

Interactive Student Learning Technologies in Higher Education

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Received: November 11, 2022

Accepted: December 9, 2022

Online Published: December 17, 2022

doi:10.5430/jct.v11n9p107

URL: <https://doi.org/10.5430/jct.v11n9p107>

Abstract

The essence of interactive learning, a description of the possibilities offered by interactive technologies, means of implementing interactive learning and an assessment of the difficulties of this type of tools for organizing the learning process was considered.

The survey of participants' understanding of the interactive learning components, the differences between interactive tools and other innovative tools for organizing the educational process in higher education was analyzed.

Analytical and bibliographic methods were used to analyze the literature on the use of interactive technologies in higher education, followed by a questionnaire survey to explore the practical aspects of interactive technologies in higher education institutions.

The directions of modern scientists' work on the use of interactive technologies in higher education were analyzed, and some issues on the effectiveness of interactive tools in teaching students were elucidated.

Keywords: interactive technologies, higher education, interactive learning, student interaction, interactive models of the learning process

1. Introduction

Today's global standards in education imply training highly qualified professionals who are able to integrate theoretical knowledge and practical skills into a coherent system, while mastering new technologies independently.

Numerous events testify to the fact that personality is a determining factor in the development of democratic society and the state based on the rule of law. Therefore, the educational process of higher education institutions should be aimed at developing the applied competences of future specialists: personal and life-creative, communicative, socializing, and intellectual-informative. This interpretation of learning objectives in higher education strengthens the importance of technical and technological tools used in the educational process in higher education institutions, among which the use of interactive learning technologies plays a dominant role (Du et al., 2022).

In order to successfully fulfill their personal potential, applicants for education should have conditions for the development of such personal qualities as mobility, the ability to integrate into a dynamic society, critical thinking, the ability to generate new ideas, the ability to make non-standard decisions and take responsibility for them, communication skills, teamwork skills, the ability to adapt to learning situations and model them, etc. The use of interactive learning technologies in higher education institutions will help to meet such challenges.

The aim of the article is to review the scientific literature and analyze the survey conducted in order to identify the peculiarities of using interactive technologies in higher education, to clarify the advantages of such learning tools and to determine the features of effective use of interactive tools in higher education.

The difference between interactive learning and any other more traditional learning is that pedagogical interaction does not only take place between the teacher and the students. Students themselves actively interact with each other in the search for and creation of new knowledge or in the process of forming and developing new skills. In this case, the

primary role in the learning process is assigned to the interaction between education applicants, rather than to the student-teacher relationship, as in the traditional learning process (Julia et al., 2020).

According to the results of the study, the conclusions were made that both students and teachers of higher education institutions considered the main components of interactivity to be dialogic, consideration and analysis of each problem from a different perspective, changing traditional teacher activity through the predominant activity of students, sharing knowledge, actions, forming skills for working with scientific and pedagogical literature. As noted by the respondents, the main features that distinguish the interactive tools used in higher education institutions are reflection of responsibility and volitional self-regulation, co-creativity, respect for the opinion of each participant in the learning process, freedom to choose their own decisions on the organization and learning content.

Personal responsibility for one's own performance during learning and the development of teamwork skills have been identified by higher education students and educators as basic prerequisites for successful learning in an interactive mode.

In the course of the study, the principles of consciousness and responsibility, dialogue and individual freedom were identified by the respondents as principles for the effective use of interactive technologies in higher education.

At present, according to the survey participants, such interactive methods as game-based learning, situational tasks, master classes, case study methods, multimedia lectures, and practical courses are predominantly used in higher education. Among the advantages of interactive learning in HEIs, the respondents named the possibility for students to be more independent and self-confident, participation in the learning process of each student, constant and active use of previously acquired experience.

2. Literature Review

The topic of using interactive technologies in education has been extremely relevant and prominent in recent years. The use of interactive technologies in higher education has been extensively researched by scholars around the world (Reinhold, Hoch, Werner, & Richter-Gebert, 2020).

