

# POSSIBILITIES OF APPLYING INNOVATIVE TEACHING TECHNOLOGIES WITHIN HIGH EDUCATION DIDACTIC SYSTEM

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## Abstract

The article discusses importance and significance of innovative teaching technologies within didactic system of higher education and possibilities for employment of active training methods in lectures. It introduces to modern concept of innovative teaching technologies, analyzes theoretical level of exploration in employment of innovative teaching technologies within didactic system of higher education and explores variety of activating training methods in lectures from the viewpoint of pedagogues.

KEY WORDS: innovative teaching technologies, training method, activating method, upbringing technologies.

## Introduction

„We stuff heads of young people with data of previous discoveries and results instead of teaching how to trace them. We treat intelligence as a storage, which is to be heaped up, not realizing that it is an instrument to be employed“ (J.W. Gardner).

Demand for development of new technologies and knowledge in modern life brings changes in society, in its approach to human upbringing and didactics. Do acquired knowledge and developed abilities of people meet the demands of society, of learners themselves and continuously changing world of activity? In a general sense it is a discussion about the quality of teaching. No matter how complicated the concept of quality in a scientific sense would be, on a practical level it tells much about satisfaction of supposed and expected needs among participants in the process of teaching and learning. The highest quality of learning or studies is achieved, when demands of learners, pedagogues, social groups and employers are satisfied (Laužackas, 2008). Efficient training methods and forms are very important for achievement of qualitative results. Starting with J. A. Comenius, an originator of didactics, a science of teaching, topical remains to be the question about what the subject and aim of teaching is and what means are to be employed for its achievement. The great Czech pedagogue treated method as the major key to learner's intelligence and heart: "Teaching method has to know and understand the difficulty of the method, to assist in quick and thorough learning, protecting learner from intimidation and deterrence from further learning, stimulating and encouraging his willingness to learn" (Comenius, 1927, p.158).

Eternal didactic problem („how to teach?“) nowadays takes a new shade. Rapid changes and modern technologies of upbringing result in changes within academic didactic provisions and approach, namely, in academic teaching and learning methods. **Analysis of human memory and mental abilities shows that passive learning is not most productive and does not satisfy human demands for information and acquisition of skills. Modernization of technologies replaces passive methods with active ones, which results in more rapid and efficient achievement of desired results. Teaching itself becomes more interesting and attractive. There are numerous works of national and foreign authors about active teaching/learning methods:** D. C. Berliner, N.L. Gage (1994), M. N. Grendstand (1996), Podlasyj (1996), R. Arends (1998), Petty (2006), J. Geniušas (1932), St.Šalkauskis (1933), V. Rajeckas (1997), M. Teresevičienė and G. Gedvilienė (1999), L. Jovaiša (2001), P. Jucevičienė (2003), A. Bėkšta (2005) and V. Lukošūnienė (2005), A. Glosienė (2006), M. Jėčiuvienė (2008) et al.

**Research problem:** strategic aim of education in Lithuania is an innovative and self-dependent, thinking critically and creating individual. One of major pedagogical problems is inconsistency between what lecturers expect from students and what students actually learn. As far back as 1929 in his essay „University and its functions“ A. N. Whitenhead wrote that higher education has to teach students how to creatively comprehend knowledge. It means that students have to contemplate critically and independently (Universitetinė didaktika. Švietimo studijos. 2005). Therefore, innovative active methods are basic pedagogical instruments in preparation of students for different vocational activity.

**Subject** of the article is innovative teaching technologies within didactic system of higher education.

**Aim** of the article is to reveal significance and importance of innovative teaching technologies in training of students for vocational activity.

### Objectives:

1. analysis of concept of innovative teaching technologies;
2. analysis of active teaching methods and possibilities for their employment in higher school.

**Research methods:** analysis of scientific literature, questionnaire, statistic methods.

## 1. The concept of teaching technologies

Modern society started developing in Lithuania during interwar period (1918-1940). Outstanding educators Stasys Šalkauskis (1927), Juozas Geniušas (1927), Antanas Maceina (1936) and others were encouraging to replace passive teaching methods with active ones by employing modern technologies, integrating teaching subjects, etc. When discussing the concept of method as a rational way, focused on aim of studies, S.Šalkauskis (1991) emphasizes compatibility of method with student's make-up and peculiarities of studied subject. He points to two types of method: *tethic* („proposing“) and *heuristic* („discovering“). He emphasizes heuristic method, showing active role of student in the process of studies, highlighting development of his self-dependence, encouraging him to strive for perfection and innovations.

While analysing organization of the training process, J.Geniušas pays particular attention to implementation of such principles, as naturalness, imagination and activeness. The essence of principles and their employment is defined on the basis of child's psychology and theoretical conceptions of new pedagogical trends, on the basis of own experience and data of foreign experimental researches (Geniušas, p. 312–322). According to him, a child „should not only hear and see what a teacher is telling and showing him, but also to independently remake it: orally, in written, in drawings, modelling and, finally, express it in play“(Geniušas, p. 692). Therefore, empiric experience with its visual aids and their important role are particularly significant in conscious and firm pickup.

