

Problems regarding implementation of e-learning

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Abstract

When considering the implementation of e-learning into our system of education, attention must be paid to the demands to be met at different levels.

It is a known fact that the difficulty of implementation varies from primary school to university. In primary schools, e-learning is only a supplement to traditional lessons, while at university tutorials can be made up entirely of e-learning elements. However, High School falls between these two levels - the extent of e-learning is not adequately defined and its implementation is much more problematic than one would expect.

Ideally, the progress of a student's comprehension should grow linearly from primary school to university. This would also allow for a gradual increase in the e-learning content of lessons. However, the reality in education is quite different. It must be recognised that the transition between primary and high school, and between high school and university is not as smooth as it should be.

There exists a large gap in a student's comprehension at these two stages of transition, which for many students results in a reduced level of achievement. This happens because, before the transitional stage, students are not as competent in their independent learning skills as the next stage would require.

A decrease in overall success rates is seen very early in the first year of these stages of transition (the first year of high school and the first year at university).

This gap in a student's comprehension at these transitional stages results in further difficulties because of the increased use of e-learning in the stage that follows. Students have enough problems developing their learning capabilities and further changes (however positive) can also lead to a reduced level of achievement.

When considering implementation into the system of education, all three levels must be coordinated in order to reduce the large disparities that cause so many problems.

Keywords: e-learning, learning, high school, informatisation, technology, comprehension

Introduction

Just as in life, the goal of education is to teach a student the art of understanding and developing for himself/herself, the various areas of his/her activities. Traditional methods of teaching cannot fill the void left by the inadequacies of their own techniques, even allowing for the review of lessons, demonstrations, exercises and the addition of other elements to supplement traditional lectures. When trying to ascertain the level of pupils' understanding of a specific subject it is very difficult to do this collectively. In addition, the lessons themselves can be a problem as the speed of delivery can be critical because some pupils will find it too fast and others too slow. A further issue to be considered is the teacher, who can become jaded through having to go over the same material time and time again when teaching several classes of the same grade in one day.

As a result of these problems, and other problems in our education system which place too much emphasis on accumulating data (and too little on understanding and using them), we observe that pupils:

- lack fundamental logic,
- have great difficulty understanding and interpreting various concepts,
- fail to fully understand what they are learning and the work they do,
- rarely use their reasoning powers or critical judgement,
- have no patience when solving problems...

Nevertheless, these problems can (at least) be minimised using modern methods of education based on e-learning elements. Initial experiments in implementing e-learning methods were, of course, conducted at universities where possibilities for implementing them were greatest. At that particular level we can expect students to be mature enough to handle material which demands their full comprehension, and work independently.

On the other hand a lot of e-learning solutions also emerged at primary school level, where the teacher's role and influence are totally different from that of the tutor at university. It is evident that at this level much greater coordination is required than at the higher levels, and that e-learning is used mainly to make lessons more interesting.

To some extent, the findings which fall half-way between the areas encompassed by universities and primary schools are to be found at high school level, where the least changes occurred. At high school pupils already have a greater understanding and are ready for more demanding and systematic work, but still require effective guidance. However, by virtue of being a half-way house, this level is also the most problematic with the least solutions. This anomaly is critical as it is at high school level that pupils' futures take shape and they decide the way in which they will further their education. Later results (at university) are essentially connected with knowledge and skills which pupils acquire during their high school education. The mere accumulation of data will certainly not qualify them for the level of comprehension required for university work.

