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THE LEARNING ENVIRONMENT AS SERVICE TO SUPPORT EDUCATIONAL PROGRAMME

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Abstract

To leading universities, with their human resources potential it is necessary to develop next-generation Learning Management System that provides special items of the comfortable education environment for students and teachers. The task to find the ways for realize statements CDIO is most important when to create comfortable Information & learning Environment, that is based on the principles of conversation and interaction between student and teacher. The knowledge, learning content and the net interpersonal communication are e-learning facilities for formal and informal interaction between members of educational process. Such system has to be based on the experience of communication in social media. On the other hand, the competence approach presupposes to use up-to-date pedagogical methods that are of great meaningful for personal development education. The new educational conditions are context where competences are developing. Information & Learning Environment for students and teachers were designed in accordance with the theory and the practice of social network connectivity. The model has allowed it possible to compile information flows dynamic database of teaching materials and the educational documentation. System provides not only consulting interaction the teacher – the student – Institute's methodical but also implements serious pedagogical tasks. Such approach allows organizing virtual education overview mode of laboratories, offers an opportunity works in virtual space, setting thus conditions for modeling of situations. The synergy of mobile and remote training contains huge potential of development of educational services.

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1. Introduction

Information & Learning Environment implementation to leading universities demands of such educational process model, wherein teacher's professional and student's cognitive activity are transferred from real space of university buildings to virtual informational space. Appearance of the personal computer and access to the Internet has introduced into the education not only the new technical butdidactic possibilities, such as simplicity of the interaction, access to the global information and visualization of the processes.

Knowledge is turning to the structured products in the new mobility educational environment. This knowledge is very flexible and can provide the students to choose content, period, place and time training. Such knowledge is well corresponding to the different educational style and can to encourage students and teachers creativity.

The existing Learning Management Systems (LMS), such as Blackboard, learning Space, or Prometheus, are based on the averaged model of the educational institution and they are insufficient to innovative research universities. The open architecture of MOODLE or Sakai is more flexible, but it has limitation in terms of integrating and using of different services and databases.

On the other hand widespread occurrence of MOOC platforms and courses placed on them is very impressive, for example, Google and EdX cooperate in developing an open source platform (Open EdX) and site for online training MOOC.org. EdX, Coursera, UDACITY, Udemy and others offer courses independent of or in collaboration with universities. The phenomena of MOOCs is connected with placing them in the wider context of open education and the changes that are currently taking place in higher education (Yuan, & Powell, 2013).

Students' motivations to study different courses using MOOCs may be range on four categories (Yuan & Powell, 2013):

- To support lifelong learning.
- To get social experience and intellectual simulation.
- To overcome barriers of traditional education.

To experience or explore online education.

2. Problem Statement

Higher education has faced such global challenges as new literacy and, without a doubt, for leading universities with their human resources potential it is necessary to find the best approach that can provide special items of comfortable education environment for students and teachers. We need to understand demands of our students who would like to have less traditional lecturing and more guided opportunities for learners. The different ICTs are central technologies for literacy within the global community in an information age (Armstrong, 2009).

The task to find the ways for realize statements CDIO is most important when to create comfortable Information & learning Environment, that is based on the principles of conversation and interaction between student and teacher.

2.1. Personal Development Education.

In accordance with opinion of Zeer (2006) development and self-development of the participants of the educational process to provide educational activity as action of encouragement are of great value for the personal development education. Importance and meaning trends of such model of education are to develop person self-determination self-regulation in the net generation.

The creative person, capable to self-evolution and adaptation when changed technological, social and economic conditions is the result of personal development education. The competence approach presupposes to use up-to-date pedagogical methods that are of great meaningful for personal development education. These ways promote to develop independence of thinking, initiative and creativity and allow improving student's abilities during individual feedback. There is individual feedback that as the highest level of the training activities stimulates students in learning about new knowledge and making decisions.

Such understanding of university education role is entirely consistent with the update statements of goal CDIO for engineering education.

2.2. Trends of the development of Educational Environment.

Possible trends can be finding with taking to consideration in engineering education of didactical parameters of the social media services (Siemens, 2011; Grainger, 2013). The new net generation of work, production and experience are creating a new culture, which is calling as social network, and a transaction in network structures is calling as network communication.