After restoration of independence (11 03 1990) national educators started gaining experience from western researchers D.C.Berliner, N.L.Gage 1994, M.N.Grendstand 1996, R.Arends 1998, G.Petty 2006 and others. They differently define teaching methods, but the essence remains the same, for example, “it is a model of teacher's recursive actions, it can be employed in teaching different subjects, it is typical to more than one teacher and important for learning“ (Gage, Berliner, 1994, p.,307. G. Petty (2006). They propose to employ methods not only on the basis of chosen aims, but also to pay attention to demands, expectations and ergonomic environment of learners. Variety of methods stimulates pedagogical activity, pleases pedagogues, encourages them to experiment with groups of students and to reject inefficient methods.

Soviet pedagogy (Lithuania was ruled by Soviets in 1940-1941 and 1945-1990) aimed at conveyance of information, which had to provide learners with maximal amount of knowledge. This tendency is still rather strong even after 22 years of independence.

Modern paradigm is typical to all EU countries. It aims at independent acquisition of knowledge, development of practical abilities, when method in the process of upbringing is a way of interaction between educators and learners. It is continuously improved during their pedagogical meetings, their communication and cooperation (Dumčinė, Bajoriūnas, 2006).

A. Glosienė (2006) characterizes changes in Education studies in the following way: “Aim of higher schools nowadays is to provide students with specific knowledge and to teach them how to learn, prepare them for lifelong learning, to shape their desire to search, discover, evaluate critically and employ information for solution of problems, decision making, for continuous update of their knowledge, for vocational and personal development. Higher schools have to develop the culture of learning, which would stimulate students and graduates to strive for learning and to be able to do that in continuously changing informational environment“ (Glosienė, 2006, p. 190).

According to M. Jėčiuvienė (2008), upbringing of enterprising and creative individuals would be the biggest challenge for higher school. However, the question emerges – whether or not lecturers are able to do that? Prof. P. Jucevičienė (2003) and others maintain that the role of educator in modern society is that of an assistant, taking care of learner and the process of his knowledge improvement. While communicating with learners and observing them, the educator concludes about abilities and needs of each learner and on the basis of these observations develops a democratic learning environment, which would enable learners to construct meanings, understanding and knowledge.

The term “teaching/training technologies“ is nowadays very frequently employed in the science of upbringing. Scientific literature provides with different versions of its explanation, for example, the art of teaching, development of skills and abilities, employing innovative training methods, meaningful implementation of teaching aims and results in the process of upbringing (Беспалько, В.П., 1970). The term involves forms, methods, lecturing methods in education institutions, organizational and methodological means in the process of upbringing.

Some researchers (Подласый, И. П., 1996) classify the methods of upbringing in accordance with technologies: *productive technology* - (explanation, instruction, work with books, practical classes, testing, lecture, demonstration, illustration, audio/video, etc.); *cooperation technology* (major methods - interview, discussion, cognitive play, control, programming, practical training, problem-orientated training; auxiliary methods - illustration, work with books; *saving technology* (major methods – narration, discussions, disputes, subject based plays, video/audio methods, observation; auxiliary methods – situational method, unconventional methods, demonstration).

Evidently, the term is realized differently – some researchers perceive it in narrow sense, whereas others comprehend it in wider sense and even offer their own classification. We should accept researchers' observations as a versatile explanation of above term, when all of them reason in a similar way.

N.Kuitienė (2005) maintains that particularly important are creative methods of training and their employment in lectures. On the basis of these methods critical thinking and ability of students to solve problems in nonstandard situations is developed. In that sense significant are exploratory methods, involving into research activity and exploration of reality.

When classifying all training methods, Finnish researchers distribute them into five categories: conveyance of information, activity based training, assignment based training, literature based training, virtual training, however, giving preference to active methods of teaching (A. Karjalainen, K. Aihos and S. Jutima, 2002).

Professor L. Jovaiša (2007) distributes methods into *informational*, applied for conveyance of information (demonstration, analysis of different sources, etc.), *practical-operational* for development/self-development of abilities in specific activity (practical classes, practice, laboratory, etc.), *creative*, stimulating student's self-dependence, critical and creative thinking (problem solution orientated studies, case analysis, etc.).

Modern society needs creating personalities, employing their intelligence as an instrument. It is not easy to define and specify creativity. According to B. Edwards, it could be a personal property, assisting in discovery of something new (Humanistinių vertybių įtvirtinimas aukštajame moksle. p. 270).

Professor L. Jovaiša, the classic of Education studies (2007, p. 127-128), defines creativity as a complex of personal properties, which enables to achieve original, socially significant and qualitatively new results of activity, whereas a creative type of lesson is designed for productive and creative activity of schoolchildren. Similar though more mature should be classes with students in higher school. Dictionary of Psychology (1993, p.151) defines creativity as a human ability to offer new ideas, to think self-dependently, in non-stereotyped way, to orient quickly in problematic situations, to easily find atypical solutions. *Methods of active training* could help to implement these objectives, as they are methods of pedagogical activity, providing with opportunity for better realization of teaching content and improving ability of critical thinking, employment of knowledge both in ordinary and new conditions. Methods of upbringing are as important factors of pedagogical activity as aims and content of upbringing.

