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PSYCHOLOGICAL READINESS TO USE DISTANCE LEARNING AMONG TEACHERS INVOLVED IN DIGITALIZATION

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Abstract

The article discusses the preliminary empirical results of psychological readiness to use distance learning technologies (DLT) in school and university teachers' professional activity. The demands placed on teachers creating distance electronic courses, are increasing in the conditions of digitalization in modern Russian education. The research examines the motivational, emotional, cognitive and behavioural aspects of the teachers' psychological readiness to use such courses in their practice. The study involved 95 teachers of different age and professional state, from small and large cities. A version of readiness form was developed and tested. The data obtained shows no difference in readiness and the level of use of distance learning technologies between residents of different size and distance from the centre of settlements. Such result indicates the ability of remote technologies to perform the functions of a social elevator, equalizing the opportunities and rights of different people to receive quality education. Significant differences between users and not-users of distance learning technologies were obtained in emotional and behavioural components of psychological readiness. Besides, there are no differences between these two groups in professional commitment, cognitive and motivation components of readiness, age and residence. The study allows outlining the steps for the formation of psychological readiness to use distance learning technologies in teaching practice.

Keywords: Psychological readiness, distance learning, teacher, digitalization.

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1. Introduction

There is no doubt that the informatization of education in Russia has many positive results, such as implementation of programs for teachers of computer science in pedagogical universities, introduction of computer science as a school subject, technical equipment of educational institutions with computer equipment on the stage of "computerization" from 1985 to 1993; development of a new information culture, information outlook, the study of the informatics fundamentals, training of specialists using new ICT in their professional activities – from 1993 to 1998. All these processes were accompanied by development and introduction a number of documents (concepts) from different ministries and departments regulated the process of informatization. A period of crisis (1998 – 2001) entailed the process of informatization decentration. At the same time since 1998 the development of a distance learning system begins as part of the informatization process; in particular, the implementation of the federal target program (Noskova et al., 2015; Laptev & Noskova, 2016).

However, it should be considered how the informatization education is currently located. The problems of educational informatization are the fundamental global problems of the 21st century all over the world (Gutiérrez-Esteban et al., 2015; Minyurova & Kalashnikov, 2017). Technical characteristics of technologies are growing, and their cost is decreasing. It makes them accessible to the mass user. Society is not always ready for this (Laptev & Noskova, 2016; Nechaev & Durneva, 2016; Semenova, 2018). That's why this article is devoted to the phenomenon of readiness

2. Problem Statement

There are two approaches to understanding the phenomenon of digitalization. A more rigorous understanding is presented in computer science. A freer interpretation of digitalization is characteristic of the social and philosophical sciences. Analysis of various approaches in understanding the process of digitalization in education also allows to distinguish two main areas: “technical-oriented” and “person-oriented”. The “technical-oriented” approach is based on the idea to form a new type of intelligence and a new attitude to the rapidly changing information and technical reality (Shmatkov, 2015). This direction was influenced by the intention of adapting a person to a new stage in the development of the information society based on the widespread introduction of information and communication technologies. The result is the development of technical skills based on the mastery of computer technology and the reduction of content and methodology of education.

The “person-oriented” direction comes from the central role of a person (both a student and a teacher) in the educational process. This approach is focused on mental states of a person faced the need to develop and use previously unfamiliar knowledge transfer tools. So, the concept of psychological readiness for the use of distance learning technologies was formulated. As a basis, the dictionary definition of readiness was used. The following definitions of readiness are indicated in the “Psychological Dictionary”: 1) armed with knowledge, skills, and abilities; 2) readiness for emergency implementation of the existing action program; 3) consent, determination to perform an action (Davydov, Zaporozhec, & Lomov, 1983).

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The students have changed radically — that's the main reason of educational decline in the USA. It depends on rapid dissemination of digital technology (digitalization) at the end of the 20th century. Digitalization (such as computer games, Internet, cell phones and instant messaging) is an integral part of their lives. It changes not only their experiences, but also the brain structures. Prensky (2009) calls them “native speakers”, or Digital Natives. People who were not born into the digital world are Digital Immigrants. And the “digital immigrant accent” can be seen in many things. We think that this "accent" manifests in psychological unreadiness to use new technologies. In the professional activity of a teacher, this is the unreadiness to use distance learning as well (Prensky, 2016).

