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PROBLEMS OF AN INTERDISCIPLINARITY IN COMPARATIVE EDUCATION IN THE INFORMATION AGE

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Abstract

The article is devoted to the topical issues for the methodology of modern comparative research in education, which at the moment in the information age should be interdisciplinary in describing and explaining the educational phenomena and practices; build on the results of research in other areas of knowledge and carried out by specialists from different scientific fields. In modern conditions, the interdisciplinary of comparative research requires an expansion of the framework of this approach, their orientations to results of new disciplines taking into account electronic means of the analysis and assessment of data with the prospect of moving from interdisciplinarity to transdisciplinarity. The interdisciplinarity in comparative research is studied in the works of foreign and domestic scientists. The article says that in different states of the post-Soviet space. Various problems of interdisciplinarity are explored in the context of comparative pedagogy. The article explains the concept of the local interdisciplinarity which applied in modern comparative pedagogy; the concepts of comparative and comparativist studies are explored on the basis of the morphemic analysis of the suffix use in Russian and English; the results of the analysis of interdisciplinary indicators in the field of educational institutions, including the digital environment, are presented; reveals some aspects of expertise available in an interdisciplinary perspective.

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Keywords: Interdisciplinarity, comparative research, post-Soviet educational space, educational environment, expertise of educational achievements.

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1. Introduction

"Ainsi entre le regard déjà «codé»
et la connaissance réflexive,
il y a une région médiane
qui délivre l'ordre en son être même."
M.Foucault

The comparative pedagogy faces the problems of determining, understanding and interpreting of the most important theoretical grounds for a comparative research in the field of education, which can and should be built on these grounds in the modern conditions of the development in the information society. For a long time, they remained descriptive without explanation and comprehension of complex educational phenomena what was not allowed to see the prospects for the development of educational paradigms. At present, it becomes obvious for comparative scientists «… the need of developing the their scientific apparatus by the comparative pedagogic and to build their own theory of cognition if it is necessary to justify a new cognitive attitude in understanding the evolution of the world educational space in connection with its global transformations in the new ideology context of the educational progress in information age» (Tagunova, 2012, c. 17).

It should be noted that already today interdisciplinary permeates different parties and aspects of education at different levels (psychology, sociology, mathematics, culture, ecology, etc.) including actually the pedagogy. This applies not only to the field of comparative research in pedagogy. The relevance and necessity of precisely fundamental research, which makes it possible in general to rethink the methodological approaches to their implementation that it would be adequate to the current situation in pedagogical science and most scientists of different countries rightly point out practice. For example, some domestic and foreign experts note the low quality of research in the field of education, the weakness of methodological positions and principles; the discrepancy of the research tools with them, which often does not allow to recreate the integral picture of the studied pedagogical phenomena, comprehend them and give them an explanation (Bondarevskaya, 2012; Cyrkun, 2011; Fel'dshteyn, 2011; Landman, 2003; Little, 2000; Vavrus, Bartlett, 2009). The comprehension by the scientist-educators of the basic directions and laws of the development of pedagogical science from the standpoint of an interdisciplinary approach (Ivanova, 2016) would allow "... to increase the productivity of research practice, to implement a more adequate description, reasoned explanation and accurate forecasting of changes in pedagogical reality" Kuharchik, 2005, p. 75).

The great Foucault pointed out (see the epigraph) that between the codified view (in our understanding – the traditional monodisciplinary study) and the interpretation of the results in comparative research exists an intermediate area that reveals the essence of phenomena (let us call this area interdisciplinarity) (Fuko, 1977).

2. Research Questions

The object of our study is interdisciplinary comparative studies in general terms and specific studies relating to different fields of knowledge including the educational sciences. "The science about education" is the accepted and most widely used term in the world educational space, which maximally

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reflects the Russian understanding of pedagogy as a science about education. In the literal meaning of the term "pedagogy" as a science of education is used only in a few countries. More often pedagogy is understood as didactics in these countries. Undoubtedly, one cannot say that pedagogy and didactics are complete synonyms, but quite often, they are synonymous. Differences between pedagogy and didactics are defined in this way: pedagogy is aimed at the practice of teaching pupils in the classroom and didactics – on the reflection on the transfer of knowledge (Linda, 2011). Therefore, the terms associated with single-root words to the word "pedagogy" will be understood as the science of education in the international classification of sciences. The pedagogy corresponds to educational sciences in the Russian classification of science.