When choosing and offering students different teaching methods, lecturers have to consider criteria of active methods (**methods have to create conditions for relax and motion, they also have to involve many participants and offer them conditions for communication, they have to activate available knowledge and positive qualities of participants, making them useful for entire group (Bėkšta A. et al., 2005).**

Practical peculiarities in study related activities and good ergonomic conditions are important for employment of active methods. After evaluation of their availability on the basis of these criteria lecturers are likely to choose and offer most efficient study methods, encouraging, stimulating and activating all learners.

Activating teaching/learning methods encourage students to take interest into discovery, analysis and synthesis of knowledge, to search for new facts and find creative methods for solution of problems, to identify their interrelation. Employment of these methods leads to tolerance and nurturance of social openness and reciprocal understanding, respect, development of cooperation, development of ability to listen to each other, implantation of general human values (humanism, tolerance, responsibility, conscience, self-confidence, creation, free and good will). Methods of active learning enable to realize the essence of undefined situations and undertake new activities. Active learning secures its integrity and self-expression (Aktyvaus mokymosi metodai, 1998, p. 8).

Lithuanian pedagogues N.Bižys, A.Bėkšta (2005), M.Jėčiuvienė (2008) and others describe many inventive and complementary training methods, stimulating cooperation, inter-assistance, outspokenness, critical thinking, activity of schoolchildren, etc. A wide range of modern training methods is oriented towards learners and stimulation of their teaching/learning activity. "These are most efficient learning

methods, stimulating activeness, i. e. discussions of training material, its own practical testing and teaching of others. Methods must create environment, which would stimulate learning and enable to rest on largest possible sensations in one's own activity. Learner achieves best results when he is an active member in the process of learning" (Šiaučiukėnienė, 2006, p. 107).

Scientific literature describes different active training methods, employed in the process of higher education studies: demonstration, work in group, electronic teaching, search of literature, discussion, project method, verbal introduction, scientific paper, reviews, essay, learning blogs and diaries, drafting of bibliographic list, didactic testing, graphic and visual methods, maps of ideas and notions, map of ideas, introduction of banners/posters, portfolio method, case analysis, etc.

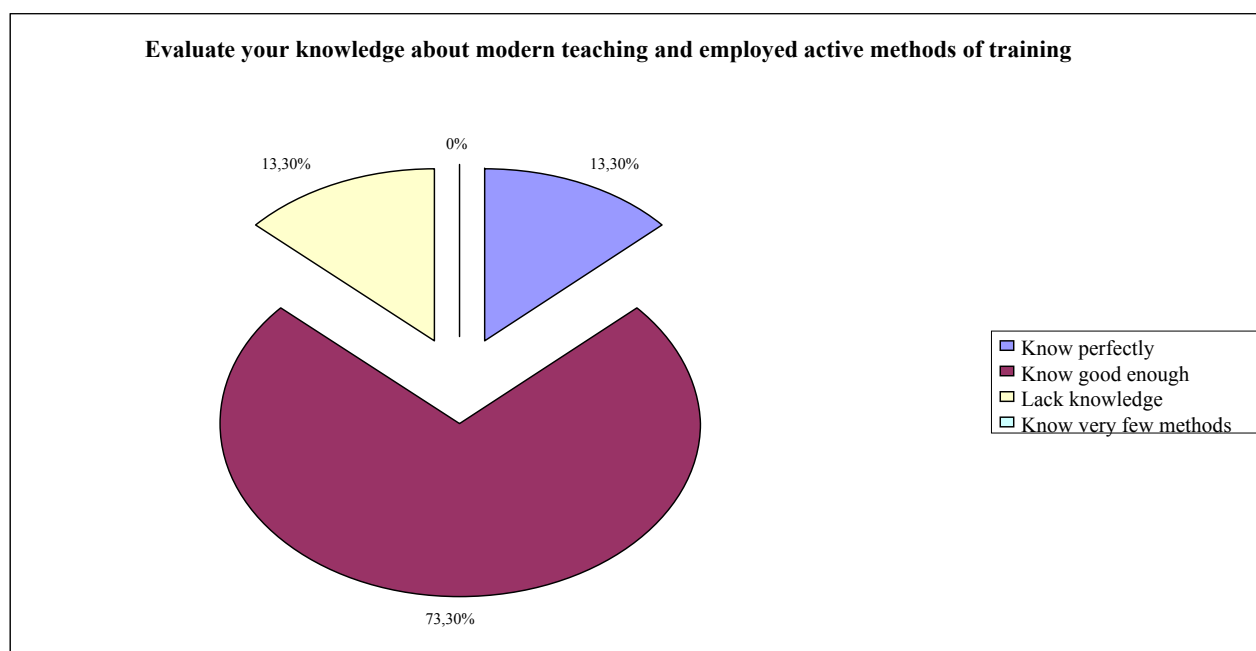
## 2. Lecturers' approach to active methods of teaching and possibilities for their employment in the process of higher education studies and preparing students for vocational activity

