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Model of Network Communication Between Establishment of Higher Education and School in Terms of Intensification of Practical Orientation of Bachelor's Training of Pedagogical Education

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Abstract: At the present time, it has been implemented the modernization of principal professional educational programs that implies, first of all, professionalization of the future teacher education. The model of bachelor's training of pedagogical education is based on the intensification of practical orientation and implemented in network communication of training institutions of general and higher education. It has been arisen the problem of absence of models of network communication university-school, oriented to intensification of practical directive effect of bachelor's training of pedagogical education. Thus, it comes to head the necessity in the development and study of the model of network communication of educational institutions of general and higher education, promoting intensification of practical orientation of the future teachers' training. The objective of this research is to develop and describe the model of network communication of educational institutions of comprehensive and higher education that will allow a bachelor, who is about to get pedagogical education to realize professional development, grounded on reflection of educative and professional actions. The network communication of educational institutions of comprehensive and higher education is meant to be joint activity of educational institutions corresponding to selection criteria for participating in interaction oriented to intensification of practical directive effect of bachelor's training of pedagogical education. Institutions of general and higher education in the framework of network communication are mutually responsible for the result. Working activities that are difficult to form at university are to be formed at school. We have advanced a thesis that the offered model is effective if the roles of a teacher-supervisor, a university teacher will be differentiated and a student also will: model professional and training activities in the conditions of supervision; fulfil joint work with group-mates, the teacher-supervisor, the university teacher; make upward movement in studying cycle module: reflection, diagnosis, planning. The model of network communication was approved in Yelabuzhsky Institute of Kazan federal University in 2014 on the basis of the schools of the town of Elabug, Tatarstan, Russia. The approbation has shown that the suggested model of network communication will allow the bachelor who is about to acquire pedagogical education to realize a professional development and change learning and professional actions; to try for the first time, on the role of a teacher, interact with the teacher-supervisor on solving professional problems at instrumental level, enter into educative communication and analyze his professional and teaching activities. Such reorganization forms the basis and ground for further development to fulfil working activities.

Key words: Student, bachelor, intensification of practical orientation, modeling, joint work, professional standard of an educator, teacher-supervisor, network communication between higher educational establishment-school, model

INTRODUCTION

Development and approval of a new Professional Standard of an Educator (PSE) inevitably involves revision of the existing standards of the content of pedagogical education (Yamburg, 2012). The analysis of PSE shows that a teacher of the time is needed to know not only his subject but to be a master of the category of basic knowledge in other disciplines to take a creative approach to his matter and be ready to response to the requirement changes. An educator of the time is to successfully use information and communication technologies to easily communicate with participants of information-educational environment,

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including the internet (Galimullina and Lyubimova, 2013). The teacher is required to have a certain "universality" and mobility his readiness to work in various educational conditions and to have ability to professional self-development of standard and also non-standard working activities. The world has been changing, children has been changing that in turn, brings forward new requirements of pedagogue qualification. But, it is impossible to require of the pedagogue what he has never been taught of he has never tried to do.

At the present time modernization of the Main Professional Educational Programs (MPEP) is being implemented, the central purpose of which is bringing the programs of pedagogical personnel training in correspondence with PSE (Margolis, 2014). The necessity of major alteration of content and technologies of pedagogical training is determined to provide the realization of a new professional standard, new standards of school and preschool education (practical competences, level rise of pedagogues of preschool and elementary education, perspective of career and education for the teachers) (Safronova and Bysic, 2014). Modernization of MPEP means, first of all, professionalization of an educator's training that is such model of his practice-oriented training in which the main educational result is ability to built future professional activity (Margolis, 2014). Such model is based on intensification of practical orientation of training of future teachers and put into practice in network communication between educational institutions of general and higher education (school and university partnership) which allows the bachelor of teachers' training education to fulfil professional development (rearrangement of his professional activities), based on reflection of teaching professional activities.