The efficiency of interactive technologies depends on the extent to which personal characteristics and capabilities of each subject of the educational process, the prospects of its development are taken into account. Hence, the priority of subject learning over informational learning, the focus on the formation of students' subjective worldview as opposed to programmed perceptions, diagnostics of personal development, situational design, meaningful dialogue, inclusion of learning tasks in the context of life needs (Smaniotto Costa, Batista, Almeida, & Menezes, 2020; Zhanga & Aslan, 2021).

The rationale for the use of various interactive technologies in higher education institutions derives from the possibility of transforming the learning process through these technologies into cooperation, mutual learning (collective, micro-group, group, cooperative learning), in which student and teacher are equal parties in a mutually beneficial process (Erdener & Kandemir, 2019; Cung et al., 2019).

The opportunities offered by interactive technologies, namely collaborative pedagogical interaction, a variety of pedagogical techniques, learning in pairs and small groups, maximize each participant's activity and contribution to the final learning outcome, encourage the formation and clarification of own opinions, value judgments, the ability to recognize feelings and attitudes, and encourage the free exchange of opinions. They help to develop skills of active listening, empathy, cooperation, assertiveness and tolerance; stimulate the development and self-improvement of emotional stability and sensitivity, communication flexibility, empathy, reflexivity, etc. (Tracey, Wang, Trimble, Mainsbridge, & Douglas, 2022; Roque-Hernández, Díaz-Roldán, López-Mendoza, & Salazar-Hernández, 2021).

The essence of interactive learning is the organization of constant interaction of all participants in the learning process, none of whom remain passive, because they are put in a situation of active learning in a cooperative mode. With this type of learning, by analyzing their own actions and those of their partners, everyone can change their behavior pattern, acquire the necessary knowledge and skills more consciously and feel as close to their future professional activity as possible (Mairéad et al., 2022; Barrot & Acomular, 2022).

The shared activity of students in the process of learning and assimilation of learning material means that everyone contributes individually to the process, and knowledge, ideas and ways of doing things are exchanged (Odinokaya, Andreeva, Mikhailova, Petrov, & Pyatnitsky, 2020; Hernández-Torrano & Ibrayeva, 2020).

This takes place in an atmosphere of friendliness and mutual support, which enables not only the acquisition of new knowledge, but also the development of cognitive activities that professionals will later need when pursuing higher

forms of cooperation (Martin & Bolliger, 2018).

The leading means of implementing interactive interaction in the educational process is to ensure an optimal combination of different types of activities, especially communicative, for all subjects of learning, thus creating a comfortable environment in which everyone feels their individuality, independence and success. The implementation of interactive learning requires the involvement of relevant personal experience (feelings, experiences, emotions, responses and actions) of learning objects, various forms of cooperation, reflection of acquired knowledge and skills, formed value orientations, attitudes, etc. (Muir, Milthorpe, Stone, Dymont, Freeman, & Hopwood, 2019).

Interactive learning technologies provide a co-operative learning organization where individual tasks become group tasks, each member of the group makes a unique contribution to the collective achievements, and the efforts of each group member are necessary and indispensable for the success of the whole group. The skilful use of various interactive technologies in the organization of the learning process in higher education relieves nervous tension, allows for a change in 'habitual' activities and allows for a focus on current issues that require daily attention (Vagg, Balta, Bolger, & Lone, 2020; Tseng, Kuo, Yeh, & Tang, 2022).

The evaluation of the available scientific works on the issue under study has made it possible to establish the absence of a practical assessment of the available interactive learning tools from the perspective of the feasibility of their use in higher education, as well as the priority of their application during the educational process.

3. Aims

The aim of the survey was to find out the views of higher education teachers and students on the specifics of the use of interactive technologies during the learning process in higher education institutions.

4. Materials and Methods

Practical study of features of interactive technologies application during the educational process in higher education was conducted by surveying 192 students and 184 teachers in 12 higher education institutions of Volyn, Rivne, Zhytomyr and Kyiv regions of Ukraine. The research was conducted using the following methods of data study and processing: comparison, analysis, synthesis of information, historiographical analysis and assessing the dynamics of the development of interactive technologies in the historical perspective.

During the survey, the respondents were asked several questions regarding the main aspects in applying educational strategies for students. Survey participants were asked to express their subjective viewpoint on each question as a percentage from 0% to 100%.

