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**FROM THE TRANSMISSION OF KNOWLEDGE
TO THE DIGITAL TRANSITION:
THE GREAT CHALLENGE OF UNIVERSITIES**

The article reveals some challenges facing the system of national education in the Republic of Kazakhstan in the field of digitization of academic communication. The study of this problem is inevitable in the era of universal global digital communication in the academic world. According to the objectives of the state program «Digital Kazakhstan» approved by the Government of the Republic of Kazakhstan № 827 12.12.2017: «Industry 4.0, one of the drivers of digital transformation industry, is the concept of production, where additional value is provided by the integration of physical objects, processes and digital technologies, in which physical processes are monitored in real time, decentralized solutions are adopted, as well as the interaction of machines between themselves and people».

The national education is one of those fields where digital communication skills need to be implemented at all levels, while at the same time providing the tasks of educating young people, as well as adequate communication with the global academic world in the process of the internationalization of higher education and research. The article is written within the framework of realization of research project «Multidimensional Research of history, problems and prospects of implementation of international educational projects in the Republic of Kazakhstan» on grant financing of the Ministry of education and science of the Republic of Kazakhstan.

Key words: Model of national education, internationalization of higher education and science in the Republic of Kazakhstan, democracy, education, John Dewey, International educational projects, digitalization in the Republic of Kazakhstan, academic communication, communication model, University 4.0.

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Саңдыққа білім беру арқылы өту: университеттерге үндеу

Мақалада Қазақстан Республикасының ұлттық білім беру жүйесіндегі академиялық коммуникацияның цифрландыру саласындағы кейбір міндеттер анықталды. Бұл мәселе академиялық тұрғыда жалпы жаһандық саңдық коммуникацияда сөзсіз зерттеуді талап етеді. Қазақстан Республикасы Үкіметінің 2017 жылғы 12 желтоқсандағы № 827 қаулысының

міндеттеріне «сәйкес өнеркәсіптің цифрлық трансформациялану драйверінің бірі болып табылатын Индустрия 4.0 қосымша құндылық физикалық объектілердің, процестердің, цифрлық технологиялардың бірігуінің есебінен қамтамасыз етілетін өндірісті ұйымдастыру тұжырымдамасы болып табылады, бұл ретте нақты уақыт режимінде физикалық процестердің мониторингі жүзеге асырылады, орталықсыздандырылған шешімдер қабылданады, сондай-ақ машиналардың өзара және адамдармен іс-қимылы жүреді». Ұлттық білім – бұл барлық деңгейлерде енгізілуі тиіс жастарды цифрлық коммуникациямен бірмезетте қамтамасыз ете отырып жоғары білім мен ғылымды интернационалдандыру процесінде жаһандық академиялық әлеммен барабар қарым-қатынас жасаудың бір саласы болып табылады. Мақала Қазақстан Республикасы Білім және ғылым министрлігінің гранттық қаржыландыруы бойынша «Қазақстан Республикасындағы халықаралық білім беру жобаларын жүзеге асырудың тарихы, мәселелері және келешегін көп қырлы зерттеу» ғылыми жобасының шеңберінде жазылды.

Түйін сөздер: Қазақстан Республикасының жоғары білім және ғылымды интернационалдандыру, ұлттық білім үлгісі, Джон Дьюи, халықаралық білім беру жобасы, Қазақстан Республикасындағы цифрландыру, академиялық коммуникация, коммуникациялық үлгі.

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От передачи знаний к цифровому переходу: вызов университетам

