

**OPPORTUNITIES AND BARRIERS OF IMPLEMENTATION
OF SMART-TECHNOLOGY IN EDUCATION:
OPINIONS OF TEACHERS AND STUDENTS**

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Abstract. The article is devoted to the analysis of the main stakeholders' ideas about the opportunities and barriers of smart technologies implementation in the learning process. The actualization of this topic is due to the understanding of the need to respond to the significant challenges occurring today in society as a whole and in the education system. Russia is gradually implementing a new development paradigm called digitalization. These circumstances require the use of smart technologies in higher education, creating conditions for improving the quality of training. Issues related to the assessment of the importance, opportunities and barriers of the implementation of smart technologies in education by the target groups.

What attitude towards smart-technologies of the stakeholders connected on a straight line or indirectly with an educational system? Whether they are ready to their active use in the practitioners? Whether there are obstacles to implementation of smart technologies in education and what estimates of the main stakeholders of barriers? For the answer to the questions sociological examination was conducted. It was conducted in March-June, 2018. The qualitative methodology allowing and 37 stakeholders were interviewed using the semi formalized interview technique.

Focus of attention was concentrated on identification of description of the diskursivny field of effects and barriers of smart technologies in education. For the analysis of data, the discourse analysis of texts of an interview of the interviewed persons was used. During systematization of statements of participants of inspection, the following was revealed.

First, regarding the views of respondents about smart technologies in training, three ways of reasoning are formed. First: smart learning is "something new, necessary, special", characterized by greater detachment from the educational process, because it is endowed with uniqueness. The second discourse is a "reluctant rejection", bordering on denial of the use of technology. The third - "discourse of everyday life", presented by students and researchers, is close to the ordinary, so it has a better chance of inclusion in the training

Secondly, in the assessments of stakeholders of the advantages of new ways of learning, three groups of opinions can be distinguished: "unjustified

pessimism", based on the moments associated with the inability to replace the personal communication of the student with the teacher with formal interactions that are inherent in smart technologies. The second group - "unjustified optimism", focusing on the independence, independence of the student, the comfort of the temporary and spatial type - "when I want, then I learn." And the third, reflecting the "adequate capabilities" of smart technologies in training.

Thirdly, ideas of stakeholders of the importance of smart technologies in education, possibilities of their introduction and readiness of participants to use clever technologies in the course of training are individualized and poorly make common cause with each other. In educational community there are no unambiguous positions concerning effects of Smart technologies in the higher education system, but there are polar and opposite judgments.

Fourthly, the absence joint responsibility (consensus) about opportunities, barriers and prospects of Smart technologies in education forms two main models of a reasoning. The discourse of optimists is more approximate to reality, has concrete active focus, is focused on introduction of new forms in education. The discourse of pessimists means forming of barriers, distances with clever technologies. In the social environment the deficiency of opportunities for development of smart technologies in training seems. Elements of the environment are estimated as a hindrance, and possible "partnership" with clever technologies is described as "the postponed introduction". Its carriers are not ready to show activity in relation to new technologies. Heterogeneity of reasonings is directly connected with optimistic or pessimistic moods of interested persons and sets different models of motivation among stakeholders in relation to the prospects of use of smart technologies in an education system.

Keywords: smart training, technology smart in education, barriers of implementation, assessment of stakeholders

Introduction

In modern society it is difficult to reevaluate importance of information technologies, the Internet of communications and mobile communications. In relation to the individual of Smart technology have enormous potential: from communicative opportunities, to wellbeing and safety. But there are open questions of value and perspectives of digitalization in an education system. Decade "smart technologies" are need for the different industries and spheres, articles that appear: "classical" learning is gradually succeeded by smart education" (Ardashkin, I. B., 2017: 3). The term "smart training" is included into a lexicon of educational institutions and other structures. Some

researchers create bases of understanding of the concept of smart education: "Smart education, is a flexible training in the interactive educational environment by means of content from around the world which is in free access" (Tikhomirov V. P. 2011: 25). Others interpret to smart technologies and define their opportunities: "Smart technologies allow to produce the educational smart products giving the chance to different categories of users in an initiative and interactive look to get an individual education" (Nesterov A.V. 2015: 3). A variety in interpretations, nevertheless, allows to speak about uniformity in understanding of smart technologies as about the flexible, available, enriched with achievements of information society educational system including nonconventional forms of education (webinars, electronic courses, Moodle, etc.). And, on the one hand, create conditions for a training massovization, and, with another, - uses of individual approach in education (Glukhov V. V., Vasetskaya N.O. 2017). But there are questions connected with the estimates of the importance, opportunities and barriers of implementation of smart technologies in education from target groups which are not mentioned by sociologists. What attitude towards smart-technologies of the stakeholders connected on a straight line or indirectly with an educational system? Whether they are ready to their active use in the practitioners? Whether there are obstacles to implementation of smart technologies in education and what estimates of the main stakeholders of barriers? For the answer to the listed questions sociological examination was conducted.