The survey was conducted by the research authors taking into account the number, age and gender composition of teachers and students in the educational institutions on the basis of which the study was conducted.

All respondents agreed to the disclosure and publish the information provided.

The survey was conducted using Survey Planet service.

5. Results and Discussion

In exploring the practical aspects of the use of interactive technologies in higher education institutions, the organizers of this study first explored the participants' understanding of the essence and components of interactivity (Figure 1).

According to the survey participants, interactivity mainly involves: being dialogical, considering and analysing each problem from a different perspective, changing the traditional teacher's activity through the predominant activity of students, sharing knowledge, actions, building skills for working with scientific and pedagogical literature.

Thus, the largest number of interviewees, including both teachers and students of higher educational institutions, have identified the following components of interactive learning: the interaction of a microgroup, an audience of students and virtual partners in the educational process (such a component was determined by 47% of teachers and 54% of students of educational institutions), a change in the traditional activity of a teacher (51-53%), as well as the exchange of knowledge, actions, and the formation of work skills (49-54%).

In the survey, respondents identified the following differences between interactive learning tools and other innovative tools for organizing the learning process in higher education (Figure 2).

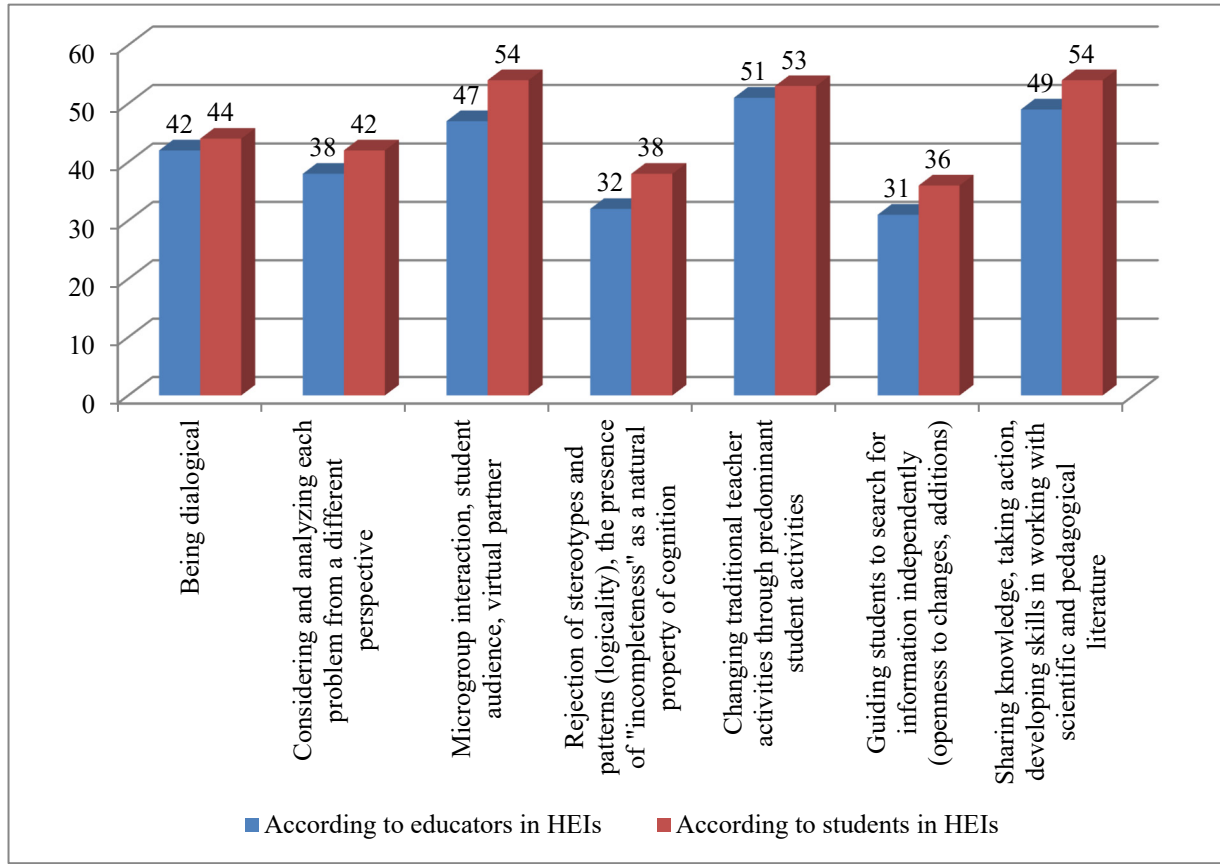


Figure 1. Survey Participants' Understanding of the Components of Interactive Learning, %

Source: constructed by the authors.