В статье раскрываются некоторые задачи, стоящие перед системой национального образования Республики Казахстан в области цифровизации академической коммуникации. Исследование данной проблематики неизбежно в эпоху всеобщей глобальной цифровой коммуникации в академическом мире. Согласно задачам госпрограммы «Цифровой Казахстан», утвержденной постановлением Правительства РК №827 от 12.12.2017: «Индустрия 4.0, один из драйверов цифровой трансформации промышленности, представляет собой концепцию организации производства, где дополнительная ценность обеспечивается за счет интеграции физических объектов, процессов и цифровых технологий, при которой в режиме реального времени осуществляется мониторинг физических процессов, принимаются децентрализованные решения, а также происходит взаимодействие машин между собой и людьми». Национальное образование является одной из тех отраслей, где навыки цифровой коммуникации должны внедряться на всех уровнях, обеспечивая одновременно задачи воспитания молодежи, а также адекватную коммуникацию с глобальным академическим миром в процессе интернационализации высшего образования и науки. Статья написана в рамках реализации исследовательского проекта «Многоаспектное исследование истории, проблем и перспектив внедрения международных образовательных проектов в Республике Казахстан» по грантовому финансированию Министерства образования и науки Республики Казахстан.

Ключевые слова: Модель национального образования, интернационализация высшего образования и науки в Республике Казахстан, демократия, образование, Джон Дьюи, международные образовательные проекты, цифровизация в Республике Казахстан, академическая коммуникация, коммуникационная модель, Университет 4.0.

Introduction: Civilization, society and communication

The basic assumptions of the research concerning the process of digitalization of academical communication in the Republic of Kazakhstan in the context of internationalization of national education and research is that the education model corresponds to the true needs of society.

Deliberately, the term «society» is not replaced with the term «culture» ordinary used in the Kazakh humanities. The research avoids civilizational connotations. The «culture» (and, by association, the «national culture») in Kazakh humanities is a term traditionally used in civilizational context that considers a particular area of existence of culture, but not a particular society in its concrete current historical, political, social situation. Society, for its

part, is a term that reflects a more realistic approach which is, in the spirit of pragmatic (then, Dewey's) philosophy «concrete» in its immediate connotation to the real and hic et nunc effect.

To clarify this point, let's just try to look at some parallels between the structure (though it is not about structuralism as a methodological approach in this study) or the model of this particular society – or a political structure, or a political model of this concrete society – and the educational model that is used to educate both the younger generation (children) and adult students (university, students). This model consistent with one another exists by correspondence of its «architectonic» model, i.e. the model of organization, of management principles, of communication between its parts. This conformity of models provides the continuity of «experience» in order to maintain the existence of group throughout the history time.

Such a point of view in the history of the philosophy of education was adhered by John Dewey. In one of his works *Democracy and Education: An Introduction to the Philosophy of Education* (1916) he affirms:

«With the renewal of physical existence goes, in the case of human beings, the re-creation of beliefs, ideals, hopes, happiness, misery, and practices. The continuity of any experience, through renewing of the social group, is a literal fact. Education, in its broadest sense, is the means of this social continuity of life. Every one of the constituent elements of a social group, in a modern city as in a savage tribe, is born immature, helpless, without language, beliefs, ideas, or social standards. Each individual, each unit who is the carrier of the life-experience of his group, in time passes away. Yet the life of the group goes on.» (Dewey, 1916:3).

This quote reflects one of the most interesting aspects of Dewey's vision of education as a social phenomenon, that is its futurologist aspect. Education is one of the most «down to earth» social practices, which is dramatically aimed to the future by the immediate hic et nunc realization of tasks of the everyday education. Thus, speaking about the correspondence of the educational model of the true social and political model that exists in the society, the present research adheres to the same point of view. Education is not only a simple mechanism of transmission of indispensable information from one (generation) to the next one (generation). The spontaneous and natural character of education as social activity detains a temporary connotation to the future (a future) explained in this concrete transmission.

How, however, the true conformity of the educational model is possible, if we consider it as a replica of the political, social and ideological machines that create the most real (not ostentatious or imagined) society in which this model is accepted? Dewey clearly shows:

«Society exists through a process of transmission quite as much as biological life. This transmission occurs by means of communication of habits of doing, thinking, and feeling from the older to the younger. Without this communication of ideals, hopes, expectations, standards, opinions, from those members of society who are passing out of the group life to those who are coming into it, social life could not survive.(...) Society not only continues to exist by transmission, by communication, but it may fairly be said to exist in transmission, in communication. (...) Not only is social life identical with communication, but all communication (and hence all genuine social life) is educative» (Dewey, 1916:4).

