

Student's Research Work as the Condition of Continuity of General and Professional Education

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The problem in question is necessitate by the contradictions between requirements of successive educational process of general and professional education and the absence of new mechanisms of providing the continuity of education which is effective under modern conditions. The aim of the article in question is to provide the potential of the research activity of students as a factor of integration of general and professional educational activities. Theoretical analysis and synthesis are used as the method of investigation for the basis of continuity of education, modeling of the integral pedagogical system, university-school and pedagogical experiment in checking the interdependent process of development of research activity of schoolchildren and students and providing the continuity of general and professional education. The article also describes the structure of research activity and appropriateness of its development with school-children and students, and explains its integral character which provides the subjective development of a personality of a student that, in its turn comprises the inner structure of educational continuity. The article is of scientific value both for teachers-researches, studying the problem of successive education and for practicing teachers, who want to provide effective educational process.

Keywords: general education, professional education, succession (continuity), research activity, pedagogical integration, continuous educational process, subjective development of a personality

INTRODUCTION

Quite new aims and tasks are set nowadays to the educational system, which are defined by the social task, a new model of a specialist and a professional. It is necessary to shape a personality who is able to organize his professional activity under constantly changing socio-cultural conditions (Asadullin, 2013). It is quite clear that it is impossible to realize the given tasks in the given educational system

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which has age and time limitations. The system which gives education once and for all has vanished. Today's priorities are directed to the "education without limits", which is received by a human being throughout his lifetime, irrespective of his age and profession (Verbitski & Ribakina, 2010).

One of the chief characteristics of the traditional educational system is its stopped character.

While solving quite different educational tasks, and, consequently, using different forms, means and methods of teaching, every step of education within the common structure is an individual, more or less independent unit. This situation within the duration of the functional education as the social system, leads, inevitably to a problem of successive ties between different structures. The traditional educational system, without losing its significance, was unable to provide formulation of a personality and a specialist, who corresponds to the requirement of a new social task. (Efimova, 2013)

The analysis of pedagogical, philosophic and psychological literature shows clearly the attention of scholars and practitioners to the problem of continuity both vertical and horizontal. Nevertheless it is worth mentioning that all the attempts at solving the problem of continuity and succession in education are directed to the optimization of the educational process both in its contents and activity. The research in question is aimed at searching the links of its different stages.

At the same time, works researching the essence of a personality, his biosocial phenomenon and psychological qualities enable us to say that the inner essence of the problem of continuity, depends, to a greater degree on the personality of pupils, their psychological qualities, their ability to adopt themselves to changing pedagogical conditions at the stage of transition from one educational step to another. Among a great number of works on continuity of education we failed to find the works which show the attempts of scholars to solve this task by turning their attention directly to personalities of pupils as an inner continuous educational upbringing process.

It should be remembered that modern priorities of the higher professional education are directed on formulating the personality of a specialist, whose leading component is his profession of individual creative – research activity. (Zagvazinski, 2014).

Thus, in a two – level system of higher education, experimental – research competences are singled out both in educating a bachelor and a master. This leads to strengthening the system of using research activity in a higher educational institution as well as the strengthening of the level of its usage.

The approach presupposes formulating the research activity at an early stage of education, and this process must be reached already in a secondary school. At the same time, nowadays secondary schools practically don't possess mechanisms of formulating research activity.

At the same time, the analysis of activity of leading school teachers and University teachers show that active formulation of research activity begins only in a higher educational institution and continues in the process of tuition after graduation whereas in a secondary school only separate unconnected skills are formed. This prompts that one of the main reasons of disconnection of educational processes in a secondary and higher schools might be the introduction of a quite new kind of activities which introduced without any preliminary preparation. Urgent necessity of the systematic formulation of research activity arises under the condition of integrating secondary schools and higher schools.

At the same time, we have noticed inadequate (insufficient) number of works, reflecting pedagogical conditions of forming research activity of school-children and absence of works describing pedagogical conditions of integral and systematic process of forming and development of research activity of a pupil-student.

MATERIALS AND METHODS

The following methods of investigation were used theoretical (method of theoretical analysis and synthesis, method of abstraction and concretization, method of systematic approach); diagnostic and empirical (study of literature and documents observation, questionnaires, testing, study of pupils creative works and estimation of their quality by competent judges); experimental (starting pedagogical experiment in finding out succession ties at the stage «school–university» and the condition of research work development and forming experiment in creating integral pedagogical systems, based on principles of development of research activity); mathematical data of the experimental research .

