Productive University Education in the Context of Human Capital Development

Elena Yu. Ignateva [1,2][ORCID 0000-0002-1521-5018],
Svetlana N. Gorycheva [1][ORCID 0000-0002-6160-134X],
Marina V. Zvyaglova [1*][ORCID 0000-0002-7536-1957],
Sergey M. Yolkin [1][ORCID 0000-0001-5998-7215]

[1] *Yaroslav-the-Wise Novgorod State University, Veliky Novgorod, Russia*
[2] *St. Petersburg Academy of In-Service Pedagogical Education, Saint Petersburg, Russia*
Marina.Zvyaglova@novsu.ru

ABSTRACT

The article discusses the problem of productive education at a university, identifying its general didactic structure. In the context of the development of human capital in the knowledge economy, an overview of the most significant areas of transformation of higher education is given. The urgency of the idea of productive education as a promising educational format, implying two lines of productivity, has been substantiated. The first line is associated with obtaining an external observable product of educational activity (for example, a solution to a case or a created project). The second line of productivity is internal personal increments that arise in the process of carrying out this activity. The fundamental position of the authors regarding the systematic approach when considering productive education. On the basis of theoretical analysis, the authors identified a general didactic structure of productive education, independent of the level of higher education. This is a system that includes goal-setting based on the principles of practice-oriented education and quasi-professionalism; content in the form of systemic generalized knowledge; problem, project or case study technologies; reliance on the existing stock of specific knowledge; evaluation of the external product (as an alienated result) and the internal product (personal increments), interdependent among themselves. Particular attention is paid to the harmonization of the content and procedural aspects of productive education in the article. The article provides examples of courses / modules implemented in the logic of productive education in bachelor, master, and postgraduate studies. The analysis of the didactics of the courses allowed the authors to assert about their general structure, independent of subject specificity. The feedback results obtained by various qualitative methods demonstrate the productivity of these courses for students, which is expressed in the experience gained and the independent acquisition of new knowledge, in the practical testing of knowledge and in the quasi-professional context of learning, subjective involvement in educational activities and awareness of external and internal results.

Keywords: human capital, productive education, systemic generalized knowledge

1. INTRODUCTION

In the era of post-industrialism, the most important driver of the economy is human capital, which includes "knowledge, skills and attitudes that allow a person to create income and other useful effects" both for the individual himself, his employer, and society as a whole [1]. The connection between human capital and education is obvious [2, 3]. Education strategically acts as an investment rather than a costly sphere. Investment in education is investment in the future. Today, it can be assumed that future changes will be associated with the penetration of artificial intelligence into all spheres of society. This new reality will place different demands on people employed in the knowledge economy.

The intellectualization of the economy cannot but affect the higher education that the cadres prepare for the economy. There is an active debate on how to train students to work alongside highly intel-

ligent machines. There is a general trend associated with the personification of education, with the priority development of flexible skills, creativity, universal skills and positive social attitudes, self-organization, etc. [4-7]. This process is associated with digitalization [8]. The relationship between various personal qualities (for example, benevolence, conscientiousness, extroversion, etc.) and creativity are investigated [9] in order to understand how to harmonize the learning process. In the context of education, the conclusion is made about the need to strengthen the accent in the phrase "human capital" on the first word – human [7, 10]. Of particular importance in the creation and development of human capital is knowledge management, which contributes to the transformation of human resources into capital [11].

One of the promising ideas in the modern world is productive education. The relevance of the idea is largely due to the ideology of the consumer society, which focuses on specific perceived results in any field of activity. In modern pedagogy, the terms "productive technologies", "productive thinking", "productive tasks", "productive educational activity", etc. are actively used.

The history of the formation of the theory and practice of productive education began at the end of the 19th century and is associated with the names of foreign and Russian educational researchers. A new round of interest in productive education (more often the term "productive learning" was used) began in the 1970s [12, 13].

The essence of productive education comes from the concept of "product", i.e. the result of effective education is usually a product.

We agree with A.V. Khutorskoy, that it makes sense to talk about two types of products of educational activity – results that condition each other – external and internal [14]. External products are some observable results, evidence through which the course and acts of activity can be observed. Internal products are difficult to observe, as a rule, delayed results in the form of personal gains. But it is for them that educational activities are carried out. The idea of student involvement in activities, "learning through activities" – is the principled position of productive learning.