That is, it is impossible to hope that some ideal (and ideologized) imaginary picture of the desired present and future of this given community will outshine the fact of the accepted communication practices reflecting the very reality. The process itself of living together educates, but not only a formalized process of teaching and learning. Education is for the social life like nutrition and reproduction are to biological life that is a necessary, basic and primary activity for surviving society. Thus, it is in communication that the very process of teaching-learning transmission is carried out. Communication is the mirror of the true society and of the true model of national education corresponding to it.

«Communication is a process of sharing experience till it becomes a common possession. It modifies the disposition of both the parties who partake in it. That the ulterior significance of every mode of human association lies in the contribution which it makes to the improvement of the quality of experience is a fact most easily recognized in dealing with the immature. That is to say, while every social arrangement is educative in effect, the educative effect first becomes an important part of the purpose of the association in connection with the association of the older with the younger». (Dewey, 1916:11)

Thus, it is in the mirror of communication that the real, concrete and true needs of society could be viewed. Communication and the model of transmission in everyday life reflect the whole social model and its necessities, «beliefs, ideals, hopes, happiness, misery, and practices».

In such a context the topic of the article must be considered as a valid according to the processes that take place in the contemporary Kazakhstan. According to the objectives of the state program «Digital Kazakhstan» approved by the Government of the Republic of Kazakhstan № 827 from 12.12.2017: «Industry 4.0, one of the drivers of digital transformation industry, is the concept of production, where additional value is provided by the integration of physical objects, processes and digital technologies, in which physical processes are monitored in real time, decentralized solutions are adopted, as well as the interaction of machines between themselves and people». (https://docs.google.com/document/d/1k0biT_M3gK5HwAE05-cGTbZ-qf44De8BXzad_nghjU/edit).

Though, this «interaction» is communication in its specific look that is digitalized communication. The national education, in turn, is one of those fields where digital communication skills need to be implemented at all levels, while at the same time providing the tasks of educating young people, as well as adequate communication with the global academic world in the process of the internationalization of higher education and science.

Economy of knowledge / globalization / digital transition

European universities were born in the eleventh century, the first being Bologna in Italy (1088) and then Paris (1150). The motto of the university of Bologna (the «process of Bologna» was named after this) gives the former program these two institutions and their followers have had throughout centuries: Alma Mater Studiorum. This latin sentence means: «The mother that nourishes with knowledge».

Since then, the program of the universities has always been to elaborate this «food for soul» that knowledge is and then to transmit it to students. The conditions of this transmission are academic freedom, institutional freedom (the right to deliver degrees and diplomas), and political freedom (the right to behave as an universitas, that is a community of researchers, teachers and students, producing new scientific knowledge according to their own rules and habits). This knowledge was then dispatched in all Europe with a set of travelling professors, thus acting as the first European net which was already a web of science, despite the slowness of the process, (traveling by feet and horses being slower than digital signals of course).

Nowadays, though the universities yet seem to partake this old ideal of a community elaborating

and transmitting knowledge (every institution in higher education wants to be labelled «university»), the landscape of higher education has dramatically changed.

First for historical reasons:

The weight of knowledge in society has evolved from scholastic and religious knowledge, which is conservative (because it orders societies), to the increasing power of technoscience that shapes and transforms societies, bringing radical mutations, and so become a progressive or even revolutionary force.

Since the scientific revolutions of the 17th and the industrial one that immediately followed, science has become through universities and state-controlled institution, the main transformative force of societies and environment.

That is why higher education and public research are nowadays a very competitive environment, which tends worldwide to become homogeneous in practices and methods of management, an environment which must produce results proportional to the amount of money the governments inject in the circuitry.

Despite the scientific research and technological development (R&D) are for the most part the fact of private corporations looking for business opportunities, the states and government cannot disengage from planning research and must fund and control research more or less heavily. Knowledge is not a product like others. It is power: *Scientia postestas est*, said Bacon in the 17th century (Bacon's works led to the creation of the Royal Society for the advancement of learning, the first state controlled and funded institution of science that played a major role in Great-Britain economic and military domination over the 18th Century). Thus the state, as a political entity, has his word to say in science at least for two reasons:

1) for fundamental political reasons of country autonomy (ie not being overcome by foreign powers), like, for instance, the mastering of new sources of energy, which is the crucial political challenge of the next century, and

2) education, because the level of pluri-disciplinary education of the people to master and accept the technological evolutions is the key to the future development of a society and of its economic progress.