Ministry of Education and Science of Russian Federation implements the project on development new modules of the basic professional educational programs for the bachelor course and the magistrates with intensification of practical research orientation of training in the framework of modernization project of teachers' training education and Federal target program of education development for the period of the years 2011-2015. One of the participants of the project is Kazan Federal University. Educators of Yelabuzhsky Institute of Kazan Federal University (YeI KFU) have worked out the modules of the basic professional educational program of training of pedagogical personnel, one of which is the module "Discipline of mathematical and natural-science cycle: natural-science and mathematical knowledge in teaching practice". The module corresponds to a cluster of educational activities that covers natural-science and mathematical knowledge and its role in teaching practice and aims at fulfillment of home and international requirements to professional qualities of a teacher. The module is a part of basic professional educational programme of applied bachelor course on speciality "Pedagogical education". It is oriented to bachelors, starting pedagogical training (course 1, semester 1), realized in the process of network communication with schools and has practical orientation. The module is realized via immersion into real atmosphere of practical educative activity on preparation and conduction of different activities in the framework of educational programmes (Lyubimova and Sabanayev, 2014).

At present, it has appeared the need in the development and substantiation of the model of network communication between teachers' training institutions of general and higher education favouring the intensification of practical orientation of future teachers' training.

Forms, means of network communication are determined by its objectives and tasks. In our case, the main target is to immerse future educators into professional activity. The objects may vary depending on the level of readiness of a student to carrying out these or those activities. Thus for example, the bachelor starting his pedagogical education has not been ready to work out training programmes to prepare and conduct lessons to be in contact with schoolchildren as a teacher. But from our point of view, immersion of a student into educative activity is to begin with the 1st days of his education in higher educational establishment. Such student can see the pattern of professional activities of the teacher-supervisor and other pedagogues as if "from within" and acquire basic working activities at instrumental level taking on a role as a teacher.

The objective of the research is to develop and describe the model of network communication between educational institutions of general and higher education (school-university partnership) that will allow the bachelor, acquiring his professional education to realize his professional development (reorganization of his professional activities) based on reflection of pedagogical activity.

We have advanced a thesis that the model of network communication of educational institutions of general and higher education will be effective if the teachers' roles and the roles of educator-instructor are clearly determined and also a student is to:

- Model educational and professional activity (for example, on lesson preparation and conduction with group-mates, on technical fulfilment of the order on making a product of intellectual activity) in the conditions of supervision

- Perform a cooperative work with group-mates jointly with the teacher-supervisor and the niversity tutor
- Accomplish upward movement in module studying (by means of solving educational and professional tasks) according to the cycle: reflection, diagnosis, planning

MATERIALS AND METHODS

Network communication between school-university: Fundamental changes of content and technologies of bachelors' training for pedagogical education, allow to increase the potential of educational processes at the expense of interaction with other participants of educational activities providing formation of educational network.

In Federal Law of December 29, 2012 N 273-ФЗ "About education in Russian Federation" it is stated: "Network form of implementing educational programmes provides the learning with opportunity of acquiring of an educational programme by using resources of several establishments carrying out educational activities, including foreign ones and also by using if necessary, resources of other establishments".

Network communication is a new culture of joint activity implying readiness to the partnership maintaining here its uniqueness, non-repeatability of crucial occupational competences, aimed at mutual profitability and real economic and social effect from cooperation of interested parties (Bugrova, 2009).

By network communication between educational establishments of general and higher education, we understand joint activities of educational establishments corresponding to selection criteria for participation in communication directed to intensification of practical orientation of bachelors' training for pedagogical education. It is school that is the key source of the most significant components of profession-oriented programmes content and is considered there as an equal if not a major partner of higher school (Zeichner, 1983; Cochran-Smith and Lytle, 1999; Toom *et al*., 2008).