Innovation educational institutions of Ufa–lyceum № 62 and № 96 served as the experimental basis of research, as well as leading universities of the capital BSU, BSPU, USOTU, USATU, BSMU.

The research consisted of three stages.

The first stage included the analysis of the essence, the problem of continuity and singling out its leading factors.

Theoretical analysis of the structure and contents of research activity, finding out integrating of developing and creative potential of this activity, enabling us to use it as a linking factor in continuity of education on the stage of «secondary school of 3–d stage–initial courses of university».

On the second stage the stating experiment is realized; theoretical modeling of pedagogical conditions of forming and development of research activity in a secondary school and university, realization of forming experiment.

The model of integral pedagogical system «secondary school of 3–d stage–initial courses of university» were worked out methodically and tested of the Third stage, which was built on the principals of research activity, the results of testing were analyzed as they influence the continuity of ties between general and professional education steps with further correction on their basis of pedagogical conditions of development of research activity.

RESULTS

Logic–categorical analysis of the structure and the essence of research activity enabled us to single out its developing, forming and integrating potential. The research activity is a constructive creative activity in building the scientific vision of pupils' world.

The significance and multi–planning system of treating the structural activity, multiple classification of this notion is shown on the basis of analysis of philosophical and psycho–pedagogical literature. The research activity in the aspect of various classifications is creative ; according to the subject of activity–cognitive and above the subject, according to the character of actions and operations–constructive; and serves as a transition form from the external subject activity to the internal mental activity; integrates in itself the elements of cognitive and professional activity.

Comparing the peculiarity of research activity of a schoolchild, a student and a scholar we found out the level changes from the school investigation to the tuition – professional and then to a scientific research activity. We observed the growing significance of the subject of investigation from subjective to objective and scientific novelty, the functional structure of investigation is changed from reproductive repetition of the experimental work according to ready schemes up to creation by the investigator of new methods and technologies, methods and means of investigation become more complicated, and, at last, the formation of subjective positions of the investigator appears from the performer of the given research

actions and operations to the organizer of his own research activity. As a result of our analysis we built up the logics of the research activity of a schoolchild – student – professional in the direction of subjective development of the learner – investigator, which is determined by a gradual complication of the subject of the research activity, preserving its initial general genetic foundation. In view of the given logics we determined the pedagogical conditions of the continuous development of research activity of a schoolchild - student in the system of “school – university” which results in active production of tuition and individual scientific research in the educational process of secondary and higher schools. Multiple repetitions of the stages of research activity is provided: approximately-motivated (setting the aims and tasks of the research organizing (planning the work) constructive – fulfilling (realization of the tasks), and reflexive – estimative (analysis of the results of the investigation). The leading line of the development is a gradual growth of the subject of investigation, which provides the continuous connection of types and forms of the research activity. The parallel theoretical analysis of continuity categories enabled us to define the key features of the given phenomenon and process: ties going in the order of continuity, preserving the common beginning; appropriateness of developing the inner adaptation mechanism of an individual; manifestation of the inner structure and logics of the development of the research activity; orientation on the inner appropriateness of the development of the subject of the research activity. In the structure of continuity the following aspects are singled out: external (forms and methods of integration of tuition processes) and internal (adaptive qualities of an individual) succession ties, and also vertical ties (which are presupposed by the multiple levels and multiple stages of the tuition process) and horizontal (enabling to integrate subjects, courses, educational institutions, to create through educational plans). Theoretical analysis showed great concern by the problem of continuity of tuition on all transition stages. A great number of articles, monographs and thesis investigations exist, which deal with the problem in question which were published from the 60-th of the previous century up to now.

It suggests that the problem continues, to be actual, and, consequently, is not solved to the end. The most vulnerable point of the successive education is the transition from the secondary education to the higher professional education. After comparing the standards of the secondary and higher professional education and analyzing the experience of leading practicing teachers we proved, that educational processes at school and university differ considerably in target, contents and structural components. The accepted educational practice reflects external coordination, conditionality and mutual addition of the two educational processes, and at the same time internally they remain quite different. The comparative analysis of the inner structure of these processes showed the sharp change of the leading type of activity when it is changed from one educational system to another. Secondary schools base their educational-upbringing process on playing and tuition – cognitive activity, whereas universities use actively the tuition-research and scientific-investigation activity.

