Н. П. КОПЦЕВА

Конструктивистская педагогика в контексте современной философии образования

Введение. Актуальность исследования обусловлена дефицитом концептуальных и методологических основ для модернизации образовательных практик в условиях повсеместного перехода к новым образовательным технологиям, связанным с электронным обучением и дистанционными образовательными технологиями. Цель статьи – определить ключевые особенности конструктивистской педагогики для выстраивания учебного дизайна, под которым понимается ряд педагогических практик для создания серии учебных событий, позволяющих обучающему наиболее эффективно приобретать необходимые ему знания и умения.

Материалы и методы. Использованы методы критического анализа современных концепций конструктивистской эпистемологии: применены методы выделения идеальных типов и контент-анализа; использовались элементы выделения концептов, отражающих основное содержание конструктивистской педагогической парадигмы.

Результаты. Анализ современных форм конструктивистской педагогической парадигмы раскрыл ее возможности для преодоления кризисных моментов в современных процессах повсеместного перехода к форматам электронного обучения и дистанционным образовательным технологиям. Повышение информационной компетентности преподавателей позволит эффективно использовать конструктивистские методики и активизировать возможности обучающихся по созданию личных смыслов познания. Среди инновационных образовательных технологий конструктивистской педагогики большой потенциал содержит образование, связанное с выполнением творческих художественных заданий в нехудожественном профессиональном образовании.

Заключение. Конструктивистская педагогическая парадигма выступает новой философией образования, которая способна системно перестроить образовательный процесс на уровне бакалавриата и сформировать активную позицию студента как основного субъекта образовательного процесса.

Ключевые слова: философия образования, конструктивизм, конструктивистская эпистемология, электронное образование, дистанционные образовательные технологии, обучение на основе искусства

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Constructivist pedagogy in context of modern philosophy of education

Introduction. The relevance of the research is underpinned by the lack of conceptual and methodological framework for the upgrade of educational practices against the background of common transition to new educational technologies associated with e-learning and distance learning technologies. The purpose of this article is to identify the key features of constructivist pedagogy to build the educational design understood as a set of teaching practices to create a series of educational events that allow a teacher to acquire the necessary knowledge and skills in the most effective way.

Materials and methods. We used methods of critical analysis of modern constructivist epistemology approaches; we applied methods of ideal type differentiation and content analysis; we used principles of definition of concepts reflecting the substance of constructivist pedagogical paradigm.

Results. The analysis of modern forms of the constructivist pedagogical paradigm revealed its capabilities for overcoming crisis points in modern processes of common transition to e-learning formats and distance learning technologies. Increasing information competence of teachers will make it possible to leverage constructivist methods and stimulate the students' abilities to create their own sense of learning. Among the innovative educational technologies of constructivist pedagogy, there is a great potential for education related to the performance of creative artistic tasks in non-artistic professional education.

Conclusion. The constructivist pedagogical paradigm is a new philosophy of education that is likely to systematically restructure the educational process at the undergraduate level and form an active position of student as the main subject of educational process.

Keywords: philosophy of education, constructivism, constructivist epistemology, e-learning, distance learning technologies, art-based learning

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Introduction

The modern philosophy of education is characterized by a strongly pronounced constructivist turning point focusing on the dynamic relationship between how teachers teach and how students learn. One of the most important sources of constructivist pedagogy are: L. S. Vygotsky's concept of social and cultural conditioning of the learning process [1], Jean Piaget's theory of cognitive development [2], and the "Instructional Scaffolding" method used by Jerome Bruner [3] and other pioneers of cognitive psychology [4; 5; 6]. Among the outstanding and significant researchers who predetermined the emergence of constructivist pedagogy we should name M. M. Bakhtin [7], J. Lave and E. Wenger [8; 9], D. Brown, A. Collins and P. Duguid [10; 11], D. Newman, P. Griffin, M. Cole [12; 13; 14], and B. Rogoff [15].

Constructivist pedagogy is not a separate pedagogical school or methodology (in contrast to the S. Papert's theory [16]), but a conceptual and methodological basis for teaching theories and teaching methods [17]. Basic ideas of constructivist pedagogy are used for various areas of educational reforms and the development of innovative teaching practices [18]. In this day and age, the advantages of constructivist pedagogy become important for the effective distance education when the educational design changes from a behaviorist approach focused on "impartial" assessment of learning outcomes and confidence in achieving the desired results to maximizing students' own knowledge and self-control over their own success in education [19].