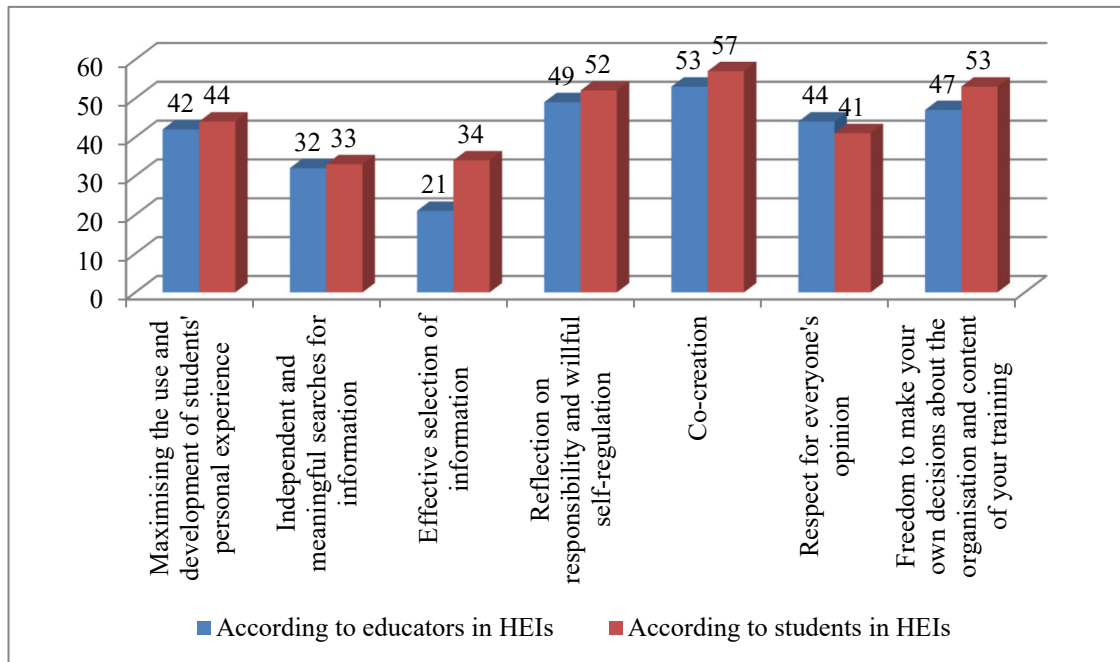


Figure 2. Differences between Interactive Learning Tools and Other Innovative Tools for Organizing the Learning Process in Higher Education, %

Source: constructed by the authors.

As noted by the respondents, the main features that distinguish the interactive tools used in higher education institutions are reflexivity of responsibility and volitional self-regulation, co-creativity, respect for the opinion of each participant in the learning process, freedom of choice of own decisions on the organization and content of learning.

It is worth noting the highest rating of co-creation as the main difference of learning with the help of these tools (53% and 57%, respectively). By the way, particular attention should be paid to a slightly lower assessment of the characteristic features of interactive learning tools for reflection, freedom of decision-making and independent search for information on the part of teachers than on the part of students.

As the main prerequisites for successful interactive learning, students and teachers in higher education have specified (Figure 3).

