

# E-LEARNING AND EVALUATION IN MODERN EDUCATIONAL SYSTEM

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## Abstract

Implementation of information and communication technologies, as well as emersion of new user interfaces and web 2.0 technologies changes the way of education system, the way of living and business transactions in general. The way we communicate, operate, produce and live is changing.

In accordance with it, the systems of education change from traditional to modern. The following changes occur: from content delivery to knowledge production, from transfer of knowledge from teacher to student towards encouragement of development and construction of knowledge, from courses and programs changing to the adaptation of the study environment, from the faculty professionalism to the quality of teaching and student learning and the early involvement of students in research work and projects. These occurring changes also affect the student and professor mobility. Here the word "mobility" represents more than the student exchange programs and the easier transitions from one's home university to a foreign one, but also the way professors conduct their classes. With the development of certain software, a student's class attendance no longer represents an important factor, as they can now learn from distance using the mentioned software, taking the learning process one step further.

In order for said changes to occur, the use of e-learning and the development of new tools are almost mandatory. With this in mind the goal of this paper is to analyze quantitatively the changes that are occurring almost every day that affect the student's learning and the professor's teaching methods.

**Keywords** - e-learning, cone of learning.

## 1 CONE OF LEARNING

Confucius, the famous Chinese thinker and philosopher, once said, "I see and I forget, I hear and I remember, I do and I understand." We all know this instinctively, but perhaps Edgar Dale, a U.S. educationist at Ohio State University, explained it the best. He studied inter-relations of different audio-visual materials and their positions in learning processes and expressed the divisions based on extreme two points between direct experience and pure abstraction. His study was experience based, as he conducted his research based on the experiences he got from his own students.

What he did was try different teaching methods on each student group. After two weeks, Dale tested their knowledge. The results showed a significant deviation between different learning methods. Dale could divide those methods into passive and active learning, and each of them into a nature of enrollment, as reading, looking at pictures, seeing a movie, giving a talk, or doing a presentation. The data showed that in active learning his students performed above average.

The results indicated that, after two weeks time, the student group that learned from reading remembered only about 10% of what was written, while the student group that learned from watching a demonstration or an exhibit remembered 50%, and the group that actually did the real thing or simulated a real experience remembered an astonishing 90%. These results are illustrated in Fig. 1.

Moreover, students who remembered by reading or hearing were able to define or describe the things they remembered. Students who remembered by hearing and seeing were able to apply what they learned, but only those who learned by saying or saying and doing could analyze, evaluate, criticize what they knew.