3. Purpose of the Study

The purpose of the study is to explain the understanding of the concept of the local interdisciplinarity in modern comparative pedagogy; the concepts of comparative and comparativist studies on the basis of the morphemic analysis of the suffix use in Russian and English; and some aspects of expertise available in an interdisciplinary perspective.

4. Research Methods

The authors use the analysis of leading comparative studies in education, linguistic analysis of the basic concepts of the study, and the method of peer review.

5. Findings

Before analysing the leading comparative research which claiming an interdisciplinary leading in school education one should define the concepts: "comparative" and "comparativist" studies that are most often used by pedagogue-comparativist. Comparative studies on the semantics of suffixes (-ист) in Russian (-ist in English) are interpreted as studies belonging to comparative pedagogy. Or they have a synonym "comparative-historical". Interdisciplinary comparative researches are considered as clearly comparative. For confirmation, we give two examples in Russian and English. Russian example is explained our understanding of words: "gold" and "golden". “Golden” in the second case is the property of the object, which brings it closer to the "gold" by some indication. Therefore, we can say that the "gold" ring is a ring that is essentially gold and the "golden" ring is a ring that only seems gold. English example is connected with the words: “art” and “artist”. Therefore, a study of art is a branch study. However, a study of an artist is a study, which connected with the personal artist. Consequently, the "comparativist" study is not comparative but approaches it according to some criteria. Relationship with the field of research or with specific researchers determines the name of the study. Comparativist study is the connection with the researcher. Comparative is connection with the area. Thus, the presence of the suffix -ist changes the meaning of not only the title for the study but also its content (Ruchimskaja, 2013).

The area of study of many comparative scientists is a detailed study of the relationship between comparative education within the mono-discipline "pedagogy" with the historical pedagogy, theoretical and empirical pedagogy, didactics, the evaluation of results, management, etc. In addition, the

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interdisciplinary research in comparative pedagogy is characterised by an interaction between teachers, psychologists, sociologists, demographers, edumetricians, linguists, physiologists and others. Therefore, there is domestic multidisciplinarity and external interdisciplinarity because there is a unification of knowledge from different areas of pedagogy and from other sciences. One can call the method of conducting such research "locally multidisciplinary", since the educator, more often compares data in his research on the basis of literary sources of other researchers, although he uses factual information from other sciences and primarily from psychology, sociology and cultural studies. That is here we observe multidisciplinary only within the pedagogy itself. In the full sense such interdisciplinary studies cannot be considered even at the internal level of one science since according to Mirsky there are only two components of interdisciplinarity entirely: organizational and information (Lukatskii, 2016; Mirskiy, 1980, 2001), and the first methodological component is not perceived as a subject of research, which in education is multidisciplinary, but for comparative education by definition it is mono-disciplinary within comparative pedagogy.

Traditional science, as a rule, is mono-disciplinary. Interdisciplinarity is a new phenomenon that emerged in the middle of the 20th century. An interdisciplinarity is not yet formed as a separate science but actively comprehended by different scientists from different disciplines and different countries. More and more scientists are on the platform of interdisciplinary: a physicist cannot carry out research without mastering the mathematical tools; political scientist – without an involvement of sociology, history and economics; scientist of science - without linguistics and philosophy; edumetricians – without pedagogy, psychology, mathematics, linguistics, semiology. In general, today breakthrough researchers are at the intersection of sciences that is they are interdisciplinary. Interdisciplinarity is the virtual alliance of all the relevant objectives of the study of one discipline and goes beyond the theories and methodology of one discipline. Therefore, Benson in 1982 pointed out five arguments against interdisciplinarity in integration research:

1. A seriously confused awareness of interdisciplinarity in pedagogy (what, why and how to teach, train and measure results is the lack of meaningful goals of interdisciplinarity in standards, coupled with the class lesson system and the substantive teaching).

2. The doubtful pedagogical practice of inter-subject educational projects, when there is not enough time to assimilate the base of any of the participating disciplines.