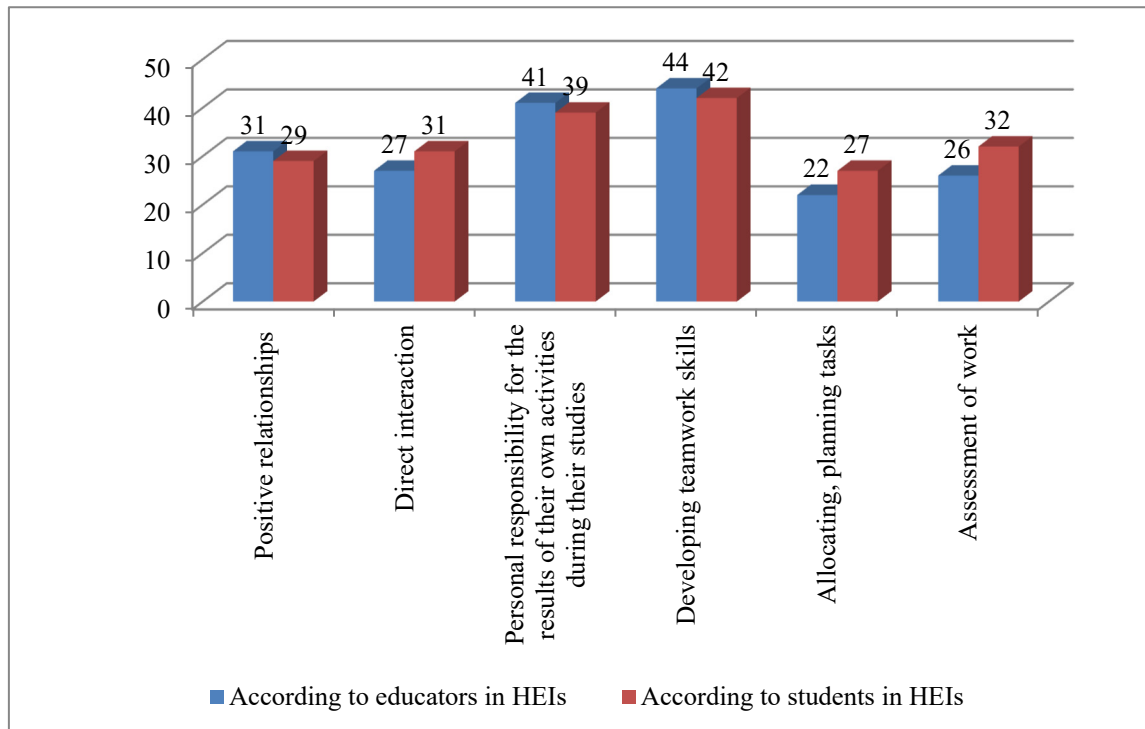


Figure 3. Basic Prerequisites for Successful Learning with Interactive Technology, %

Source: constructed by the authors.

- personal responsibility for their own performance during their studies
- developing teamwork skills.

It should be noted that such prerequisites for successful learning with the help of interactive technologies as direct interaction and positive relationships are rated very low by respondents (31-29% and 27-31%, respectively); consequently, this indicates a gradual increase in trust in automatic resources in the educational process and a decrease in the role personal communication when studying educational disciplines.

During the research process, respondents were asked to name principles for the effective use of interactive technologies in higher education (Figure 4).