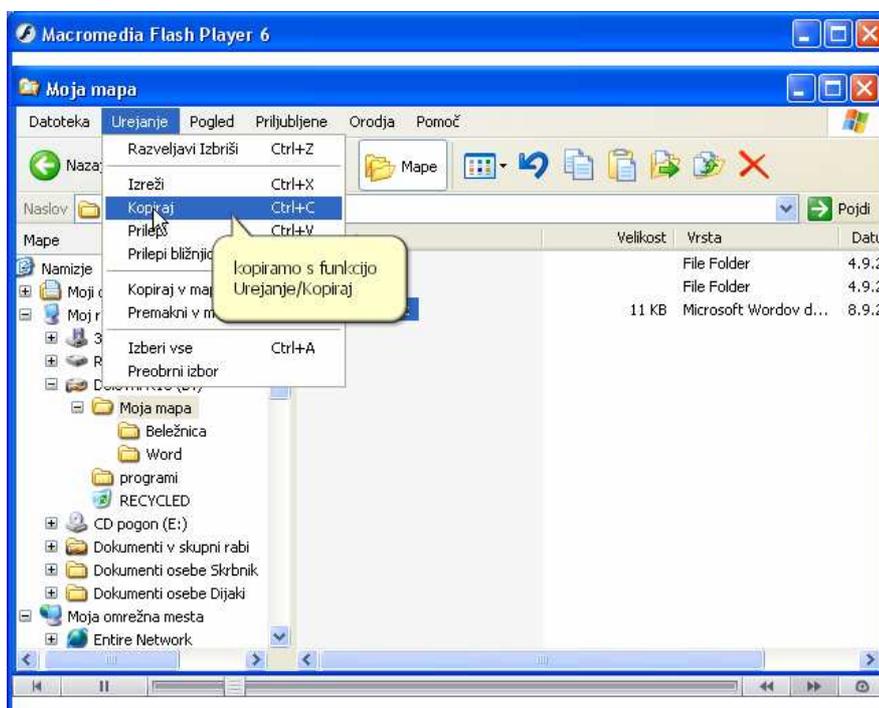
1. Lessons with a multimedia content

For this reason a survey was conducted in 2003/2004 (repeated and revised in 2004/2005) at Moste Ljubljana High School to investigate the suitability and effectiveness of implementing e-learning elements into the subject of Information Science.

New methods of work were based on short multimedia snapshots containing material of an instructive nature. These snapshots were made available to pupils at all times to watch at will and consolidate their knowledge. Based upon pupils' feedback the snapshots were improved and supplemented in such a way as to become even more informative and aid comprehension. In this manner deficiencies were promptly removed and additional facts included to avoid the possibility of a teacher forgetting any important points. These snapshots also reduced the need for the endless and tedious repetition of the same subjects over and over again, as every problem that emerged was specific and therefore different from another. All this not only helped the pupils, but made the teacher's work a lot more dynamic and therefore more pleasant. Thanks to

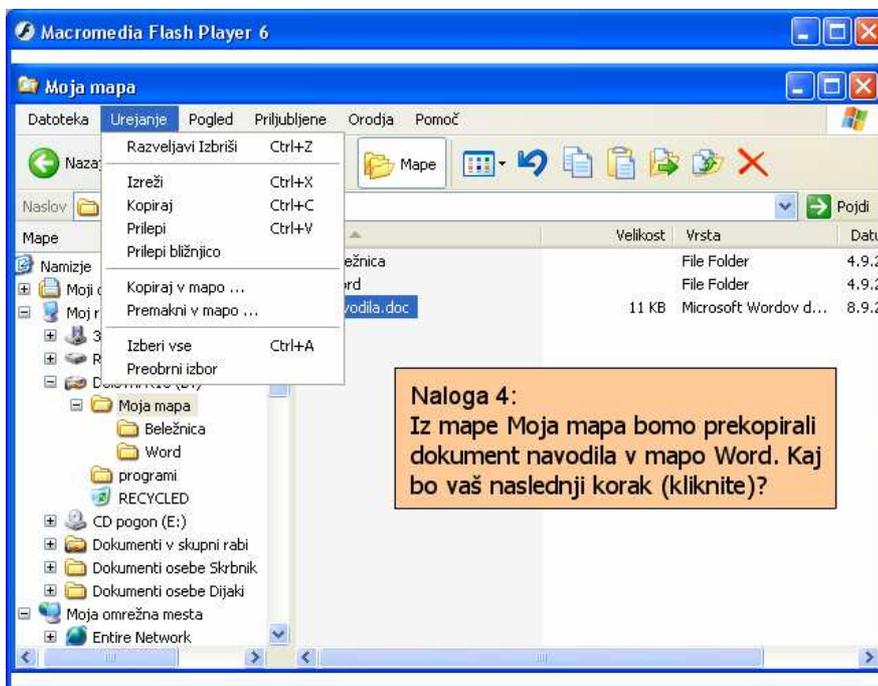
these snapshots the teacher could easily spend a lot more time with individual pupils, concentrating on their problems, while others could continue undisturbed to learn from their snapshots. The pupils' motivation was also improved as each pupil could determine his own speed at mastering individual subjects and, even if somewhat slower than the others, achieve the same goals. Until then lessons had been delivered at a predetermined speed, which for some pupils was too fast, and for others too slow. The variation in speed required to achieve similar goals can, in itself create new problems as the quicker pupils need to be kept occupied with new tasks, which is sometimes difficult when giving (or repeating) basic lessons.

Studies were later consolidated with exercises and project work while the teacher monitored progress and pointed out to pupils any mistakes or poor understanding of the subject matter. This new method of work also gave the teacher a rapid feedback on any problems encountered, so that fast remedial action could be taken. Fast problem solving is often vital as it impacts on the understanding of the material that follows.



