

The Use of Interactive Learning Technology in Institutions of Higher Learning

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ABSTRACT

This paper is linked to a study aiming to provide a theoretical rationale for the methodological foundations of the use of interactive learning technology in institutions of higher learning and undertakes to describe the process of practical implementation of this approach and analyze the outcomes. The authors examine the views expressed by various researchers on the concept, essence, and effectiveness of applying interactive technology in colleges, identify issues in its use, and take a look at some of the requirements for it. The methodology of applying interactive learning technology in colleges is predicated upon the instructor possessing the necessary skills and competencies and having the ability to employ the various techniques for interactive learning. The findings of an experimental study conducted by the authors attest to the effectiveness of using interactive learning technology in the teaching and learning environment and lead them to conclude that integrating interactive learning systems with traditional ones and harmoniously combining them may help improve the overall structure of the learning process and boost student progress.

KEYWORDS

learning technology, interactive learning technology, person-centered approach, interactive methods of learning, techniques for interactive learning

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Introduction

The aims of the present-day system of higher education are governed by the degree of influence it has over the making and development of the person of each student. This is why college didactics ought to be aimed at cultivating in future specialists a comprehensive set of applied competencies: personal-creative, communicative, socializing, and intellectual-information. An approach of this

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kind is expected to help augment the technological aspect of the learning process in college.

There are a number of reasons urging the development and application of innovative pedagogical, especially interactive, technology in college student learning. Firstly, it is the need to implement a systemic-activity, person-centered approach with a view to not just systematizing the actions of all participants in the learning process but also providing them with a personally-significant direction in which to act. Secondly, the time has come to replace the rather tenuous way of passing along knowledge verbally with a more active means of learning. Thirdly, it has become crucial to be able to foresee the possible outcomes of the learning process, avoid negative consequences, and design a positive guaranteed result, which requires a seamless technological chain of actions with proper forms, means, methods, and techniques in place underlying instructor and student interaction (Burkhanova & Rodionova, 2012).

An analysis of scholarly research (Panina & Vavilova, 2008; Nikishina, 2007; Panfilova, 2009) indicates that, amid a changing educational paradigm in college, it is definitely pays to make a shift to some novel learning technology (including interactive) that is oriented toward the personal development and self-development of each participant in the learning process, including both the instructor and the student (Shevchenko, Guseva, & Lebedeva, 2009).

The way the word “interactive” is defined in most dictionaries implies acting upon or in close relation with each other. So, essentially, interaction is about all participants engaging actively in some sort of give-and-take (Gavronskaya, 2008).

Interactivity in learning could be construed as a capacity for interacting and learning by way of conversation, dialogue, or action. Thus, literally speaking, we could term “interactive” a method whereby the learner is viewed as a participant expected to perform certain actions. He acts as not only a listener or an observer but takes an active part in what is going on and, thus, basically, appears to actually be a driving force behind it all happening (Suvorova, 2001).

Scholar S.S. Kashlev regards as interactive the types of technology that have students engage in active interaction in class, implying that by offering a personal contribution to the common cause in class each participant will have the chance to gain some new knowledge through organizing collective activity, starting at the level of 2–3 individuals interacting and progressing to wider interaction among many (Kashlev, 2011).

In the authors’ view, interactive learning is about students assimilating information by way of real-world, intensive learning, as opposed to dull cramming of “dead” information – it is a hyperactive social process wherein the student is not just a learner but is someone who actually *creates* “living” information, being led by the teacher down the right path to getting the best results, based on the harmonious assimilation of knowledge that is in demand in present-day society.

At the same time, the student and the teacher act as equal subjects of the learning process. Their interaction is devoid of dominance, in thought or viewpoint, by one participant over another and factors in the specific experience one possesses and its practical application. A model of this kind implies



continual communication between the instructor and students and that among the latter. In the end, we have a scenario where all members of a team are engaged in communication with each other (Stupina, 2009) [9].

Interactive learning is advantageous as it helps establish a friendly atmosphere among the participants and have them connect with each other, helps boost learner self-reliance and self-assurance, has the instructor encourage students towards working together, enables learners to overcome the fear of a language barrier, helps mitigate authoritarian teacher rule, keeps everyone engaged in activity, assists low-achieving students, and has participants make an active and continual use of the knowledge and experience gained earlier (Klarin, 2000).

