefore, integral quality indicators were used, which indirectly made it possible to estimate the degree of readiness of future experts for professional work and for application of acquired knowledge, skills according to the positions chosen by them.

Productivity of such development was considered from two aspects. The first aspect was a product in a material-substance form, which acted as a result of the future professional's work. The other aspect was an individual side of a future expert as a complex of public relations with the inherent level of thinking and culture.

The culture of thinking was considered as a binding element, which united productive forces and productive relations, and, accordingly, which resulted in the professional work of an expert. In the given quality the culture of thinking acted as one of factors of its development and improvement.

The growth of efficiency of the culture of thinking development of future experts, namely the necessary development level of professional-significant knowledge and abilities, should become the result of the use of a complex pedagogical impact; available creative approach to informative activity; a wide cultural, professional outlook and psychology-intellectual readiness in realization of the acquired knowledge and abilities; formation and firmness of the motivational elements of professional orientation.

According to the criteria of the culture of thinking development of future experts and to the allocated indicators of their efficiency, the system of effectiveness ratio was created, which covered not only the general effectiveness ratio of professional readiness, but also the effectiveness ratio of mastering of *knowledge, abilities development, thinking development* (ability to think effectively), *motivations* to study the material of professional orientation and *emotional development of culture*.

Data Analysis

The technique of the substantiation of indicators of efficiency and finding these factors included complex application of statistical research approaches. The techniques described in the studies by G. Valeyev (2002) and E. Sidorenko (2002; p. 218) were used.

To identify the development rate of culture emotional components, three tests were used:

1. A test questionnaire on the diagnostics of emotional intelligence according to M. Manoylova's technique (2004).
2. A test questionnaire for the definition of the level of emotional intelligence according to David Ryback's technique (2007).
3. A test for the definition of the level of emotional intelligence according to G. Holl's technique (1913).

Research Results

Technology of realization of model of positional training

Already at the first stages of the realization of energizing means for mastering knowledge and skills, it is particularly necessary to keep the space in which they exist by which they are created. And at first not every student manages to do this. Therefore, they need a purposeful activity in order to keep the content (sense) of a training material when memorizing, to connect and recode the text in a more compressed form, e.g., in theses or semantic facts. Thereby the content space can be withheld if formulated in the form of a sequence of semantic facts and actions. It is important for training because the material which is mastered by students can appear detached from situations in which it should be applied.

Introducing the term “space”, it is important to emphasize that the position which is or can be occupied by the student is characterized by substance definiteness, his/her culture of thinking. In other words, any position which the trainee can occupy is not simply an indifferent attitude, but an obligatory active relation to something. Thereby the position acts as a means through which the subject sense is generated as a result of the contradiction permission between the subject and the object.

The content space of an investigated subject is actually a standard space, also called a *standard subject model of a trainee*. It means that the student cannot change this space but can only seize it as an educational-cultural professional norm. He/she is artificially (preventively) put into an environment where it is obligatory to accept and express personal position in relation to the studied material, and at the same time, the culture of thinking is formed.

In the course of professional competence/culture of thinking development, we constructed an educational activity for the trainee to express his/her personal attitude to the investigated (studied) material, i.e., *to define the position*. The *technology of the positional training model* was embodied by us in different ways; here is one of such examples.

First, the teacher holds lectures, and students closely follow the material. After the lecturer's consent they unite into voluntary affinity groups to show their position. We present a system of positions developed by N. Veraksa (1993).

The *first position* (subgroup) is called “*Thesis*”. The task of students in this position is a possibility to retell the basic matter of a studied material by means of several short theses. This position works as short deduction in memory of an investigated material, the analytical position is not important, according to which

the student should carry out the analysis of the heard material, but a position of curling of its content in a more compact form.

The *second position* is called “*Concept*”. The task of students in this position is to make a list of the basic concepts which open the content of a studied theme of employment, and then to define to (decipher) each of them. This position belongs to an analytical category and opens base concepts of an investigated theme. In this position, the student can make an analysis of the specified content in an implicit form. For all students of this position, the problem is not of reproductive, but on the contrary, of analytical character, so that they do not just define or identify these concepts, but they define their intrinsic content, i.e., how far the presented content reflects its semantic aspect. Students in these two positions can use the basic (semantic) abstract in a subject as a support material.

The *third position* is called “*Image*”. In this case, students should express the studied material in the form of a scheme, drawing, pictogram or other visual image. Representation of structural units, their distinctive functional features, communication between them in the form of a graphic image, the musical overture, a poetic fragment or mimic representation and gesture is possible. All the three positions are interdependent and are located in the same educational subject space.

The following two positions represent the second space connected with value judgment or acknowledgement of the content of a training material. These positions are connected with formalism elimination in studying of a substantial part of a material.