3. Obstruction of the development of disciplinary competence at a proper mature level.

4. Intersubject education suffers from the insufficient rigour of scientific thematic training.

5. The relatively high cost of inter-subject teaching (Benson, 1982).

All five arguments can be heard today, not only from teachers but also from academic educators. More than forty years have passed and "things have not budged an inch". However, Benson indicated out that the comparative scientist faces an important and difficult work to find answers to these arguments not only intellectually but also politically. It is necessary to critically comprehend comparative studies of the integrative plan (so-called interdisciplinary at that time), mass comparative research are necessary, first, an interdisciplinary approach should be widely applied in dissertational studies, notes Benson. Therefore, it is necessary to increase the time for developing the foundations of interdisciplinary training and to increase the scientific rigour of interdisciplinary critical thinking (Benson, 1982).

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Today in the opinion of the majority of actively working both domestic and foreign specialists in this field, the prospects for the development of comparative research in education are associated with interdisciplinarity, which in their opinion provides the synthesis of scientific knowledge from different fields and disciplines. The interdisciplinarity allows using this knowledge for solving the tasks of pedagogy; every discipline appears in research only as a form of organisation of scientific knowledge the acquisition of which becomes possible because of interrelations between different branches of knowledge. There are also uses methods and technologies from different sciences thanks to which it becomes possible to effectively solve common problems for different scientific fields with the aim of obtaining a new interdisciplinary knowledge (Chernysheva, 2013; Kashaev, 2011; Boruha, Verzunova, 2012; Snopkova, 2015).

Russian scientist identifies (Creswell, Plano Clark, 2011) three main types of problems that can be solved because of interdisciplinary research – their attention is drawn to the mandatory components that make up the interdisciplinary study:

- Methodological (highlighting a single subject/object of research, which is of interest for different areas of scientific knowledge, scientific disciplines);
- Organisational (interaction of research participants, representing various scientific disciplines);
- Informational (interdisciplinary and multidisciplinary analysis of results, implementation of expertise, coverage of research results, an introduction of research results into practice).

Having conducted a detailed analysis of the state of interdisciplinary in modern science, Mirsky concludes that interdisciplinarity is developing as his own area of knowledge, he notes characteristic examples of extensive mastering of interdisciplinary content by other sciences (Lukatskii, 2016, c. 14).

Pedagogy already actively uses many components of interdisciplinarity, includes in its conceptual-categorical apparatus the appropriate terminology and vocabulary, the logic of the presentation of the material, the structure of the construction of interdisciplinary research. The application of the interdisciplinary approach as a basic, its methodological, theoretical and technological support, is for pedagogy an actual science problem. Today, educators understand that it is the use of an interdisciplinary approach that will create an interdisciplinary toolkit to develop in pedagogy " a real methodological dialogue and within the scientific reflection while maintaining the integrity of the pedagogical science as an independent discipline that has its own means and mechanisms of development and reproduction" (Lukatskii, 2016, c.115).

Comparative pedagogy (Vul'fson et al., 2013) is based on the results of researches obtained in other areas of scientific knowledge – in philosophy, cultural studies, sociology and psychology. So, for example, the known Russian comparative scientist Suprunova, addressing the problem of interdisciplinary in comparative pedagogy, in detail describes its relationship with other sciences, traces the dynamics of the development of these interrelations, substantiates the causes of their emergence, deepening and expansion. According to her, this is precisely the manifestation, on the one hand, of interdisciplinarity in comparative pedagogical studies. On the other hand, they are closely related to those areas of scientific knowledge that study man and society in the system of their interrelations and relationships.

According to the scientist, interdisciplinarity is manifested in the fact that comparative research is carried out, as a rule, in the context of the socio-economic, political and cultural development of the countries and regions studied (sociology, economics, political science and other social sciences). Based

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on a comparative analysis of the results in pedagogical research of Russian and foreign comparativists, Suprunova distinguishes five basic models of the connection between comparative pedagogy and other areas of scientific knowledge:

1) A critical and creative using the products of theoretical activity (designs, concepts, principles);

2) An application of methodological tools of other sciences;

3) The enrichment of the theoretical foundations of comparative pedagogy;

4) Participation of representatives of pedagogical comparativists in complex research related to the theoretical substantiation and development of issues of education and personal education;

5) The development of common concepts and terms in many sciences (Suprunova, 2015).