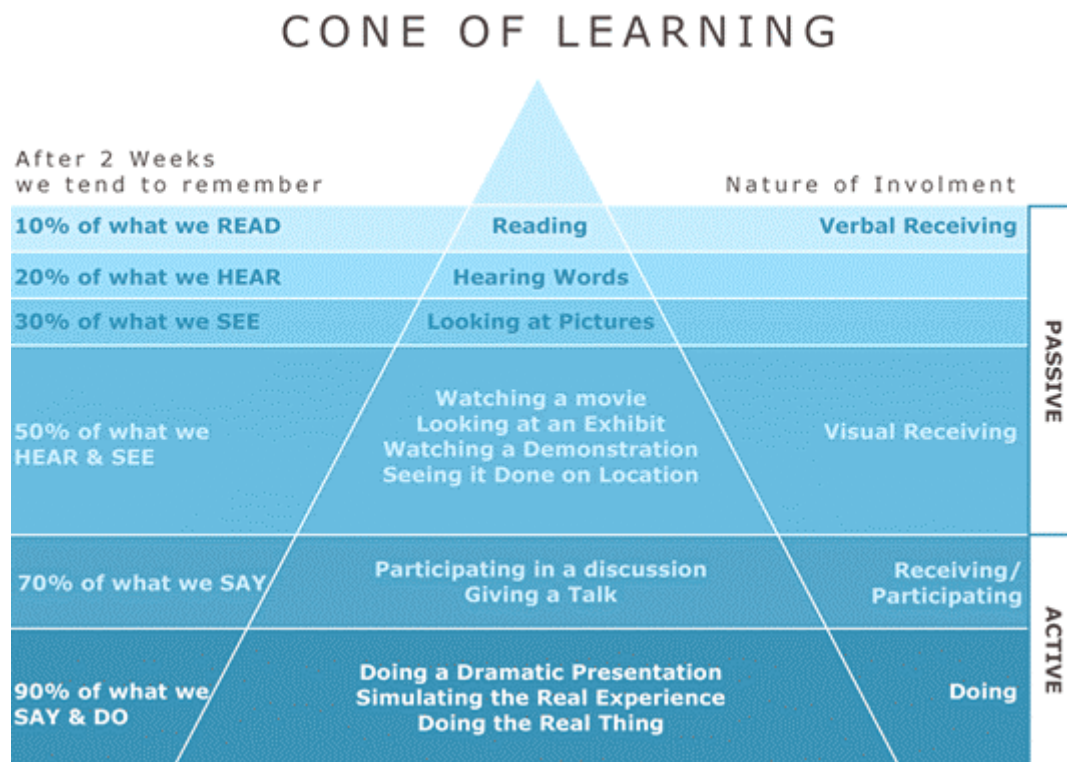


Fig. 1. Edgar Dale's cone of learning [1]

## 1.1 Applying the cone of learning

There are several problems in the used learning methods, which can be grouped in three categories. The first one is the problem of exponential world knowledge growth, which makes prompt adjustment and fast fact acquiring the key of success. [2] Despite the quicker adapting that is nowadays required, the majority of the learning institutions still rely on the old fashion way of information transmitting. [3]

Students are taught the information is complete and static, and are encouraged to absorb the materials rather than challenge them to come up with a better solution. The next group of problems is resulted by an inadequate course evaluation, as the rapid industry development is rarely in correlation with the study program development. This results in a less than perfect educational providing. The third group of problems is the gap between the knowledge that is taught in the universities and the knowledge that is expected from a student in a job position.

It is common for excellent students to perform less then excellent in their jobs, and vice versa, students who struggled their way through school to have admirable success in the work environment. This alone is a proof of the differences in the ways of thinking that are learned in a university and the way a person is expected to perform a job.

In order to bring a solution to said problems, changes in the teaching methods are inevitable. The student's main goal has to become to acquire knowledge he will most certainly need, rather than to obtain a diploma; and this can be done by adapting the learning environment to match a working environment.

## 1.2 Improving the learning methods

The determination on basing the learning system on methods used decades ago, ignoring the exponential growth of technology and the changes that come with it, will lead only to a more decade system. Science, people and technology are changing too rapidly to follow them using the traditional teaching methods. Thus, only new and innovative learning methods can make a difference. In the University of Zagreb, Faculty of Graphic Arts, there are several courses where the professors are determined to solve or at least to ease those problems by adjusting the learning methods to mach Edgar Dale's cone of learning by e-learning.

By using e-learning is hoped to achieve changes in the way of thinking and learning, to shift from a vertical hierarchy to a horizontal one, where professors and students can call each other colleagues, thus referring to one another as practically equals, emphasizing the idea of a common goal – innovative learning. Moreover, it is hoped to shift from the years or even decades ago defined course materials to an adaptive learning system where students get to choose the topics they would like to explore further. By giving them this option, Dale's cone of learning is being implemented, and doing research for themselves and by presenting this research in front of the whole class will remember it much better than they would have if a professor just made them learn it. Those implementations would most likely lead to a change in the learning system.

Student's knowledge will no longer have to be acquired by merely a professor's lecture that will then be expected to reproduce, but by reproducing a knowledge based on experience. It is needless to say this knowledge would be not only much better understood, but also the students will remember it much longer and much better.

## **2 E-LEARNING IN MODERN APPROACH TO LEARNING**

Learning is a process of achieving certain competences that can be defined as a dynamical combination of cognitive and metacognitive skills, knowledge and understanding, as well as the development of social skills and growth in ethical values.

The target of every educational program should be to enable its participants an optimal balance in developing all of the above. The system itself should be directed to its participants and the results they achieve. In the academic environment, this calls for a need of overcoming the situation in which the educational program is often a reflection of the professor's interest and expertise areas.

E-learning enhances the quality of the educational process by enabling the practice of new roles in the process of learning. The student role is no longer passive and the communication within the system occurs in both ways. In addition, during this process of e-learning, lifelong learning technologies are used, which is highly significant since in the environment of exponential knowledge growth that we live in, rises more the importance of how things are being learned in consideration with what is being learned (through a certain course) because the constant expiring of what was once a fact.