### Organization and results of the research

The method of questioning was employed in the research. It is the most reliable method for analysis of pedagogues' approach, as it is anonymous and stimulating willingness of respondents for cooperation. Lecturers in academic study programmes were chosen for above research. 30 lecturers, working in Pedagogical faculty of KU, were questioned by this method. The sample was not big and it did not represent the entire population. Received data can easily appear to be atypical from the viewpoint of the whole population. However, conclusions that were made in the process of the research will be significant, as they will be a reflection of actual situation, related to research problem, which is very important for each higher education institution, striving for improvement of study quality.

Analysis of research results is made and received data processed on the basis of *Excel* programme. Analysis of data was made on the basis of higher education study practice, its concept and lecturers' approach to possibilities for employment of active teaching methods in lectures.

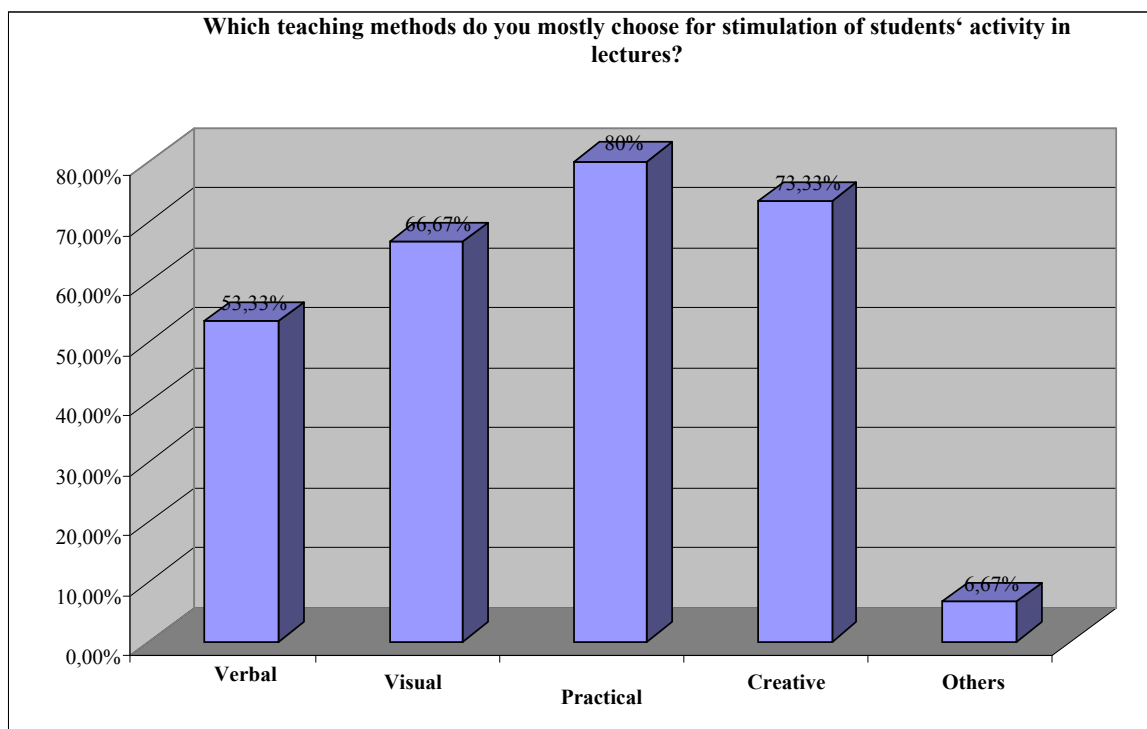
Employment of questionnaire aimed at attempt to find out whether lecturers in higher education study programmes are strong enough in their knowledge of modern training, modern teaching technologies and activating methods of training. Data of the research (pic. 1) show that most of them (73,30 %) are sure they know well enough about these methods. Some of them (13,30%) know them perfectly and are able to employ different methods in the process of upbringing. Another 13,30 % of lecturers maintain that they employ active training methods, however, they lack knowledge about how to employ them in lectures, practical classes, laboratory and seminars. Lecturers presume they lack literature about modern methods of upbringing and possibilities for their practical employment, when giving lectures in different subjects of study programmes, including academic and college studies.