Network communication is becoming today a powerful resource allowing educational establishments to dynamically develop in society. It makes it possible to:

- Distribute resources by having general activity problem
- Rely on initiative of each concrete participant
- Make an immediate contact of participants with each other
- Build various possible ways of development by having a common external aim
- Use shared resource of network in case of necessity by every concrete participant (Lyubimova and Borisov, 2014)

Network communication between educational establishments of general and higher education is based on network participants' interest in using joint status, material, staffing and information resources of the network in training pupils, school-leavers and students for a higher establishment and also future teachers (as in our case). Arrangement of the network communication between higher school-school is realized on the basis of multyway system of interaction between participants of educational process in which the learning has access to all elements of educational network for obtaining educational results. It is obvious that the principles of communication higher school-school are directed at sharing of a part product of its activity by one educational establishment with the other and vice versa. In particular, the tasks of formation of competences of a future teacher are mutually distributed among the participants of the network. Establishments of general and higher education in the framework of network communication are mutually responsible for the result: those working activities that are difficult for a student to be studied in the process of education at higher school can be acquired at school.

Traditionally by realization of the models of network communication the central figure is a pupil. At the present time, universities and pedagogical higher schools need changes of such approach, namely: the key figure becomes a student is a future pedagogue who is in the process of network communication to acquire professional experience in practice, carrying out educational and professional (working) actions (Lyubimova and Borisov, 2014). Existing at the present time models of network communication of educational establishments of general and higher education can not be used in the process of bachelors' training entering pedagogical school in the conditions of intensification of practice-oriented directive effect of education. Consequently, there appeared the necessity of development of such model of network university-school communication that will permit a student-bachelor entering pedagogical school to effect professional development and reorganize his educational and professional actions: to act as a teacher for the first time, interact with a teacher-supervisor in terms of solving professional tasks at instrumental level, enter into pedagogical communication and reflect the educational and professional activity. Such reorganization is supposed to form the basis and foundation for the 1st year students to further develop their abilities to do the working actions.

The model of network communication school-higher educational establishment: Let us proceed to the very model of the network communication school-higher educational establishment. Let us single out professional and training actions of the student of the suggested network model.

Modelling of professional and training activity in the conditions of supervision (by way of the example of preparation and conduction of a lesson with group-mates): The bachelor of pedagogical education is not still ready in full measure to master technologies of preparation and conduction of lessons, however, he is able to learn to teach the students like him. In teaching process, the learner is given an opportunity to model his future professional activity by preparing and conducting lessons with students of his group. The acquired experience will make it possible for the student to get ideas of his future professional activity and will prepare him for acquiring professional competence. In these conditions the teacher acts as:

- A consultant on questions of content choice, development of accompanying materials and also planning, preparation, organization and conduction of a lesson
- An assistant on solving common problems arising in the process of the student's modeling professional and training activities
- An expert, estimating professional and training activities of students at all stages of preparation, conduction and analysis of a lesson

The main tasks of a university coordinator are:

- Making the list of problems appearing in the process of modeling by a student professional and training activity
- Organizing the process according to the cycle reflection, diagnosis, formation of professional and training activity of students
- Forming the general means of professional and training activity

Cooperative work with group-mates jointly with the teacher-supervisor and university coordinator (in the example of technical feasibility of product of intellectual activity order): Cooperative work as an important component of the model of network communication school-higher educational establishment prepares students for cooperation on solving complex pedagogical problems, the bachelor acquires an experience of communication as if "on equal terms", learns to go deep into the problems which a present-day school teacher encounters. In our case, the joint work is done for the purpose of studying by students tools of making a Product of Intellectual Activities (PIA) at the request of the teacher-supervisor. The students work in small training groups on mutual learning technologies of making PIA in certain programme products. During consultations with the teacher-supervisor requirements specification on making PIA is defined more exactly, the learning demonstrate intermediate results of the work.

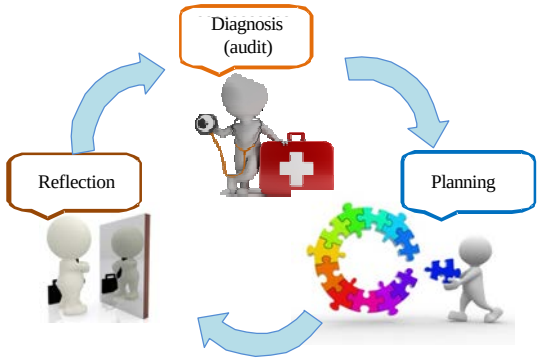

Fig. 1: The cycle of student's activity in the process of module application

In Table 1, execution sequence of professional and training activities is given by way of the examples of technical feasibility request at the product of intellectual activity Educational Multimedia Resource (EMR).

