ISSUES RELATED TO THE IMPORTANCE OF METHODOLOGY CHANGE IN TEACHING NEW GENERATION STUDENTS

К ВОПРОСУ О НЕОБХОДИМОСТИ ИЗМЕНЕНИЯ МЕТОДОЛОГИИ ОБУЧЕНИЯ СТУДЕНТОВ НОВОГО ПОКОЛЕНИЯ

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The article discusses cognitive features of the new generation of students born since 2000, interprets the connection between the ways they perceive new information and the effectiveness of teaching methods for students in higher education establishments.

В статье рассматриваются когнитивные особенности студентов нового поколения, родившихся с 2000 года, интерпретируется связь способов восприятия ими новой информации и эффективность методов обучения студентов в учреждениях высшего образования.

Keywords: generation "Z", cognitive features, James Flynn, education efficiency.

Ключевые слова: поколение Z, особенности восприятия информации, Джеймс Флинн, эффективность обучения.

https://doi.org/10.46646/SAKH-2022-1-180-183

Intensive development of technologies that has taken place in recent decades worldwide, digitalization and computerization of the economy, the Internet and social networks have significantly affected all spheres of people's lives. This has led to the fact that the current generation of students differs from previous generations by a deeper involvement in digital communication and a sharp reduction in verbal contacts. This is the generation born in the information society. Its representatives also differ from teachers, even young ones who have recently graduated from a university, in terms of the style of thinking, the speed of perception and processing of information, and the time they spend paying attention to one object. Different education trends in teaching methods all over the world frequently become "fads" and may fade away due to the constant search of teachers for the proper and effective way of delivery information to students. But in the post-soviet countries teaching methods and technologies, which many years ago seemed to be efficient, are already looking rigid and conservative for current generation of learners, as those teaching methods and technologies were designed for previous generations of students, the so-called Generation X, people born between 1963 and 1981, and Generation Y, people born from 1981 to 1999.

Teachers were not ready for such prompt and dramatic change in strategies of learning, information cognition and worldview of those, brought by the millennium. A so-called generation Z is used to get predominantly digital information, and this fact has dramatically changed social life where now mutual communication of young people occurs only through social networks, instant messengers and applications on gadgets and devices. Even when young people are in the same room, at the same table, they prefer to communicate in "digital" way, transitioning and perceiving the information through texting, stickers, emoji, not verbally. There's seen a sharp reduction in reading fiction in the traditional «paper» form which is known to seriously affect both the mechanism of perception and assimilation of information received verbally, and the ability to verbally present one's thoughts.

As a fact, education systems of many countries couldn't have been able to timely catch trends in the change in the cognitive abilities of new generations of students methods, didactic material and the entire system of education are still predominantly conservative. The traditional organization of the educational process in most of post-soviet countries is insufficient and must be replaced by a personalized, productive organization of the educational process. Progress in the field of microprocessor technology makes it publicly available today. And the combination with artificial intelligence technologies involves the transformation of traditional educational and methodological materials that will become visual and "tangible", which will allow to fully carry out all the steps of the phased formation of knowledge and competencies in the course of a direct dialogue with students

It seems interesting to pay attention to the theory of the New Zealand political scientist James Flynn, who established the pattern of growth in the intellectual abilities of each new generation of the population.

The Flynn effect is as follows: over the years, the median value increases, becoming above 100. New test-takers show ever higher results on old tests. This means that the average IQ of recent times, as determined by the new tests, corresponds to the higher IQ of past years. Thus, the average IQ of people is continuously increasing, and the complexity of tests is continuously increasing as well.

Flynn showed that from 1934 to 1978, the average IQ of US residents increased by 15 points–about 3 points in every decade. Similar studies in other countries have shown similar results, though varying by country. Thus, Flynn described a 20-point increase in the IQ of Dutch conscripts from 1952 to 1982.

Studies conducted since 2000 have shown a decline in the Flynn effect - IQ growth slows down, stops, or even gives way to a decline. For example, a 2004 study of the IQ data of Norwegian conscripts showed that after the mid-1990s, growth stopped and was replaced by a slight decline; the work of Tisdale and Owen, conducted in 2005 and again in 2008, showed that the IQ test scores of Danish conscripts increased from 1959 to 1979 by 3 points per decade, for the decade 1979-1989 rose only by 2 points, for 1989-1998 years - by 1.5 points and for 1998-2004 decreased by the same 1.5 points [1].