**Picture 1.** Evaluation of lecturers' knowledge about modern training and active teaching methods

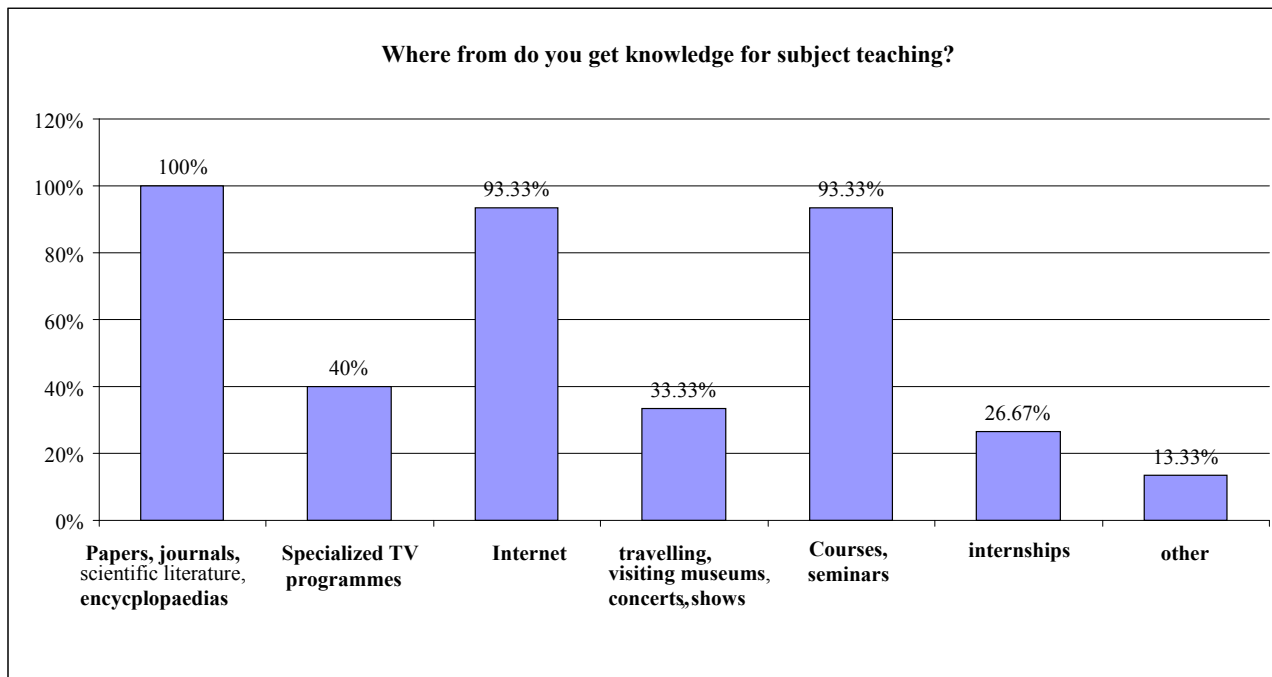
Respondents pointed to most meaningful methods, stimulating activeness of students in lectures (pic. 2). 80 % of pedagogues are sure that practical – operational methods are most efficient, since they help to develop abilities for performance in a certain sphere and to form necessary skills. 73,33 % of respondents think that creative methods, stimulating self-dependence, critical and creative thinking, help to activate students in lectures, particularly, when studies are oriented towards solution of problems. 66,67 % of respondents maintain that visual methods are most efficient in stimulation of students' activeness in lectures. Researchers maintain that we recall 30 % of what we had previously seen and 50 % of what we had seen and heard. Therefore, visual methods are very popular in teaching of students from different programmes. Verbal methods, stimulating students' activeness in lectures, are meaningful for 53,33 % of respondents. They are employed to impart information, for example, for analysis of different sources, etc.

Choice and employment of methods for activation of students depends on chosen aims, demands of learners, ergonomic environment, available instruments and emotional climate.