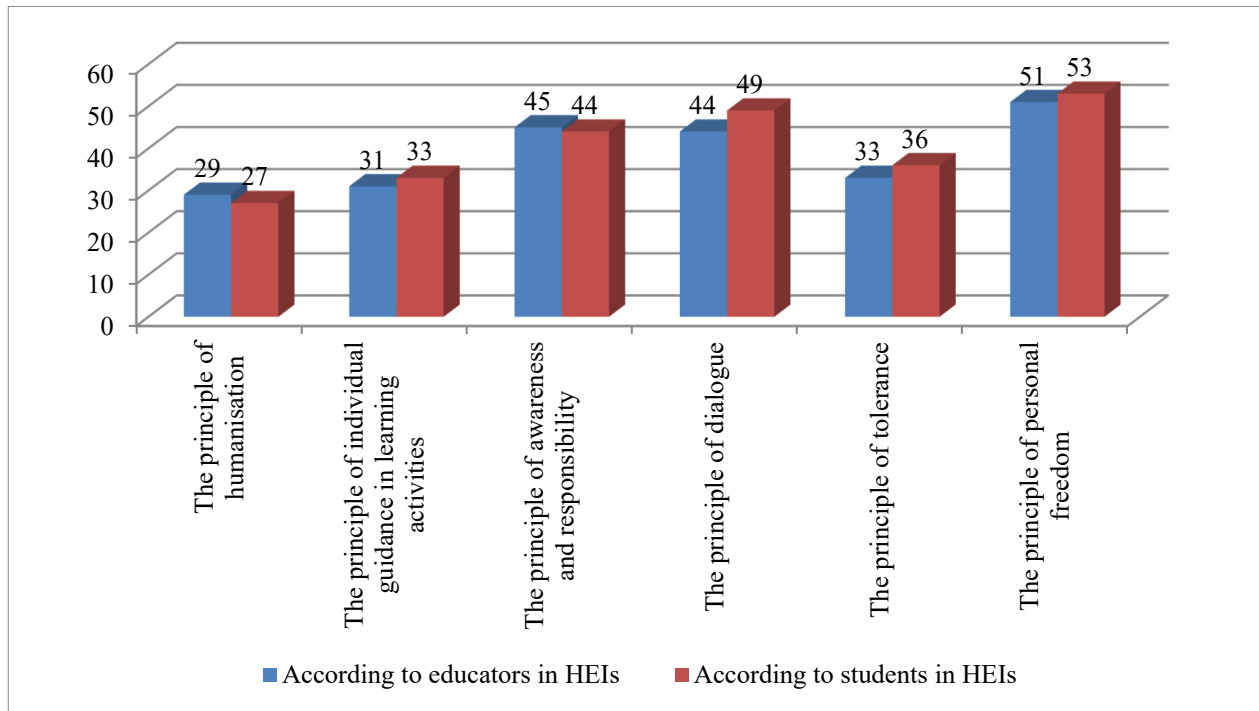


Figure 4. Principles of Effective Use of Interactive Technologies in Higher Education, %

Source: constructed by the authors.

According to the survey participants, the implementation of interactive technologies should, above all, be based on the principles of consciousness and responsibility, dialogue and individual freedom.

Of the benefits of interactive learning in the HEI, respondents mentioned (Figure 5).