The effectiveness of interactive technology depends on how well it factors in the personal characteristics of each subject of the learning process and the prospects for their development. Hence the priority of subject-oriented learning versus information-based. The use of person-centered technology implies changes in the teacher and student position aimed at the democratization of their relations, which will be conducive to the actualization of the student's personal functions, facilitate his professional self-development, and help create the right conditions for his self-actualization (Gushchin, 2012).

Of great importance is the instructor's skill level. The instructor will be creative and innovative only when he is aware of himself as not just a teacher, someone who carries certain information, but also a research scientist, someone who is expected to be good at not just answering questions but also asking them and encouraging students to come up with the answer on their own (Vetrov, 2012).

The most common interactive methods currently employed in college are: skill workshops, case problems, master classes, press conferences, testing, the case method, learning through play, round tables, multimedia lectures and practicals, and electronic study guides. Lecture classes and practicals mostly employ individual hand-out materials and video, audio, and computer equipment (for conducting focus groups). All this helps cultivate the professional potential of future specialists. Students prepare scientific papers which they present at conferences, defend term-papers and diploma papers, and develop presentations of their work based on information-communications technology. Lately there has been wider use of business roleplay as part of the learning process. Business roleplay is an interactive form of learning that facilitates boosts in student learning-cognitive activity, for, in modeling managerial, economic, psychological, and pedagogical situations, students not only strive to personally engage in problem-solving but can also encourage their fellow students to do the same (Gulakova & Kharchenko, 2013).

Despite the fact that there has been sufficient research into the use of interactive learning technology in college, there still are a few thorny issues remaining concerning the practical use of interactive learning methods and techniques as part of seminar classes with smaller groups of learners.

In the authors' view, the following factors need to be taken into account to ensure that smaller groups are industrious and the individual actions of each

participant are integrated into the collective activity of the group subject of learning:

the psychological compatibility of students;

one's learning potential, interests, and propensities;

the optimum combination of the pair-group, collective, and individual forms of work.

the degree of orientation of interactive technology toward the education/bringing-up process.

The authors expect that adhering to the above set of factors in tandem with employing techniques for interactive learning, will help achieve tangible boosts in the effectiveness of the educational process and the caliber of student knowledge.

Methods

In implementing interactive learning, one may want to follow a certain set of requirements which if failed to be adhered to may result in limited efficiency gains (Korotkova, 2015). Several such requirements are exemplified below.

1. It pays to conduct an introductory class to give the students an idea of what interactive technology is about and provide an insight into some of the methods that will be employed in class, using which may alter the usual style of learning. This class can be used to try to explain to one the essence of interactive learning and go over the basic rules of how to use it working in smaller groups and the collective as a whole. Such rules can be as follows:

1) The opinion of each participant is important to the rest, and he ought to be heard out by all means.

2) No one should be scared to speak up, even if his views do not coincide with the majority opinion.

3) All participants in interactive learning are partners, not opponents.

4) It pays to discuss what the person says, not the person himself.

5) Each participant is expected to think things up and over and then express his thoughts to the rest, rather than being a mere observer of the way others are doing it.

6) One should speak in an articulate, legible, and attractive manner.

7) It pays to be able to not only express your own thoughts but hear others out as well.

8) Try to put forward and assert only ideas and views that are well-founded.

2. At the initial stages of implementing interactive methods of learning, it makes sense to form groups of 5–6 students.

3. In forming these student groups, you need to factor in both their personal desires and their degree of readiness for completing the assignment set for the group. Research indicates that heterogeneous groups are the most efficient to



work with. This way, high-achieving students can assist and guide low-achieving ones.

4. Interactive learning cannot be implemented if the learning process lacks a friendly atmosphere within the team; it needs to be created and maintained continually.

5. Both the instructor and the student are expected to prepare scrupulously for each class.

Discussed below is one of the ways to apply interactive technology in a seminar class. Developed by the authors, it consists of several stages.

Stage 1. Organizational-reflexive (5–7 min.). Here, the instructor familiarizes the students with the class topic. It incorporates a brief introduction to the technology the class will be based on and involves the reflexive tuning-up of students for the activity process through the collective formulation and writing-down of specific rules for the proper conduct of class using the “open mike” technique.

The “open mike” technique is used to enable the collective establishment of activity rules that will be followed during the class. Students are asked to use an imaginary microphone (it can be a marker pen) to formulate a requirement for the desired conduct of the students and teacher as part of a group activity involving collective discussion of the class topic. These sentences are written down on a separate blackboard (or a large sheet of paper), and, in the event someone violates the rules during the class, the instructor is expected to note that down and “fine” the offender.