**Picture 2.** Most frequently employed training methods for stimulation of students' activity

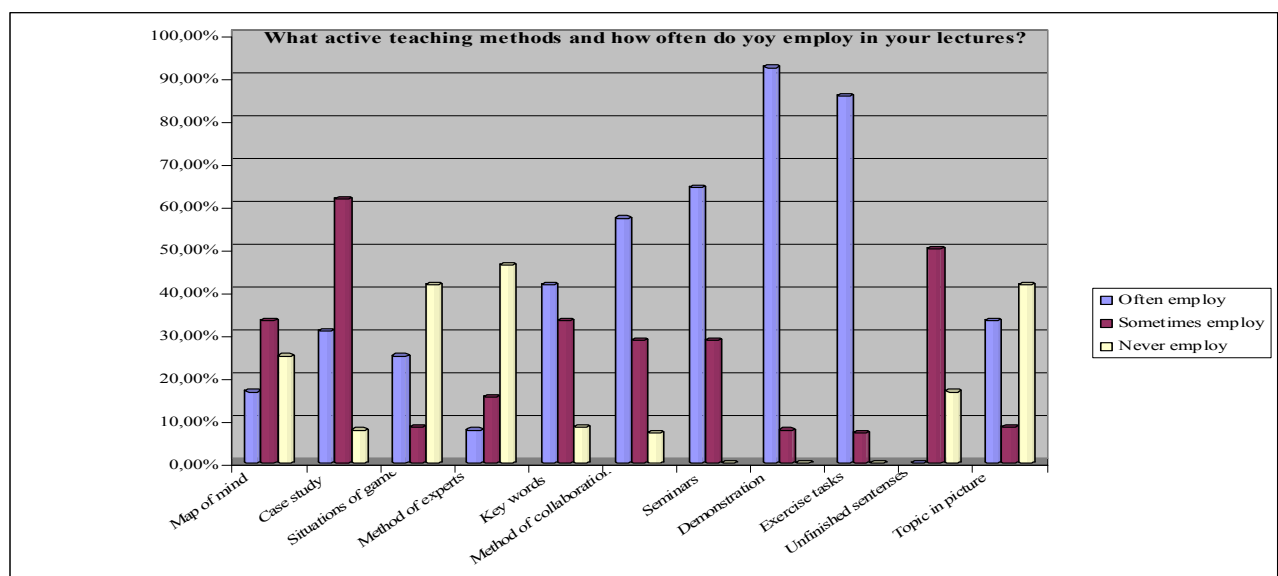
Above questionnaire attempted to find out where from lecturers receive knowledge, necessary for teaching their subject. Science is developing rapidly and pedagogues have to continuously update their knowledge, when teaching students. Lecturer's portfolio has to be dynamic and continuously updated, as content of a training subject and training methods are very often changing. 100 % of respondents made a remark (pic.3) that they receive necessary knowledge from scientific research literature, encyclopaedias, scientific journals, etc. 93,33% of pedagogues presume that information form internet and participation in different retraining events (seminars and courses) help them to update their knowledge. Very often these events are fee-paying, so lecturers make use of their own financial resources for improvement of their qualification. 40 % of pedagogues think that they receive necessary knowledge, watching specialized TV programmes. 33,33 % of them noted that trips to different countries help them to develop and gain experience. A rather small part (26,67 %) of respondents noted that internships also contribute to deepening of knowledge. They are treated as the best method for perfection in vocational activity, however, higher education institutions presently do not provide with opportunities for internships, particularly in foreign countries. In summary, knowledge for training lecturers are mainly received from literary sources, internet and qualification events.



Picture 3. Sources of knowledge for subject teaching

Aim of present-day higher school is to provide students with specific knowledge and to teach them how to learn, to prepare them for lifelong learning, to develop their aspirations and abilities for search, discovery, critical evaluation and employment of information for solution of problems, decision taking, for continuous update of knowledge, for vocational and personal development. Lecturers must assist their students in their attempts to take a fancy to teaching/learning, to experience inner ties with training subjects. The research aimed at finding out what methods enable students to become more active and conscious, to dive more actively into the process of teaching, to develop own approach and to defend it. Respondents pointed (pic. 4) to variety of active training methods, which they most often employ in their lectures (demonstration, practical assignments, method of short questions-answers, reflection, discussion, brainstorm, creative activity, method of cooperation, analysis and comparison of schemes and tables, etc.

Most often over 92% of lecturers employ the method of demonstration in their lectures, about 87% of them apply the method of practical assignments. About 40% of respondents never employ the method of situation play and the method of experts (45%).