The role of private universities is generally to sell a passport for business through the acquisition of competences. The role of public ones is to foster the intellectual development of the nation and bring progress in fundamental research. Many of the

future jobs are not yet invented and many of the traditional jobs are going to disappear (because of IA for instance). New markets, new social needs, and above all new possibilities because of new tools means new jobs.

This brings us to the second point. The reason why the landscape of higher education dramatically changed is that new tools of transmission and elaboration of knowledge have appeared with the digital revolution, which is not only linked with the internet and its resources, but also

- with the increasing power and wide availability of the hardware,
- the increasing capacity of digital and dematerialized storage of data (notably in the cloud),
- the new models of artificial intelligence for managing Big Data (like the deep-learning), and so on.

This is more akin to a transition rather than a revolution, because all these innovations are widely accepted and awaited for in our societies. Nevertheless, despite many of our activities are widely digitalized, this transition seems to be not only slower in universities, but it seems too to be paradoxically inconsistent with the former ideals of the Universitas.

Digital tools are employed everywhere, but the promises of a real transformation of the universities are not yet kept. Digital libraries are just libraries, even if easier to use, digital humanities are a collection of corpses, and more generally computers have not freed researchers and students but have enslaved them to quality processes and constant feedbacks, applications forms, imperatives emails, and to a bureaucracy that deprives them of their drive to research.

The major challenge of the years to come will be to produce tools to give back time for research and improve the conditions of producing collaborative knowledge. From a political and even philosophical point of view, the digital transition will be accomplished when digital science will produce more freedom in everything relating to knowledge. European governments are conscious of this challenge. They recently joined in a coalition for «plan S», which means widening the concept of Open Science. This is the new frontier.

Open science rests upon:

- technological conditions: dematerialization, open edition platforms, open source tools...
- ethical: collaborative work that prevent the malicious consequences of a liberal-driven university (plagiarism, «publish or perish», artificial rankings...),

– political conditions (European-level plans or even worldwide plans to counter the power and influence of the GAFAM),

– economic conditions (the struggle against the dominance of editors like Elsevier, Springer; allocate funding according to the needs of society...), a sustainable definition of «knowledge economy».

The ultimate goal being to free the energies of public research and to reintegrate the idea of a community that begins when teaching the humblest of the students. There is a lack of new tools and processes, and my unit, the Centre Granger in France, is currently developing such tools with many partners. We hope to change things and help the digital transition to build a better and improved society through science and learning with the digital technology not being our master, but our instrument.

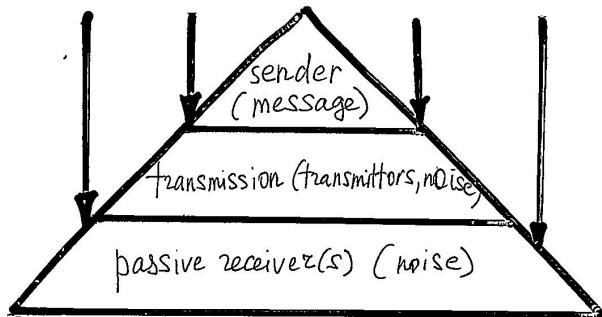
Social model and its educational and communicative conception

Thus, the digitalized communication in the Kazakh society, and, as related to this research, the academic digitized communication, is a priority task when it comes to internationalization processes in the system of national education and research. Moreover, the relationship between an academic communication model and a university model give us an image of society as such. Moreover, this communication model shows us the future of the group and its possibility to develop throughout the time of history.