The *fourth position* – “*Critics*”. In this position the student is supposed to find discrepancies and contradictions in a training material, i.e., to express a critical attitude to it. This position is characterized by non-acceptance by the student of the sense (idea) or content which is based on its subjective analysis. In this case, the student’s activity is designed and directed towards the analysis of discrepancies, inaccuracies and contradictions in an investigated material.

The *fifth position* – “*Apologist*” – is, on the contrary, directed towards acceptance by the student of the studied content. It expresses the subjective relation to the content of a material from a position of concordance of the points of view of the one who estimates it, with the sense of the author (teacher).

The latter two positions represent estimated space with mastering and an estimation of activity of the participants in the educational process.

The *sixth position* – “*Reflection*”. The main task facing students in this position consist in their having to understand the difficulties connected with mastering of a training material. It in a sense is integrated with the position which connects space of senses and space of the subject content.

The *seventh position* – “Expert”. In this position, students should estimate the activity of all participants in the educational process, including the teacher, from the position of the master-expert. But at first they should ask substantial questions to all participants of employment on the basis of which answers aggregate and the verdict about their work is given.

Students choose the listed positions. Rigid fixation of positions for students is not supposed, but one restriction is entered: in a subgroup there should not be fewer than three persons. It is important to present all listed positions in class; therefore, work with the use of a given technique after the conducted lecture can proceed on the following coupled employment or already in separate student groups with other teachers (assistants) who would study the heard material of lecture on seminar or practical employment on this theme.

The mechanism of distribution of positions was very simple: forms were prepared, in which the position name was indicated. After a lecture part of the class, the form sheets with all named positions were put on a table and each student chose the form sheet with a suitable position, entered the surname, and on the same form sheet wrote the results of judgments of a material or activity.

During group work, the students one-by-one showed the results-positions, answered each other's questions and handed over the form sheets to the teacher. For instance, the “Image” group drew a scheme, defined a figurative drawing both on a form sheet and the blackboard, so that all the participants could see it. Each group had about five minutes for presentation. In fact, it could take much longer.

Research material and results

During the pedagogical experiment, except for the definition of particular professional skills and abilities, the level of development of the students' thinking was evaluated with the use of the following parameters:

1. Ability to learn and recreate the studied material without external support, depending only on memory (*recognition* level or *low* level).
2. Ability to retell the training material content with one's own words (drawing, scheme etc.), to make its interpretation, to prove certain judgment, to provide results (level of *understanding* or *admissible* level).
3. Ability to analyze and identify interdependences and differences between causes and effects (level of *transferring* or *sufficient* level).
4. Ability to give an estimation of value of methods, receptions, the importance of different results (level of an *estimation* or *high* level).

The graphic representation of the results of the formation of the students' thinking is presented in Figure 1.

Figure 1. Levels of thinking development in the students of the experimental and control groups

According to the results of testing (Figure 2), the development effectiveness ratio of *emotional intelligence* of the students (k_{EI}) of the experimental (2.70) and control (1.66) groups is not so high compared to other criteria of the culture of thinking. In our opinion, it is explained by the fact that the majority of students lack the ability to recognize, perceive and regulate personal emotional states and feelings, and as a result, they are hardly able to manage themselves or their relationships with people. As the essence of the given component is emotions of the examined students, who show mental processes and stances connected with instincts, requirements, motives displayed in the form of direct experience of significant phenomena under situational conditions, the test results are very unstable and depend not only on the internal subjective factors of the examined individuals, but also on many external irritants (uncomfortable environments, unhealthy sanitary-and-hygienic conditions, etc.). However, the components development effectiveness ratio of emotional intelligence of the experimental group (2.70) go beyond the limits of an insignificance zone, which means that the applied pedagogical impact system even under conditions of poor balance among the examined individuals shows a positive effect.

Figure 2. Levels of emotional intelligence development among the students of the experimental and control groups

The general development effectiveness ratio of the culture of thinking of the future experts (K_{KEM}) was calculated with the use of the following formula:

$$K_{KEM} = \frac{k_{Zn} + k_{Um} + k_{Mi} + k_{Mo} + k_{EI}}{5}$$

Where k_{Zn} – effectiveness ratio of mastering professional knowledge, k_{Um} – development effectiveness ratio of professional abilities, k_{Mi} – thinking effectiveness ratio, k_{Mo} – motivation effectiveness ratio for studying professionally oriented material, k_{EI} – effectiveness ratio of emotional intelligence.

The calculated effectiveness ratios of the culture of thinking criteria are presented in Table 1.