Ascending motion in application of a module (by means of professional and training tasks solution) according to the cycle: reflection, diagnosis, planning: Necessary criterion for model realization of network communication is successive ascent of a student to fulfilment of professional activity according to the cycle: reflection, diagnosis, planning. In the process of forming competence providing readiness of a student to realization of work activities it is cyclically accomplished:

- Reflection of competences
- Diagnosis of competences, formed in the framework of the module
- Planning of information and educational resources, scientific and educational events and studies with group-mates

The cycle of student's activity in the process of module application is illustrated in Fig. 1.

Reflection assists students in formulating the obtained results, predetermining the objectives of further work, correcting their educational path. It, in this case, is

Table 1: Execution sequence of professional and training activities on creation of educational multimedia resource

Professional and training activities	Activities
Transfer of requirements specification	Cooperative work in the conditions of supervision
Independent work on implementation+mutual control+self-evaluation	Fulfilment of interactive tasks. Participation in educational and reflexive forums
Work with information sources on the subject	of distance course. Writing essays on understanding of a role and place of EMR in education, problems of their creation and application
Conducting an analysis of possibilities of basic EMR.	Using recommendations and indicated (and found) resources independently
Independent work+mutual control+self-evaluation	(in consulting and interacting with c teacher), material studying; interactive tasks doing; participating in an educational forum; developing parameters matrix of software environment of EMR creation
Orientation, evaluation, consolidation in the process of discussion	Preparation and participation in round table conference "Sharing of experience
concerning the problem of software choice for creating EMR	in studying methods of working with software of EMR creation"
Independent work+mutual control+self-evaluation	Student's work in distance course under the guidance of coordinator: using recommendations and indicated (and found) resources independently (in consulting and interacting with a teacher), mastering material; doing interactive tasks; participating in an educational forum; substantiating choice of software environment for EMR creation (as "Mind maps", "Filters" with adding in e-portfolio)
Work in small training groups on mutual learning of technologies of	Material preparation for conducting lessons with group-mates on mastering
EMR creation	work technique in a concrete programme product for EMR creation
Tool mastering of creating multimedia resources	Cooperative work in higher school. Preparation of a lesson with group-mates on mastering work technique in a concrete programme product for EMR creation
Tool studying of creating multimedia resources	Cooperative teaching on mastering tools of creating multimedia resources
Independent work+mutual control+self-evaluation	Student's work in distance course under the guidance of a teacher: using recommendations and indicated (and found) resources independently, mastering material; doing interactive tasks; participating in an educational and reflexive forums. Analyzing feasibilities of principal EMR
Joint work on mutual teaching of EMR technology. Conducting a lesson	Conducting a lesson by group-mates
prepared in small groups	
Participation in discussion on the subject "Problem of software choice for	Materials preparation. Problem brainstorming, juxtaposition of diverse attitudes,
EMR creation"	opinions and propositions in the course of discussion
Specification of motion trajectory in the process of objective fulfilment	Joint work in the conditions of supervision
Student's individual actions on fulfilment of a concrete share of common	Practical application of methods of work in creating a concrete EMR
work on EMR technologies	
Presentation of intermediate realization results to customer	Joint work in the conditions of supervision
Preparation for presentation of the created of EMR and presentation material	Demonstration of presentation materials of EMR defence
of defence	
Participation in conference-presentation	EMR defence for discussion and evaluation by group-mates, high school "EMR
keeps up with the time"	coordinator and teacher-supervisor

not only the result but starting link for new educational activities and new goal-setting. For organization of learners' reflection the following is used: questionnaire of self-examination and self-evaluation and forums of reflection in distance subject courses.