At the chapter VII of his work, Dewey considers two principal different types of government, that is despotically governed state and, as he said, «the democratic ideal». It would be an error, he remarks, that there is no common interest in the type and model of government called by him «despotically governed». The despotically governed state partakes among its members common interest as all societies. But the main function of this type of communication is a «simply capacity for fear». The leading leitmotif in a despotic state is fear, and this is not the fear that makes us to take care of the future, of our health or to save money. This fear is an isolated fear, a fear as such. This isolated fear affects the forms of communication, including academic communication, the forms of communication that serve the transfer of knowledge, of information, of experience, that is the education.

In such a situation where the fear becomes the first motivation for an individual, the sense of his activities is completely absorbed by its emotion. There no place to conjoined communicative experience, to exchange and to the mutual and meaningful interaction of individuals. Then, the

communication takes a pyramidal and vertical (top-to-bottom) form of exchange of information (model 1).



Model 1 – «Pyramidal and vertical (top-to-bottom) form of exchange of information»

In opposite of the fear as leitmotif of despotic communication, there are at least two elements that characterize a democratically characterized society and, consequently, its education and communication.

1. The democratically organized society and its model of communication has more numerous and more varied points of shared common interest, and, at the same time, the greater reliance upon the recognition of mutual interests as a factor in social control.

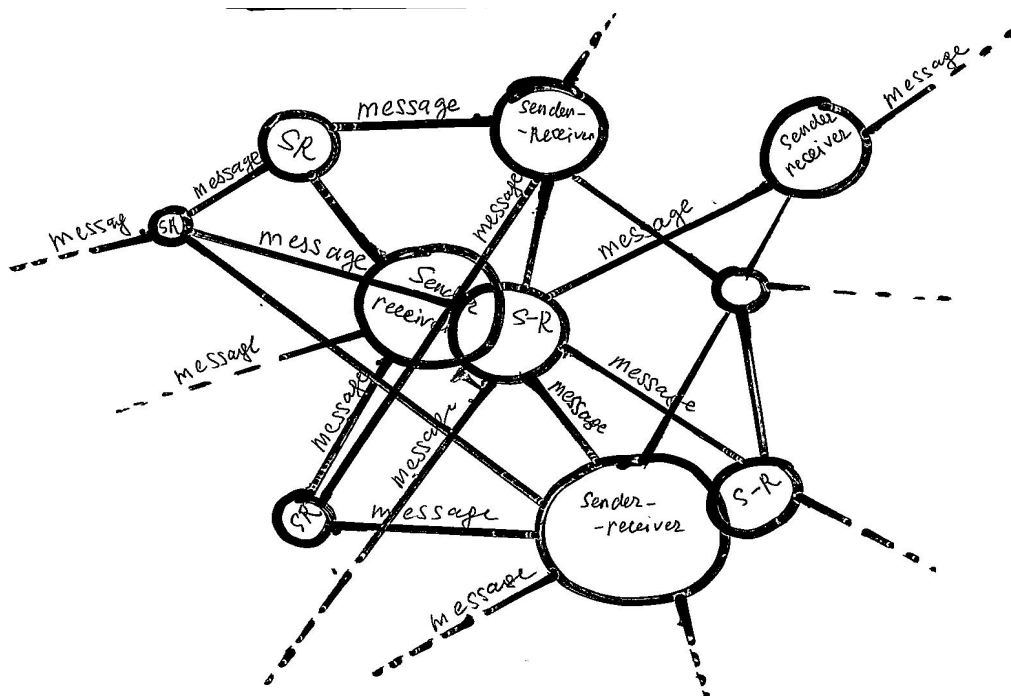
2. Besides, this type of government and communication means not only freer interaction

between social groups (once isolated so far as intention could keep up a separation) but change in social habit, its continuous readjustment through meeting the new situations produced by varied intercourse. (Dewey, 1916:100).

The democratically organized society need more than other types of government to have a deliberate and systematic education, because of its form of a social life in which interests of its members are mutually interpenetrating.

«A democracy is more than a form of government; it is primarily a mode of associated living, of conjoint communicated experience. The extension in space of the number of individuals who participate in an interest so that each has to refer his own action to that of others, and to consider the action of others to give point and direction to his own, is equivalent to the breaking down of those barriers of class, race, and national territory which kept men from perceiving the full import of their activity.» (Dewey, 1916:101).