Picture 1: *multimedia snapshots*

For better and faster work and to allow all pupils to assess their comprehension of the subject matter, multimedia questionnaires are used. These provide pupils with an instant feedback on their progress as, in the event a wrong answer is selected, an explanation follows which helps the pupil to understand the work sequence and leads him towards next question. This kind of monitoring of a pupil's understanding takes a lot less time, involves the whole class and does away with the need to extract the answer from pupils not fully 'au fait' with the subject matter. One of the greatest advantages is that these pupils are not exposed to ridicule in front of the entire class, and this impacts positively on their self-confidence.

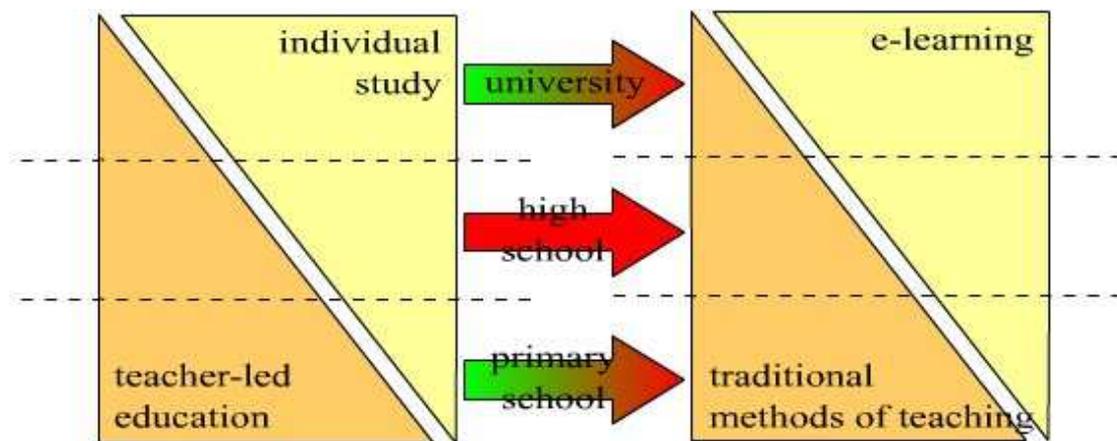


Picture 2: multimedia questionnaires

2. Problems associated with e-learning in high school

The diagram below shows the characteristics associated with each level of education and the possibilities of implementing these new methods of education. We note that teacher-led education decreases and individual study increases as we move from primary school to university. We also deduce that e-learning is most suitable for universities and lifelong learning while at primary school level it mostly has an entertainment value (and

adds variety to lessons). We can therefore easily extrapolate a logical relationship between a pupil's level of comprehension and the level of e-learning implementation at the different levels in education. It follows that problems would logically occur mainly at high school level (red arrow) where there is the greatest interaction between the different methods (wide area covered by both methods). Consequently, high school levels of education should require the greatest coordination between traditional methods of education and levels of comprehension, which is not the case. In fact this particular level is vague and poorly defined which only serves to hinder the implementation of e-learning.



Picture 3: characteristics associated with each level of education and the possibilities of implementing new methods

A detailed survey¹ of high school education shows us other difficulties associated with the implementation of e-learning in our system of education. Results show that pupils are aware that they remember things better if they work out answers for themselves but still want a teacher to provide them with direct answers. These results indicate the shortcomings in a pupil's understanding at primary school level, where there is excessive use of traditional methods of teaching at the front of the class.

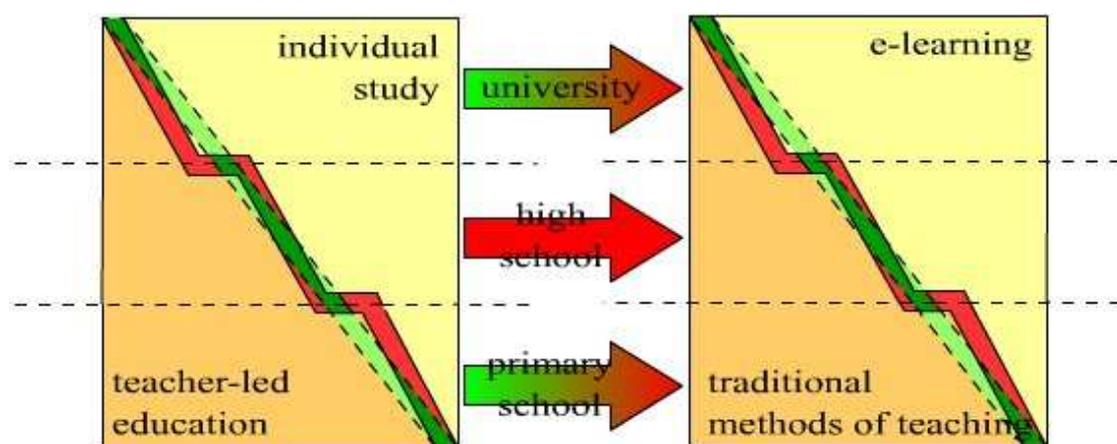
An essential part of our education should concentrate on a pupil's thought process rather than compartmentalising pupils into categories defined by the teacher. With traditional methods of teaching we will fail to develop a pupil's creativity and instead will create a mediocre generation needing continual guidance.

