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Information technology application to improve future professionals' financial literacy competence

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Abstract **— The overall level of financial literacy of the country's population largely determines its economic development. The low level of such knowledge leads to negative consequences not only for consumers of financial services, but also for the state, the private sector and society as a whole. The development and implementation of programs to improve the financial literacy of the population is an important direction of public policy in many developed countries.**

To measure a person's financial ability, it is necessary to evaluate what they are doing as a financially capable person. The level of professional, and, in particular, financial literacy, depends on the effectiveness of actions to solve the tasks. Practical recommendations of financial literacy problem solution were proposed by the authors.

Thus, in this study the possibility of using breakthrough information technologies in improving personalities' financial literacy is proved theoretically and experimentally.

Keywords — financial literacy, person's financial ability, person's financial ability, information technologies, financial consultations, risks of excessive personal debt

I. INTRODUCTION

At the stage of development of market relations in Russia it is necessary to understand the necessity to improve the financial literacy of the population. Especially this need arises in the crisis periods of the economy. Financial literacy is a sufficient level of knowledge and skills in the sphere of finance, which allows to assess the situation in the market correctly and make reasonable decisions. Key financial concepts knowledge and the ability to use them in practice enables a person to manage their funds properly.

It should be noted that the overall level of financial literacy of the country's population largely depends on its economic development. The low level of such knowledge leads to negative consequences not only for consumers of financial services, but also for the state, the private sector and society as a whole. Therefore, the development and implementation of programs to improve the financial literacy of the population is an important direction of public policy in many developed countries.

The processes taking place in connection with the society informatization provide not only to the acceleration of scientific and technological progress, intellectualization of all types of human activity, but also a qualitatively new information environment of society creation, ensuring the development of human creativity.

The face of Russian companies is presented by young, active, talented professionals with financial literacy. The growth of financial literacy leads to a reduction in the risks of excessive personal debt of citizens on consumer loans, reducing the risks of fraud by unscrupulous market participants, etc.in Russia, financial literacy is at a low level. Only a small proportion of citizens are familiar with the services and products offered by financial institutions.

Financial literacy is "the ability of an individual to receive, understand, and evaluate the essential information he needs to make decisions with awareness of the possible consequences of his/her actions." In other words, financial ability is the practical activity of an individual to achieve his/her goals. Therefore, if we want to measure a person's financial ability, it is necessary not so much to measure a person's knowledge as to assess how much what he/she does corresponds to our ideas about what financially capable people do [13].

Financial literacy helps only people with developed self control skillsж otherwise it does not explain a reasonable behavior. The issues of financial literacy were considered by Bondareva S.A., Abalkin L.I., Brehova Y. V., Amosov A.P., Miloslavsky V.G., Gerasimov V.S., Tranova V.A., Gerasimova O.S., Heilyk I.A.

The methodological basis of the study was also the theory of readiness for various activities of E.P. Ilyin, P.A. Rudik, M.D. Levitov and the theory of communication of B.G.

Ananyev, A.A. Bodalev, M.S. Kagan, A.A. Leontiev, A.N. Leontiev, B.G. Lomov. When considering the psychological aspects of higher professional education, including the problems of personality development, we referred to the works of K.A. Abulkhanov-Slavskaya, L.S. Vygotsky, A.N. Leontiev, S.L. Rubinstein, V.I. Slobodchikov and others [2, 10].

The fourth industrial revolution (Industry 4.0) is transforming manufacturing in line with the digital consumer revolution [10]. Industry 4.0 leads to the digitalization era. Everything is digital; business models, machines, operators, environments, production systems, products and services. It's all interconnected inside the digital scene with the corresponding virtual representation. On a higher level of automation, many systems and software are enabling factory communications with the latest trends of information and communication technologies leading to the state-of-the-art factory, not only inside but also outside factory, achieving all elements of the value chain on a real-time engagement. Everything is smart [1].

An example of the application of the Industry 4.0 concept in different spheres of industries and economics process has been presented in many research works: Alcacer V., Cruz-Machado V., Beard-Gunter A., Ellis, D.G., Found P.A., Garcia-Garza M.A., Ahuett-Garza H., Lopez M.G., Orta-Castanon P., Kurfess T.R., Coronado P.D., Guemes-Castorena D., French, T., Chute C., Kerin M., Lim S., Kim, J., Masood T., Egger J., Rossit D.A., Tohme, F., Frutos M., Scharl S., Praktiknjo A., Tran N.H., Park H.S., Nguyen Q.V., Hoang T.D., Vinaja R. and others [5, 6, 7, 9-12, 15, 16, 20, 21].