Basic philosophical ideas of constructivist pedagogy are associated with the understanding of knowledge as a whole, which is mentally constructed through actions and experiences that the student develops both in the process of direct learning and in a broader social and cultural environment. Knowledge is actively constructed by students when interacting with external objects and adapting to external and internal reality. This reality is interpreted differently in different social and cultural environments, so different students have different knowledge, and only in the process of social communication this knowledge becomes generally valid. To increase learning efficiency, the learning environment should be specially designed so that a student would be in constant and active interaction with this external environment, so that their thought patterns would constantly increase their adaptation to external conditions.

The main principles of constructivist pedagogy are "viability", students' activity of to create "viable" knowledge and meaningful social communication [20]. It appears that open and distance education focused on the activity of students, their own control over learning outcomes and taking personal responsibility for these results is in tune with the basic principles of constructivist pedagogy.

Constructivist pedagogy is based on constructivist epistemology (cognitive theory), which goes back to I. Kant's transcendental philosophy [21], where we do not know an object as a thing in itself, but we know our own ways of cognitive construction of this object. Knowledge is not passively absorbed by a cognizing subject, but is actively constructed by them. Similarly, in the context of constructivist epistemology, the purpose of cognition is not adequate recording of "objective reality", but efficient adaptation to it and arrangement of one's own experience in line with the tasks of this efficient adaptation. In other words, knowledge organizes the inner world of a subject but does not reveal objective laws, while

scientific cognition should not be metaphysical or self-directed, but always practice-oriented and contributing to a certain improvement of our existence.

It is obvious that the desire to create training programs and educational design for open and distance education based on the principles of constructivist pedagogy makes it necessary to solve a number of conceptual, methodological, and procedural issues. Thus, for example, we should consider the specifics of social communication environment where students with initially different social and cultural experiences create generally valid knowledge by their joint actions and discussions as it applies to the conditions of e-learning and open distance education. In the same way, it is necessary to study how students organize their vigorous activity aimed at revision of their knowledge, its reconstruction, and practical experimenting, where they would be able to put new information into their existing cognitive systems. D. Spinner-Littles and S. Anderson point out that the effective learning is based on reflection, personal understanding, and constant behavior changes [22].

The purpose of this study is to identify the key features of constructivist pedagogy to build the educational design understood as a set of teaching practices to create a series of educational events that allow a teacher to acquire the necessary knowledge and skills in the most effective way.

Materials and methods

The study materials are theoretical principles and summaries showing the effectiveness of the use of constructivist pedagogy in modern realities. Numerous educational materials related to current educational practices, including distance and open undergraduate education, were analyzed. We used various content analysis scenarios [23] to identify key concepts of modern constructivist pedagogy, methods to differentiate ideal types in extensive empirical research material, as well as the method of critical analysis and critical evaluation of current theories and teaching practices. The research rests upon extensive experience of teaching a number of academic disciplines related to development of critical thinking, formation of skills and abilities by students to organize the process and results of their cognitive activity themselves in the humanities and social study courses of the university bachelor's degree program [24].

Results

The debate between the protagonists of "traditional" and "constructivist" pedagogy is so fierce that when it comes to terminology its participants talk about different sides in the battle or opposite sides of the barricades [26]. This bitterness appears understandable since the disputes and disagreements are based on living teaching practices rather than abstract concepts and result in change of not only individual approaches or methods, but of the paradigm that defines all basic elements of national and global educational systems. Of course, the research is complicated by the fact that active discussions are a sign of modern science, and the adherents of constructivist pedagogy themselves have different understanding of their goals and purposes. There are a number of constructivist positions, which serve as a basis for choosing a particular educational practices by one or another university teacher:

1) radical refusal to consider truth or knowledge as existing in an external and objective way, as something "materialized" and preceding their "cognition"; radical constructivists understand knowledge as a dynamic result of active social communications, where knowledge is a viable explanatory pattern obtained as a result of "sense making" [27];

2) the "soft" version of constructivism does not entail a paradigm shift in the traditional philosophy of education, but is focused on complementing the existing knowledge and practices with approaches where the relevance of knowledge, its authority and truth are fully determined by students, and knowledge is as true as it is "viable"; at the same time, the "viability" of knowledge is defined as the quality of cognitive structures, and "reality" as a source of challenges to check this viability [28].