The development of the practice of productive education at the university has determined the need for scientific comprehension of this phenomenon from the standpoint of didactic knowledge at different levels of higher education.

2. MATERIALS AND METHODS

Purpose of the article: substantiation of the general didactic basis of productive education based on generalization of the experience of its implementation at the university (on the example of training courses for bachelor's, master's, postgraduate studies).

The research tasks are presented in the form of research questions:

1) What is the general didactic basis of productive education?

2) What practical examples of courses can be attributed to productive education?

3) How are the training courses of productive education perceived by the trainees?

Research methodological apparatus: systemic, activity-based, and constructivist approaches, comparative didactic analysis, qualitative methods of obtaining feedback in teaching.

3. RESULTS

When building a general didactic basis for productive learning, we will rely on the characteristics of activity (subjectivity, activity, purposefulness, objectivity and awareness).

From the standpoint of the activity approach, the subject's active position of the student is a necessary condition for productive education. Problem-based, project-based training, case technologies [15], and leadership practices [16] meet these requirements. Productive education is distinguished by practical orientation and quasi-professionalism, which are realized at the stage of goal-setting [17].

In this context, the question of educational content is natural. Unfortunately, the analysis of the practice of project-based education allows us to conclude that the most important principle of productive education, concerning the content of education, is being violated.

This principle proceeds from objectivity as a characteristic of cognitive activity – activity is always objective, and mental action is meaningful. "... the mind develops only in real knowledge, that it cannot be broken, like some steel spring, and that the mind itself is nothing but well-organized knowledge," noted in his time K.D. Ushinsky [18].

Cognitive activity unfolds on a certain educational content, the development of which is one of

the obligatory results of this activity. The specificity of productive learning is that the content is offered in the form of systemic generalized knowledge. Systemic knowledge performs connecting, organizing and orienting functions, explaining the phenomena of reality at a high level of generalization. Their formation is associated with their transfer to new situations and conditions, for solving theoretical and practical problems. Systemic knowledge, by its nature, acts as a means of communication between the individual and the surrounding world. Their assimilation contributes to the formation and formation of the personality itself. However, the implementation of the functions of systemic generalized knowledge will be possible if they become an element of the "personal situation", i.e. meaningful specifically for each student. The organization of the process of their formation is associated with the solution of the issues of selection of the necessary material in the course with the isolation of basic concepts, leading ideas; identifying the features of the construction of the selected material; organization of teacher and student activities. For their assimilation, students' activity with adequate content is necessary, the result of which will be the mastery of systemic generalized knowledge as a result and as a means of cognition of the surrounding world. The teacher creates conditions that allow the student to identify, generalize the connections and dependencies characteristic of the given content, to systematize them. Such conditions are created when organizing students' actions aimed at actively transforming the object of study. The study shows that the effectiveness of the implementation of these actions presupposes the organization of independent cognitive activity of students at all stages of cognition. At the stage of studying new material, the key moment will be the development of knowledge previously studied and appropriated in combination with new educational material (constructivist approach).

The specificity of the assessment process in productive learning is that both results / products are important – the cognitive activity itself and the project itself as its result. The combination of effective and procedural approaches makes it possible to implement the modern trend in assessment – diagnostics of the dynamics of educational achievements [19]. Thus, the assessment of educational activity itself as a process of growing internal results allows one to diagnose the acquisition of an internal result by a student as the main product of training.

Thus, the general didactic structure of training courses in the context of productive education does not depend on the level of education and includes:

- goal-setting based on the principles of practical orientation and quasi-professionalism;

- the content of the training course based on the extraction of systemic generalized knowledge and leading ideas;

- problem, project, case study technologies;

- reliance on the available minimum necessary baggage of specific knowledge;

- evaluation of the external and internal product, interdependent among themselves.

When assessing the effectiveness of productive education at the level of mastering systemic generalized knowledge and determining the indicators of their assimilation, one should take into account the following factors. First, we should remember about the ability to express the student's own attitude when solving problems of objectively reflected reality, and second, the student's ability to use the acquired systemic knowledge as a means of establishing the relationship between the past and the present, knowledge of today and forecasting the future.

Here are examples of the organization of productive education in different courses/modules for different levels of higher education.