Following Prensky, Griffiths (2016) considers most university and college professors as «digital immigrants»: because they were born before a digital age and now they are involved in digitalization, not being prepared to it by their previous experiences. Today's (and tomorrow's) students, however, are «digital natives», they're well knowledgeable in new technologies and fluent in skills. Distance learning isn't suitable for those students who need "face-to-face connection" to remain disciplined and focused in their studies. She writes: "Navigation of multimedia, knowledge of computer-based technology, and explicit guidelines for students are essential. The literature demonstrates the need for both faculty preparedness and student readiness for success in on-line learning. Successful orientation to the course, communication, and clear expectations by both instructor and learner are needed for academic success" (Griffiths, 2016, p. 158).

Prensky (2009) discusses the role of "digital wisdom" as it applies to one's ability to use new technologies effectively.

Most authors dealing the problem of psychological readiness consider sustained readiness could be indicated as a structure including: positive attitude to a particular type of activity, profession; character traits, abilities, temperament, motivation adequate to the requirements of the activity, profession; necessary knowledge and skills, professionally important features of perception, attention, thinking; emotional and volitional processes (Ponikarova, 2013). Goryunova & Lebedeva (2018) examines the problem of technological readiness of teachers for distance learning, but does not research psychological readiness.

The presented structure composition of the phenomenon does not specify the readiness to use the new distance didactic tools. Among all the results of researches devoted to the problems of psychological readiness for distance learning it was found only one dedicated to this issue by Horzum & Cakir (2012). The purpose of their research was to examine the relationship between readiness (Autonomy and Control & Motivation), willingness ("finding distance learning useful", Perceived Usefulness & Perceived Affection) and anxiety distance learning. The scale was developed by the researchers and opinions of several experts on distance learning. These authors remain that the readiness of the students consists in high level of willingness and consciousness and low anxiety. However, students feel fear, eagerness, apprehension and excitement in anticipation of distance learning courses. Above all they have difficulties in using technology. 74,5% students did not want to have distance learning. The anxiety level of students firstly taking distance learning course is close to high. In general, students are ready for distance learning, but special efforts are needed to reduce anxiety. According to results, very important distance learning

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meets our needs and provides enjoy for us. Distance learning is effective when it helps to solve personal problems (Horzum & Cakir, 2012).

In the 1990s the terms describing various types of negative impact on human technology — technophobia, computer phobia, cyber phobia, technological (computer) stress, computer anxiety etc. have been appeared (Khasawneh, 2015). At the same time, the first studies of the technophobia phenomenon prevalence in various occupational and age groups have been appeared. Statistics show that the number of people in samples from different countries experiencing computer stress reaches 50 % and, therefore, technophobia is a normal human response to technological stressors (Brosnan, 2003). Studies of human emotional reactions on interacting with computers suggest that technophobia is a sustainable emotional response of a person to the stress of interaction with a computer. This kind of sustained anxiety forming in the educational process is transmitted from teacher to student and student, reduces the effectiveness of technology development and lowers the overall effectiveness of educational activities (Brosnan, 2003; Khasawneh, 2015). In general, the readiness to study remotely is much more research than the readiness to teach remotely. But we think in most cases, unsuccessful distance learning and dropout rate are determined with the unreadiness of teachers to teach.

This article doesn't deal with the technological, but with the psychological results of the education digitalization. It seems today we can distinguish the following phenomena relating to the subjects of education included in the digitalization processes: the lack of internal conscious motivation to use modern technologies and technical means with the classrooms equipped; fear of using information systems (for example, intra-company systems with student and teacher profiles); identification of oneself as a developer in online courses, where the real role of the developer is limited to the authorship of the course content; lack of moral satisfaction from working in a distance learning system; low score for online courses; frustration with online learning; partial use of the capabilities of the distance learning shell due to ignorance and lack of confidence in its capabilities.

3. Research Questions

3.1. Research question 1

What is the structure of psychological readiness phenomenon in the context of distance learning?

3.2. Research question 2

Are there any differences in psychological readiness between two groups of teachers – users (DLT+) & non-users (DLT-)?

4. Purpose of the Study

The purpose of the study is to analyse the psychological readiness to use distance learning technologies of teachers involved in the digitalization process. The first task of this research is to develop theoretical model of mental phenomenon "psychological readiness" and its diagnostic analogue making possible to operationalize "readiness" and to reduce it to numerical values. And the second task is to

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explore psychological readiness of teachers in contemporary Russia as users and developers of distance learning technologies.