Another comparative scientist Tagunova writes about the possibilities of using synergetic methods in comparativist studies. Her research is used trans-disciplinary and technoscientific methods. In this direction, the researcher sees the prospects for developing an interdisciplinary approach in pedagogical comparativistics. Tagunova concludes that today due to the rapid development of psychology, the neuroscience is changing the methodology for conducting comparative comparativist research in education – it is deepened and expanded through conclusions and research results from other areas of scientific knowledge. There are changes in the conceptual apparatus of comparative pedagogy and approaches to the study of objects and the direction of research are becoming different. Transformation of monodisciplinarity in a comparative research into transdisciplinarity is marked. Tagunova notes that today it becomes necessary, conducting research in the field of education, "... constantly monitor the emergence of new approaches, the features of the rethinking of basic concepts, modern data obtained in other sciences (not always adjacent, social and natural science), which can have a serious impact on increasing the effectiveness and reliability of the knowledge of pedagogical science. Comparativistics should outstrip the development trends of pedagogy itself, promote its development, explain the possibilities in raising the scientific status" (Tagunova, 2016, c.116).

An appeal to an interdisciplinary approach is the subject of research by Russian specialists in the field of education as a whole (Boruha, Kashaev, Chernysheva and etc) and among comparative scientists of the near and far abroad (Cyrkun, Jaskevich, Snopkova – Belarus; Kusainov – Kazakhstan; Puhovskaja, Shimanovsky – Ukraine).

So the opinion of the well-known comparative scientist Snopnova deserves attention, she notes that the methodology of pedagogy has some a patterns of configuring the knowledge on an interdisciplinary basis – in her opinion, there are an "axonometric model" of Arlamov (2009) and synergetic models of very specific pedagogical phenomena. According to Snopkova, the actuality of the application the interdisciplinary approach in pedagogical studies and the prospects for their development on its basis are due to the specific feature of modern post-non-classical science based on the integration of natural, socio-humanitarian and technical discipline (Snopkova, 2013).

Koussainov is the founder of comparative pedagogy in Kazakhstan, the author of numerous scientific articles and monographs on pedagogical comparativistics, is also convinced that its further development will be based on an interdisciplinary basis (Koussainov, 2013). In our opinion, one can see the interpreting the research problems of improving the quality of education in the works of Koussainov.

Comparing the assessment of the quality of education in different countries, we distinguish the following approaches:

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1. Comparativist in the general sense.
2. Comparative-pedagogical (pedagogical comparativistics).
3. Collated (the experience of foreign countries).
4. Participative (participation in international studies for the quality of education).
5. Subject (curriculum).
6. Interdisciplinarity (local and internal).
7. Interdisciplinarity (external).

In the last decade, fascinating events took place around the world in the interdisciplinary design of the school's educational space, assessing the quality of education by different methods (multi-subject, intersubject, multiplex) (DeMarais, Narum, Wolfson, 2013; Naydenova, 2012). There is an interest in creating new, active, project-based learning spaces in each discipline.

The educational environment essentially becomes interdisciplinary: information technologies, communication in different symbolic languages, not only lingual, artistic education in other disciplines, pedagogical assistance, etc. New learning spaces are often flexible in size and location and differ significantly from the lecture hall of yesterday – today a new learning person is formed in such an environment (Suprunova, 2015). Today the nature of the educational activity is inherently based on teamwork and interaction, often virtual and geographically remote. Employers are looking for graduates who can be more productive in today's fast-growing economy. Flexible, multimodal and authentic learning spaces are created in schools. The ecosystem of education is quite complex and evolves right before our eyes. There is a transformation of the learning space (Department of Education and Training, 2010).

In the near future the educational environment in the school will have all the characteristics of an active learning environment – flexibility, mutual collaboration, teamwork, projects – and will add opportunities for the development of creativity and constructive thinking among all participants in the educational process, that is, the environment will become interdisciplinary in nature (Valenti, 2015).

Therefore, when assessing the quality of education, there is an interdisciplinary evaluation of the performance of the test, which is designed in accordance with an interdisciplinary approach, that is, the test is multidisciplinary and interdisciplinary. In addition, the social, emotional, valeological and another background of the learning process is taken into account with an assessment of the educational space in its formal, informational and informal components. It is necessarily in the multiplex to include individual indicators of the teacher's electronic portfolio with the addition of indicators on the skills of using information technology to enhance their professional development (Naydenova, Naydenova, 2016; Dudko, 2016).

Simultaneously with the transformation of pedagogy, there have been changes in the society – today schoolchildren are Millenium children or digital aborigines. They have been growing since birth in the digital environment, with the Internet and gadgets. Until now, the school offers education in the space chosen by the teacher, according to his schedule and in a style that is convenient for the teacher. Today's high school students do not accept this model, demand that education is offered in a space that is convenient for the student, their own training schedule both in terms of subjects and in terms of training time, in a style that fits modern realities. These spaces, schedules and styles are often radically different from those of traditional school education. Parents and students demand from the school better

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personalization, involvement and feedback, preparation for a faster entry into the labour market (Beetham, 2016).