Thus, there is no single conceptual framework in the constructivist pedagogy, the range of approaches is distributed between a radical rejection of "traditional" pedagogy and its "soft" complementation with innovative teaching approaches and methods associated with stimulation of the maximum activity of students.

The educational practices characteristic of constructivism are based on several basic processes:

1) process of social coordination of the meaning and reliability of knowledge [29];

2) process of development of cognitive schemes associated with the alternation of continuity and discontinuity in the acquisition of patterns [30].

Social coordination of meanings and acknowledgement of social concertation in the recognition of certain knowledge as reliable is the most significant epistemological process in the paradigm of constructivist pedagogy. This means listening to what "others" say to determine whether we really understand their point of view, to check the correctness of our understanding. During the interview, we ask questions, make statements that may be difficult to interpret from other points of view, pay attention to the meaning that led to a failure in mutual understanding and acceptance of points of view, and fix many other shortcomings inherent in our cognitive and understanding structure. Knowledge is formed as a meaning that is "personally significant" to a student. For example, memorization of some digital information will be different if it is an abstract numerical formula or a mobile phone number (a series of phone numbers) that has personal relevance. Teaching practices contributing to the construction of personal relevance of certain knowledge are the most important part of constructivist pedagogy [31].

Constructivist epistemology is based on current discoveries in the field of cognitive sciences. Thus, J. Sweller discusses the question of why one material is learned with difficulty and understood with the same great difficulty, representing a huge internal cognitive load in a particular individual learning process. Resting upon the modern theory of information processing, he proposes to divide complex educational material into a number of simpler schemes, study them sequentially, and then combine separate schemes into a whole, since it is almost impossible for a teacher to reduce the individual level of internal cognitive load, and it is necessary to build educational practices taking into account this cognitive reality [32].

The fundamental relativity of all knowledge produced by people is also an epistemological issue. How can be generally accepted knowledge and community knowledge possible if all knowledge is only relatively true? In the epistemological relativism paradigm, it is the constructivist pedagogy with its focus on the individual way of constructing thinking schemes, determination of personal needs and personal meanings (both individual and group) for acquisition and internalization of specific

knowledge that can be most effective. If a student is aware of an urgent personal need, then the reality of learning becomes most probable [33].

What are the most successful constructivist strategies for distance and open education? This topic is well studied and a set of these strategies is well known. We can point out four actively developing educational strategies that have really proven successful in the educational practices of different universities and in different educational environments:

- 1) project-based learning environment [34];
- 2) situation-based learning environment [35];
- 3) computer support [36];
- 4) use of cognitive (intellectual) tools [37].

But a bare listing of these strategies shows that there is nothing particularly constructivist in them. Moreover, all these strategies were created and activated precisely in "traditional" pedagogy intended for acquisition of adequate knowledge about objective reality. Obviously, these strategies will not make educational practices "constructivist" by themselves, but only if applied by a teacher who stands on the position of constructivist pedagogy.

What is common to both paradigms is recognition of the crucial and meaningful role of a teacher or instructor (coach), who affects both the personal meanings that students create and the processes of social harmony in creation of a generally accepted meaning.

Of course, a significant difficulty in the constructivist pedagogy is the assessment of students [38]. If the indicator of assessment is the so-called "viability" of knowledge, then the real problem in the educational process is those students who do not show interest in changing the level of their knowledge and do not commit themselves to understand other people and coordinate their personal understanding with these others. This raises the challenge of measuring the degree of student's involvement in the educational environment, and this measurement should continue over the entire period of their participation in educational design.

Australian researchers G. Tennenbaum, S. Naidet, O. Jeget, and J. Austin suggest taking into account 8 parameters that may indicate the teacher's choice of a constructivist paradigm:

- 1) style of educational process and environment (focused either on a student, or on a mentor or content, or neutral or indecisive in relation to both);
- 2) reliability of content of the educational process (real, realistic or abstract-theoretical content);
- 3) student's personal experience (desired or offered for support, used in the educational process, or, on the contrary, not in demand and not used);
- 4) student – student interaction (encouraged, not required, whether teacher's participation in the interaction is encouraged);
- 5) a student reasons, "thinks out loud" (encouraged or discouraged);
- 6) feedback on results (positive and encouraged, or negative and dismissive);
- 7) development of thinking skills, intellectual techniques (dominant, random or partial, ignored);
- 8) students' contribution to educational practices (socially significant, not evaluated, not in demand) [20].