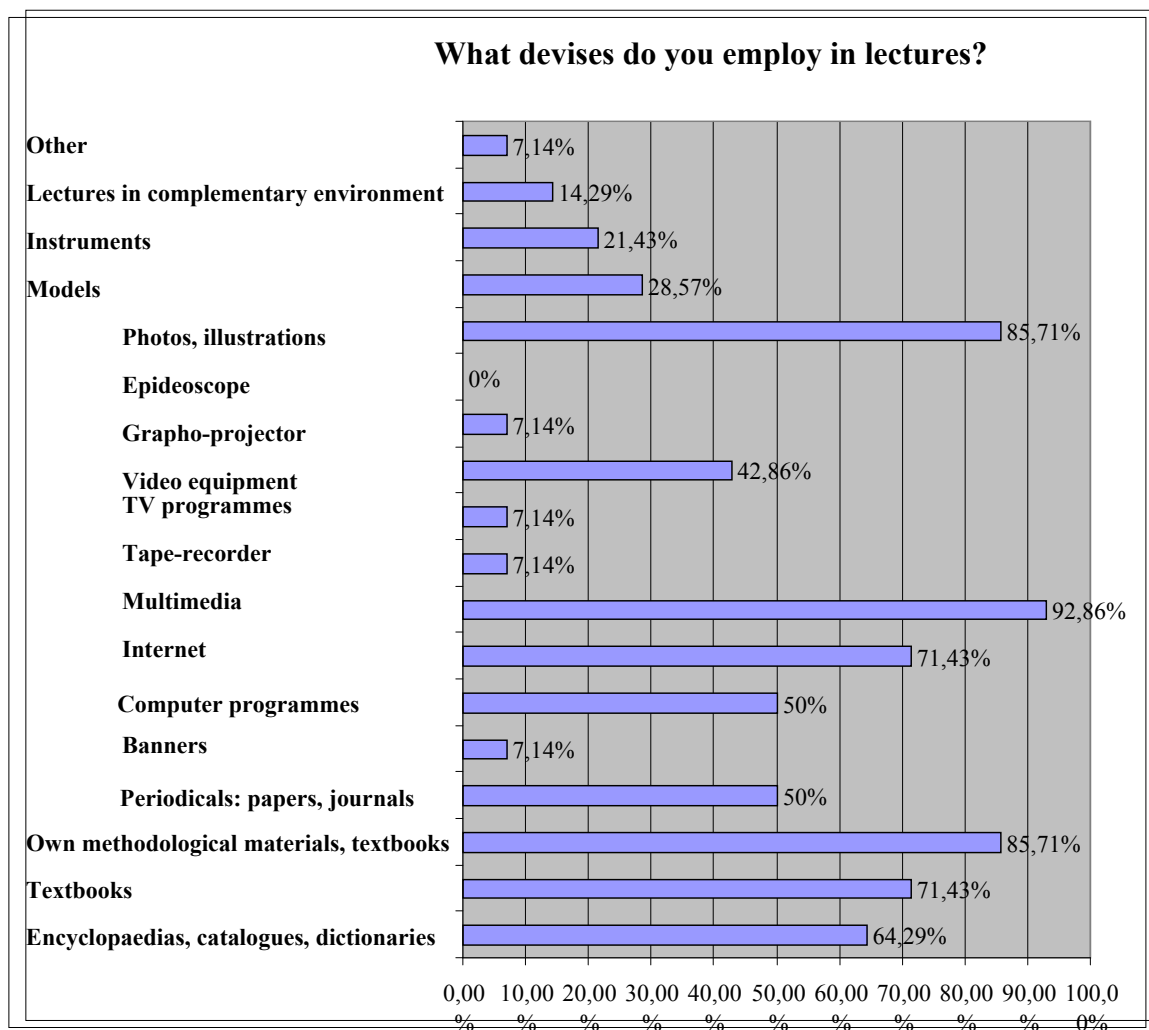
Picture 4. Active training methods in lectures

Analysis of the research results shows that 70% of lecturers employ the methods of reflection and brainstorm, stimulating students for self-dependent activity, logic thinking and creative approach to problems. A large number of lecturers employ the method of creative activity, methods of reflection and project activity. The method of project activity is sometimes employed by 57 % of lecturers, almost half of them (46%) sometimes apply the method of project activity, the method of questioning is often employed by 40% of respondents. The research showed (pic.5) that play method (23%), test planning method (25%) and monitoring (27%) are almost equally employed in the process of studies.



**Picture 5.** Methods of active training in lectures

Data of questionnaire show that pedagogues employ different training technologies and technical devices (textbooks, own methodological materials, encyclopaedias, dictionaries, internet, computerized training programmes, models, instruments, multimedia, video and audio equipment, etc.), assisting students in mastering and deepening of knowledge. Scale of modern training and technical devices is very wide and oriented towards stimulation of learner's activity and his interests. 85,71% of respondents say (pic. 6) that they traditionally use their own training means and textbooks, 85,71% of pedagogues vary their lecturing with illustrations and photos (pic. 6). It was noticed that a large number of higher school lecturers employ modern technologies of training and upbringing (data bases, computerized training programmes, etc.). 71,43% of them employ data bases and catalogues with modern scientific information and results of topical international scientific researches. It means that close cooperation with libraries in this sphere enables to make use of modern scientific literature and get acquainted with global scientific projects, scientific events, innovations and technologies. Respondents made no hint about employment of such modern technical devices as interactive board, shooting camera, cameras, computers, scanners, digital technologies, etc.



**Pic. 6.** Training and technical devices, most frequently employed by lecturers in their lectures

Therefore, it is possible to maintain that a wide range of active teaching methods are dominant in modern paradigm of upbringing, however, very often activating methods intermingle with classic methods of training and upbringing. In practical activity they used to be, still are and will be employed. Different is only complexity of modification in their employment at continuously changing process of pedagogical activity and its improvement. Optimal way in development of study quality in higher school would be employment of time and experience approved methods. Tune of different methods will enrich and spice up the process of training and meet the aim in most optimal way.

## Conclusions

1. Strategic objective of education in Lithuania is an innovative and self-dependent, thinking critically and creating individual. Active methods of training help to strive for this objective. Researchers were writing about these methods already in the beginning of 20<sup>th</sup> century. They differently characterize active teaching methods, but the essence of the notion itself is treated in a similar way – they all recognize their efficiency in the process of teaching. Training methods in the process of studies have to be chosen with respect to information, which is to be solidified and what skills are developed. Selection of activating training methods and their employment depends not only on chosen objectives. It is very important also to pay attention to learners' demands, expectations, ergonomic environment, available devices and emotional climate. Only then activating methods will help to solidify knowledge efficiently.
2. Creative individual is able to adapt himself in different vocational activity and continuously changing world. Activating training/learning methods encourage to take interest in knowledge, to discover, analyze and synthesize it, to search for new facts, to discover creative methods for



solution of problems. Analysis of pedagogues' approach to active training methods shows that most appropriate and optimal activating methods in academic lectures and other classes are: demonstration, reflection, brainstorm, discussion, project method, creative activity, questionnaire drafting, method of short questions-answers, employment of schemes and tables, individual activity, report, individual reading, planning of portfolio.