Teachers should therefore make every effort, especially at the start of the school year, to give pupils individual attention to ensure they gradually familiarise themselves with new methods of learning. This could easily be overlooked, resulting in pupils even feeling they are not getting enough individual attention (when possibly this is much greater than with more traditional methods).

Other results of the survey also show that at high school a reduced level of guidance could work better with the older classes, resulting in pupils being better prepared for work at university. The first year grade of high school still requires considerably more by way of traditional methods (since primary school does not prepare pupils adequately).

Given that new methods of teaching demand more patience and especially more time on the part of the teacher (usually in short supply), many teachers choose to show pupils the answer (irrespective of whether they fully understand it or not) instead of guiding them to it step by step. This is also one of the reasons why pupils are not familiar with these new methods. Another problem is the ideal (represented by the green line) as against the factual (represented by red line) level of comprehension in a pupil's learning process.

We can see that between the transitional stages of our education system (i.e. between primary school and high school and between high school and university) there is a great gap separating the ideal from the factual level of comprehension. The following diagram illustrates these findings.



Picture 4: comparison of ideal and factual transition between stages and methods of teaching

The level of comprehension in a pupil's learning process is mirrored by the implementation of e-learning in our system of education. The examples show that, as we saw before, for primary school and university this is quite well defined. The problem arises in particular at high school level which has to deal with both transitions (from primary and to university) in the comprehension element of learning and implementation of e-learning in varying degrees. As the survey shows it is quite possible that pupils are generally more satisfied with new methods of teaching but at the same time encounter quite a few problems through their failure to adapt to this new method of work. We therefore have to recognize that we may face a reduction in pupils' achievement through their not being competent enough to learn independently with the increased use of new teaching methods. This reduction of achievement, associated with competence in their learning ability, is clearly seen in the first year after transition between primary school and high school and also between high school and university. We must not overlook the fact that similar consequences will result if we implement e-learning without a fixed plan or if we plan it too extensively at the start.

Conclusion

We have to recognize that e-learning is a reality and represents the future of education, and that these changes have to be implemented at all three levels of our education system. Even greater emphasis has to be devoted to high school education which falls between the other two levels. Nonetheless we have to recognize that there are also possible problems which can arise through the implementation of e-learning.

Co-operation with the primary school system is therefore essential. It has to teach pupils the basis of comprehension as a process of learning and has to prepare them for the transition to high school. High school itself has to proceed with this process and prepare pupils in levels of comprehension to the extent where they can meet the expectations required at university level. Meanwhile we have to be careful when implementing e-learning elements and with it the modernisation (and significance of) of high school education in the face of the crisis described by Ernesto Ottone² as follows : »The mass media constitute a powerful reality which can spread at a tremendous speed; the

collective imagery and what people know are strongly determined by them. Unless secondary education takes into account this reality as both a foundation and a starting point, it will become devoid of significance, banal and platitudinous, as well as incapable of vying for attention with external stimuli.«

Biography

Sašo Puppis is a computer engineer, M.Sc. who was awarded a Master's degree in 2005 by the Faculty of Computer and Information Science (University of Ljubljana, Slovenia) for his work »High School Education in the Information Era«. Since his graduation, he has been involved with education at the same university from 1998. In the same year he was also employed by the Ministry for Education and Sport, while from 1999 he was employed at the Moste High School (Ljubljana). He has continued to work in collaboration with the Ministry for many years and has developed various programmes for them and has undertaken other work in the field of Information Technology. During his time at Moste High School, besides teaching, he spent a lot of time working on the review and modernization of the subject : »Information Science«, described also in his M.Sc. work mentioned earlier.

¹ Sašo Puppis, magistrska naloga: Srednješolsko izobraževanje v informacijski dobi, <http://eprints.fri.uni-lj.si/archive/00000177/01/MAG2.pdf>

² Ottone Ernesto, Rethinking Secondary Education, Unesco-Orealc, Bulletin 42, April 1997

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