As a result, schools – leavers, who possess separate disconnected skills of research activity, are not prepared to do integral investigation in a higher institution. Analyzing the works of psychology of an individual, we came to a conclusion that external coordination of educational standards is not enough. The essence of educational succession on this stage is in inner adaptation of personal mechanisms of the learner, in his ability to adapt easily to the pedagogical conditions of the changed educational process. Thus we have found out the interdependence of developing processes of the research activity and professional orientation of a schoolchild – student that are coordinated both externally and internally as a condition and a result. Research activity is, on the one hand a form of

external realization of a professional orientation of a personality, and on the other – the condition of his development. It has been proved that the line of development of the learner is built according to the following logics: tuition-research-professional-research-scientific-research activity. Besides, a schoolchild – a student – a specialist is always in a position of a developing subject of research activity. The appearance in a schoolchild skills of research activity creates the inner foundation for forming professional skills and as a consequence – strengthens the development of professional orientation, as in the process of development of research activity are “crystallized” professionally significant requirements, motifs, interests, skills and habits. Consequently, a necessity arises in creating external educational environment which provides continuous forming of the research activity of learners at school and university. To this end a model of continuity is worked out as a result of theoretical investigations in general and professional education, the key foundation of which is the research activity of learners, which fulfils the function of connecting and integral factor. The components of the research activity are used in this quality: organizing (fulfillment) and reflexive (control and estimation). The integral continuity is provided by preservation and development of basic contents-technological components of research activity. Pedagogical conditions of developing research activity are realized in the integration of school and university, which in its turn, provide external successive ties. The model is integral educational process, including senior grades of secondary school and junior courses of University and enable us to analyze the system of continuous education “school-university” in the logics of development of research activity inside which the subjective development of a specialist together with internal succession of general and professional education. The experimental work is directed on finding out contents-technological basis and pedagogical conditions of continuity of forming research activity of schoolchild – student. And the research work itself is seen as the internal condition of continuity in the system “school-university «it has been proved by a pedagogical experiment the presence of the level differentiation of successive ties in the system “school – university”. The most important characteristics of which are the quality of acquiring knowledge, the level of personal worry and professional orientation of a personality of learners, the level of their research activity development. We have singled out three levels of continuity in order to define the effectiveness of the research activity on the development of successive ties in the system of “school-university». Zero level of continuity is characterized by a reproductive, stereotype level of searching activity, unsteady motifs of tuition, absence of professional orientation. The sufficient level is provided by a reproductive-creative level of research activity, the motifs of tuition are of partial-professional character. The high level of continuity is characterized by a creative level of research activity, professionally significant steady motif of tuition. The following criteria were used in our experimental work: the total quality of acquiring knowledge, skills and habits. The level of personal worry of the learners. The level of their professional orientation. At the same time, the dynamics of research activity development, including contradictory, constructive and reflective skills were observed. The results of stating experiment demonstrated lack of orientation on the development of successive ties in the system of «school-university» on formation of inner mechanisms of adaptation of an individual to the changing conditions of the educational process and also absence of pedagogical conditions for forming research activity as one of such mechanisms. External coordination of programs and standards of educational steps of school and university strictly exists in the modern educational system, but at the same time polarity of the two educational processes in realization of these programs is observed. Continuity of contents and forms of general and professional education is of linear, external character, which is expressed in quantitative addition of knowledge. In secondary schools the

conditions of «crystallization» and consequent growing of professional skills and habits and formation of professional orientation of learners` personality does not exist. The experiment forming research activity of senior school-children of secondary schools, served as a leading method. In the experimental groups, which consisted of pupils of senior profile grades of secondary schools pedagogical conditions for active development of research activity were formed: problem-search methods of tuition were used; cognitive individual activity of learners were activized; the research activity of school-children expressed itself as an individual tuition-research work, combining theoretical and experimental methods of investigation; professional orientation and thematic continuity of tuition-research work of schoolchildren and students were realized; seminars and consultations were held on the questions of research work organization of schoolchildren for subject teachers, working in experimental groups. This approach was realized as problem-search methods of constructing the contents of learning material, investigating forms of tuition, the system of creative tasks, presupposing the absence of prepared beforehand monosemantic answer, as well as logically combined non-standard forms of lessons-investigation, discussion, role-playing, depending of research realization in individual above subjects research activity of schoolchildren. The dynamism of integral research activity and its separate components were observed according to individual search-research work. (Table 1)