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## INOVATYVIŲ MOKYMO TECHNOLOGIJŲ TAIKYMO GALIMYBĖS AUKŠTOJO MOKSLO DIDAKTINĖJE SISTEMOJE

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### Santrauka

Apie aktyviųjų mokymo(si) metodų taikymą yra rašę pasaulio ir Lietuvos mokslininkai: D. C. Berliner, N.L. Gage (1994), M. N. Grendstad (1996), Podlasyj (1996), R. Arends (1998), Petty (2006), J. Geniušas (1932), St.Šalkauskis (1933), V. Rajeckas (1997), M. Teresevičienė ir G. Gedvilienė (1999), L. Jovaiša (2001), P. Jucevičienė (2003), A. Bėkšta (2005) ir V. Lukošūnienė (2005), A. Glosienė (2006), M. Jėčiuvienė (2008) ir kt.

**Tyrimo problema:** strateginis Lietuvos švietimo tikslas yra inovatyvus, savarankiškas kritiškai gebantis mąstyti ir kurti žmogus. Todėl inovatyvūs aktyvieji metodai, ruošiant studentus įvairiai profesinei veiklai, yra pagrindinė pedagoginė priemonė galinti padėti pasiekti šių tikslų.

Straipsnio **objektas** – inovatyvios mokymo technologijos aukštojo mokslo didaktinėje sistemoje.

**Tikslas** - atskleisti inovatyvių mokymo technologijų svarbą, ruošiant studentus profesinei veiklai.

**Uždaviniai:**

1. Išanalizuoti inovatyvių mokymo technologijų sampratą.

2. Ištirti aktyvius mokymo metodus ir jų panaudojimo galimybes aukštojoje mokykloje.

Šiuolaikinėje ugdymo paradigmoje mokymo tikslas - išmokyti savarankiškai įgyti žinių, formuoti praktinius gebėjimus. Ugdymo procese metodas yra ugdytojų ir ugdytinių sąveikos būdas. Taigi kiekvienas ugdymo metodas apima ugdytojo ir ugdytinių veiklą, veikloje naudojamas priemonės bei veiklos organizavimą. Ugdymo pamatas yra sąveika ugdytinio su ugdytoju, jos nuolatinis tobulinimas, ugdymo metodai turi tą sąveiką optimizuoti per ugdytojo ir ugdytinio pedagoginius susitikimus, bendravimą ir bendradarbiavimą bei ugdymo priemones (Dumčienė, Bajoriūnas, 2006). Inovatyvūs aktyvaus mokymo metodai – pedagoginės veiklos būdai, suteikiantys galimybę ne tik geriau įprasminti mokymo turinį, bet ir plėtojantys gebėjimą kritiškai mąstyti, taikyti žinias tiek įprastomis, tiek naujomis sąlygomis. Ugdymo metodai yra ne mažiau reikšmingas pedagoginio darbo veiksnys nei ugdymo tikslai ar turinys. Aukštųjų mokyklų dėstytojai, dirbantys įvairiose studijų programose, parenkant studijų metodus pirmenybę turėtų teikti inovatyviems metodams, orientuotiems į studentų kūrybiškumo ir bendrųjų bei specialiųjų kompetencijų plėtotę: debatai, atvejo analizė, realių problemų sprendimas projektuose, išvalgų bei plėtros scenarijų kūrimas, praktikos darbo vietose ir kt. Pedagogai taikantys klasikinius metodus, paskaitas turėtų planuoti taip, kad studentai aktyviau jose dalyvautų: paskaitų metu įvesti kai kurias veiklas; dalį paskaitų medžiagos pakeisti į savarankiškus skaitymus; pasiekti, kad dalį medžiagos studentai pasiskaitytų prieš paskaitas; įpareigoti studentus kai kuriuos temų klausimus parengti ir pristatyti savarankiškai; įtraukti studentus į diskusijas ir kt. Studentus aktyvinantys inovatyvūs mokymo(si) metodai, skatina ne tik domėtis, atrasti, analizuoti, sintetinti žinias, ieškoti naujų faktų, rasti kūrybiškus problemų sprendimo būdus, bet ir gebėti rasti jų tarpusavio sąsajas. Taikant studentus aktyvinančius mokymo(si) metodus skatinamas atvirumas, tarpusavio supratimas, pagarba, stiprinami bendradarbiavimo ryšiai, ugdomas gebėjimas išklaudyti vienus kitų; tolerancijos supratimas, įgalina pasinaudojant tuo, ko išmoko, suvokti neapibrėžtų situacijų prasmę, leidžiama imtis naujos veiklos; garantuoja mokymosi integralumą ir saviraišką.