Speaking about the specifics of application of the principles of constructivist pedagogy in e-learning and distance education and resting upon the experience of multiple proposals available today in the emerging Russian environment of open and digital education, it is impossible to ignore the fact that the bulk of e-learning and distance education is represented by online lessons where 90 to 100% of time takes the teacher's

message (conversation, lecture) on new forums (which are already built in the required interface of modern open educational platforms), where it is proposed to ask questions, discuss formal topics of test assessments of knowledge, and practically no conversation is expected between students on the studied topics, or conversations between teachers and students, where the process of coordination, correlation of different thought patterns, different "understandings" could take place, where the vital practice of constructing generally valid knowledge would be honed.

It could be assumed that open-ended questions would prevail in teachers' assignments, but this was not the case. It is extremely rare for teachers to formulate open-ended questions in online courses or offer students various ways to construct knowledge based on the general discussion and meaningful personal experience. But if the narrative part of a lesson has already been created and a teacher does not need to spend time to reproduce and replicate it in the classroom in real time, then the time saved could be used to organize individual construction of thought patterns, contribute to the formation of personal needs of students in the internalization of certain knowledge.

As a rule, textbooks including presentations and texts in the form of an electronic and/or printed book are used in e-learning and distance education along with video lectures and test tasks based on the content of video lectures. The analysis of these presentations and textbooks published on Russian educational platforms shows that apart from the electronic format, there are no special paradigm changes in them. This is usually a narrative text containing a set of definitions, descriptions of various concepts, appeals to various iconic "names" and recommendations to get acquainted (read) certain "texts".

Constructivist pedagogy offers mandatory inclusion of a number of elements in these textbooks, the presence of which in textbooks will make the educational process much more efficient and personally relevant for students, including:

- 1) content area which is comparable with personal experience of students, authentic to their personal experience (in contrast to inapplicable examples, theoretical schemes, and abstract reasoning) [39; 40];
- 2) reality or realism of the content area [41];
- 3) broad and encouraged interaction between teachers and students [42];
- 4) interaction between students is encouraged [43];
- 5) students determine their own learning goals and assessment procedures [44];
- 6) teaching style that encourages students to demonstrate independent thinking [45];
- 7) subject of training is presented as a modern practice, disclosed based on the relevant data [46].

Constructivist pedagogy most often captures and solves such issues as: 1) lack of interaction between students and between a teacher and students [47]; 2) lack of motivation of students to check their understanding through feedback and discussion of what and how they are thinking and looking for [48]; 3) dogmatism of knowledge presented as "truths" that must be learned and uncritically reproduced [49]; 4) absence of real situations as the objective side of education [50]; 5) irrelevance of the studied material to personal experience of students [51].

Constructivist pedagogy offers a number of formats and approaches for solving these issues. Some of them can be successfully implemented in the Russian educational environment.

Of special interest is the art-based pedagogy: performing creative tasks and understanding the subject through interaction with a work of art. Art-based pedagogy, or ABP, relies on

symbolic interactionism and the theory of transformative learning. Symbolic interactionism describes how human actions are based on the meaning that people assign to a situation or object. People construct these meanings through social interactions that occur using symbols of language or art. The transformative learning theory explains how students think critically about their experiences and prerequisites for learning to make them more open, coherent, and clear [52]. Art is defined by J. Dewey as "the most effective way of communication that exists" [53, p. 286]. In the context of ABP-learning, this means that art is an alternative language, the use of which in education is focused on students' performance of creative tasks.