II. RESEARCH METHODOLOGY

The uncertainty of the parameters of financial literacy and the conditions that ensure its improvement is due to the undeveloped diagnostic apparatus, tools for quantitative measurement of financial literacy of the student's personality.

The purpose of this study is to prove the possibility of using breakthrough information technologies in improving the financial literacy of future professionals theoretically and experimentally. To achieve the goal the following tasks are set:

1. Identify the potential of breakthrough information technologies in improving financial literacy.
2. Develop and prove practical recommendations to improve the financial literacy of future professionals.

The methodological basis of the study was formed by the ideas of psychologists and teachers on the understanding of the didactic process as a communicative one. The choice of research methods is determined by the meaning of research tasks. The comparative method was used as a guide. Main research methods are: conceptual modeling and pedagogical experiment in its ascertaining and formative versions. From the system of empirical methods for solving specific problems of the study, the following were identified: questioning, testing, expert evaluation method (content analysis of products and activities, observation of participants, analysis of interview materials), self-assessment.

III. RESEARCH RESULTS

In the context of experiment we conducted analysis of disciplines, programs, regulations.

The solution of these problems at the level of the organization, conceals a complex work which is based on a thorough study of the specifics of the labor activity of specialists, their professional and motivational features in the economy.

In particular, it seems appropriate to implement the following practical recommendations:

1. Development and implementation of the profile "Financial literacy" from the 2020/2021 academic year, which allows training of the professional community to ensure financial literacy of the population.
2. Inclusion of discipline "Financial literacy" (containing blocks "Budget literacy", "Pension literacy", "Financial discipline", "Banking literacy", etc.) in all curricula of secondary vocational and higher education institutions.
3. To authorize curators to provide lectures on financial literacy on a quarterly basis. At the same time, while carrying out these activities, it seems advisable to involve practitioners.
4. To strength social advertising in the field of financial literacy by:
   - creation of special videos (including those with the participation of famous people) containing explanations of terminology and individual issues with broadcast on television, Internet sites of official bodies of state power and screens in subway cars;
   - create audio ads for their use on radio and public transport connected with the issues mentioned above;
   - placement of materials in printed publications (primarily in official publications used for the official publication of normative legal acts).
5. Creation of clinics of financial consultations on economic and law faculties of the leading universities of Russia for the purpose of assistance to all interested citizens that within the investigated question will allow:
   - reduce the workload of officials of the relevant public authorities;
   - strengthen the quality of training in relevant areas of training;
   - increase the level of financial literacy of the population.
6. The organization of competitions of scientific and creative works on improving financial literacy among different groups of students with the promotion of the winners until they are non-competitive admission on a budgetary basis of training for "Financial literacy" and "Financial transparency".
7. As part of the improvement of pension literacy of citizens it is recommended:

7.1. To modernize the personal account of the insured person by increasing the detail with a detailed calculation of the amount of the assigned pension, including the allocation as separate blocks:

- number of years of insurance experience (currently present);
- total amount of funds of individual pension coefficients and breakdown for definite period (present at present);
- the number of individual pension coefficients for socially significant periods (in summary and broken down by periods) with a detailed indication of the stages of their calculation);
- fixed payment amount;
- type (Federal / regional) and the amount of social Supplement to the pension (if any);
- indexation for each date of its carrying out with indication of stages of calculation (including reduction of percent of indexation, allocation of the sums before and after that), etc.

7.2. Introduce the obligation of client services of the Pension Fund of the Russian Federation to organize at least 1 event in 1 month in each educational institution of the relevant public legal education.

7.3. Oblige the head of the Pension Fund of the Russian Federation to report to the population on the done work and work plans at least 1 time a month (and also following the results of calendar year in March of the financial year following reporting) by means of video addresses, duration not less than 10 minutes (following the results of calendar year - not less than 30 minutes).

7.4. Provide work of client services of the Pension Fund of the Russian Federation on Sundays in the mode of the full working day not less than 1 time in 4 weeks.

7.5. To evaluate the possibility of combining client services in Federal cities into single large pension centers on the basis of the main departments in order to improve the coordination of the actions of the relevant officials.

8. Taking into account the risk of delays in responses in a number of state and local authorities and ensuring prompt informing of the population on issues of interest to them, it seems advisable to reduce the maximum allowable period of consideration of citizens ' appeals from 30 calendar days to 7 working days.