The society development trend is increasing of the number of social network connectivity, personal sites, blogs, twitters, looking through viewing in Internet news, movies, concerts, and meetings, scientific and artistic proceedings. Network communications open long-term plans in education because of personal expert knowledge supports the network development and involves the members to the net generation by interacting in new ways. Thus, network communication as a communication system allows creating innovation models to manage education process. That model is necessary way to organize joint recourses using. New reality of the learning environment Web 3.0 is a return to what was great about media and technology before Web 2.0: recognizing talent and expertise, the ownership of ones words, and fairness (Calacanis, 2007). That provides big difference of educational recourses, created by all members, including students.

3. Research Questions

The new educational conditions are context where competences are developing. The knowledge, learning content and the net interpersonal communication are e-learning facilities for formal and informal interaction between members of educational process. Up-to-date transfer of individual activity to Internet allows realizing and developing Information & Learning Environment for students and teachers by adaptation services of social media to teaching with using distance educational technology.

Thus, the educational networks can consider as permanently developing internal structures. Students can get necessary competences when they use obtained knowledge to solve professional practice tasks of different levels. Tasks have to be described such as situational statement and request for students

to make right decision. The main questions are old and new at the same time: for students - how to get the best competences, for teachers - how to design such courses and bring best knowledge for wide audience. So we need to understand two things:

- How to create the person, capable to self-evolution and adaptation when changed technological, social and economic conditions.
- How to develop educational environment to create the person, described before.

4. Purpose of the Study

For modern education in general and for technical universities in particular it is very important to create the person, capable to self-evolution and adaptation when changed technological, social and economic conditions, so the purpose is to overcome barriers in learning of engineering sciences and to find appropriate configuration of the Smart Learning Management System in accordance with the update statements of goal CDIO for engineering educational process.

5. Research Methods

Information & Learning Environment for students and teachers should be designed on the experience of communication in social media and in accordance with the theory and the practice of social network connectivity. The proceeding in the field of the theory of connectivism, a 'cognitivist' theory (Armstrong, 2009;Zeer, 2006; Siemens, 2011) of knowledge and learning, experience that is based on conversation and interaction, on sharing, creation and participation in social network and professional community such as Facebook, eLearningPro, OpenClass – all these are the scientific base to create successful personal e-learning environment. Consequently it was possible to solve tasks by using social software in accordance with the main ideas of Web 3.0 concept (Silva, MahfujurRahman& El Saddik, 2008), (Yen et al., 2015):

- using web-services in general (social networks, blogs, forums, wiki-pages, tags, tabs etc.),
- distributed resources using,
- forming of societies, supporting of communication and new conversances,
- using "group mind" to develop social services,
- transforming of the user's role from passive reader to creator of content (knowledge),
- getting the system of information by using key words (tags),
- using of special technical facilities (RSS, Atom for content syndication; technologies AJAX, mash-up).

Properly the features for Learning Environment and Learning Management System (LMS) should be formed in accordance with (Harvey, 2013):

- pedagogical design of training course,
- interaction activity between teacher and student,
- procuring of necessary knowledge,
- learning result of assessment

and other activity during formal and informal learning.

6. Findings

Tomsk Polytechnic University has developed student-centered model of Information & Learning Environment for cooperation between students and teachers on the base of the communication practice of social networks. The main way to reach objective is the pedagogical design of the Smart Learning Management System in accordance with the update statements of goal CDIO for engineering educational process. Implementation of system gives to the university the ample opportunities to raise to a qualitatively new level of education. Right now that system is not only order of the day buta vital necessity.

6.1. Student-Centered Model of Cooperation Subject of Educational Progress.

System provides not only consulting services but also implements serious pedagogical tasks. It forms motivation for constructive, cognitive and creative activity, develops base informative & communicative competences of the teachers and students. They not only work together but they obtain basic network communication skills.

There were taken into account next items during designing system:

- Information resource has to carry out the full information support for educational projects and to serve such as informational channel and channel of feedback between members of the educational process.
- Communicative forms in Internet have to form student's community and to allow developing necessary competences of interaction.
- Tools of the learning environment have to allow to members changing knowledge, experience, ideas, presenting the result of their activity, giving possibility to expert works by social and professional community to develop creativity and critical thinking.

Organization of educational process at new virtual network environment demands new approaches to management. Such approaches will allow solving the problems of using group works and effective management by educational process. It is necessary to create program & methodology platform for virtual learning environment, that platform has to give wide forms and methods range for interaction teachers and students, including means of group work.