5. Research Methods

Generalized information allows to distinguish the psychological readiness in distance learning as six terms composed (see scheme in figure 01).

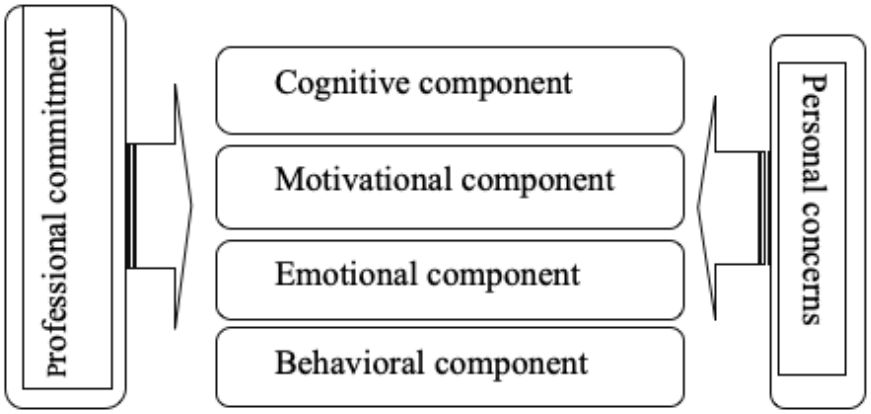

Figure 01. Psychological readiness 6-component model

5.1. Questionnaire "Positive Attitude to Profession Activity"

Positive attitude to profession activity – a component that perform the function of facilitating the entire complex of psychological readiness. A questionnaire of "professional commitment" developed by Minyurova and Kalashnikov (2017) was used to diagnose the level of positive attitude to teacher profession. A questionnaire consisting of 15 items was validated on a sample of 90 teachers in the age range of 21-62 years with professional experience from 1 month to 39 years. Each item was rated on 4-point Likert scales: altogether agree (3), I agree rather than disagree (2), rather disagree than agree (1), absolutely disagree (0). The participants' answers were evaluated on a 7-point Likert scale from 1 (completely disagree) to 7 (absolutely agree). Exploratory factor analysis based on the principal component method and varimax rotation was used to identify the factor structure of teacher's professional commitment. Based on the values of factor loadings, three factors were identified. The first factor named "professional affectivity" combines the variables reflecting the emotions affection, job satisfaction, pride from being in profession, adoption of common professional goals and values. The second factor named "professional stability" includes variables reflecting the awareness of the difficulty of leaving the profession due to investing in it and a sense of duty towards it. The third factor named "professional activity" is the desire of employees to devote themselves to the profession, to spend extra time and make efforts in their professional activities.

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5.2. Psychological Readiness Original Form

The original form of 36 items was developed to measure the next four (2-5) components of psychological readiness. Each item was rated on 4-point Likert scales: «altogether agree» (3), «I agree rather, than disagree» (2), «rather disagree than agree» (1), «absolutely disagree» (0).

1. Cognitive component measures thoughts and attitudes to distance technologies (include questions such as «I am convinced that mastering DLT promotes professional development».

2. Motivational component measures the internal and the external components of readiness motivational aspect; (including such questions as «I have no particular desire to deal with distance learning because I'm not interested» (reverse question).

3. Emotional component points out feelings to distance learning (include such questions as « I experience negative emotions (fear, anxiety) when I have to deal with distance technologies» (reverse question);

4. Behavioral component checks representations of hypothetical behavior and real acts undertaken using distance technologies (include such questions as «I notice visible progress working with DLT».

5.3. Personal Concerns Using Distance Technologies

Six questions were developed to estimate this type of personal concerns. It was supposed that personal concerns perform the function of suppression the entire complex of psychological readiness. Personal concerns were evaluated using a three-point scale: «agree» (2); «difficult to answer» (1); «disagree» (0).

5.4. Methods of statistics

Descriptive statistics, Spearman rank correlation coefficient, Mann–Whitney U-test and Exploratory factor analysis based on the principal component method and varimax rotation were used.

5.5. Sample and Data

The study was organized as an anonymous online survey based on Google forms. The participants were asked open direct questions about their age, professional state, place of work and residence. So the study involved 95 professionals of secondary (26) and higher school (69) in the age of 23-77 years, 84 female and 11 male. The participants were the residents of 23 settlements of Russia: 59 were residents of megalopolises; 14 people – residents of a million population cities; 13 people – residents of cities with a population of 750-200 thousand and 9 people – residents of small cities with a population of 77 to 1,3 thousand people. The official status of participants ranges from professor, doctor of science, to school teacher and kindergarten teacher and was ranked from 8 points (professor) to 1 point (kindergarten teacher).