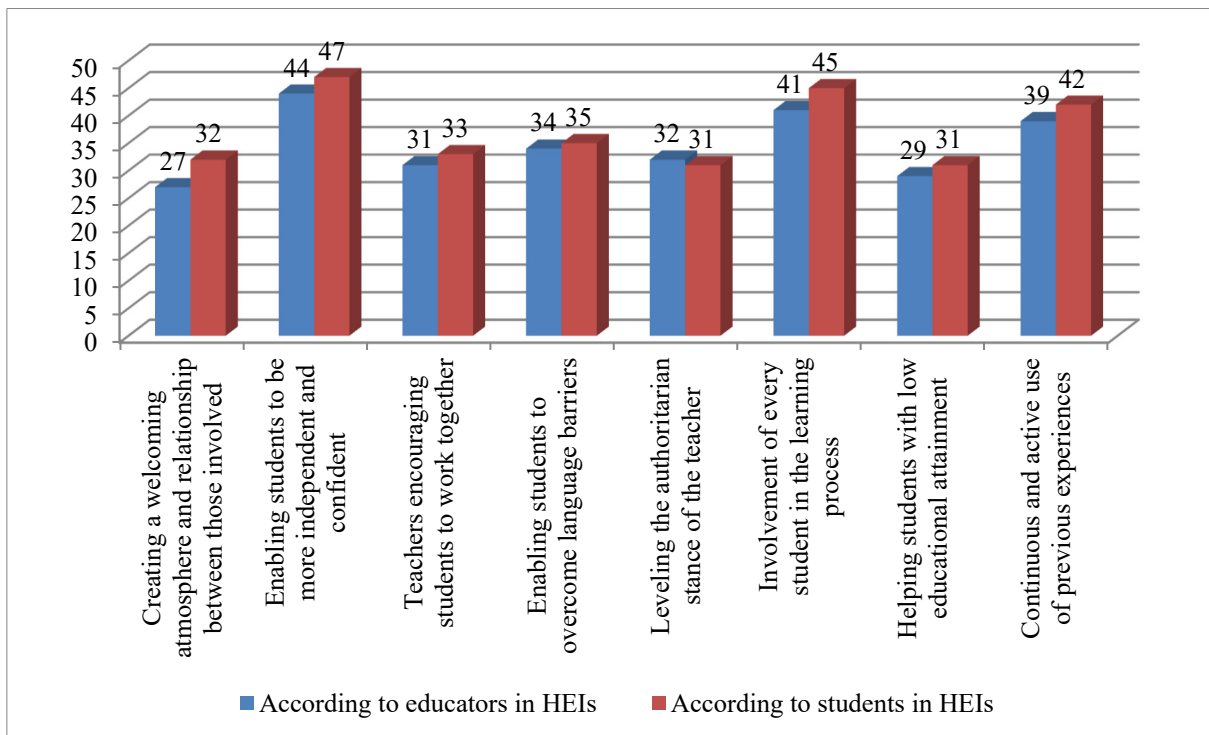


Figure 5. Benefits of Interactive Learning in HEIs, %

Source: constructed by the authors.

- enabling students to be more independent and self-confident;
- the participation of each student in the learning process;
- continuous and active use of previously acquired experience.

Currently, according to the survey participants, interactive methods mostly used in higher education are as follows (Figure 6).

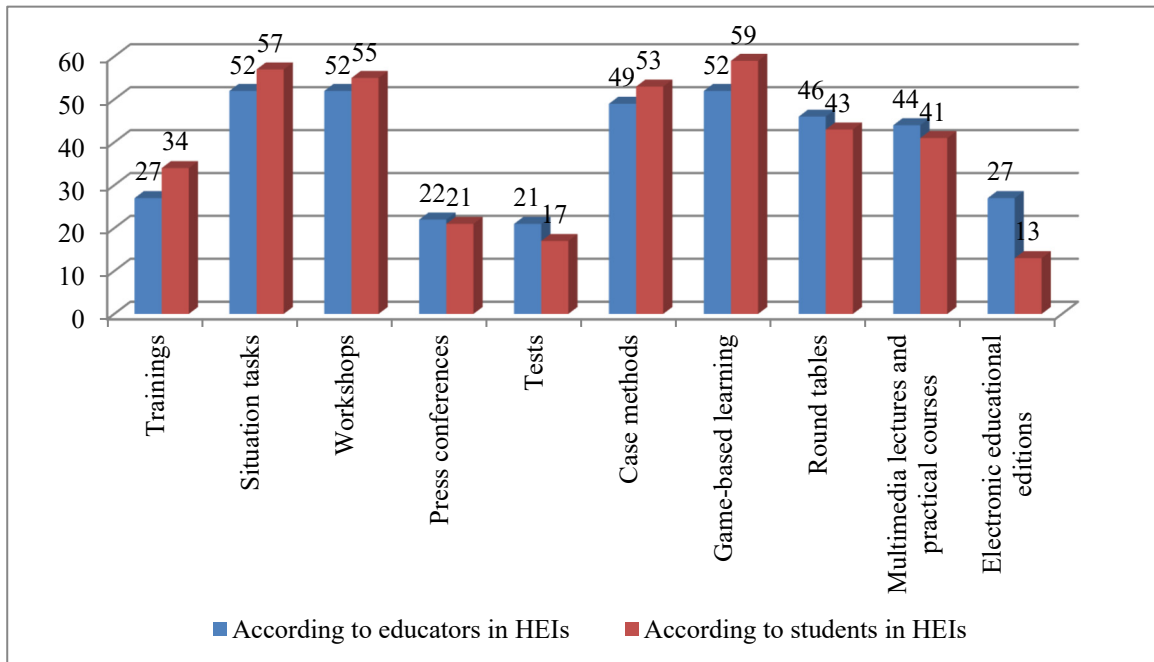


Figure 6. Interactive Methods Most Commonly Used in Higher Education Institutions, %

Source: constructed by the authors

- play-based learning;
- situational tasks;
- masterclasses;
- case methods;
- multimedia lectures;
- practical courses.

As the survey has shown, such methods as test tasks, press conferences and electronic educational publications are rated quite low by the survey participants, from 13 to 27%, which indicates a significant drop in the effectiveness of these learning tools as such, which are positioned as interactive elements of learning. Along with this, situational tasks (52-57%), case methods (49-53%) and game-based learning (52-59%) are extremely popular).