On this stage there were formulated base demands to the System of the Learning Environment, which had to (Starodubtsev, Shamina, Bulanova, 2012):

provide the members of educational process with

- a simpler tools to create new knowledge,
- alearning content, information, software become available independent from time and place,
- correlation between credits & modules organization and the student's academic references rating,
- a possibility of joint educational activity at virtual room in synchronous mode,
- a possibility getting knowledge from Internet, systematizing, handling and recording information, using knowledge on practice,

- a possibility operating with LMS MOODLE as a subsystem, accessing the resource, that were created on the base of LMS MOODLE,

- efficient registration the teacher's and student's learning activity and transparent on-line and on-time representation of the personal and group learning achievements,

- fast pace of renovation of professional knowledge and getting of actual "first-hand" information,

create

- conditions for rational education process planning for all modules during semester/quarters,

- personal and comfortable educational conditions for students and teachers,

reduce

- the student's and teacher's overhead involved making procedures to export – import of e-documentation (homework, laboratory work report, coursework, etc.),

realize

- personal monitoring procedures of the academic assessment and students learning activity,

joint

- formal education and informal interaction on the base of external communication services,

support

- students motivation for creative activity and making knowledge.

Professional interaction of community members is one of the most important elements to form students' motivation and develop their potential. It was necessary to organize public space on www.tpu.ru for meeting, conversation, exchange of experience of teachers from Russia and different countries.By this means Web 3.0 tools are becoming an essential feature of the modern especially virtual academic process, and, on the other hand, implementation of social networks to e-learning not only increases student's interest for academic process but allows simultaneously solving special pedagogical tasks such as control and assurance of flexible interaction between teacher and student.

6.2. The Basic Services of Electronic Education Environment of TPU

Institute of Distance Educational of Tomsk Polytechnic University (TPU) has realized the modular model of education process. Now TPU is supporting all information activity of students (Starodubtsev, Shamina, Bulanova, 2012). The model has allowed it possible to compile information flows dynamic database of teaching materials (modules) and the educational documentation. In the same time, the model provides interaction the teacher – the student – Institute's methodical service.

The student's on-line service includes:
- Interactive calendar of education and society,
- Assignment DropBox (upload and grade files),
- Gradebook for teachers and students (view, enter and manage grades),
- Personal news and announcements.

In the working process there are such services as interactive training round on a site for university entrants and students of first level and elaboration the tools of retake of the academic failed tests or exam by using the distance educational technology.

Experience of working and operation of services within the limits of the educational project directed on construction of the information educational environment and network community has show that both in contexts of pedagogical designing, and within the limits of technical realization the right decision was accepted strategically. Teachers and students, who took survey, have noticed that the new educational environment is simple, friendly and fairly easy to use and to understand.

Such approach allows organizing virtual education overview mode of laboratories, and also offers an opportunity works in virtual space, setting thus conditions for modeling of situations. The synergy of mobile and remote training contains huge potential of development of educational services, therefore especially established attention is given to possibility of distance education technologies, which

- can support self-development trained and existing technologies e-Portfolio (www. pebblepad.co.uk),
- removes a press of time in a psychological context, recourses, the conflict of roles,
- effective using of space and time allows at training and to redistribute time for performance of projects, carrying out of discussions.

The training by using of modern IT technologies is got by such principles of pedagogical activity, such as

- principle of the maximum variety of the given possibilities for development of the person,
- principle of an individualization and training differentiation,
- principle of creation of educational environment for student's team projects at the minimum participation of the teacher,
- principle of a freedom in choosing students of additional educational services, the help, guidance.

7. Conclusion

The modern students feel themselves comfortable in virtual space and they are the active users of the new multimedia products. Information and communication technologies become essential parts of their life. It is the main task for university when Information & Learning Environment is created to use contemporary information technologies. It will allow making academic process not only comfortable and available, but really fascinating for all students. E-learning environment opens for teachers rich possibilities to use new creative methods in modules training.

Except direct effect as support of teachers with e-learning environment and academic services, Smart LMS provides common professional development for university' scientific and educational personnel because of in new conditions teachers' communicative competence is growing, personal innovative methodical system is forming, teacher's self-expression is ensuring.

Finally all these promote growing of human capital of university and country.

Acknowledgments

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