Methodology, methods

The sociological survey conducted in March-June, 2018 formed an empirical basis. The qualitative methodology allowing to capture some nuances of opinions and meanings of target groups was applied, technique of the semi-formalized interview was used. The volume of a sample was 37 people. The panel of stakeholders is presented by five different groups: authorities, heads of the organizations, teachers, students and research associates of higher education institutions of Tomsk. Focus of attention was concentrated on identification of awareness of stakeholders on smart technologies and the description of the diskursivny field of effects and barriers of smart technologies in educational process. For the analysis of data, the discourse analysis of texts of an interview of the interviewed persons was used. During systematization of statements of participants of inspection, the following was revealed.

Results

Possibilities of smart technologies in educations: opinions of stakeholders

First, concerning ideas of respondents of clever technologies in training three vectors of reasoning are created. The first discourse: smart training is

"something new, necessary, special", is characterized by bigger dispassionateness from educational process as it is allocated with uniqueness. It included authorities, heads and teachers: "... *an advanced subject ... it is new to us ...*" (*the teacher, the man*). The second discourse - "the alerted rejection", use of technologies adjoining on refusal: "... *the term enters into a stupor ...*" (*the teacher, the woman*); "*I do not understand about what the speech*" (*the teacher, the man*). In this way the heterogeneous group on the status, age and gender. It not only the faces far from education process, but also teachers, with various specialization. The third – the "dullness discourse" presented by students and research associates is brought closer to the ordinary therefore has more chances of inclusiveness in training: "... *anything – the smart, is used also in everyday life*" (*the research associate, the woman*).

Secondly, in estimates of stakeholders of advantages of new ways of training it is possible to allocate three groups of opinions. The first – "unjustified pessimism", is generally presented by teachers. Opinions are based on allocation of the moments connected with impossibility to replace personal contact of the student with the teacher with formal interactions which are put in smart technologies. The key thesis of this group - is lost authenticity of educational process: "... *electronic training from hopelessness, interaction with the teacher – will not replace any online course*" (*the teacher, the man*). The second group can be characterized as "unjustified optimism". Representatives of this type focus attention on independence, independence of the student, comfort temporary and spatial on type - "when I want then I study". This group refuses to notice pluses of traditional training. The third group of opinions reflects "adequate opportunities" of smart technologies: "... *everything that it is possible to transfer to figure, to formalize is smart technologies. But there is an aspect which is not formalized: understanding is only through real-life communication*" (*the teacher, the woman*).

Thus, it is possible to observe differences in knowledge of the main groups of stakeholders. Their representations are in a continuum from the pathos importance to vigilance and unwillingness something to change in the educational practices. Some respondents are initiative in development and use of smart technologies, they position themselves as active agents who seek for changes take new forms of education and are integrated into them; others – are afraid that new technologies will force out the teacher from the educational environment, the third take a waiting or neutral attitude. Are most initiative and generally seeing the mass of advantages in new ways of training – students. The lack of consensus in estimated judgments of the

main users of smart technologies can demonstrate disbelief (lack of hope) for improvements in an education system in general.

Logic of reasonings on smart training obstacles

At all optimism of moods of some informants, the general opinion – barriers exist. Five factors interfering implementation or implementation of smart-technologies in an educational system were allocated. Treat them – state of the economy, legal aspects, material and technical resources of higher education institution, pedagogical practices in the form of programs and techniques and also a human factor. It was offered to informants to estimate influence of the specified aspects on development of smart technologies in training. A consensus was not expected since during the analysis groups were distinctly shown it is pessimistic also optimistic stakeholders. Some participants of poll as deterrents on the first place put insufficiency of financing and material restrictions. Generally, in this way, teachers and research associates, i.e. persons knowing a high school situation from within spoke: "... *financing constrains ... kind of we did not seek to pass completely to Smart technologies, financing of education such is that in many cases there is not enough money*" (the teacher, the man). Others, on the contrary, emphasized that: "*the economy and financing – not most important, a deterrent, weakness and lack of legal aspects – will constrain more, especially in the right – many things contradict each other*" (the head, the man). The third, as the main barrier called teachers, and this opinion to a thicket was expressed not by students, but teachers: "... *it is heavy to senior generation to get used to implementation of smart technologies or not desires to master new*" (the teacher, the woman).