The general effectiveness ratio of the culture of thinking (K_{KEM}) in the experimental group (3.08) exceeds the obtained indicator of the same factor in the control group (2.45) by 0.63 units. Comparing the efficiency of each criterion in the experimental and control groups, the greatest progress was reached in regulation of the internal and external mental activity of the examined individuals (difference in ratios of emotional intelligence – 1.04) and in the development

Table 1. Effectiveness ratio of the culture of thinking criteria

Indicators	Culture of thinking criteria					Factor of culture of thinking (K_{KEM})
	knowledge (k_{Zn})	abilities (k_{Um})	motivations (k_{Mo})	thinking (k_{Mi})	emotional intelligence (k_{EI})	
Experimental group	3.61	3.29	2.99	2.80	2.70	3.078
Control group	2.74	2.77	2.79	2.28	1.66	2.448

of knowledge (difference: 0.87). It is necessary to note that the difference in the indicators of the abilities and thinking development ratios is identical (0.52); it means that dynamics of their growth is at the same level, which means the level of the students' thinking increases with the level of their professional abilities and vice versa. The lowest efficiency in the culture of thinking development of the future experts occurred in motivation for learning the educational-professional material (0.2).

The analysis of the conducted experimental work shows primary directions in the improvement of using a complex of pedagogical conditions to develop the culture of thinking based on the positional training model, namely: *ability to express the thought; education of professional behavior "being on the position"; motivators, culture of thinking development of students through personal position* (and not just acquisition of a set of ready professional knowledge).

At the stage of statistical data processing two criteria were used: a parametrical method $c2$ ("chi-square") and nonparametric Fisher's angular transformation (φ^*). Critical value $c2$ for a significance value 0.05 and one degree of freedom makes 3.84, (Sidorenko 2001, p. 328). The value calculated by us $c2 = 6.88 > 3.84$, therefore, the difference between two samples (ours are experimental and control groups) can be considered as true. Having also compared the limit values to the calculated empirical values of φ^* by Fisher's method, we can also state that the *positive effect* is obtained. For two other group pairs which took part in the experiment, the $c2$ value and φ^* are in the same ranges. Thus, the obtained values exceed critical limits, which means, in mathematical terms, that the differences between the considered distributions are *statistically significant*, therefore, the applied complex of pedagogical conditions *promotes growth in thtte level of students' culture of thinking*.

Discussion

After finishing the pedagogical experiment, we made a comparative analysis to identify the dynamics of increase in the levels of the culture of thinking development indicators of the students of the experimental and control groups at the beginning and the end of the experiment. The procedure was chosen on the basis of considering the final development ratios of the culture of thinking. The research results allowed for comparing the indicators of distribution of the students at general levels (*high, sufficient, admissible, low*) at the end of the confirmative and forming stages of the experiment (Table 2).

Table 2. Distribution of students at levels of formation of culture of thinking of future experts

Groups Development Levels	Experiment beginning (%)		Experiment end (%)	
	Experimental group	Control group	Experimental group	Control group
High	21.1	20.8	77.8	21.3
Sufficient	15.1	15.7	17.0	15.4
Admissible	42.8	42.2	3.0	43.3
Low	21.0	21.3	2.2	20.0

Comparison of the research results allowed for a conclusion concerning the *important positive shifts* in the indicators of the experimental group at the end of the experiment. As shown in the table, both in the experimental and control groups approximately the same number of students according to the development levels was at the beginning of the experiment, though there was a considerably smaller percentage of students with low and admissible levels of the culture of thinking in the experimental group at the end of the experiment (2.2% and 3.0% respectively), and a rather big percentage with sufficient and high levels (17.0% and 77.8%), while in the control group, these indicators remained much lower. Besides, during the experiment final stage the data were obtained, which testify that the success rate of training in class where the positional training model was most actively used also changed: In the control group the success rate changed from 87% to 92%, and in the experimental one – from 88% to 99%. In the experimental group the quality of training also essentially increased: from 63% to 80%.

By mathematical processing of the results of the pedagogical experiment by means of criterion c_2 and Fisher's angular transformation, it is proved that the research results are statistically significant, which *confirms the efficiency of the model of positional training*.

The pedagogical experiment made it possible to:

1. Confirm experimentally the developed theoretical model of positional training of a future expert taking into account interrelations between: components of knowledge, abilities, motivation, thinking and emotional intelligence.
2. Define the priority motives of future experts in the development of their culture of thinking for successful professional work.
3. Confirm the didactic value and efficiency of application of the positional training model through realization of the active approach in training.
4. Obtain comparative results concerning the levels of the students' culture of thinking development in the experimental and control groups, both at the confirmative stage, and at the stage of experiment development.

Conclusions

The positional model of training removes the formal moments of educational process, communication failure between teachers and students, between training material and those who study it. The main thing is that the informative activity of future experts is effectively concentrating on the development of necessary professional competences and cultures of thinking. They have to become active participants in the discussion on the studied material as they know they should express the position which they have chosen. Such a system is an actual embodiment of an active approach in training, as it strengthens personal interactions of teachers and students, removes stress arising in the traditional system of studying.

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