The art-based pedagogy studies represent a special multi-aspect area in the modern pedagogical science [54]. Thus, art-based pedagogy has proved its efficiency in various areas of undergraduate education, including training of nurses, when, along with traditional questions and tests, students received tasks related to the creation of photo collages and paintings [55]. P. Levi summarized numerous data on art-based pedagogy studies and justified the efficiency of teaching methods based on it [56]. V. I. Zhukovskiy and N. P. Koptseva developed a concept where art pedagogy correlates with the maieutic function of an art historian, who undertakes a task of helping a recipient comprehend the ideas embodied in a work of fine art [57]. H. Seifter, T. Busvik and N. Nisli consider it possible to apply art-based pedagogical technologies in the process of training students in economics specializations [58]. S. Shields, R. Fendler and D. Hen justify the possibility of developing stable research competencies of students by creating works of art [59]. K. Meltzer and E. Schwenke explore the possibilities of art-based pedagogy for improving the quality of adult education [60]. In the process of creative learning, students go beyond memorizing the correct answers and move to a position of research and reflection. Students develop their ability to generate ideas and think outside the box. Creative processes associated with art are alternative and meaningful ways of learning. Aesthetic and artistic research offered to students is a way to develop knowledge about the meaning of previous (personal) creative artistic experience in order to understand and establish viable thought patterns.

A common problem observed here is the self-concept of students as non-creative people. In addition, creating and sharing works of art with peers and teachers can also dampen the mood. Students are used to linear learning strategies with measurable results as opposed to unpredictable approaches to results measurement, which are typical of art-based pedagogy. However, ABP-learning does not identify the quality of artistic elements as a criterion for evaluation of creative tasks, but emphasizes and articulates such criteria as the connection with practice, the level of reflection and, exchange of ideas. Students should be sure that these are the criteria.

In the context of the constructivist paradigm, where not only the complexity and uniqueness of each student is recognized, but each student is an integral and important participant in the educational process, the ABP learning is efficient since students create cognitive schemes reflecting their cultural origin and socio-cultural features of their original mind-set. Taking into account the student's culture of origin and reducing the educational process complexity associated with legacy and historically contingent cultural symbols, language, logic is possible when performing the artistic tasks, where cultural diversity is not an obstacle but an advantage and where personal experience and personal perception manifested in the implementation of creative artistic task unconditionally serve as a basis for understanding.

For example, Australian researchers K. Rieger, V. Chernomas, D. Macmillan, and F. Morin wrote several scientific articles describing the experience of using ABP learning for future

nurses, where students were asked to express their personal experience of clinical practice in an artistic and creative way. This is about people with significant experience ranging from 5 to 15 years of service in clinical institutions. And already at the first stage of this creative artistic task, the process of its implementation was accompanied by active reflection, including both divergent (studies of multiple ideas) and convergent (making a decision about one idea) thinking. Performance of a creative artistic task resulted in constant self-assessment of students. The creative art works presented in the group aroused discussions among other students. And, of course, there is a discussion as to whether a teacher can objectively evaluate performance of this kind of tasks and what criteria for evaluation are possible here in general [61; 62; 63].

Performance of creative artistic tasks is evaluated by students as an opportunity to express their abilities freely, evaluate their personal experience, which will help or hinder them to complete this task. Students evaluate on their own the questions of how much their inner desire motivated them to complete this task, and how much motivation was exclusively external. Or they admit that initially they took this task as a necessary part of the learning process ("as a must"), and then they were able to capture their creative self-efficacy determining both the process of task execution, and its result. Students worry about how much their personal creativity will determine the teacher's assessment and express the opinion that traditional methods of assessment are ineffective here. They also assess the content of this task with professional skills training: how creative artistic tasks are related to the current profession, to the development of professionally essential qualities, how practicable it is to spend time and energy to perform this kind of task, if there are other time-consuming tasks the professional focus of which is undoubted, etc. There are also internal obstacles for students to present their creative art works in the group. As a rule, the group becomes more sympathetic after demonstration of such tasks, but this is preceded by fears of condemnation from other students or the teacher.

The most important point in the ABP learning is to understand what the personal aesthetic experience of students is and how it can affect their professional activities. This experience can be negative or positive, and the main thing is that it becomes a subject of reflection. Students can understand that creative artistic tasks stimulate out-of-the-box-thinking, which can be professionally relevant. But they can also see that their professional area does not require special aesthetic experience and that their aesthetic experience can be standardized and minimized depending on their professional workload. Assessments of the learning process where such creative artistic tasks exist will also matter. Students can experience moments of "genuine learning" when they reflect on various stages of their attitude to this task, its progress and assessment. They can see that a teacher focuses on their unique personal qualities, their personal experience, and their personal creativity, and thus strengthen interaction with a teacher, gain experience of positive interaction, and strengthen the possibility of such interactive communication in other educational practices [64].