Stage 2. Motivational (5–7 min.). Actuating motivation for activity. Research attests that increased positive motivation can help compensate for a student’s lack of knowledge, competencies, and skills. The effect from the activity of even poorly prepared students will be much greater if they are provided, at the beginning of class, with the opportunity to formulate their own motives for activity. At the same time, student activity levels will be higher if the motives for their behavior are predicated on what they personally expect from taking part in the class. At this stage of the class, the instructor recommends that students motivate their activity using the “group expectations” technique.

Under the “group expectations” technique, the instructor splits the class into groups (5–6 students each) and puts forward the following general question for discussion – ‘What do you expect from your today’s activity?’ The groups are given 2 minutes to come up with the answer. All student wishes are written down.

One then writes on the blackboard (or a large sheet of paper) the key message point conveyed during the activity, “I expect today’s activity will...”. Group members then finish the sentence in writing with their personal suggestions, which can be anything from “...produce new work techniques”, “...introduce some interesting information”, “...provide me with the opportunity to have my say”, or “...foster understanding” to “...result in a positive appraisal of my efforts”. The instructor then concludes the stage by stating, “Therefore, the main objective of our joint activity is to... Let’s direct all our efforts toward having our collective expectations met. We can now move on to the actual

exploration and discussion of the issues” (formulating the objective and plan for exploring the issues in groups).

Stage 3. Instructional-exploratory (50–60 min.). Using the “brainstorming” technique (5 min.) students in the groups identify the key issues for the subject, formulate them in the form of questions or problems (not a single sentence by a group member gets overlooked), take turns reading them aloud, discuss them, and identify new ones (based on the number of groups in the class). Then, using the “learn by teaching” technique, the instructor organizes group work on one of the issues identified.

Under the “learn by teaching” technique, the instructor appoints group readers. Here, the objective of each group member is to assist his group-mate in solving a problem. This part of the stage begins with the “immersion” technique, whereby the instructor suggests that students make use of the various study aids, like software, textbooks, monographs, personal notes, or support literature, to “immerse” themselves in the essence of the issue and try to identify the main thing one would like to tell the group reader about. Then, over the course of 1 minute each group member has to “tell”, or “demonstrate”, as much important information on the report’s subject as possible to the group reader. This can be some of its content, major definitions, additional information, interesting facts, specific arguments, conceptual tenets, etc. The instructor arranges the group work in a circular fashion, and there is a time limit to follow: a group member on the reader’s left speaks for 1 minute; then there is a 30-second pause (this time is used by the entire group to reflect on what they will do and say next and by the group reader to digest what he has just heard); then the next student engages in the same 1-minute-long activity, followed by a 1-minute pause, followed by a third student doing the same for 1 minute, etc. Subsequent to the initial in-group activity, the students move on to the discussion of the issues. The instructor organizes the activity in such a way that the readers take turns speaking on behalf of their group (5 min.), followed by members of their group supplying some additional remarks supplementing their report (1 min.), and only then the proceedings are turned over to students from other groups. Thus, the issue is discussed twice – in-group and in-class. Subsequently, each group rates the reader’s performance, whilst the latter, in turn, assesses the “help” that has been extended by the group and rates the performance of each of its members.

The use of this method activates the student’s cognitive self-reliance (striving and being able to think independently, being able to find your bearings in a new situation, express your thoughts in a clear, easy-to-understand, and concise manner, come up with an approach of your own to resolving an issue, think critically, reason independently, and be willing to help others enrich their array of competencies).

The authors’ pedagogical experiment on the analysis of the effectiveness of applying interactive technology in a seminar class was conducted via an experimental and a control group of students in their third year of study majoring in the same field.



Interactive technology in a seminar class was implemented with the experimental group of students. These results were compared with those from working with the control group, which was not exposed to interactive technology, meaning that seminar classes for the latter were conducted using traditional methods of learning.

The experimental and control groups were compared using the following parameters.

Firstly, the authors assessed one's command of the material (on the information and personal levels) and one's mastery of the ways in which to engage in academic work, and one's ability to put together a comprehensive image of the object under study.

Secondly, the authors explored the change in the personal-conceptual attitude of those in the experimental group compared with that of their control group counterparts toward the study material and their own cognitive activity.