In the «ideal» democratic society, thus, there is no place to the barriers to the free exchange and communication of experience. The digitized model of communication is one of the most progressive forms of communication that corresponds to the ideal of modern and mobile democratic society without artificial barriers. This model has a «rhizomatic» form of transmission of information, from deleuzian «rhizome» (Model 2).



Model 2 – «Model of rhizomatic learning»

According to some scholars (one of them and the most known is Richard Rorty (Rorty, 1982), delezian thought logically continues the way of pragmatic Dewey's theory of education. The comparison that Dewey made between learning as a need for continuity of social life and nutrition and reproduction as a need for continuity of biological life and rhizomatic model of learning (i.e. the communication process) is a logical continuation of the tendency for understanding (and idealizing) the social as biological. This model corresponds to the aims of the program «University 4.0», that is to integrate into a single world a digital ecosystem and is a cyberphysical complex that includes simultaneously a real academic and research processes and their virtual counterparts.

The concept of digital academic communication model – university 4.0 in the Republic of Kazakhstan.

Digitization of the higher education system has become a global trend not only in Kazakhstan but in the whole world. The use of digital technology is seen to expand the possibilities of acquiring the new knowledges. Online tutorials, massive online courses give limitless freedom to consume knowledge everywhere. Thousands of applications make life easier for the student, who increasingly resorts to the fact that ready answers can almost always be found on the Internet platform.

According to the State and a different Universities programs, such as «Industry 4.0» and «University 4.0», the digital communication model in the higher education system must first meet the needs of the digital economy and the training of a competitive specialists well oriented in the world educational space.

The XXIst century gave to the world not only a vector in the direction of digital communications, but also a new generation, whose childhood, youth is held in digital space. This generation, born in 2000, the American educator Mark Prensky called «digital natives», whereas today's teachers are «digital immigrants» (Prensky, 2001).

Between this two groups of digital natives and digital immigrants, there is no common language of communication. Education in the new digital format is such that students often teach teachers how to obtain and process new information, and the critical selection of information collection channels.

It is all connected with the new style of communication [Saparova D, Kanagatova A., 2018]. Teachers today complain about modern children-digital, but they insist on a new format pedagogical approaches to modern students, namely: to revise

the methodology of presentation of material and style of communication. What does it mean?

1. First, the digital communication model is characterized primarily by its interactivity, i.e. it carries out bilateral communication through information technologies;

2. Secondly, the expansion of access to information and its relative freedom;

3. Finally, the convergence that is the combination of functions and capabilities of digital devices, which gives a great tool to today's educational process.

It is already a long time ago that marketers and psychologists have proven multitasking and clip-thinking of a digital-generation children (www.sparksandhoney.com//Meet generation Z: forget everything you learned about millennials). Both the thinking and the procedure of information processing differ from previous generations. Hence the content of the curricula should be written in the language of digital culture. For example, the American educator offers the use of computer games as a learning material (Prensky, 2001). In other words, in the era of digitization, educators (or «digital immigrants») must change and understand that there is no problem of communicating with the digital generation, but there are the new prospects to see their «subject» under another perspective and there are a million available opportunities and interesting possibilities for communicating it to their learners.

One of the leading trends in the modern higher education of the Republic of Kazakhstan corresponds to these goals, namely the «University 4.0» concept. Responding to the challenges of the Fourth Industrial Revolution (Industry 4.0), the University of 4.0 strives to integrate into a single world both the digital ecosystem and a cyberphysical complex, a combination which includes simultaneously a real academic and research processes and their virtual counterparts.

This model is implemented in Kazakhstan, for instance, by the Al Farabi Kazakh National University. The concept «University 4.0» assumes the use of cloud technology to automate the various activities of the university, the introduction of so-called smart technologies in the management of campus infrastructure, the use of technology Big Data to create an analytic base. (<https://newtimes.kz/es-hche/tekhnologii/81286-kaznu-sozdaet-model-tsi-frovogo-universiteta>). This model of the university involves automation and intellectualization at all stages of production and of transfer of knowledge.