There are different forms of e-learning:

- learning using ICT (Information and Communication Technologies)
- mixed learning as a combination of classroom teaching and teaching over the system
- learning at distance [4]

When choosing a form of e-learning one should have in mind the type of course it should be applied to as well as the needs and possibilities of students and professors.

E-learning should not be seen as an alternative educational system but as an enhancement of the existing one. It is a way of developing the current system by applying the available technologies with the goal of elevating the learning process to a higher and more efficient level of not only receiving but also creating knowledge.

Today, we are faced with a new generation of students, and the aberrational characteristics present among them in comparison with the older generations are only going to be more emphasized with the upcoming ones. The new generations of students are capable of fast information adoption and multitasking and they call for a random access to information ("anytime, anywhere"), they are accustomed to Google-like informational systems and multiple media operating. They expect to be rewarded at all time.

Past educational systems were based on the idea of delivering the knowledge to the student who accepted the given knowledge in a passive manner. The professor played the role of the keeper of the knowledge. The individual effort was valorized.

This kind of model is unacceptable to the new coming generations of students and isn't in concordance with the situation waiting for the diplomats in their future working environment where they will be often expected to work as a part of the team. Even more, the job they will be performing will call for high performance characterized by constant activity, quick and innovative problem solving as well as spotting problems that were not before recognized as such.

Trough e-learning a new educational environment can be set; an environment constructed in the direction of interaction, processing information, knowledge constructing, researching and problem solving. The students are asked to actively get involved, and often work in teams. The role of the professor is to design the methods of learning and help each student develop his own talents and capabilities.

The focus is shifted from what the student is like (do they attend classes and can they reproduce what they have been taught with great accuracy) and what the professor is doing, onto what the student is doing. [5] This is made possible with the use of modern technologies.

The professor can monitor what the student is doing through the whole course, follow his or her progress and give a suggestion if there is a need for such. The student can also be the “professor” in some situations. Students can interact among themselves as well, and form a motivating environment for further activity.

As cooperation is one of the main characteristics of this model of learning, in contrast to prior plain subjection to professor’s authority in a one-way system, even the evaluation part of educational process is done in congregation. This way everyone is included in all of the segments of the course and by evaluating and critically perceiving other topics (chosen by other students who have different interests) one can learn about them and rise from lower levels of creativity to the higher ones.

In a modern learning process, each of its participants has to take an active part in it and share a part of the responsibility concerning it. This means that the student too plays a role in the creation of his own learning environment.

The respect of specialties and individual interests of each student can be seen from the different form of creative work given to him to choose from, like presentations, internet research, essays, forum activity, since wanted competences can be reached trough different ways.

### 3 SURVEY

In order to evaluate the e-learning system on practical level, a survey among 40 students was managed. This survey was conducted in the University of Zagreb, Faculty of Graphic Arts; where there are several courses where the professors are determined adjust the learning methods to mach Edgar Dale’s cone of learning by implementing the e-learning system.

It is important to emphasize that the survey was performed after the last class of a particular course and that it was anonymous. Students were asked to put real thought into answers and be truly honest. Questions and their results are shown in diagrams 1, 2, 3 and 4.