Thirdly, during the experiment the authors analyzed such personal indicators of the participants' performance as one's thinking ability and mental flexibility levels and one's self-appraisal. Assessing the change in thinking ability involved the use of a set of methodologies intended to determine the learner's ability to discern the essential attributes of objects and phenomena (the Identifying Essential Attributes methodology), identify the abstract relationships between objects (the Complex Analogies methodology), and construct logical linkages (gauging one's mental flexibility). The participants' self-appraisal was determined at the start and at the end of the experiment.

Thus, the authors conducted an integrated assessment of the effectiveness of using interactive technology from both a pedagogical and psychological standpoint.

The study results were assessed qualitatively and quantitatively by way of statistical processing of data using the Student criterion.

Results

To start with, the authors attempted to determine student mastery of the study material by checking the knowledge levels in both groups, which turned out to be somewhat lower in the control group versus the experimental one. Those in the experimental group exhibited the higher number of assignments graded "A" and the lower number of poor grades received. The fact that those in the experimental group did better on the various types of assignments (e.g., testing the ability to discern consistent patterns and identify causes, solve exploratory problems using certain knowledge, or furnish examples matching a certain phenomenon) also testified to their in-depth and steadfast knowledge of the discipline.

Prior to the start of the experiment, the authors conducted an assessment of the students' thinking ability and self-appraisal levels. A comparison of the average indicators of student thinking ability and self-appraisal levels for each group indicated insignificant differences.

The results from questionnaire surveys indicated that at the outset of the experiment almost all participants listed their core discipline among their

preferred subjects. Virtually all participants had a high estimation of the significance of knowledge acquired in the subject to their future occupation.

Subsequent to the conduct of the experiment on applying interactive technology, a repeat diagnosis was conducted.

In conducting the experiment, authors utilized the following forms of control in relation to the experimental and control groups: practicals and tests. This knowledge control package was put together factoring in a body of knowledge and competencies on topics mastered as part of the core discipline.

In the repeat diagnostic experiment, student knowledge levels were assessed based on the outcomes of tests taken by the students, their performance in seminar classes, and author observations. The experimental group scored higher in these types of learning activity. The knowledge control results achieved by the experimental group versus the control one indicated that the study material is assimilated much faster and in a more cognizant and thorough manner when learners arrive at a truth through efforts of their own.

Students in the experimental group scored higher in tests than those in the control one throughout the independent research activity they were involved in. This fact substantiates that the use of interactive technology helps create the right pedagogical conditions conducive to proper student mastery of the discipline's knowledge system.

This inference was substantiated by the findings of a comparative analysis of tests taken by students in the experimental and control groups. It turned out that in taking the tests those in the experimental group relied a lot more on knowledge gained earlier. Their answers were more concise, better structured logically, and more reflective of the problem's essence. These students employed methods of solution that were most adequate to the problem and were more flexible and dynamic in using them.

A combination of the above results found reflection in specific changes in the academic progress of students in the experimental and control groups during the academic process.

Since the final grade is a sort of reflection of not just how well the student has mastered the subject but also his overall attitude toward, ability to stay focused on, and interest in the discipline, as well as the degree of formation of his motivation for learning it, it is possible to assert, on the strength of the above results, that the use of interactive methods of learning alongside traditional ones ensures boosts in all types of indicators.

The above-formulated inference is also substantiated in analyzing the change observed during the experiment in the indicator of both groups' activeness of participation in seminar classes.

Both groups took a test known as The Emotional Coloring of In-Class Situations. The outcomes for the experimental group, compared with those for the control one, proved to substantiate the above inferences. All members of the experimental group, as opposed to the control one, attested to experiencing positive emotions when working; 88.3% of them expressed a liking for solving problems in groups based on material covered and 72.4% attested to experiencing no negative emotions in performing any independent work. On all these indicators, the control group scored worse than the experimental one.



Considering all of the above, it may be of interest to attempt to analyze the use of interactive technology in terms of changes in the level of communication between the students, their thinking abilities, and their self-appraisal. Comparing the outcomes for the experimental and control groups based on a survey of instructors indicated that by the end of the study the experimental group exhibited a much better situation in terms of the relations between students in all major respects, including the general cultural aspect, the interpersonal relations aspect, and the emotional aspect. Throughout, and as a result of, the experiment, the control group demonstrated no change in terms of emotional-psychological climate. The authors are convinced that these outcomes quite convincingly attest that the continual use of interactive technology may ensure the best emotional ambiance for students.