We will demonstrate the structuring of the content of the working program using the example of the course "Theoretical Foundations of Pedagogy", section "General Pedagogy and Theory of Education" (1st year of study). Topic 1: Pedagogy in the System of Humanitarian Knowledge. The leading idea of the topic: *Pedagogy occupies a special place in the system of humanitarian knowledge and aims at the study of the processes of education, training and personality development.* Key concepts: *Pedagogy, education, training, development, upbringing, methods of pedagogical research, the system of pedagogical sciences.* Technologies and forms of organization: *Workshop, mini-lecture, reading text with markup, group work, discussion, brainstorming.* Reflection: *cinquain.* Assignment for the student's independent work: *to draw up a memory map on the topic, create a diagram that reflects the relationship of pedagogy with other sciences and reveals the system of pedagogical sciences.*

The module for bachelors "Socio-pedagogical Diagnostics" (2nd year of study) includes three educational elements, united by the logic of preparing the future social teacher for the study of personality, family and society by methods and diagnostic techniques through their quasi-professional application. For example, when analyzing a questionnaire as a

diagnostic method, students develop a questionnaire for students and parents on a given topic. The logical conclusion of the study of the module is the analysis by students of pedagogical situations in accordance with their vision and the choice of methods and techniques for carrying out diagnostics of the child, family and the surrounding society. In the course of training, students create their own methodological and diagnostic portfolio.

The study of the module for bachelors "Technologies for the Work of a Social Teacher with Various Categories of Families" (3rd year of study) results in the development of a program of social and pedagogical work with an incomplete or substitute family. The content of the module is structured in such a way that in the process of studying topics, students' knowledge is increased in the areas of activity of a social teacher, forms and methods of his work with the family, the existing programs of social pedagogues are analyzed.

The mastery of the modules' content ends with student feedback structured according to the "Square of Impressions" technique (What did you like? What remained unclear? What do you suggest to include in the course? What knowledge and skills will you apply in the future?).The following answers are the most common: "Theoretical material was constantly translated into practical actions" (Natasha K., 2nd year); "It was interesting to study this or that method, and then try to implement it in practice" (Alena S., 2nd year); "For the first time I developed the program myself, and not just told the teacher what I knew about the subject" (Natasha E., 3rd year); "I believe that the knowledge and skills gained will be useful already during the practice period" (Vadim S., 3rd year).

Graduate students majoring in "Management of Education" carry out the project "Program for Studying the Effectiveness of one of the Strategic Directions in the Development of Education". The educational process, as an object of research within the framework of this course, acquires a specific (product) presentation in the form of such a program. Graduate students have the opportunity to choose the direction of upbringing that is closest to their interests, but at the same time they acquire generalized knowledge of how and with what diagnostic tools it is possible to study its effectiveness, how such a program is built in principle. In this case, the necessary basic knowledge is the knowledge of the educational process itself, obtained earlier.

The external product of the course "Pedagogy and Psychology of Higher Education" for each post-graduate student is a project of their own academic discipline, built on the basis of the new scientific knowledge acquired in the field of their scientific interests. Practical orientation in this case is associated with the sphere of scientific interest of each post-graduate student and the need of the university to develop new modern training courses. The post-graduate student takes from this course a generalized knowledge of the features and algorithm of pedagogical design. In this case, the project technology optimally corresponds to the goals of productive education. This option is well suited for post-graduate students in the 2nd and 3rd years of study, when they are already deeply immersed in their research. In the 1st year of post-graduate school, as our experience shows, it is perceived more difficult, but it acts as an additional incentive for the graduate student to deepen his scientific topic. Postgraduate students from different areas of training are involved in the discussion of new training courses, as a result of which everyone builds a generalized systemic idea of pedagogical design. The teacher also finds himself on the field of subject knowledge that is new to him, the result of the design is largely unpredictable. The teacher and post-graduate students study together, which is one of the hallmarks of productive learning [16].

Feedback (the "HIMS" technique) made it possible to identify the positive aspects of productive education: "I liked developing my own course, which helped to look at my dissertation from the outside and see a new application of the material"; "Experience in developing your own program"; "The most important for me were questions related to psychological development during training, since the answers can be applied both to myself and to the audience of the lectures; about adjusting your teaching (to build the order correctly, think about which way of obtaining information is the most productive, etc.) and about adjusting your lectures (take into account the age of the audience and the psychology of this age, psychological and information security)". The main problem for the post-graduate students was the lack of time allocated for the study of the course.