Since 1990, basing on the Flynn's research, and continuing similar studies scientists around the world recorded decline in the intellectual level of people. In 2000, the world average IQ was 90.31. According to the forecast, by 2025 it will be 86.67 points. It is noted that if the tendency is the same, then in about 150 years the average level of intelligence of an adult will be equal to that of the current nine-year-old child. But it is difficult to agree with such a forecast. Perhaps using the old tool (IQ) to measure the completely changed cognitive abilities of new generations is not practical. The cognitive abilities of generation Z have changed, and we probably need to measure the level of intelligence in a new way, as well as the approach to teaching new generations should be different.

However, many researchers show that new generations have become faster: they perceive more data per unit of time, their "throughput" has increased. The daily volume of information necessary for assimilation is growing, the time for consuming individual fragments is becoming less and less. At the same time, the information capacity of messages tends to remain at the same level. This leads to a "densification" of messages and explains the increase in the "throughput" of new generations of students.

It has also been found that it is increasingly difficult for students to concentrate their attention. Research conducted in late 2014/early 2015 by the Canadian division of Microsoft shows that the ability to hold attention on one object has decreased to 8 seconds from 12 seconds in the previous generation. For the study, they used data obtained by various methods (including the recording of brain activity using EEG methods) from a sample of 2,000 Canadians. The evidence of this study brings us to the need of speaking quickly, removing the «padding» from the materials suggested to people to make interaction more efficient.

People of the new generation operate more easily with abstractions. For them, everything has become an interface. All information has become virtual. Physical media is a thing of the past. Now, instead of disks, books, cassettes and records, we have their virtual casts, concepts of informational things.

Another feature of generation Z is reading information in fragments and diagonally. They don't have the time or patience to consume content from end to end. Research shows that web users no longer read in the usual sense of the word. They «scan», picking out individual words and sentences, which is actually the «F-pattern» F-Shaped Pattern For Reading Web Content (original study) – a widely used term - the principle according to which Web users often browse resources (increased attention to the first lines and a quick look at the beginning of the next).

Observations show that for the most part, students of the new generation perceive traditional textbook texts with difficulty, read, as noted above, diagonally, or moving their gaze through the text resembles the letter F, when the first lines are captured while reading, and then the amplitude of gaze movement narrows, covering to the bottom lines all the smaller, left part of the readable text. As a result, the meaning is captured momentarily and does not remain in memory.

A distinctive feature of the new generation is clip thinking - the ability to briefly and colorfully perceive the world around us through a short, bright message, embodied in the form of a video clip, TV news or in another similar form.

The owner of clip thinking operates only with meanings of a fixed length and cannot work with semiotic structures of arbitrary complexity. Outwardly, this is manifested in the fact that a person cannot focus on any information for a long time, his ability to analyze is reduced.

Much of the above suggests that there is a need not only to change the approach to the technology of teaching new generations of students, there is a need for the digital transformation of education following the focus on the digital transformation of the economy (it is ideal that the transformation of education is ahead of the transformation of the economy and is ready in advance to work with each new generation of students, taking into account the peculiarities of their cognitive abilities).

This is not a transition to remote education, which began to be actively used during covid -19 pandemic. This is, first of all, the possibility of activating the combination of a collective (group) educational process in the classroom using the capabilities of modern computer technologies, with the individualization (personalization) of education, when each student gets the opportunity for additional independent creative work with remote control and online correction by the teacher.

The teacher cannot ignore these features, otherwise the learning process becomes formal: the teacher seems to conduct classes, responsibly presenting all the material provided for by the State Educational Standards and work programs, and the consciousness of students does not perceive these materials or perceives it partially. This is also confirmed by periodic checks of the residual knowledge of students in Russia[2].

The effectiveness of any training depends on the following components: the presence of an incentive; the effectiveness of the developed technologies and methodological materials; effective interaction between the teacher and the student.

The desire of the majority of students to successfully pass the exam should be replaced by their understanding that their personal material well-being and career growth will depend on the acquired competencies and the ability to apply them in practice. This can be achieved through conversations, constant reminders, especially at the very beginning of training.