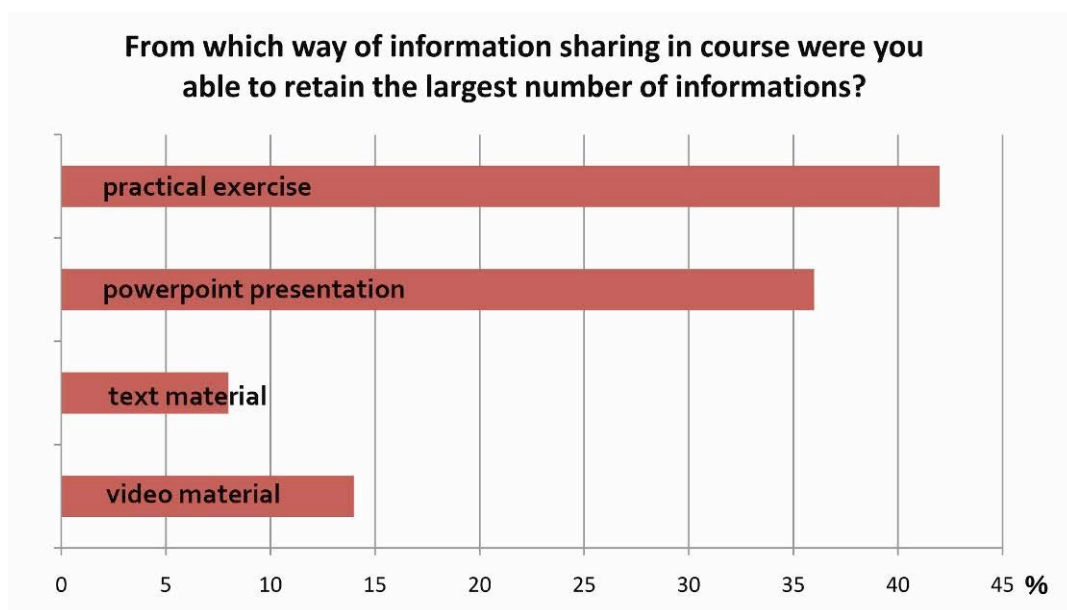


Diagram 1

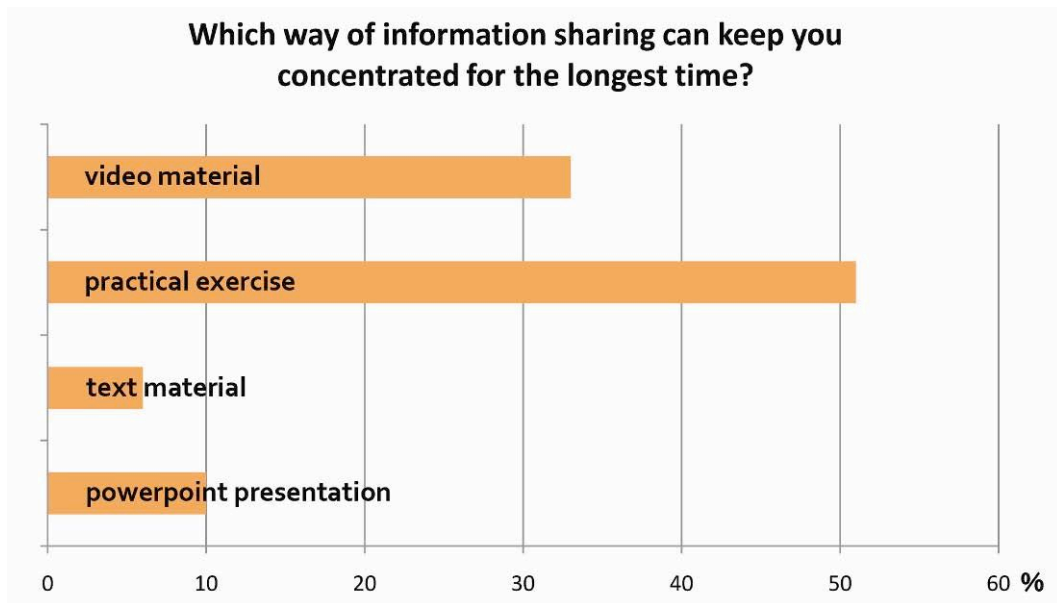


Diagram 2

Diagrams 1 and 2 confirm Dale's cone of learning theory. It is visible that the largest amount of information is remembered when doing practical exercise, and the least when reading plain text. PowerPoint presentations also help students memorize lectures, which is understandable, since the presentation has the element of interaction between the audience and the lecturer.

Video materials also help maintain the concentration. Therefore, as new educational approach provides student's self-involvement in creating of lectures, it also results with greater information absorption.

When finally the question whether e-learning is better than the classic way of learning was asked, 83% of students said "yes" (diagram 3). When facing this new system for the first time, students were a bit confused, since they haven't faced that approach of learning before.

There were some questions about lecturer's expectations, but after a while, students adopted this new way of information sharing and learning. Also, after taking a class, they were able to point out the advantages of e-learning system in comparison to conventional one (diagram 4).

