

Methods for Overcoming Psychological Barrier by Adults while Studying Information Technology

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Abstract. The article considers the problems of teaching information technology to the adult population of Russia in accordance with the strategic direction of the country's development until 2025 - the digital economy, which requires improving the process of teaching information technology (IT), developing new pedagogical technologies and methods focused on modern conditions. Evaluation of developed methods of teaching IT and overcoming the psychological barrier in a large sample of the country's population for a long time shows their replicability and effectiveness.

Keywords: information technology, training, methods, psychological barrier, adult population, digital economy.

1 Introduction

The digital economy is included in the list of the main directions of the strategic development of Russia until 2025. Despite the fact that the strategy involves the creation of new jobs, overcoming poverty and social inequality, there is a high probability of the so-called “digital divide” - a gap in digital education, in terms of access to digital services and products, and, as a result, the gap in well-being of people [1-9]. Especially strongly negative manifestations will affect people of the middle and older age groups of the population, most of whom do not own computer technologies.

Consequently, there is a need to create a system for teaching computer technology to the adult population, the goal of which is to introduce the population to new realities of the digital economy and eliminate “computer illiteracy”. In accordance with these goals, the main task of the system is to develop computer or information technology (IT) training methods for the adult population of the country, which will minimize the risk of a digital divide and overcome the psychological barrier in mastering IT [2, 4, 5].

2 Methods

To develop methods of overcoming the psychological barrier in the study of IT for different age categories of trainees, the authors use a long-term analysis of their activities during theoretical and practical classes [2, 4, 5].

The study involved:

- Schoolchildren studying engineering at schools;
- Students studying various IT courses at colleges;
- Students studying various IT courses at higher educational institutions;
- Undergraduates, graduate students and applicants for the scientific degree of candidate of sciences (to a limited extent);
- Participants in various advanced training courses.

We performed modeling of various non-standard situations that arise when working with a computer. We used the methods of system analysis and methods of “brainstorming” to find a way out of these situations, so that students can subsequently cope with problems when working with a computer on their own.

3 Results

The effectiveness of developed methods of IT teaching and overcoming the psychological barrier was tested (2000-2019) in different categories of students:

- Teachers of various specialties of higher and secondary professional educational institutions of the city of Samara and the Samara region (from humanitarian disciplines to natural science disciplines);
- Employees of the financial and economic sphere (accountants and economists of schools in the city of Samara and the Samara region);
- Workers of industrial enterprises of Samara;
- Executives of the education department of the Samara region.

The study of the behavior of these categories of trainees showed that their main problem is a psychological barrier that arises due to the complexity of the computer and lack of faith in ability to successfully master IT. This barrier leads to errors of various kinds, incorrect reaction of the participant to arising situations and inadequate actions, negatively affecting training.

Due to the age characteristics of schoolchildren and most students, the process of overcoming the psychological barrier occurs less painfully and more quickly than in adults who are not associated with information technology before this training. In addition, the length of study for schoolchildren (2 years) and students (4 years) allows them to gain sufficient IT experience and believe in their strength [2, 4].

The duration of IT training in advanced training courses is, as a rule, from 36 to 72 hours, which is insufficient for studying them.

Thus, the tasks of adult training are the most difficult and can be solved by:

- Overcoming the psychological barrier;
- Learning the basic methods of working on a computer;
- Preparing for independent mastering of a computer after the completion of classes. It means that adults develop research behavior.

The problems of the emergence of the psychological barrier in teaching various disciplines have been studied for many years, but most of these works are focused on the study of foreign languages (in particular English) by students of universities [6-10].

The problems of human interaction and computing machines have been studied since 70-80s of the last century. A lot of materials are also devoted to IT. As for the problems of adult education, they were not considered or were considered rather superficially. Pedagogical technologies, which allow relieving psychological tension in adults and make them confident in computer skills, were not developed [6, 8, 10].

Let us consider methods of overcoming the psychological barrier, since overcoming the natural distrust of participants to a complex technique, their fear of accidentally spoiling it is an important condition for their effective training, successful mastering the techniques of working on a computer.

The psychological barrier often occurs in people of middle and older age, as well as people with education in the humanities. Therefore, it is advisable to form groups in accordance with the age and professional characteristics of students and apply teaching methods adapted to these categories.

Consequently, it is necessary to build a pedagogical process so that, in addition to studying IT, students will learn to overcome the fear of technology and strengthen the faith in their own strengths and capabilities.

The removal of psychological tension and mobilization of participant's abilities are specific compared with the usual psychological counseling [2, 4]. In order to successfully solve the problem, the teacher teaching the class must improve his own communication skills. In addition, he must clearly know the causes of psychological tension and how to relieve it. As a result of studying the typical mistakes of inexperienced users, the main, most common causes of tension were identified, their classification was carried out and methods for their elimination were developed (Table 01). The developed methods are primarily aimed at teaching participants how to overcome critical situations that arise when working on a computer.

Table 01. Reasons of the psychological barrier and ways to remove it.

№	Main reasons	Ways to remove psychological barrier
1	Complexity of the computing system	The structure and work of the system is considered simplified. All concepts and devices of the computer are considered in a close logical relationship. In the future, with the emergence of basic skills, knowledge of the system is deepened and supplemented by new, more complex concepts.
2	Fear of spoiling expensive equipment	The computer has protection against incorrect user actions (Fool Proof). Therefore the system, in general, will not allow incorrect actions by the participant or input of incorrect data.
3	Unfamiliar situations, inability to find a way out of them without a teacher	Different situations and ways out of them are considered. Actions that lead to unexpected results are performed and ways out of such situations are shown. Problems that may occur in a particular situation are noted and solutions are considered.
4	Inadequate response of the system to participant's correct actions	You must learn to analyze the situation that has arisen, checking actions accuracy: <ul style="list-style-type: none"> - Actions seem to be correct, but in fact they are wrong. You need to carefully repeat all actions from the very beginning; - Software error (occurs relatively often) or computer failure (rarely), you need reset.

5	Loss of orientation in a large number of new terms, operations and algorithms for their implementation	Before learning new concepts, you need briefly revise the basic terms and operations studied previously. Thus, definitions, concepts, operations are fixed, and only after you study new elements. It is recommended to write down concepts, operations and methods of working on computer in notebook. It is proposed to work independently with these notes, since even IT-experts work this way.
6	Lack of experience	The functions of the help system - help, reference, hints, etc. are considered. It is proposed to develop your own help system in notebooks, since a relatively small number of techniques, elements, etc. are used in practical work. All IT specialists keep similar records at the initial stage of their work because of the large amount of new information and peculiarities of human perception.

Source: Authors.

4 Conclusion

Based on the considered features and techniques of IT training, pedagogical methods for teaching non-specialists to work on a computer, the authors develop the curricula and technology for conducting classes:

- The main attention is paid to the logical understanding of the process of working on a computer. It is viewed in dynamics, and the participant, together with the teacher, moves from simple operations to complex computer procedures;
- Under the guidance of the teacher, the participant gains experience in researching Windows applications, which allows him to independently study and use new applications in the future;
- The emphasis is not on cramming. It is on developing the ability to generate new methods based on the acquired basic knowledge and skills;
- The participant learns skills to overcome situations associated with erroneous actions of man and computer.

The developed methods were tested on various categories of participants in IT advanced training courses - accountants of schools in Samara and Samara region, workers of industrial enterprises of Samara, executives of the education department of Samara region, teachers of many Samara and Togliatti colleges, schools and universities, and these methods showed good results [2, 4, 5].

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