4. DISCUSSION

The research carried out made it possible to pose new debatable issues on the didactics of productive education.

Scientists offer a wide range of methodological approaches to productive education [12]. However, this list does not include the systems approach,

which, we believe, should lead it. Any pedagogical phenomenon (occupation, project, educational process, etc.) is systemic. Harmonization of the content and procedural aspects of education in the process of achieving the goal and forming the products of educational activity is a didactic axiom.

The implementation of the principle of practice-oriented productive education led to the question: is a real connection with practice obligatory? We believe that quasi-professionalism is enough, it is not necessary to always choose real topics of projects based on the requests of real organizations in different fields of activity, although this direction is now being actively promoted. There are undoubtedly advantages in this, in particular, an increase in the student's interest in the real result of the project, the potential opportunity to interest organizations in the use of the project (i.e., the commercialization of knowledge). But we also see a disadvantage in this. After all, the main activity of a student is cognitive activity, and the internal result is much more important than the external alienated product of this activity. Otherwise, we observe a shift in markers in activity - it already looks more like a business than a learning process. At the same time, one must not forget that "activity and consciousness", according to S.L. Rubinstein, "form an organic whole" [20].

The issue of approaches to the formation of educational content is also disputable. We have applied an approach based on the isolation of generalized system knowledge. We believe that other approaches can be used, for example, based on concepts or "big ideas". Revealing the specifics of different approaches to the formation of educational content in productive learning requires further research.

Discussion is unfolding in relation to methods and technologies in productive education. To assess the effectiveness of productive education, we used qualitative methods. Of course, in the light of the growing interest in evidence-based pedagogy, quantitative methods are also advisable.

Thus, the field of discussion in the didactics of productive education is quite wide.

5. CONCLUSION

In the knowledge economy, its effectiveness is determined, first of all, by the quality of human capital, which is primarily created in the system of higher education. One of the possible ways to increase the adequacy of education to the requirements of the modern VUCA-world, the authors see in the idea of productive education.

Analysis of the theory and practice of productive education at the university made it possible to highlight its general didactic structure. It is advisable to implement the goal-setting stage on the principles of practical orientation and quasi-professionalism, focus on solving applied problems. At the same time, the educational content is formed at the level of leading ideas and systemic generalized knowledge that ensure the fundamental nature of education. Activity learning technologies (problem, project, case technology and others) guarantee the subject position of the student, his involvement in educational activities. The productivity of education is expressed in the results of two types: visible, external – alienated from students the results of their educational activities (projects, solving cases, reports, etc.) and internal, implicit, personal increments and transformations.

Analysis of different courses in bachelor, master and postgraduate programs showed that the revealed didactic construct of productive education is clearly defined in their construction, organization and implementation. Qualitative methods made it possible to assess the productivity of the courses for students (external and internal results).

A more detailed identification of the didactic specificity of productive education at different educational levels seems promising.

AUTHORS' CONTRIBUTIONS

Elena Yu. Ignateva – development of the concept and methodology, substantiation of research tools; analysis of scientific literature and practical experience, revision of the text. Svetlana N. Gorycheva – development of the concept and research methodology; data collection; analysis of Russian-language literature; summing up the practical experience of organizing productive education at a university. Marina V. Zvyaglova – generalization of practical experience in organizing study lessons; analysis of English and Russian literature; structuring and revision of the text. Sergey M. Yolkin – generalization of practical experience in organizing study lessons; analysis of English-language sources.

REFERENCES

[1] "Twelve Solutions for New Education". [Dvenadtsat' Resheniy dlya Novogo Obrazovaniya], Report of the Center for Strategic Research and the Higher School of Economics, 2018. (In Russ.). Retrieved from https://www.hse.ru/data/2018/04/06/1164671180/Doklad_obrazovanie_Web.pdf

[2] G.A. Klucharev, I.G. Dezhina, "Russian Education for Innovative Economy: "The Pressure Points"", Sociological Studies [Sotsiologiches-kie Issledovaniya], 2018, vol. 9(413), pp. 40-48. (In Russ.). DOI: 10.31857/S013216250001957-5

[3] D. Acemoglu, J.D. Angrist, "How Large Are Human-Capital Externalities? Evidence from Compulsory Schooling Laws", NBER Macroeconomics Annual, 2000, vol. 15(1), pp. 9-59. DOI: 10.1162/08893360052390220

[4] J.E. Aoun, "Robot-Proof: Higher Education in the Age of Artificial Intelligence", New York, London: MIT Press, 2017, 216 p.