There are many professional practices where the focus is on science instead of creativity, on acquisition of certain knowledge and following instructions to perform a number of mandatory professional functions. Performance of creative artistic tasks, both individual and group, introduces creative forms of activity into professional training, where there was no place for them earlier. Reflecting on one's creative potential can cause stress, the same as the process of developing an idea for creative implementation, lack of creative skills, and the need to spend a lot of time on this kind of task is stressful. It requires a

certain teaching effort, interaction of students with a teacher to reduce this stressful load and overcome possible crisis moments. Teachers may also face a situation where students already have a large workload in other academic subjects, including those required for their specific professional education, so it is necessary to take this load into account and explain to students that performance of a creative artistic task will not impede their training in other academic disciplines.

New assessment criteria are being developed for ABP learning, approaches to which vary from a complete rejection of traditional assessment methods to a combination of traditional and new assessment methods. Performance of a creative artistic task in professional education can be evaluated by several factors:

- 1) message clarity and intelligibility;
- 2) encouraging the intended use;
- 3) full expression of ideas;
- 4) demonstrating an effective process of developing ideas and implementing them;
- 5) developing the abilities for thinking (creativity, selection of an idea) [65].

There is a number of arguments related to the refusal to assess a creative task in any way, since such assessment does not correspond to the essence of the creative process and may reduce internal motivation to perform this task as creative and focused on the manifestation of the existing personal abilities.

Criticism of constructivist pedagogy is particularly evident in the discussions around mathematical education. This is about the so-called "math wars" that unfolded around teaching mathematics in high schools in the United States in the 1990's. Parents and mathematical scientists protested against the country-wide introduction of mathematics textbooks based on constructivist approaches and containing no standard mathematical methods. For example, it was suggested that the circle area formula should not be communicated to students, but derived by them in the classroom. Or it was suggested that school experiments, traditional for demonstration in primary classes, should be "developed" in the classroom first, and then shown as a matter of course [66; 67].

Some constructivist teaching methods were critically evaluated as, according to critics, they focused on a higher level of thinking skills than it could be expected from students of a particular age. These situations were especially vividly discussed when it came to knowledge in the field of social sciences and learning to write [68].

As a rule, proponents of constructivist approaches argue that there is no need for extremes and that constructivist methods complement traditional approaches. These techniques allow to take into account personal and specific circumstances to involve students in the learning process and make this involvement more efficient.

Results and discussion

The growth of educational practices related to e-learning and distance learning technologies is accompanied by an active public discussion indicating a decreasing efficiency of education outside of active interaction between teachers and students, between students and students. However, the criticism itself does not mean that this efficiency decrease cannot be overcome. On the contrary, online learning contains a number of opportunities that can be introduced into the educational process by focusing on constructivist teaching methods and will make its positive results more apparent.

Reliance on communication and social skills, and intellectual collaboration distinguishes constructivist teaching methods from learning through memorizing the content of lectures, repeating it, and working alone.

It seems that e-learning in the social sciences and humanities can mostly be organized relying on the encouragement and development of intellectual cooperation, social and communication skills. The discussion format fits into a lecture session for a total of up to a third of time allotted for lectures. This discussion format is supported by almost all existing online education platforms.

Among multiple online courses presented on the Russian open education platform, the English-language course "Why we post: the anthropology of social media" attracts special attention [69]. Already in the introduction, it is reported that this course will not be a monologue. And throughout the time, this dialogue is encouraged by both visual images (students are always addressed by a team of teachers-researchers, not just one lead teacher), and the choice of tasks and assessments. Thus, after asking students to answer the questions of the first test and choose the answers that seem correct to them, when checking the correct answers, a student receives a message that all his/her answers were correct and that there can be no wrong answers here. However, what we see is neither "flirting" with students, nor the desire to win their loyalty in an easy way, but a vivid demonstration of the fact that social anthropology (studying which is one of the mega-tasks of this course) has an interesting subject matter and every judgment here is perceived not as "right" or "wrong", but as having the right to exist and as a starting point for research and reflection.