Diagnosis is being carried out in the form of audit of the obtained results during all the process of module application, including the frameworks of network communication. It is realized by means of evaluation of student's activity by his group-mates and visiting teachers in cooperation with an educator.

In the process of planning a student develops his competences connected with education and information environment. The student prepares materials for classes and learning hours on natural-science subject area, works out presentation support of the given events, participates in public debates as a coordinator and an ordinary participant, works out electronic educational resource as a technical performer, plans lessons for group-mates, builds electronic table-patterns for their further use in practice at school.

RESULTS AND DISCUSSION

Since, the idea of organization of network communication is advanced by higher educational establishment then, it is worth considering first the roles of the very participants of this party. The central figure doing all the work on ties with school, deciding the issues on organization of interaction and distribution of tutor-consultants between subgroups of students is a teacher-coordinator, it is he who teaches school with respect to module. Tutor-consultants are the advanced students of those departments according to which the profile module is carried on. The tutor-consultants help students of small groups in solving problems and difficulties arising in the process of carrying out professional and training activities. Now, it is worth considering roles appearing by network communication at secondary educational establishment. The main roles are:

- Teacher-customer: school pedagogue (not on the profile module but on the basic special subjects of the students) giving to small groups tasks in the framework of subject area of laboratory works

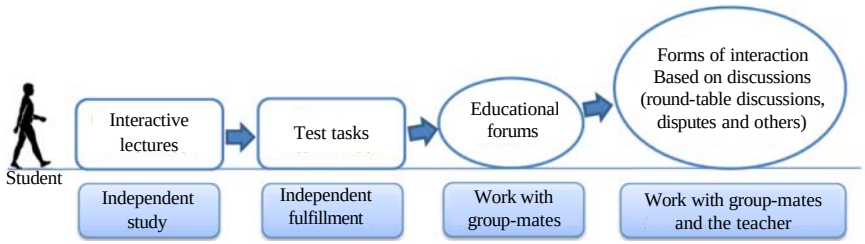

Fig. 2: The trajectory of acquiring by the student theoretical knowledge

- Teacher-supervisor: educator-tutor, carrying out supervision of professional and training activities of future educator and demonstrating the best patterns of this activity
- Teacher-expert: educator, assessing professional and training activities of students, e-portfolio, worked out supporting lesson materials with group-mates (events) for teacher-customer and so on

In addition, there may appear corresponding roles for instance:

- A consultant on carrying out one or another professional and training (work) activities, appearing in the process of training in educational section (analogous to the functions of tutor-consultant)
- An assistant on solving common problems on organization of ommunication

Areas of contact of participants of educational establishments are the educational events such as seminars, round-table conferences, discussions, meetings on issues and so on. It is conducted master-classes, round-table discussions with advanced teachers in full training groups in combination with next fulfillment of professional and training activities by students in small groups. Such interactive teaching methods in cooperation allow to give up monological lecturing. The student becomes proficient in theoretical constituent of the module successively: studies interactive lectures, carries out test tasks, analyses gaps, failures, overcomes them under the direction of the teacher at educational forums, prepares for participation in discourses in the conditions of supervision without assistance in electronic training at the site distance learning of KFU. The trajectory of acquiring by the student proficiency in theoretical material is represented in Fig. 2.

The effective form of network interaction is the work of the teacher-supervisor in small groups of students. So, by studying the set of educational activities “Information and communication technologies in education”, the students with the teacher-supervisor in cooperation prepare for the lessons to be conducted among the group-mates.

In terms of special practical training session the cooperative work on developing electronic educational resource is carried out. In addition, the future educators acquire skills to organize teaching cooperation and joint activities with a university teacher, a teacher-supervisor and students of the same year, including in the internet to work in a group to figure out a common solution to a problem; to formulate, argue and persist in their opinion. School visiting by small groups of students assist in intensification of their attention, more close communication with the teacher-supervisor that has effect on the quality of performing technical tasks as a consequence, the students’ acquiring of competences implied in the module. The scheme of the teacher-supervisor influence on the students is in Fig. 3. Technology of network interaction of the suggested model implies the following succession of actions:

- Directors of educational establishments discuss goals, expected results and obtain mor specific information about network communication, afterwards, they enter into the contract of cooperation
- The supervisor of the module gets connected with the school vice-principal. The school principal in his turn selects the most proficient teachers of their school subjects to be as a teacher-supervisor, a teacher-expert, a teacher-customer in the subject groups of students. Let us take notice that one and the same pedagogue possessing high professional competence can combine all mentioned activities
- The coordinator determines the most responsible senior students as tutor-consultants
- The training groups are divided into subgroups (small groups) fixed for the tutors
- The coordinator and the school vice-principal assist in direct acquaintance of students with the teachers-supervisors at school

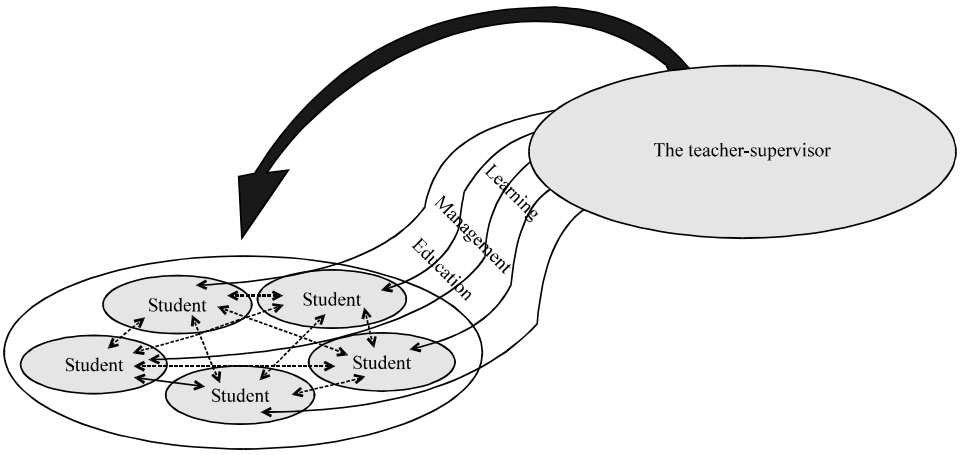

Fig. 3: The scheme of the teacher-supervisor influence on the students

- The participants of the network determine the working plan, define the main level tasks of network communication

Afterwards in the conditions of supervision the students do the mentioned above professional and training actions (modeling, joint work, ascent according to the cycle and the others).

The participants of the network interact throughout the process of learning according to the module within which they immerse and participate in solving problems arising in real professional activities of the teachers. Thereby, the future teachers starting their pedagogical education adopt some methods of a teacher practitioner.

Summary: This model of network communication was being tested in EI KFU in the period from September to November, 2014 in terms of the module "Disciplines of mathematical and natural-science cycle: natural-science and mathematical learning in teaching practice" on the basis of schools No. 8 and 9 of the town of Elabug. The main objective of the module is providing successive systematization by the student of his natural-science knowledge in a single picture of the world, acquisition by teaching tools in educational information environment in practice of network interaction higher educational establishment-school. The supervisor of the module is F.M. Sabirova, associate professor, the chair of physics and information technologies.

In module test 127 students of three departments of EI KFU on speciality "Pedagogical Education" have taken part:

- The department of Russian philology and journalism, special subjects "The Russian Language, the English Language" and "The Russian Language and Literature" (38 students)
- The department of psychology and pedagogy, special subjects "Preschool Pedagogy and the Foreign Language" (61 students)
- The department of physical training (28 students)

The module was approbated by means of organization of the joint work of: The university teachers of EI KFU, responsible for the learning of educational sets of the module (T.I. Anisimova, associate professor of the chair of mathematical analysis, algebra and geometry, E.Z. Galimullina, senior teacher of the chair of informatics and discrete mathematics, Ye.V. Gromov, associate professor of the chair of philosophy and sociology, Ye.M. Lyubimova, senior teacher of the chair of informatics and discrete mathematics).