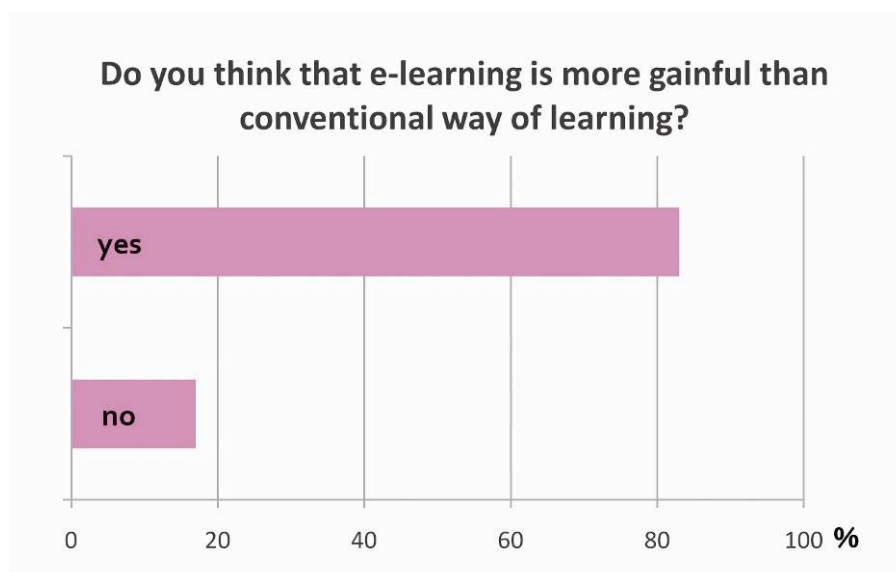


Diagram 3

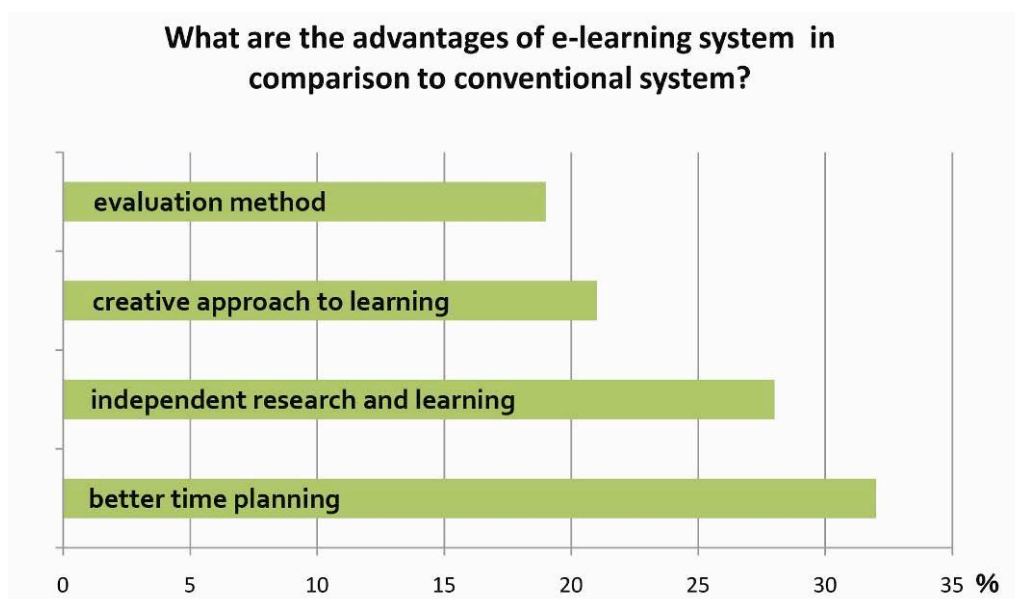


Diagram 4

## 4 CONCLUSION

According to the survey results and the cone of learning theory given by Dale, it is obvious that the way of learning in a modern educational system should be improved. Not only that the technology has developed in past ten years, but the general lifestyle, too. Informatization gives new options for performing some tasks, simultaneously adjusting their performance to student.

E-learning provides direct student's involvement in planning and development of the class. It also gives a motivation to student and professor to improve their work and communicate in order to express their opinion and give creative advice how to make particular course more interesting and pragmatic. Including video materials and lots of practical exercises for students enables them to learn and memorize up to 80% more information than they do when just reading or listening, whilst giving them an opportunity to make their own schedule of managing given assignments.

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