Peer to peer Education 4.0

A V Gurjanov¹, D A Zakoldaev², A V Shukalov² and I O Zharinov²

¹ Director, Stock Company «Experimental Design Bureau «Electroavtomatika» named after P A Yefimov, 40, Marshala Govorova St., Saint Petersburg, 198095, Russia
² Faculty of Information Security and Computer Technologies, ITMO University, 49, Kronverksky Av., Saint Petersburg, 197101, Russia

E-mail: 131926@itmo.ru

Abstract. The Education 4.0 technology has now a more secured position in systems controlling the education process. Peering technology is a perspective one to provide a high school learning oriented for students. The peering technology uses an electronic environment web-portal to support asynchronous and collaborative education. The electronic sub technology facilitates the non-auditory web-lections organization. The asynchronous sub technology realizes the online courses education chains social construction method, which correspond the student standards and personal interests. The collaborative sub technology propagates the crew method idea to grasp the competences into the education system, which may reveal the each student personality individual characteristics. There is a way described how to use simultaneously three sub technologies of the high school students peering education. To apply the peering technologies in education may help to develop synchronically student professional and over-professional competences, which are relevant for their industry job. The education peering technologies correspond the being changed today technological world. The peering education actual state is proved with the most education methods significance over-evaluation for a student oriented education.

1. Introduction

The innovation diffusion in technological industrial production determination defined a new trend of modern education related to the technical education [1, 2]. The education process classical way requires some auditory and non-auditory lections with student groups after which the tutor translated some knowledge to the students. The educational methods were chosen by the tutor will and for the students who before received some necessary theoretical background [3, 4].

The educational content and methods corresponded the closed loop educational environment isolated from the industrial production problems and its necessities of competitive personnel. To reconsider the specialist in production role and to rotate the industrial occupations only widened the competences gap between what the student have after having graduated and the production real necessities [5]. The innovation industrial employer interests are concentrated today equally in specialist knowledge and skills (soft skills, hard skills) [6, 7].

The new way to prepare the students is done with the Education 4.0 technology which fundamental is the gathered tutor experience in science and practice of several years adapted to develop so called student soft skills (hard skills) in education [8, 9]. The innovative tutor methods apply the Internet tools and web technologies for educational tasks to provide each student individual preparation and to form...
in them the team work skills [10, 11].

The Education 4.0 dominant thing is the peering technology (peer-to-peer) to personalize educational content and its consumers designer interaction [12, 13]. To apply the peering technology for technical education is a promising perspective to develop professional and organization student abilities, which correspond the industry labor market necessities. To form the future specialists executive and controlling skills is additionally actual for production segments of high personnel responsibility for their work quality [14, 15].

2. The education peering technologies
The Education 4.0 peering technology contains the mixed education method using effective tutor ways of electronic, asynchronous and collaborative sub technologies to prepare the students. The mixed education gives students the education program forms, which were un-accessible before where the education chain of the disciplines being studied and they are not fixed strictly. The mixed educational optional scenario requires to apply classical lections with auditory tutor in the educational process in different time portions and also remote non-auditory lections which require web-portals.

The Education 4.0 classical auditory lections gives the students an opportunity of direct conversation with a competitive tutor who speaks the theoretical knowledge in context for a studying group which are relevant for preparation direction. The studying disciplines materials simultaneous discussions develops the student analytical thinking and sharpens the collective social discussion skills including the human respect and their point of view (opinion). The social discussion skills constant training is of special importance for the students, which is potential production work force.

The auditory tutor and student contact may control effectively the student activity including the situations appeared in the education process. The tutor personal presence in lections significant result is the high quality of the student professional competences, which imitate in maximum the education environment atmosphere. A real communication face to face corresponds the democratic education principles, which they already used to control the education control system implemented in the high school.

The direct education theoretical reconsideration in addition to the peering education methods is a new look to the student preparation education scenario. A leading role to transform the traditional education model is for over professional competences development mechanisms, which supplement the student skills and knowledge acquired in the lection hall work. Over professional competences exclude the student identity crisis which can be clearly seen today in the academic environment because of full self-realization lack of each student.

The student oriented education process is the education control system core applied in the Education 4.0 peering technology where the best bet is for non-auditory lections. The personality oriented education process engages students significantly in the education activity, which may spawn new communication formats based on the Internet team building to make the tutor and students interact.

3. The electronic education sub technology
The electronic education sub technology is an adequate response to the education system problems made in the Industry 4.0 paradigm, which is the production technological base. The electronic education is done with the web-portal tools, which is the student transparent education environment where the education process participants have possibilities to place and view (download) the multimedia content, which is according to the standards.

The education web-portal is an IT-system unique class specialized for education tasks knowledge translation with online tools. The electronic education applies the social engineering methods and social nets communication means for student maximum penetration into non-auditory lections themes. The web-portal resources include:
- knowledge bank obtained in tutor society for centuries of tutor and research activities;
- data bank, which is the base of the education control system, which grants the students session access to the education content;
• applications, which are the part of the student work environment in the academic net which is for online discussions in chats and in education forums of audio and video materials in virtual lection halls and means to regulate the student web-surfing in the context education information.

The web-portal tools define the potentially equal for students possibilities to study the education content available for all students categories through the entire globe. The student individual features (education material perception speed, the education lections time and other) provides the flexible rules to construct the student online courses. The education web-portal forms the new level of student academic mobility where the education materials from the advanced science schools perception can be done without changing the student abide and his current life.