"Smart class" is a new paradigm in school (Department of Education and Training, 2010). The classroom is connected the personal computers and Internet access with audiovisual equipment. A class with enabling technologies has become the norm not an exception. Nevertheless, the learning process by the teacher is almost the old, excluding the appearance of presentations and slide shows, and the learning space is focused on the teacher and focuses around the training board next to the teacher. Today the computing on tablets and smartphones is common. Wireless networks have become ubiquitous. There is no doubt that the penetration of technology into the educational process and into everyday life has changed people – interdisciplinarity pervades the person everywhere. This is in education: a single topic of training in different subjects of the curriculum, the use of information technology, the analysis and interpretation of data when interacting with different people inside the school, at home, on the street, in the cinema, etc.

There is another trend that arose from the ubiquity of the Internet. It is the desire of society to buy "virtual" goods instead of real ones. The music industry was the first to feel the influence of this trend, which was reflected in the youth environment. The schoolchild keeps his favourite photos, books, songs, etc. in the "cloud". In addition, the viability of online learning is very real and mixed instruction (the combination of online and schooling) already becomes the main method in primary school.

In a mixed learning model, the class becomes another kind of active and open learning. The Academy of Khan popularised the notion of an "inverted classroom" in which what was once a class (listening to a lecture from a teacher) is now a homework, and what was once a homework (problem solving) is now time in class (*Map to Khan Academy,*2017).

Students work in teams to solve problems that often have an interdisciplinary nature using technologies, competences from other areas of knowledge. These new active learning classes allow students to acquire exactly the skills that are required of today's graduates. New pedagogical approaches require new types of space. There is a rethinking of the nature of the learning environment as active learning and cooperation space. The paradigm of changes in the educational space makes it necessary to change the educational process, build a new system for analysing learning outcomes and examining educational achievements.

The system for analysing learning outcomes is an integral part of modern education quality assessment systems. The very quality of education, being an integral characteristic, requires an interdisciplinary approach to its measurement by interdisciplinary instruments (Lukatskii, 2016).

When assessing the quality of education, it is necessary to use control and measuring materials developed by analogy with the most modern comparative study of determining the level of preparation of modern high school students for training in modern educational spaces and for living in modern conditions in the era of informatisation (PISA – The Program for International Student Assessment). By the way, the next stage of this research (interdisciplinary in its essence) will actively use digital technologies in the organisation and its implementation. The test will be electronic.

Therefore, the study of the methodology for evaluating results in interdisciplinary research should be carefully studied and implemented in national systems for assessing the quality of education, with a focus on students' assessment of "what is good and what is bad" (Cooper, Robinson, Patall, 2006) in

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modern life and in this rapidly changing world (Creswell, Plano Clark, 2011; Rees, Main, 2015; (Tay, Diener, 2011).

Any measurement in the era of informatisation is conducted with using modern tools on methodology in two paradigms (quantitative and qualitative). Recently, a mixed or hybrid methodology has been used more often (Creswell, Plano Clark, 2011).

Examination of educational achievements is a process of evaluating educational achievements by different criteria by different specialists with the collection of various information. Again, we are observing interdisciplinarity: one subject of evaluation is a specially organised team of different specialists using interdisciplinary information support (Lukatskii, 2016).

When examining educational achievements, various aspects are being addressed. The issue of inverted learning is particularly relevant and consequently, the various components of the impact of homework on the quality of education, for example: "which method of evaluation is better?" (Bjerkaas, Wolberg, 2012); "does homework improve academic performance?"; comparability of the effectiveness of homework, carried out in writing or electronically (Cooper, Robinson, Patall, 2006), etc.

In addition, when we are examining educational achievements much attention is paid to the assessment for teacher training the learning of pupils. Among them, there are important aspects: pedagogical methods of teaching, professional development, the external educational level of the teacher outside the profession (Wenglinsky, 2001). Two hypotheses are proposed for analysing the results of such an examination in the framework of this comparative study under the auspices of the ETC – the testing service in education (USA):

1. Practical teaching methods will have the greatest impact on student achievement; professional development of skills is the next in importance and the general education of the teacher is the least. The rationale for this hypothesis is the following: the class is the main place in which teachers and students are participating, therefore, the decisions of the teacher as to what to do in this space will most strongly affect the results of the students.