Equally important as an indicator of a personal nature that deals with one's success in learning, as well as one's ability to adapt into the environment and have a vision of the prospects for one's future development, is self-appraisal. The authors are convinced that learning ought to help develop an adequate self-appraisal, as an inflated, and especially a deflated one, may cause one to be incapable of coping with issues of a personal nature. Based on the findings of the repeat diagnostic experiment, it can be asserted with confidence that the use of interactive technology in the learning process, especially its continual use, helps to actually correct student self-appraisal along the way.

Thus, comparing the experimental and control groups indicates that the use of interactive technology may have a positive effect in terms of improvement in students' mastery of learning material, as well as a pronounced developmental and nurturing effect.

Discussion of results

The major characteristics of interactive learning techniques to be employed in class include:

- the student's thinking process being actuated in an induced manner, i.e. it is regardless of his will that he gets to engage in the collective process of discussion and activate his stance;
- the student remaining active for quite a long period of time (throughout the entire class), as he gets to keep track of the answers of the rest of the class;
- students enjoying a great deal of independence in reasoning, assuming greater responsibility for their actions, conclusions, etc., and staying motivated by dint of the exciting influence of emotionally-charged in-class activities;
- students continually interacting with each other and the instructor.

The fundamental principle underlying the interactive method is the collective interaction principle, whereby students attain their communication objectives via social-interactive activity, which can be done by way of discussion, dialogue, simulation, improvisation, or debate. This kind of activity matches a person-centered approach to learning. When conducted, it may result in the student coming under the team's benign influence and developing favorable

relations with the rest of the group. Thus, the authors regard the scientific basis for interactive technology to be a set of conceptual tenets of person-centered learning.

On the other hand, engaging in collective social-interactive activity provides students with the opportunity to maximally display their intellectual and creative abilities and encourages being independent and proactive in making decisions.

Thus, interactive activity is a combination of partners engaging in joint work and an instructor managing student actions. It requires giving up on standard ways of solving communication problems and ensures students intensive speech practice in a relatively relaxed, creative atmosphere. Interactivity in learning can be construed as liaising with one another and learning by way of conversation, dialogue, or polylogue, i.e. active communication. Thus, in using interactive learning technology, the learner acts as not only a mere participant (observer, listener) but also takes an active part in putting the learning process together.

The positive aspects of using interactive learning technology are:

1. It helps expand learners' cognitive potential (obtaining, analyzing, and applying information from different sources) and boost knowledge assimilation.
2. Instructors can readily keep track of student knowledge assimilation and have the opportunity to unlock their potential as an organizer or consultant.
3. There is the possibility of a partnership relationship being formed between the instructor and students and among the students themselves.

However, the findings of an analysis of the use of interactive learning technology reveal that there also are certain negative aspects that need to be addressed, like:

1. Much time may be required to study certain information.
2. One may lack pedagogical experience in how to organize this type of learning activity.
3. There is a lack of instructional materials helping to structure classes in various subjects.

These factors signal the need to train or retrain college instructors by reference to the use of interactive learning technology, as well as to develop relevant instructional materials.

Conclusion

The findings of the experimental study conducted by the authors indicate that the use of interactive technology may have a positive effect in terms of improvement in students' mastery of learning material, as well as a pronounced developmental and nurturing effect. Thus, these findings have confirmed the above-formulated hypothesis, whereby adhering to the above set of factors in



tandem with employing interactive methods of learning, will help achieve significant boosts in the effectiveness of the educational process and the caliber of student knowledge.

In conducting the study, the authors treated the use of interactive learning as a specific way to help assimilate study material within the compass of a particular discipline, topic, or issue and within that of a particular interactive technology, the ultimate objective being furthering the development of the person of each student.

The key attributes of implementing interactive technology in college formulated by the authors include: setting specific goals aimed at helping future specialists develop top communication skills; taking an effective approach to planning out and organizing the process of working toward those goals based on the use of a system of interactive exercises and scientifically-grounded active collective actions on the part of participants in the learning process; the interaction and unity of its three components: the organizational form, the didactic process, and the preparedness of college instructors for using this technology and algorithmizing instructor and student actions.

On the whole, the use of interactive technology in the learning process helps stimulate student cognitive processes and develop one's creative abilities and professionally-oriented skills under close-to-real conditions, which calls for further research on the subject.

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