When there are no limits of time and space in education process this the electronic education sub technology feature to propaganda the education material perception through modes, which are super comfortable for each student. The student personal space is formed without the necessity to be in the education facility and education content translation is done directly through a browser in any communication device available for the student.

The electronic education advantage is the tutor subjectivity factor lack, which mostly appears in practice if the student knowledge are evaluated. The education web-portal tools may automatize the student proving objective criteria with indication system, which are in each online course. Adding new knowledge and tutor methods of the education web-portal content let the electronic education sub technologies develop with time passing synchronized with all place high school self-organizing education process mechanisms penetration.

4. The synchronous education sub technology
The world industry education paradigm change defined the new education technologies implementation to control the education process. The education programs construction mechanisms traditional view included the student education fixed scenario where the knowledge and skills to be acquired were distributed in the education plan permanently. The Education 4.0 contains the idea to liberate the education facilities from the tutor approaches when the education content must be perceived by the student in a fixed strict sequence. The formal education alternative program is the asynchronous education process sub technology where students acquire the disciplines in the most comfortable for each student mode. The principle how the student chooses the education trajectory is given in figure 1.

To construct the education plan when the knowledge are perceived directly by the student is chosen by themselves where the student personality adapts the entire education process to the mode to provide the student maximum education content efficiency. The student active position creates their good intention to get new behavior skills information from the education activity, which might be useful in the professional environment. An opportunity to use professionally the acquired knowledge and personal influence for your personal education results may increase significantly the student motivation to acquire knowledge.

The asynchronous education sub technology base component is the web-portal dense education content. Each student with predetermined rules (the program general volume in proof units; the amount of education hours for a single online course and other) create their own education process with tools to control the education time. Each student adapts the competence profile and education content reception time table with their psychological features and life circumstances to provide the web-lections maximum efficiency.

Active asynchronous education provides for the students an exclusive opportunity to control the online education where the students put their attention to the courses only which containing information corresponds the student self-development trajectory. The adaptive education plans let students calculate their abilities necessary to grasp the full preparation program. The educational content diversity in a web-portal online courses options for the same disciplines, which forms the multi-way student look to the theoretical material to be acquired.
5. The collaborative education sub technology

The collaborative education sub technology includes a team approach to organize non-auditory lections where all education process participants works as a single unit to solve a particular education task. The lection traditional format is changed for some experts methods means and consultancies in the internet interaction mode. The dialogue education gives each student an opportunity to show his over professional competences in a team to solve training and control exercises with professional knowledge obtained from theoretical online courses.

The Education 4.0 collaborative sub technology team interaction is shown in figure 2. The collaborative education active participants are:

- student web-team united for particular educative lection time into a student artful team;
- tutor web-team with fixed roles uniting with each lection the flexible education process to report the context information.

Students Web-team includes the following participants:

- students team made of one students group list, which educative program includes some online courses;
- students group made of several groups participants, which are being studied in general preparation direction in the same education facilities;
- students team made of professional educative groups and persons who showed the wish to receive an additional interesting online course in the faculty order;
- a team of students and listeners temporally made for a particular non-auditory lection for some persons from several education companies including some foreign students and persons who grasp an online course with their own initiative.

Tutors Web-team includes the following education organizers:

- the educative process coordinator to control the students preparation in different directions and educative programs;
- the educative process curator who is tutor and professional expert for a narrow number of programs and disciplines;
- the educative process lector who practice directly one or several video conferences disciplines which creates the tutor presence effect or an assistant to learn additional online courses by students.

Web-teams are formed dynamically for each non-auditory lection which theme content depends on the tutor professional competences, education plans requirements and standards. The collaborative online space may involve to develop the education content the advanced specialists in different science
fields who practice their knowledge in a production. The online formats permit the non-auditory lections to realize, which they use foreign tutors to level the belt time education process influence. The foreign tutors tele-presence creates effective trans-border contact between the student youth and the entire world tutors.

Figure 2. The Education 4.0 collaborative sub technology team interaction.

6. Conclusion
The Education 4.0 technology is the modern educative process control system base made after the bologna reform of step by step principle of student education and modular approach to construct the educative program. The bologna reform development is its significant students rights increase when the student may participate the individual educative chains of the disciplines being grasped. The education peering technology is more adequate for the modern education environment requirements where the increased interest is paid to continuous student society self-development.

The over professional competences increased significance help students adapt adequately to technological defiance of industrial environment which defines their role and place in production projects according to their intellectual abilities to solve complicated tasks. Student sure state of their own abilities and professional knowledge domination is an expected result of the Education 4.0 student preparation. But the current academic environment possibility cannot let fully develop all students particular features so that why the high school lacks the necessary material and technical base and tutor practices to work out the team interaction social knowledge studied in a group.

The Education 4.0 investments must be done in parallel as human capital base production value and the laboratory equipment where students may sharpen their professional mastery in the stage of education. A non-auditory lection online form supports the social philosophy to translate the idea to increase your own education level through the entire human life. The new education control system Internet is an effective tool to provide the continuous student contact with the education environment with dense education content (online source of knowledge) which under modern technological conditions is of additional usefulness for humans once the education is graduated.

The web-portal innovation is a recommendation system to make a context educative information analysis for each student and which has some additional online courses to grasp for the student related
to the general course. The recommendation system technology uses the semantic educative content processing mechanisms, which is the multi-media object in the Internet net. Each student preference is stored in the student user search history, which is the personality integrative characteristic for recommendation systems. Soon enough we must expect the recommendation systems technology active development in education as the peering education base.

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