Thus, the analysis of the scientific literature has demonstrated that the interactive learning model implies a technological approach to the organization of the learning process. It is considered as an application of a set of interactive technologies in education, the common feature of which are certain principles of interaction, primarily, multilateral communication, mutual learning of students, cooperation of learning activities (Chen, Lei, & Cheng, 2019; Di Paulo, Wakefield, Mills, & Baker, 2017).

An essential characteristic of interactive learning is mutual learning (collective, group, collaborative), where teacher and student are equal subjects of learning (Amenduni & Ligorio, 2022).

During interactive learning, the teacher acts as a facilitator of the learning process, as a counselor. Meanwhile, effective interaction and cooperation between students are essential factors in the learning process (Ritella & Loperfido, 2021).

Interactivity involves activities in which students learn to solve complex problems by analyzing background data,

recognising contradictions, expressing alternative opinions, making informed decisions and participating in discussions. It also teaches students to simulate different situations, enriching their social experience by engaging and experiencing different life situations; to learn how to build constructive relationships in a group, define their place in it, avoid conflicts, resolve them, seek compromises, seek dialogue, find joint solutions to problems; develop skills in project work, independent work, creative work (Sansone, Cesareni, Bortolotti, & McLay, 2021).

When implementing interactive learning technologies, participants of the learning process often face certain difficulties. In this regard, it is advisable to follow the recommendations that can turn the weaknesses of the participant of the learning process into strengths:

- if students or teachers are unfamiliar with interactive learning, interactive elements should be introduced gradually, ensuring that the quality of this type of tool is high (Marcelo, Chiari, & Formiga, 2018);
- students should be trained to prepare thoroughly for interactive classes and to use simple interactive methods first - pair work, small groups, brainstorming, etc. As the students and the teacher gain experience in such work, such lessons will be much easier and the preparation will not take long;
- if the use of certain interactive techniques produces inconsistent results in a particular group, the strategy should be reconsidered and used with caution in the future;
- In order to use interactive technology effectively, especially to cover and thoroughly study the required material, the educator must plan the work carefully. This will allow to set preparatory tasks for the students, to select interactive exercises for the lesson that would give them the 'key' to learn the material, conditions in which students would be forced to take it seriously rather than performing it mechanically or "playfully" (Zhou, Li, & Wijaya, 2022);
- in order to strengthen the control of the learning process using interactive learning models, the teacher should prepare well, carefully study and think through the material. He or she should also conscientiously plan and develop the flow of the lesson, develop criteria for evaluating the effectiveness of the lesson, motivate students to learn by selecting interesting situations, problems and announce expected lesson outcomes and criteria for evaluating the students' work. (Soliman, Costa, & Scardamalia, 2021; Taroc & Paculba, 2018; Hollister, Nair, Hill-Lindsay, & Chukoskie, 2022; Bygstad, Øvreid, Ludvigsen, & Dæhlen, 2022).

In interactive learning, there is cooperative learning and mutual learning, where both teacher and students are equal learners, understanding what they are doing, reflecting on what they know, how and why they are learning, what outcomes they will achieve (Önal, 2017).

6. Conclusions

Thus, the experience of applying this type of tools in higher education proves convincingly that interactive methods intensify and optimize the learning process. They allow students to make learning more accessible. These methods also help students to learn to formulate their own opinion, to express it correctly, to justify their point of view, to argue and discuss, to learn to listen to another person, to simulate different social situations.

The scientists' research analysis of this issue allows us to single out the importance of modern interactive methods in higher education, in particular those based on using online platforms and game technologies.

Separate surveys established the exceptional importance of case methods in increasing the effectiveness of the educational process.

According to the results of the study, the conclusions were made that both students and teachers of higher education institutions considered the main components of interactivity to be dialogic, consideration and analysis of each problem from a different perspective, changing traditional teacher activity through the predominant activity of students, sharing knowledge, actions, forming skills for working with scientific and pedagogical literature. As noted by the respondents, the main features that distinguish the interactive tools used in higher education institutions are reflection of responsibility and volitional self-regulation, co-creativity, respect for the opinion of each participant in the learning process, freedom to choose their own decisions on the organization and learning content.

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