2. All three criteria for the examination of educational achievements pertaining to the teacher are combined with the background of the student (family, social, emotional, etc.) to determine the impact on the quality of education. It is assumed that the training of students is the result of interaction between students and teachers, and both parties contribute to this interaction (again, interdisciplinarity).

Thus, Wenglinsky writes in the ETC report (Wenglinsky, 2001, p.8). This study reveals important relationships between aspects of learning. On the one hand, professional development seems to have a strong effect on the practice of the teacher in the classroom. And the more teachers improve their skills, working with special groups of students, the less likely that they will teach everyone weaker. The smaller sizes of classes are negatively related to the level of professional development.

Overall, this study reveals that school choice matters, because the school provides a platform for active teachers. Active teachers insist that all students grow up regardless of their external background indicators. Teachers adapt their methods to the knowledge and experience of each individual student. Schools in which there are few active teachers, not all criteria for the evaluation of the teacher may be of particular importance since their students will be able to achieve academic standards through their own talents and household resources. However, schools that have many active teachers can actually provide

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benefit, that is, improve learning efficiency. Thanks to their teachers, schools can be a key mechanism to help students meet academic standards (Wenglinsky, 2001, c. 31).

It is necessary to recognise the leading role of ETC in the United States and in the world in general educational space in the methodology of examination of educational achievements.

6. Discussion

Reasoning over such a concept as interdisciplinarity, we recognise that understanding its necessity, its "acceptance" is not easily accustomed to the pedagogical environment. So, a number of scientists write about interdisciplinarity as multidisciplinary learning (we call this type of quasi-interdisciplinarity internal or local within one area of knowledge). We propose to use the term "comparative" for comparative studies, in contrast to a number of scientists who call them comparativist. In our opinion, there can be no comparative study without comparing the quantitative and / or qualitative characteristics of this study with other studies, including comparisons of the definitions of the conceptual categorization apparatus, the descriptive definitions given, the methodology for analyzing the results of the study, the validity and reliability of the claimed interpretations, methods and modes of interdisciplinary expertise. Students are already trained in interdisciplinary areas and sciences. Thus, biophysics and biochemistry have become sciences, although they pass through the scientific classification as natural sciences, and physics and chemistry can equally well be attributed to exact sciences. There are new directions for students' training, for example, bioengineering, which is available in medical universities. Nevertheless, are there any teachers with the appropriate qualifications? So far, this is a question, at least in Russian education.

In addition, all this requires further reflection and development of methodological support for interdisciplinary research in the field of education and in the world educational space. In our opinion, today it is only the beginning of such a discussion.

7. Conclusion

An interdisciplinary approach to comparative research turns these studies into interdisciplinary studies in the presence of three factors: 1) methodological (single subject of research); 2) organizational (scientists and practitioners from several fields of knowledge work on solving the problem); 3) information (information is interdisciplinary, its analysis, interpretation and expertise is implemented by different methodologies).

The view from Russia and the countries of the post-Soviet space on interdisciplinary has more in common than excellent. All this is connected with the classification of pedagogy as a humanitarian science in these countries, the once-founded foundations of education systems.

The interdisciplinary nature of the educational environment was already clear to scientists and practitioners, teachers and schoolchildren, parents and the society. In the information age all subjects of education have faced a lifelong learning under different approaches.

International comparative studies show that improving the quality of education in the person of the learner depends on who teaches and on the one who learns.

Therefore, the examination of educational achievements includes at a minimum: assessing the creative activity of the instructor in his practice; immanent enhancement of their professional qualifications, including the measuring qualification of the teacher; the general level of the teacher (cultural, emotional, critical, creative, etc.) outside the scope of his subject; the level of competencies of students in various fields, including in interdisciplinary areas on informal education, in connection with personal, psychological, valeological, family, emotional and other background characteristics that personalize the student.

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References

Arlamov, A.A. (2009). Celostnost' metodologicheskih podhodov v pedagogicheskom issledovanii (universalizaciya i otnoshenie kompensatornosti). *Izvestiya VGPU, № 9*, pp. 14–18. [in Rus].