Participants were also asked direct questions about the nature and number of distance learning technologies using in their everyday professional activities. The criterion of experience in the development and use of remote technologies became the basis for dividing the sample into two groups

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according to the externally manifested behavioral criterion: the first group – the active users of DLT (so called DLT+, N=44); and the second group – those who do not use DLT (so called DLT-, N = 51).

6. Findings

6.1. Preliminary testing of measuring instruments

Psychological Readiness the original form. The results gained with Psychological Readiness form were exposed to factor analysis procedure to determine the level of substantive validity of its questions. The results show the two factor structure presented in table 01.

Table 01. Two factors of psychological readiness

No	The content of the sentences	Factor 1	Factor 2
1	(1). I am convinced that it is necessary to use DLT, the future is with these technologies	**0,708151**	-0,006432
2	(10). Mastering DLT is to keep up with the times	**0,703840**	-0,042271
3	(13). Despite the difficulties of mastering the DLT, I am ready to deal well with these new technologies, not sparing the time	**0,726808**	0,239084
4	(31). I am convinced that mastering DLT promotes professional development	**0,840261**	0,105637
5	(32). Using DLT reduces energy costs and saves my time	**0,708241**	0,179203
6	(36). As a teacher, I should use DLT along with other information technologies	**0,715223**	0,050207
7	(3). I know well the algorithm of actions working with DLT	-0,109815	**0,750432**
8	(7). Much for me is unfamiliar and incomprehensible in remote technologies	0,129259	**-0,778534**
9	(17). I am not ready to get involved in the work on the use of DLT, since I still can't do a good job with these technologies	-0,280952	**-0,792583**
10	(24). As a rule, I experience negative emotions (fear, anxiety) when I have to deal with remote technologies	-0,161905	**-0,766197**
11	(30). Working with DLT is accompanied by low performance, I have little to get	-0,300829	**-0,710095**
	Expl. var	8,266	7,014

In spite of the fact that the theoretical model of psychological readiness for mastering DLT contains the idea of a four-component structure, the results suggest only a two-factor structure of psychological readiness. A significant disagreement with the theoretical construct may be associated with an insufficient quality of the formulated questions, limited sampling, but also with an insufficient level of reflection of their experience shown by the respondents. A low level of reflexivity can be considered typical if a person is asked about activities in which he did not achieve success.

Two isolated factors have high factor loadings and can be called «motivational cognitive» reflecting beliefs and willingness to follow them, and «emotional behavioural» reflecting the mastery of skills (instrumentality) and emotions when using DLT. Since the questions included in the second factor were inverse, the factor loadings for them have negative values. It was decided to use the issues included

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in the two factors as two scales and to use them as a preliminary tool for measuring the psychological readiness to use DLT.

Personal Concerns using distance technologies. This research does not study the body's psychophysiological response to computer stress, called computer anxiety, but personal concerns and philosophical experiences of teacher who has entered digital education space. The results show that the teacher has concerns about the violation of personal space and imposed communication, but most of all he is worried about worldview concerns about the disappearance of personally meaningful knowledge, the information side of the learning process (knowledge) reducing or even completely replacing the assigned personally significant knowledge (understanding), see table 02.

Table 02. Mean values and the relationship of age and scales of personal concerns

No	Questions content	X± δ N=95	Age corr. coeff.
1	I am disturbed by the fact that working with DLT may violate my personal space	0,46±0,77	—
2	I worry about the fact that working with DLT will lead to loss my copyright on the personal developed teaching materials	0,93±0,91	—
3	I am concerned that working with DLT will make me an object of imposed communication	0,75±0,92	0,28
4	I am afraid that one day distant technologies will make me unemployed, as they completely replace the teachers	0,46±0,73	0,22
5	I am afraid that technology will change our way of life, communication, and the criteria of judging other people (teachers and students)	0,64±0,81	—
6	I am afraid that the DLT will make the transfer of knowledge impersonal, at the end leading to the disappearance of personally meaningful knowledge	1,11±0,93	—
	Total score	4,46±3,46	0,26

Correlations with age and their presence and absence suggest that the most important concerns are experienced both by young and senior teachers.