9. To codify existing legislation in the field of social security, which can provide:

- appropriate consistency of normative legal acts among themselves and minimizes the risk of allowing contradictions;
- eliminating the need to search for an exhaustive list of normative legal acts on the relevant issue in the field of social security;
- simplification of work with them as professional users (for example, lawyers), and the population in view of the appeal to the uniform regulatory legal act.

10. Improvement of legal regulation in the implementation of the above proposals.

Particular attention should be paid to information technology application in the process of education.

The use of information technology is aimed at creating such forms and methods that provide effective disclosure of the individuality of the student, his cognitive processes, personal qualities, the development of intelligence. We are talking about changing the content of education, about mastering information culture – one of the components of the General culture, understood as the highest manifestation of education, including personal qualities of a person and his professional competence.

According to scientists' opinions, information technologies create new opportunities for knowledge transfer (teacher's activity), perception of knowledge (student's activity), evaluation of the quality of education and, of course, the comprehensive development of the student's personality in the process of training [3, 4, 8, 19]. The main purpose of education informatization is to prepare graduates for "full and effective participation in everyday, social and professional spheres of life in the information society" [22, p.57].

On a higher level of automation, many systems and software are enabling factory communications with the latest trends of information and communication technologies leading to the state-of-the-art factory, not only inside but also outside factory, achieving all elements of the value chain on a real-time engagement. Everything is smart. Industry 4.0 leads to the digitalization era. Everything is digital; business models, machines, operators, environments, production systems, products and services. It's all interconnected inside the digital scene with the corresponding virtual representation [1].

Particular attention should be paid to the introduction of modern forms in the process of education of persons with disabilities, which is especially important in the framework of the state program of the Russian Federation "Accessible environment" (Fig. 1).

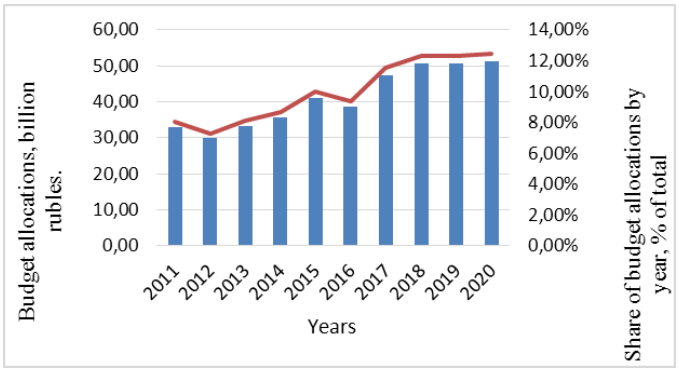

Fig. 1. Financial support for the implementation of the state program "Accessible environment".

Active use of Internet technologies, telecommunication tools by educational institutions in full-time educational process means introduction of innovative processes by means of which there are changes of the various plan: the purposes and the maintenance of curricula, forms and methods of training change. By means of information technologies,

teachers and students can use Internet services which simplify facilitate learning and speed up the educational process [3].

As it is known, in July 2017, the government of the Russian Federation a special program for the development of the digital economy was adopted. Thus, in particular, it provided for the directions given in Fig.2.

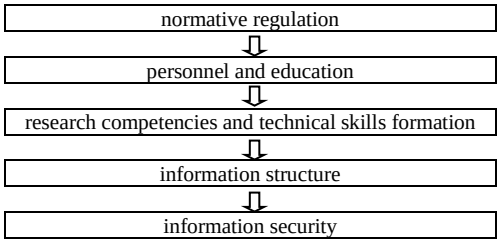

Fig. 2. Directions of digital economy development in the Russian Federation.

Dynamics of the number of students with disabilities in higher education is presented in the fig. 3.

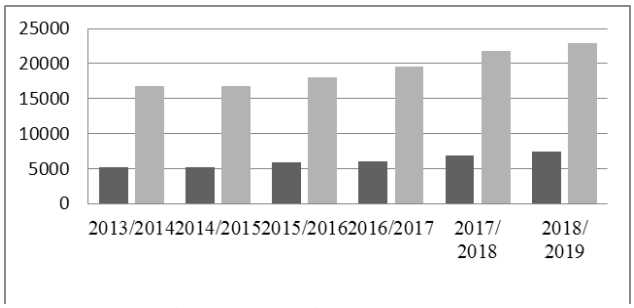

Fig.3. Dynamics of the number of students with disabilities in higher education

IV. DISCUSSION OF RESULTS

Among the existing breakthrough information technologies are the following:

1. Electronic conference.

Electronic conferences (EC), or, as they are often called, computer conferences, allow you to receive on the computer monitor of the user, at a minimum, the texts of messages transmitted by the participants of the "conference", located at different distances from each other. The software depends on the mode of use of the EC.