[5] E.F. Zeer, V.S. Tretyakova, M.V. Zinnatova, "Innovative Model of Socio-Professional Development of a Student's Personality", The Education and Science Journal, 2020, vol. 3(22), pp. 83-115. (In Russ.). DOI: 10.17853/1994-5639-2020-3-83-115

[6] C. Tripon, "21st Century Learner- Soft Skills Case", European Proceedings of Social and Behavioural Sciences EpSBS, 2018, vol. 67, pp. 37-44. DOI: 10.15405/epsbs.2019.08.03.5

[7] L.N. Stepanova, E.F. Zeer, "Soft skills as predictors of students' life self-fulfillment", Education and Science Journal, 2019, vol. 21(8), pp. 65-89. (In Russ.). DOI: 10.17853/1994-5639-2019-8-65-89

[8] V.S. Efimov, F.V. Lapteva, "The future of universities: is digitalization the priority? (Expert view)", Journal of Siberian Federal University. Humanities and Social Sciences, 2018, vol. 11(12), pp. 1925-1946. DOI: 10.17516/1997-1370-0367

[9] M. Jirásek, F. Sudzina, "Big Five Personality Traits and Creativity", Quality Innovation Prosperity, 2020, vol. 24(3), pp. 90-105. DOI: 10.12776/qip.v24i3.1509

[10] A. Asmolov, M. Guseltseva, "New view on education: from paradigm of technology to paradigm of value", European Proceedings of Social and Behavioural Sciences, 2019, vol. 64, pp. 33-39. DOI: 10.15405/epsbs.2019.07.5

[11] S. Yahya, W.-K. Goh, "Managing human resources toward achieving knowledge management", Journal of Knowledge Management, 2002, vol. 6(5), pp. 457-468. DOI: 10.1108/13673270210450414

[12] D.A. Antonova, E.V. Ospennikova, "Methodological Bases of Productive Learning", Pedagogical Education in Russia, 2020, vol. 6, pp. 163-173. (In Russ.). DOI: 10.26170/po20-06-19

[13] M.I. Bashmakov, "What is productive learning?" [Chto takoye produktivnoye obucheniye?], in Book: Theory and practice of productive learning [Teoriya i praktika produktivnogo obucheniya], Moscow: Narodnoye obrazovaniye, 2000. pp. 6-14. (In Russ.).

[14] A.V. Khutorskoy, "Didactics" [Didaktika], Saint Petersburg: Piter, 2017, 720 p. (In Russ.).

[15] E. Kolomiiets, "Productive learning technology as means of education quality provision", Continuing Professional Education Theory and Practice, 2019, vol. 1(58), pp. 42-45. DOI: 10.28925/1609-8595.2019.1.4245

[16] D. Hayes, P. Christie, M. Mills, B. Lingard, "Productive leaders and productive leadership. Schools as learning organizations", Journal of Educational Administration, 2004, vol. 42(5), pp. 520-538. DOI:10.1108/09578230410554043

[17] G.A. Stepanova, A.V. Demchuk, M.R. Arpentieva, "Modern strategy of renewal and development of education: crisis, problems, solutions", The Humanities, 2020, vol.4(52), pp. 19-31. (In Russ.).

[18] K.D. Ushinsky, "Man as a subject of education: Experience of pedagogical anthropology" [Chelovek kak predmet vospitaniya: Opyt pedagogicheskoy antropologii], vol. 1, Moscow-Leningrad: Academy of Pedagogical Sciences of Russia, 1950, 777 p. (In Russ.).

[19] V.V. Vonog, L.V. Yarotskaya, "Learning individual's development as function of productive assessment", Asian EFL Journal, 2018, vol. 20(6), pp. 429-449.

[20] S.L. Rubinstein, "Fundamentals of General Psychology" [Osnovy obshchey psikhologii], Saint Petersburg: Piter, 2002, 720 p. (In Russ.).