Based on the analysis of this open online course and a number of others, it is possible to identify the formats of classes encouraged by the constructivist pedagogical paradigm that will become more feasible and more widespread with e-learning. We are talking primarily about bachelor and master degree education, the level of school education is not discussed here, although it is not excluded in principle.

1) discussion of the results of experiments, which students conducted independently and which differ in a number of aspects, complement each other, expand the content of the studied subject matter, in online educational environment;

2) students conduct research projects in the discipline they are studying and talk about the weekly progress of their research and intermediate outcomes online; research projects related to digital data, social media, and other formats of communication and social interaction that are relevant to students themselves are quite efficient;

3) virtual group tours, when a group of students together with a teacher makes a virtual tour, where the concepts and methods studied can be presented in a real or realistic context and during the subsequent group discussion it becomes clear how these concepts and methods were implemented in the place of visit;

4) watching and subsequent discussion of films, where theories and methods obtain visual form and increase the context of perception and discussion in online formats;

5) continuous group discussions in online e-learning formats with a teaching task to involve all group participants in the discussion and preliminary clarification of social and cultural context for possible positions of students that appear during these group discussions [70].

Similarly, the electronic educational environment provides new opportunities for adequate assessment through the use of constructivist assessment approaches. Thus, the possibility of online video and audio recording of group discussions provides the teacher with the material for a more detailed assessment of the role of each student in the organized group discussion of the studied material. Teachers can use the observation method more

efficiently to assess students' progress in studying certain material. For proper assessment, the pre-testing is also important, which becomes extremely convenient in electronic form. A teacher gets an opportunity to understand which background knowledge the students had when they came to study a new topic and manage the process of studying this topic corresponding to the level of this knowledge.

Probably, a storm of criticism that descended on e-learning and distance education formats is associated with insufficient competence of the teacher who is not aware of all opportunities offered by these educational formats and does not know which methods of interaction between a student and a teacher and between a student and a student can be mobilized and developed through e-learning platforms.

In this context, of no small importance is probable decrease of students' fear of being criticized by both the teacher and other students if social interactions take place in online formats. After all, these formats allow a student to manage their actions depending on the context of discussion and feel freer in choosing their communication practices.

Conclusion

Over the centennial timeline of the constructivist pedagogical paradigm, it has demonstrated both its strengths related to the need to recognize an active role of student, and its weaknesses related to the speed of studying the material and the danger of "reinventing the wheel" in the era of rapid scientific and technological growth. We may admit the formation of a certain balanced position of teachers-researchers and teachers-practitioners, where the traditional pedagogical paradigm and constructivist methods coexist increasing their strengths and reducing possible risks.

E-learning and distance education technologies at the first stage of their mass implementation can lead to a certain loss of effect of constructivist teaching methods based on the active and group interaction between students and teachers, joint and interested discussion, taking into account personal experience and socio-cultural conditioning of the cognitive process. It may seem that e-learning and distance education technologies enhance educational methods related to the exact reproduction of lecture material, which is also checked by testing in the electronic format.

In fact, the exchange of ideas, generation of generally valid knowledge, adjustment of mental schemes depending on social and communicative context, conceptual conflicts and debates, reliance on personal experience, exchange of experience between students, consideration of real situations, including those experienced by students, support of students in their personal crisis situations related to the task, or study of a new topic – all these aspects so important for the constructivist pedagogical paradigm are complicated by formats of distance learning technologies.

However, these difficulties can be overcome, and the positive effects can be enhanced, if a number of new practices are introduced into the educational process, including the creation of new textbooks focused on e-learning and distance education technologies. These new textbooks should be initially placed in an open discussion space for teachers, so that their discussion and possible testing would attract as many researchers and practitioners as possible. And, of course, the most important thing is the use of these textbooks in a specific university environment, since their efficiency depends on the social and cultural environment that determines the cognitive abilities of students and which comes into certain conflicts

with the socio-cultural communicative and cognitive environment of a particular university that is relevant to students.

Further research will be related to the discussion of approaches to create textbooks focused on e-learning and distance education technologies and based on the principles of recognizing the crucial importance of students' proactive attitude. These principles created by L. S. Vygotsky are recognized and practically implemented all over the world today. All the more significant is their efficient implementation in new educational formats, which are materializing into an everyday pedagogical reality before our eyes.

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