Beetham, H. (2016). *Employability and the digital future of work*. Proceedings of the 10th International Conference on Networked Learning Edited by: Cranmer S, Dohn NB, de Laat M, Ryberg T & Sime, JA.

Benson, T. C. (1982). Five Arguments against Interdisciplinary Studies. *Issues in Integrative Studies*, No. 1, pp. 38-48.

Bjerkaas, J., Wolberg, S. (2012). *Homework vs. Quizzes: Which Evaluation Method is Better? Master Teacher Program Library*. West Point, NY. Retrieved from http://www.usma.edu/cfe/SitePages/MTP_Projects_Search.aspx

Bondarevskaya, E.V. (2012). Gumanitarnaya metodologiya nauki o vospitanii. *Pedagogika, № 7*, pp. 3–13. [in Rus].

Boruha, S.Ju., Verzunova, L.V. (2012). Tehnologiya mezhdisciplinarnoy operezhajushhey podgotovki professional'nyh kadrov v usloviyjakh integracii obrazovaniya, nauki i proizvodstva. *Sovremennye problemy nauki i obrazovaniya. №4*. [in Rus].

Chernysheva, E.N. (2013). Perspektivy mezhdisciplinarnogo podhoda v nauke. Vestnik Rossijskogo jekonomicheskogo universiteta im. G.V. Plehanova. Vstuplenie. *Put' v nauku. №1 (5)*. pp. 85–90. [in Rus.].

Cooper, H., Robinson, J.C., Patall, E.. (2006). Does Homework Improve Academic Achievement? A Synthesis of Research, 1987-2003. *Review of Educational Research, 76(1)*. Pp. 1-62.

Creswell, J.W., Plano Clark, V. L. (2011). *Designing and conducting mixed methods research (2nd ed.)*. Thousand Oaks, CA: Sage Publications, Inc.

Cyrkun, I.I. (2011). Nereshennye problemy i strategii razvitija pedagogicheskoj nauki, *Adukacyya i vyhavanne., №8*. pp. 16–24. [in Rus.].

DeMarais, A, Narum, JL, Wolfson, A.J. (2013). *Redesigning Space for Interdisciplinary Connections*: the Puget Sound Science Center, Biochemistry and Molecular Biology Education (in press). doi: 10.1002/bmb.20715

Department of Education and Training. (2010*). Smart classrooms strategy 2011-2014.*. Queensland Government. Australia.

Dudko, S.A. (2016). *The role of information technologies in lifelong learning development*. EEIA-2016. Moscow, Russia, June 6-7, Retrieved from http://www.shs-conferences.org/articles/shsconf/abs/2016/ 07/contents/contents. html DOI: http://dx.doi.org/10.1051/ shsconf/20162901019

Fel'dshteyn, D.I. (2011). Psihologo-pedagogicheskie dissertacionnye issledovanija v sisteme organizacii sovremennyh nauchnyh znanij. *Pedagogika., № 5*. pp. 3–21. [in Rus].

Fuko, M. (1977). *Slova i veshhi. Arheologija gumanitarnyh nauk.* Moscow, Progress. [in Rus].

Ivanova, S.V. (2016). Sovremennye napravleniya sravnitel'nyh issledovaniy obrazovatel'nogo prostranstva . *Pedagogika., №7*, pp. 82–88 [in Rus].

Kashaev, R.S. (2011). Razvitie nauki i obrazovanija na osnove mezhdisciplinarnogo podhoda. *Uspekhi sovremennogo estestvoznaniya, №2,* pp. 82–87. [in Rus].

Koussainov, A. (2013). *Kachestvo obrazovaniya v mire i v Kazahstane*. Almaty. [in Rus].

Kuharchik, P.D. (2005). *Ontologicheskie i metodologicheskie osnovy razvitiya pedagogicheskoy nauki v sovremennykh usloviyakh: uchebnoe posobie* . Minsk, BGPU. [in Rus].

Landman, T. (2003). *Issues and Methods in Comparative Politics*. New York: Routledge.

Linda, A. (2011). Pedagogy, didactics and the co-regulation of learning: a perspective from the French-language world of educational research, *Research Papers in Education, 26:3*, p. 329-336.

Little, A. (2000). Development studies and comparative education: Context, content, comparison and contributors. *Comparative Education. 36 (3),* pp. 279-296.