Generation Z students like to acquire new knowledge and are able to memorize and process large amounts of information. Therefore, firstly, the technologies and methods used by university teachers should not be developed on the basis of pedagogy, but taking into account the andragogical approach: at the university we teach adults who understand why they study, and presenting information "in a school way" which is not only doesn't allow modern students to fully perceive the necessary knowledge and form the required competencies, but also contributes to the preservation of a certain infantilism: they will tell me, they will teach me. The basis of the andragogical approach to the formation of teaching methods, work programs and a fund of evaluation tools: we teach not for school, but for life, we do not give ready-made recipes, but we teach ourselves to find and summarize the necessary information, analyze and make rational decisions [3]. This also corresponds to the peculiarities of new generations - the desire and ability to independently master and analyze new material.

Students should be imbued with the fact that they are not being taught, but they are learning, they are preparing, on the basis of the competencies they have mastered, to confidently enter life and be in demand in the labor market.

The second thing that can no longer be ignored when shaping learning technologies is that we are teaching a generation of people who were not only "born with gadgets and devices in their hands", but also lived in a family circle, all members of which are actively involved in everyday digitalization through the Internet, cellular communications, social networks, etc.

Based on the facts given above it can be concluded that to keep the attention of students, the text part of the information should be as easy to understand as possible, divided into small parts (paragraphs, sections), if possible, supplemented (diluted) with images, infographics. Moreover, one more feature of the modern student should be taken into account: the transmission and perception of information can occur only with visual signs (as it was thousands of years ago when information was transmitted by rock paintings), i.e. their thinking today is more based on visual rather than verbal perception of information. This should also be used to increase the efficiency of communicating new knowledge to students and increase the level of their cognition.

As many psychologists note, concentration of attention is more successful when different channels of transmission and perception of information are used: visual, verbal, tactile. Moreover, it is advisable for the teacher to apply the so-called methods of the "Zeigarnik effect" – interruption in presenting of the most significant information, and the "edge effect", since the information received at the beginning or end of the presentation is absorbed more efficiently. But if at the beginning of classes (approximately the first 10–20 minutes) the student is drawn into work, then the most important part of the information should be planned for presenting in the next 30–40 minutes, i.e. during the first hour of the training session. Moreover, it is better to divide the information into parts of 15–20 minutes, stopping, for example, to find out: how students understand the part of the text covered, what questions arose, so that there would be some gap between the important parts of the lecture or practical lesson. And the effect of the second «edge» should be used by interviewing students at the end of the second hour of the class, formulating the questions so that the students themselves set out (repeated) mainly the most important part of the topic studied at the lesson. In this case, replacing the source (teacher with students) will enliven the perception of tired students and will effectively use the «second edge effect».

Given the problems noted above, orally expressing their thoughts due to the long-term habit of digital communication, students should be given the opportunity to speak as often as possible during the survey process, help them learn and use specific professional terminology. For the same purpose, it is necessary to organize thematic seminars, scientific conferences, colloquia, public defenses of term papers and projects from the first year of student's studies.

It is proved that the perception and memorization of information is distributed as follows: 10 % – when reading; 20 % – by ear; 30 % – visually (visually); 40 % – by ear and visually at the same time; 60 % – during oral discussion of the topic; 80 % – with independent detection and formulation of the problem; 90 % – with independent detection of the problem and the search for a solution [4]. This phenomenon of the effectiveness of oral discussion of the topic, self-discovery and formulation of the problem, search for a solution should be used as much as possible.

In this regard, one of the effective technologies can be the gamification of the learning process, which makes it possible to immerse in real production situations and forcing students to seek and find the right managerial and organizational solutions, moreover, in an understandable and interesting system. But the creation of such programs is an expensive process and is possible, for example, by pooling the financial efforts of a group of universities.

Such form of digitalization of education increases the class work intensity and intensity of the teacher's work, but allows teachers to work with students in their usual digital environment and increase their involvement (use their desire for independent work) and satisfaction from the educational process. This is a long and laborious process, the success

of which requires a developed digital environment, the readiness of the teaching staff for change. Polls have shown that students are ready for such changes, but they also need direct, classroom communication with a teacher. It is also important to make this classroom communication interesting and accessible for perception by modern generations of students, taking into account the increase in the speed of information perception, the reduction in the time of concentration of attention on one object, the habit of perceiving information from images and short texts [2].

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