At the level of educational and scientific processes the main and inevitable consequence of the

introduction of digital communications in university life will be a change in the style of academic communication in all its stages. The two main types of academic communication – formal and informal (including formal verbal and formal written, formal primary and formal secondary, informal direct, informal mediated communications) can take at least two forms – vertical (from higher academic instances to downline) and horizontal (at the level «from researcher to researcher», «from teacher to student», «from department to department»), that is corresponding to the two above-mentioned models of communication (pyramidal / rhizomatic). (Yelizarov. 2014: 278-284). The Kazakh universities are in need of development of the horizontal type of formal and informal communication. Ideally, the model «University 4.0» will help not only to modernize the working processes in the academic world, but also to modernize the process of communication (the meaning of which, as we know, not in the content of the message, but in the process of communication). It is appropriate to remember the famous «Medium is the message»! (McLuhan, 1994).

Thus, the desired digital communication model that meets the above requirements (meeting the needs of the digital economy, expanding access to information, convergence) cannot but experience the influence of modern social and political trends. In this sense, the so-called «University 4.0» is both a consequence and a cause of certain socio-political attitudes. Can we say in this case that the new forms of communication correspond to the concept of «hidden curriculum», which is so characteristic of the theory of democratic education? Repeat:

«Society not only continues to exist by transmission, by communication, but it may fairly be said to exist in transmission, in communication. (...) Not only is social life identical with communication, but all communication (and hence all genuine social life) is educative». (Dewey. 1916:4)

Assuming that Dewey was right in his philosophical vision of the role of communication in social life and, in particular, in the educational process, we need to wait for the changes that are coming along with the advent of digital natives.

Conclusion

An important aspect of modern socio-cultural development is the transformation of information and communicative space. Widespread digitization has caused a number of changes in all areas of cultural and social life. The internet has become the main communication space, and the modern ap-

proaches to communication require a deep study. At the same time, the potential of the new cultural digital space is not defined, nor are their limitations. The world has changed, the person has changed, the objects of digital space are complementary, social and economic modernization form the environment. For modern Kazakhstan, and for its national model of education, the correct approach to the complexities in digital communication and the place of the person in it is important.

Of course, we should not lose sight of the risks associated with the development of the digital communications environment. These risks are common to all spheres of social life, including education, scientific and academic environment. They are pointed out by many modern philosophers-theorists of public space. In particular, we remember Habermas with his warnings about the illusory involvement in the democratic, social life of an individual with unrestricted access to information, its interpretation and the ability to lead a supposedly active social life in the comments to potentially anonymous sources (Habermas, 1987).

The more important, along with the introduction of new digital technologies, is to strive to a constant theoretical reflection on the essence of the process, its possible consequences and risks. It is in this sense that we need to build on the conclusions, which have long been the origin and mass diffusion of modern technologies came thinkers whose works are recognized throughout the world as classical works on democracy and education.

The essence of modern communication processes in general and academic communication in particular is in the ability to unrestricted exchange of information (that is, how we understand it at Dewey, «experience»). «University 4.0» is, from this point of view, a democratic model of the university, in which less space will remain for the negative costs of the educational system (such as the phenomenon of plagiarism, corruption, nepotism and others). Here is, for example, one of the definitions given by Dewey to democracy:

«...democracy is belief in the ability of human experience to generate the aims and methods by which further experience will grow in ordered richness... Democracy is the faith that the process of experience is more important than any special result attained, so that special results achieved are of ultimate value only as they are used to enrich and order the ongoing process. Since the process of experience is capable of being educative, faith in democracy is all one with faith in experience and education». (Dewey, 1939/1988 Dewey, J. (1939/1988).

Creative democracy – the task before us. In J. O. Bodyston (Ed.), John Dewey, the later works 1925–1953, volume 14: 1939–1941 (pp. 224–230). Chicago, IL: Southern Illinois University Press. [Google Scholar], p. 229).

The model «University 4.0» will serve as a basis and a way to further build a modernized, democratic Kazakhstani society, capable of being adequately represented on the world stage by future specialists, whom education is occurring right now.

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