Lukatskii, M. A. (2016). *On the objective of pedagogical cognition and on the scientificity criteria of its results.* SHS Web Conf. DOI: https://doi.org/10.1051/shsconf/20162901046

Map to Khan Academy.(2017). *Khan Academy Practice Exercises Correlated to RIT for Common Core of Math Map for Primary*. Northwest Evaluation Association February.

Mirskiy, Je. M. (1980). *Mezhdisciplinarnye issledovaniya i disciplinarnaya organizaciya nauki*. Moscow, Nauka. [in Rus].

Mirskiy, Je.M. (2001). *Mezhdisciplinarnye issledovanija*. Novaya filosofskaya enciklopediya, T. 2. Moscow, Mysl'. [in Rus.].

Naydenova, I.S., Naydenova, N.N. (2016). *Teacher's electronic portfolio in professional standard of teacher*. SHS Web of Conferences, Vol. 29, 2016 International Conference "Education Environment for the Information Age" (EEIA-2016), Moscow, Russia, June 6-7, 2016. Retrieved from http://www.shs-conferences.org/articles/shsconf/abs/2016/ 07/contents/contents.html DOI: http://dx.doi.org/10.1051/ shsconf/ 20162901052.

Naydenova, N.N. (2012). Mul'tipleksnoe izmerenie kachestva shkol'nogo obrazovanija. *Otechestvennaja i zarubezhnaja pedagogika. №1*, pp. 224–234 [in Rus].

Naydenova, N.N., Shaposhnikova, T.D. (2016). *Student in information society: indicators of socio-moral development of individual in quality education evaluation*. SHS Web of Conferences, Vol. 29. 2016 International Conference "Education Environment for the Information Age" (EEIA-2016), Moscow, Russia, June 6-7. Retrieved from http://www.shs-conferences.org/articles/shsconf/abs/2016/07/ contents/contents.html on 15.02. 2017. DOI: https://doi.org/10.1051/ shsconf/20162901051.

Rees, G., Main, G. (2015). *Children's views on their lives and well-being in 15 countries: An initial report on the Children's Worlds survey 2013-14*. (2015)York, UK: Children's Worlds Project (ISCWeB).

Ruchimskaja, E.M. (2013). O suffiksakh prilagatel'nykh –ist, -ast, at. *Russkaya rech'. №6.* pp. 51–54. [in Rus],

Snopkova, E.I. (2013). Mezhdisciplinarnyy podhod v pedagogicheskih issledovaniyakh kak vyrazhenie postneklassicheskogo tipa nauchnoy racional'nosti. *Vesnik Magilyoýskaga dzyarzhaýnaga ýniversityeta imya A.A. Kuljashova., № 2*. pp. 18–24. [in Rus].

Snopkova, E.I. (2015). Aktual'nost' mezhdisciplinarnogo podhoda v pedagogicheskih issledovanijah: nauchnoe obosnovanie. *Integraciya obrazovaniya, T. 19, №1*. pp. 111–117. [in Rus].

Suprunova, L.L. (2015). Sravnitel'naya pedagogika: teoretiko-metodologicheskie podhody i metody. *Standarty i monitoring v obrazovanii., №2*. pp. 48–55. [in Rus].

Tagunova, I.A. (2012). Sociologicheskie orientiry metodologii pedagogicheskoj komparativistiki. *Novoe v psihologo-pedagogicheskih issledovaniyakh. Moscow, №1*. pp. 38–47 [in Rus].

Tagunova, I.A. (2016). Kategoriya «razvitiya» v zapadnykh teoriyakh obuchenija. *Pedagogika. № 9.* pp. 109–116. [in Rus].

Tay, L., Diener, E. (2011). Needs and subjective well-being around the world. *Journal of personality and social psychology. 101 (2),* 354.

Valenti. (2015). M. EDUCAUSE Review, vol. 50, no. 4 (July/August 2015).

Vavrus, F.K., Bartlett, L. (2009). *Critical approaches to comparative education*. New York: Palgrave Macmillan.

Vul'fson, B.L., Savina, A.K., Dudko, S.A., Dolgaja, O.I., Pisareva, L.I. (2013). *Razvitie obrazovanija v evropejskih stranah v uslovijah globalizacii i integracionnyh processov*. Fundamental'nye issledovanija Instituta teorii i istorii pedagogiki RAO: trudy 2008–2012. Moscow. [in Rus].

Wenglinsky, H.(2001). *Teacher Classroom Practices and Student Performance: How Schools Can Make a Difference. Research report*. September. RR-01-19. ETS.