The teachers-supervisors of the schools of Elabug: No. 8 (Ye.V. Monakhova, the teacher of the Russian language and literature of highest proficiency, L.N. Gerasimova, the teacher of mathematics of highest proficiency); No. 9 (S.V. Borovleva, the teacher of informatics of highest proficiency, Ye.V. Kochneva, the teacher of mathematics of the first level proficiency), though the main development of professional and training activities was carried out on the basis of school No. 9.

Since in the suggested model of network interaction the main expert in defining the student's competence is the teacher-supervisor below there is the narrative evaluation of professional and training activities on some events of studying the module in the course of approbation (in terms of educational set "ICT in education").

Event; "Round-table conference Secondary education: computer study and study by means of computer": At the beginning of studying educational set the

teacher-supervisor noted that the students are glad to take part in discussion have good level of training, successfully analyze information using timely resources of information, however do not always have real estimation of the situation on use of ICT at school; it is also necessary to do some work in thesaurus learning in the area "ICT in education".

The students noted that they learned a lot of new things, tried to "look" at computer use in learning alternatively on the part of the teacher. The university educator concluded that the meetings of the teacher and the students in the 1st year of studying supposed to have positive influence on formation of attitude to the future professional activities and make it possible for the students to get rid of fear of public speaking.

Event; "Seminar the portrait of ICT of competent teacher": The teacher-supervisor noted that the students had rather critical attitude to their level of readiness to use ICT in professional and training activity. It is based on their having analyzed the demands of the time for ICT-competence of the modern teacher; the learners "advanced" their skills in rendering information on " ICT in education".

The students noted that they made it easy to work in small groups, formulate and persist in their opinion; it was necessary to process a great deal of information to argument their opinion referring to up-to-date, scientific and reliable resources.

The teachers concluded that the use of distance course made it possible to decline to lecture in a traditional way, thereby to save time for conducting interactive classes (seminars, round table discussions, master-classes, debates); it enabled students to be more independent to increase their responsibility for the results of study to do the process of study more active.

Event; "The study of software products on the subject of the introduced lesson": The teachers noted that the readiness of the students to professional and training activities in work with software environments of educational orientation had arisen. It turned out a real "breakthrough". If at the beginning of the class the students had lack of self-confidence in possibility to independently search for to establish, to study new software environments, then in the middle of the event it disappeared. Interactivity and nonlinearity of the class favoured team-work in the process of which the students made progress in acquiring of the competences. The future teachers noted that such work was more effective as compared to that when the teacher educated to everything or when they did a laboratory work on a predetermined algorithm. They expressed a desire to continue giving lessons in that way, explaining it that the proposed organization of training gave them opportunity to think, make decisions and so on.

Event; "Cooperative work. One of the small groups of students are as teachers, the other the students": The teacher-supervisor pointed out that the level of students' competence had considerably arisen. The future teachers were assured of using software tools in the process of modeling professional activity. The readiness of the learners at using diagnostic tools to control and estimate educational progress of the learners also increased. The teachers mentioned that the readiness of the students to work with conceptual device in the sphere "ICT in education", to reason, to deduce and to draw conclusions had increased. Motion according to the cycle of activity of reflection, diagnosis, building had the results. The learners had met with difficulties in analyzing the conducted lesson yet but they analyzed their activity on the whole. The students themselves who were conducting the lessons noted that being as a teacher was unusual but the first step from the usual role as a student towards the role as a teacher had already been taken. The positive moment the learning students believed was the fact that they were gaining concrete products of their activities. At that class, they created the test, the electronic tables-patterns to use methods of single-item analysis and rating performance score.

CONCLUSION

On the whole, the approbation has shown that the proposed model of network interaction based on students' immersing into the process of deciding practical professional tasks assists the bachelor starting his pedagogical education in his professional development and rearrangement of his professional and training activities: for the first time to act as a teacher, interact with the teacher-supervisor on solving professional problems at the tool level to enter into pedagogical communication and reflect his professional and training activities. Such reconstruction forms the basis and foundation for the students to further development of the abilities to perform working activities.

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