Table 1. Dynamism of research activity development orientation of schoolchildren and students in the system “school-university”

| Results | Medium level of development | | | | | | | |
|-----------------------------------|-----------------------------|------|-------------|------|-------------|------|--------------|------|
| | 10-th grade | | 11-th grade | | I-st course | | II-nd course | |
| | EG | KG | EG | KG | EG | KG | EG | KG |
| Components of research activity: | | | | | | | | |
| Project | 1,57 | 1,12 | 1,82 | 1,37 | 1,84 | 1,32 | 2,26 | 1,43 |
| Constructive | 1,65 | 1,40 | 1,76 | 1,39 | 2,00 | 1,41 | 2,39 | 1,59 |
| Reflective | 1,48 | 1,25 | 1,53 | 1,32 | 1,63 | 1,31 | 1,76 | 1,35 |
| Research activity (medium result) | 1,57 | 1,26 | 1,70 | 1,36 | 1,82 | 1,35 | 2,14 | 1,46 |

The results suggest that the development of integral research activity in experimental groups is continuous, separate components of research activity are developed synchronically. In the test group unconnected development of separate components of research activity is observed, which leads to general low level of research activity development as a whole.

Aiming to prove the influence of the process of research activity on strengthening successive ties in the system “school-university” we observed simultaneously the results of continuity of education: quality of acquired knowledge skills and habits, the level of personal worry and professional orientation of learners (Table II)

All the results were changed at the stage of transition from school to University. The quality of knowledge reduced as well as the professional orientation of learners, their personal worry increased. But such changes were expressed to a lesser degree in experimental groups.

Table 2. Dynamism of results of educational continuity at the transition stage “school-university”

| Results | Groups | | | | | |
|---------------------------------------|-------------|----|---|----|--------------------------------------|----|
| | 11-th grade | | I-st course (the beginning of the year) | | I-st course (the end of the year) | |
| | EG | KG | EG | KG | EG | KG |
| Quality of acquired knowledge (%) | 74 | 67 | 53 | 39 | 69 | 41 |
| Level of worry (%) | | | | | | |
| 1 level | 51 | 35 | 48 | 31 | 50 | 28 |
| 2 level | 33 | 38 | 31 | 34 | 36 | 36 |
| 3 level | 16 | 27 | 21 | 35 | 14 | 36 |
| Level of professional orientation (%) | | | | | | |
| 1 level | 49 | 68 | 57 | 75 | 54 | 75 |
| 2 level | 27 | 21 | 24 | 17 | 25 | 16 |
| 3 level | 24 | 11 | 19 | 8 | 21 | 9 |

By the end of the first-year tuition all the results reached the results of the 11-th grade. Students, possessing the habits of research activity, adapted easier to the educational process at University. In test groups even by the end of the first course lagging behind in all aspects were observed, that is the adaptation process was slow. At the same time in test groups the level of worry was high enough – 14% of students under test. As a rule, students are frightened at the new educational process because of new forms and methods of tuition. This proves the stabilization of successive ties when changing from one educational step to another, but not their development.

Table 3. Dynamics of results of educational continuity on the second course of higher school

| Results | Groups | | | | | |
|---------------------------------------|---|-----------------|----|---------------------------------------|-----------------|----|
| | II-nd course (the beginning of the year) | | | II-nd course (the end of the year) | | |
| | EG ₁ | EG ₂ | KG | EG ₁ | EG ₂ | KG |
| Quality of acquired knowledge (%) | 71 | 70 | 45 | 74 | 86 | 52 |
| Level of worry (%) | | | | | | |
| 1 level | 52 | 49 | 31 | 58 | 79 | 44 |
| 2 level | 39 | 47 | 35 | 41 | 21 | 34 |
| 3 level | 9 | 4 | 34 | 1 | 0 | 22 |
| Level of professional orientation (%) | | | | | | |
| 1 level | 53 | 51 | 84 | 27 | 8 | 41 |
| 2 level | 25 | 27 | 15 | 23 | 23 | 35 |
| 3 level | 22 | 22 | 11 | 50 | 69 | 24 |

To the end of achieving higher results, providing the high level of continuity, there arose necessity of changing both educational processes (of school and university) to their integration. For this purpose some complexes were created in Bashkir State Pedagogical University in which students of test groups were involved to fulfill mutual research work with schoolchildren. Research groups functioned actively including senior school and junior students, integrated classes were held, as a result of which common research works were written. The method in question

was not used with students of other Universities. The results of these experiments are reflected in Table III.