The use of the regime in the organization of training sessions requires moderation by the teacher of the conference. Work is possible in real time, for example, when using the IRC (Internet Relay Chat) and random access in time.

2. Teleconferencing and Videophone.

These means provide two-way communication between the teacher and students. At the same time there is a simultaneous two-way transmission of video, sound and graphic illustrations. All this can be seen simultaneously in three Windows on the screen of each monitor subscribers. In group classes in a large classroom, it is possible to project the image of a computer monitor on a large screen using, for example, a liquid crystal or other projection device. Hardware and software equipment of the workplace includes: computer, monitor, printer, video camera, appropriate software, keyboard, mouse, modem.

Video telephony differs from video conferencing in the limited size and quality of visual information and the inability to use real-time computer applications.

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It is possible to apply technologies of visualization of educational information within the framework of video conferences and TV conferences: intelligence map (mental map, diagram of connections, map of thoughts, associative map, mind map), brainstorming, concept trees, critical thinking technology, clusters, infographics, scribing and technology of asking questions: the technique of asking questions "6Why", cross-discussion. Technologies of visualization of educational information:

Visualization technologies allow to solve a number of pedagogical tasks: activation of educational and cognitive activity, provision of intensification of training, formation and development of critical and visual thinking, visual perception, imaginative representation of knowledge and learning activities, knowledge transfer.

Technology of problem analysis: methods of prioritization (time management), SWOT-analysis of the project/ Time management – management of work and personal time, aimed at the proper planning of current tasks and the allocation of time. It includes: daily communication with employees, co-organizers, work with a huge amount of information and distribution of tasks. For the successful organization of time resources it is necessary to follow the following requirements: to reevaluate values and priorities, to change the attitude to work and life, to engage in self-development and self-improvement, to use tactics and strategies (to spend time on more valuable deeds and deeds).

Time management provides self-organization skills that are used to accomplish specific tasks, projects, and goals. The steps in this method are planning, distribution, goal setting, delegation, time-consuming analysis, monitoring, organizing, listing, and prioritizing. Time management is necessary in the development of any project, because it determines the time of completion of the project and the scale.

By means of these technologies, priorities in work are correctly selected, deadlines are smoothly estimated and risks are reduced when managing a product or project [18, 19]. Main feature are:

- Apply Agile principles in practice (allows you to change the communication system in the team and rebuild it for productive product development);
- Use Kanban-Board (gives possibility to evaluate and decompose tasks and provide the operation of the team properly);
- Organize Scrum teams (ability to create a backlog and conduct effective retrospective);

- Assess the needs of the project (allows you to find bottlenecks and unnecessary processes, make a forecast for the growth of the team, reduce production costs).

In order to improve the interactivity of the educational process and provide a higher level of digestibility of the material is recommended to use the service "Kahoot", the advantages of the practical implementation of which are as follows:

1) ability to perform tasks remotely
2) Different job formats
3) the Use of gamification in the educational process
4) Exclusion of the influence of the subjective factor in the test of knowledge
5) teacher Opportunities:

- optional maneuver over time in relation to different issues
- identify the most problematic blocks and influence them
- evaluate both the speed of formation of the correct answer, and determine their number.

V. CONCLUSION

Thus, information technologies provide new opportunities for knowledge transfering (teacher's activity), perception of knowledge (student's activity), evaluation of the quality of education and the comprehensive development of the student's personality in the process of training. The main purpose of education informatization is to prepare graduates for an effective participation in everyday, social and professional spheres of life in the information society.

The overall level of financial literacy of the country's population largely determines its economic development. The low level of such knowledge leads to negative consequences not only for consumers of financial services, but also for the state, the private sector and society as a whole. Therefore, the development and implementation of programs to improve the financial literacy of the population is an important direction of public policy in many developed countries

To measure a person's financial ability, it is necessary to evaluate what they are doing as a financially capable person. The level of professional, and, in particular, financial literacy, depends on the effectiveness of actions to solve the tasks.

Thus, in this study the possibility of using breakthrough information technologies in improving personalities' financial literacy was proved theoretically.

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