Heads insisted on pedagogical aspects as the main barriers of smart-technologies: "... *training programs and techniques are not agile. ... coordination and the approval of programs - long process*" (the authority, the woman).

Separately as hindrances it was allocated – "language barrier", respondents pointed that Smart technology the western invention and not all users know a foreign language. Judgments of conservatism in an education system in general sounded and unwillingness to change something: "The unwillingness of people to change is a main factor" (the teacher, the man). There were judgments on demoralization of social subjects: "*Corruption, all money will not reach the destination ...*" (the student, the man). But, the separate voice sounded: "*actively now can constrain nothing ... and that there is no regulatory base - it is and it is good*" (the teacher, the woman).

Along with open statements, it was offered to informants to estimate the allocated key elements of the environment interfering in use of smart technologies in education on a five-point scale. It is economy, legal aspects,

material and technical resources, pedagogical practices in the form of programs and techniques, and a human factor. Points were summarized on each group of stakeholders, then on each element of the environment average values were calculated. "Material and technical resources" and "human factor" are more essential barrier of development and implementation of smart technologies (3.78 and 3.66 points, respectively). The highest points to "material and technical resources" as the main factor of an obstacle of smart technologies in education were delivered by teachers and students (4.5 and 4 points). Authorities consider the main barrier "a human factor" (4 points), "economy and material resources", according to them, practically do not interfere with implementation of smart-technologies (on 2 points). The greatest dispersion in estimates "the material and technical resources of higher education institutions" – 2.5 points show, the smallest – "legal aspects and "a human factor" (0.7 and 1 point).

Thus, the argument concerning the barriers interfering development of smart technologies in an education system is various and paradoxical. The subjects untied with training taking official positions show lack of a reflection concerning development of educational innovations and insist that clever technologies in training it "not just reality, and long ago reality" if there are obstacles, then these are teachers. Though subjects of educational process, show interest in innovations, but they have a lot of doubts concerning introduction clever technologists in the short term because of limited financial opportunities and the country. They can be guided by own experience: successful experience – adjusts them positively on use of smart technologies, and the absence or negative experience – excludes (disturbs) a constructive conversation on development of clever technologies in training.

Conclusion

On the basis of the analysis of opinions, estimates of interested persons, the following is revealed.

First, features of course of social changes have an impact and on the processes happening in an education system. So, lack of traditions of dialogue between the power and society and also initiatives of the state in formation of calls (problems), carrying out innovations, imposing by any structures of standards and technologies cannot yield suddenly positive result since the subjects involved in these innovations can not realize degree of their importance and prospects. Called can create illusion of course of innovations in an education system, as shows the analysis of opinions of participants of inspection.

Secondly, differences in knowledge of the main groups of stakeholders are observed. Their representations are in a continuum from the pathos importance to vigilance and unwillingness something to change in the

educational practitioners. The inclusiveness of respondents in this or that discourse allows to make a preliminary remark: in many respects and often people, using these or those innovations, do not pay attention to the name and the more so do not set a task of full interpretation.

Thirdly, ideas of stakeholders of the importance of smart technologies in education, possibilities of their introduction and readiness of participants to use clever technologies in the course of training are individualized and poorly make common cause with each other. In educational community there are no unambiguous positions concerning effects of Smart technologies in the higher education system, but there are polar and opposite judgments.

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References

- Ardashkin I. B. 2017. Smart society as a stage of development of new technologies for society or as a new stage of social development (progress): to statement of a problem. Bulletin of the Tomsk state university. *Philosophy. Sociology. Political science* 38: 32-45.
- Glukhov V.V., Vasetskaya N.O. 2017. Smart education as instrument of improvement of quality of vocational training. *Teaching Methodology in Higher Education* 6 (21): 8-17.
- Nesterov A.V. 2015. Will Smart Education Lead to the Decline of Universities? *Competence* 2 (123): 3-7.
- Tikhomirov V.P. 2011. The world on the way of Smart Education. New opportunities of development. *Open education* 3: 22-27.