We received the possibility to compare the results of continuity in two test groups: the first group of students continued to study at University according to standard programs and methods, the students of the second group were included to integrated special courses and research societies together with schoolchildren. The received results reflect considerable growth of continuity display of educational processes both at school and University in the first experimental group and weak, but steady growth. In the second experimental group compared with the test group. This provides that the formation of research activity and development of successive ties in the system of «school–University» are independent and continuous processes.

Thus, the results of the pedagogical experiment, on the whole, support our supposition that continuous development of research activity of schoolchild–student presupposes the development of external and internal successive ties in the system of «common education–professional education». We have proved that in the educational processes of the III–d stage school and junior courses of higher school. There are potential conditions for their integration on the basis of research activity development of learners.

According to the above conclusions we worked out and approbated integrative educational system «general education school of the III–d stage –junior third) courses of higher school», built on the basis of united research activity of schoolchildren and students. Modeling of such a system enabled us to single out within this system organizing–functional, logical–contents and personal structures and state basic principles of its functioning and development, to show the wide potential of developing its external and internal, horizontal and vertical successive ties, since its main task is formulating personality of a learner as a subject of his own research activity. Functioning of such a system is presented by a complex of educational –methods and organizing–pedagogical conditions. The contents of education within the system are built on the principle of growing qualitatively new means of research activity, and, as a consequence, new characteristics of researcher–subject research activity.

DISCUSSIONS

The problem of realization of continuous process is analyzed in the works of O. D. Akhulova, C. A. Pisareva and A. P. Trjapitsina (2008); R. M. Asadullin and L. I. Vasilyev (2012); M. I. Botcharov, I. I. Botcharova and L. A. Chernikh (2009); V. I. Zagvazinski (2014); E. V. Efimova (2013); M. V. Mikhailov and G. I. Kalimullina (2008); O. N. Pereligina (2015).

The idea of developing the personality of a learner as an internal side of successive education are based in the works of R. M. Asadullin (2013); A. A. Vernitski and N. A. Ribakina (2014); E. V. Efimova (2005); E. V. Efimova and G. I. Kalimullina (2009); E. F. Zeer and E. E. Simanjuk (2014); A. V. Hutorskoi (2014); V. D. Shadrikov (2011); W. Carr and S. Kemmis (1986).

CONCLUSION

Thus we proved that the development of research activity is the basic condition of subjective development of schoolchild–student as an internal structure of continuous educational process. Research activity is special kind of continuous educational process. Research activity is a special kind of cognitive activity, oriented on building a scientific picture of the world. Research activity develops in the logics: educational –research activity. We observe the growth of the of the degree of

significance of the research activity and, as a consequence, the subject of activity develops.

In the course of theoretical analysis of the problem we saw a multiple (a number of) attempts of optimization and development of successive ties on different stages of the educational process and the most critical one is the transition from the general education of a higher one. As a result we defined two approaches to the problem of continuity: on the one hand—external ties between educational steps in which a personality develops. Psychological and psycho-pedagogical basis of continuity define the priority of the second approach to the problem of continuity and give basis for defining it as a process of constant growing of the subject feature preserving the common beginning.

The results of the theoretical analysis and experimental work enabled us to build a structural –functional model of research activity, reflecting potential possibility of its realization as a factor of successive education on the boundary of school and university. This model enables us to consider continuous activity as an above the subject invariant of cognitive and general professional activity and as «common beginning» of educational processes of school and university. On the basis of naturally determined development of research activity it's above. The subject character optimum block structure is—necessary for its development, which includes theoretical methods, practical and methodological blocks. Every block provides integral development of research activity and training of its separate parts. At the same time, research activity is changed from one block to another, qualitatively its development is growing upwards. This approach provides optimal movement of successful ties. It is necessary to create a combined and research space for creating united conditions for realization of research work at school and University, which embraces general and professional education, educational standard and administrative, structural, that is to create integral pedagogical system «school–University».

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