6.2. A comparative study of the psychological readiness to use DLT in two groups of participants

At the next research step the whole sample of 95 participants was divided into two groups according to the external behavioural trait – use/non-use of DLT to those who developed and used distance technologies (DLT+) and those who do not (DLT-).

Comparison of averages across the entire empirical data bank was carried out using the nonparametric Mann-Whitney test. The most amazing result obtained is that there is a few significant difference between two groups of comparison. So groups do not differ significantly in the scales of the

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questionnaire of professional commitment, cognitive-motivational scale, personal concerns, age, and even place of residence. Thus, teachers who do not use distance learning technologies are professionally involved people convinced of the need to use DLT with the same personal fears, among them there are people of all ages living both in small and large cities. They are distinguished between each other by their professional status, but most importantly, emotional experiences and behaviour that they realize when confronted with the need to use DLT (see table 03).

Table 03. Mean values for emotional and behavioural scale and values of U-criterion for the groups users (DLT+) and non-users (DLT-)

Questions of emotional and behavioral scale (form psychological readiness to use DLT)	DLT+	DLT-	U-criterion
(3). I know well the algorithm of actions working with DLT	2,88	2,49	844 $p \leq 0,05$
(7). Much for me is unfamiliar and incomprehensible in remote technologies	2,11	2,68	709 $p \leq 0,01$
(17). I am not ready to get involved in the work on the use of DLT, since I still can't do a good job with these technologies	1,43	1,82	874 $p \leq 0,05$
(24). As a rule, I experience negative emotions (fear, anxiety) when I have to deal with remote technologies	1,63	1,96	853 $p \leq 0,05$
(30). Working with DLT is accompanied by low performance, I have little to get	1,56	1,91	808 $p \leq 0,01$

Answering the questions of the readiness form, the participants reliably less often say that they understand the algorithm of action with DLT, and reliably more often agree with the fact that they experience discomfort and lack of knowledge, that they fail to achieve success, that they experience fear and anxiety. This simple but obvious result testifies to the lack of attention paid to the training of teachers for the use of distance learning technologies, to a clear disregard for the issues of human well-being in the workplace. Preparation depends on spontaneous self-education.

This result indirectly indicates sign the careless management that does not pay attention to the planning and organization of teacher training for activities in digitalization conditions. Such management leads to negative consequences - increased physiological anxiety, unconscious, “touch” searches for ways to use DLT, low self-assessment of the results of their work. All this makes a significant contribution to the professional (emotional) burnout of teachers.

7. Conclusion

The study present theoretical model proposed by the researchers and three experts (two experts in the field of human psychology and one expert in the field of psychology of distance learning) and a tool for diagnosing psychological readiness to use distance learning need to be significantly improved. More detailed psychometric testing and a description of the model and the empirical instrument are also highly desirable. The heterogeneity of the surveyed group, on the one hand, provides a number of advantages

(the ability to explore teachers at different levels of education, from different regions of Russia, with different experience in using distance learning, etc.), but, on the other hand, does not allow for the psychometric justification of the chosen theoretical models: "sticking together" of heterogeneous variables into a single factor may be evidence not so much of the imperfections of the developed tool, as the substantial unavailability of the examined groups. In the future, it seems appropriate to identify a model group of teachers with high rates of real activity in the field of distance learning (experience in using technologies, regular distance learning online courses, development and targeted systematic implementation of the educational process using new technologies.

1. The survey covered a group of respondents living in different regions of Russia, which allows analyzing the social geography of distance learning. If there is no difference in readiness and the level of use of distance learning technologies between residents of different size and distance from the center of settlements, this will indicate the ability of remote technologies to perform the functions of a social elevator and level the difference between large and small cities, equalizing the opportunities and rights of different people to receive quality education.

2. The main factor impeding the work of teachers in the use of DLT is anxiety, fear and lack of instrumental skills of the user. These psychological phenomena of computer stress can be successfully overcome with training programs that need to be developed and implemented in the service psychological support in higher and secondary school.

3. An important result is that there are no significant differences between these groups by age, status, which indicates that the groups "Natives" and "Immigrants" do not differ by age criterion: you can be Natives in the digital space at any age.

However, the results of the study provide also the opportunity to draw future perspectives.

1. Completion and validation of research tools to diagnose psychological readiness to use distance learning.

2. Testing different samples of teachers, depending not only on age, place of residence, social status, educational level, but also depending on real achievements, success in distance learning.

3. Comparison of "Digital Immigrants" (teachers) with "Digital Natives" (students) by psychological readiness for distance learning.

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