

Myths and Realities about Technology Enhanced Learning

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Abstract. The article deals with some myths about teachers' role in a technology enhanced learning process. The spectrum of myths under discussion ranges from complete rejection of ICT to their overridealization. We have come across these myths in the context of teacher education both in national and international setting. The paper is focusing on several in-service teacher training courses on interactive teaching methods, on new technologies in education, and on computer skills. The main problems are due to the prevailing attempts bringing the new technologies to an existing school setting which is teacher-centered, with practically fixed curriculum, treating ICT as an object of study... Such conditions make it natural for the teachers to feel uncomfortable and even insecure in a technology enhanced environment where students are more experienced technically. We discuss the effects of applying a recently developed methodology (known as I*Teach) towards altering the viewpoint of the teachers about the changes in their role.

Keywords: ICT education, technology enhanced learning, myth, teacher training

1 Introduction: *New systems generate new problems*¹

During periods of extraordinary dynamical changes of Information technologies (IT) the most important questions, related to their use in education, are *where*, *how* and *why* they should be used. If technologies are treated as a subject instead of a means for the learning process, then this reduces teachers' motivation to use them. Many teachers are worried that they are not fluent in new technologies, and even if they are – they could not manage to keep abreast of their development. Trying to make up for the technological component they often forget that their power is to pass on their love for studying, because everything else is just details [1]. On the other hand the effective integration of IT in the teaching process presumes that students are “in the center” and are active. Even if educators theoretically know the advantages of active learning, they do not have an adequate experience, which could encourage them to apply this knowledge.

¹ Each subsection title ends with a law of Murphy.

This poses serious challenges to teachers' trainers – to apply the style which the teachers themselves are expected to apply in the classroom. According to John Dewey *education is not a preparation for life; it is life itself*. In accordance with this point of view we should prepare teachers to reconsider the new technologies as a means for expressing their real potential in a given knowledge area.

Scientific research on the effective utilization of computers and information technologies in the middle school has been done in Bulgaria as early as the end of 70-ies [2]. Recently this research is intensified in the context of several European projects [3]. A significant number of these projects are related to the development of IT-based educational environments where teachers are active members of a community of scientists, educators and learners.

Being in-service teachers they can apply this style of active learning in the classroom and get confident that it works well even if they do not expect it.

Skepticism is not rare. We will discuss several wide spread myths about the teachers' role in order to find out the grounds of this skepticism.

2 Myths about IT's role in education: *To err is human; to really mess up requires a computer*

We will discuss some impressions of our work with pre-service and in-service teachers for the last few years (2006-2008):

- One-year courses for postgraduate qualification in informatics and mathematics at Faculty of Mathematics and Informatics (FMI), Sofia University (SU) (~100 participants)
- Short-term courses for postgraduate qualification in IT for 5-8 grades at FMI, SU (~450 participants)
- Courses *Interactive teaching methods* and *New technologies in education* – within a PHARE project² for vocational schools in-service teachers (~430 participants)

In the cases of postgraduate qualifications people are prequalified from a non-teacher specialty (engineer, physicist, etc.) into a teacher of informatics and mathematics; or a teacher from a given subject (geography, history, English, arts, etc) into a teacher of informatics or IT for 5-8 grades.

The courses *Interactive teaching methods* and *New technologies in education* are intended for teachers from various subjects planning to integrate IT in their classes.

The audience spanned over a wide range of age, professional preparation and qualification goals: there were participants that had just graduated from university (22 years old), as well as experienced teaches (60 years old). The largest group was between 45 and 55 years old (~70%).

Regardless of this diversity most of the participants shared beliefs we didn't agree with and labeled as *myths* in this article. Based on our experience we would also try to disprove them.

The misconceptions start from the interpretation of the term technologies, which is often reduced to a list of material objects (machines, appliances,

² EuropeAid/124376/D/SER/BG.

software and hardware). It is common to disregard the meaning of the term in a wider sense, which includes systems, organizational methods, and techniques for usability. That is why specialists in other areas often claim:

Myth 1: *IT obstructs my professionalism.*

This adjustment is shared by teachers who feel very self-confident with their subjects and who prefer the role of a “guru”. Such teachers enjoy the feeling of a complete control over the situation (the class, the students’ reactions, the educational methods and models). Thus they see the IT in a class setting as threatening their authority and professionalism rather than enriching the teaching/learning process.

Definitely it is not required to apply IT in every situation. Actually, they should be used only when the teachers are sure that they can be more effective with IT. This enforces teachers to rethink the specific problems and the various approaches to solving them so that the new technologies add to the traditional teaching process.

Such enrichment could be achieved even if the teacher is not fluent with all technical details. It is enough that he can “navigate” towards a resolution in every situation even by involving students as technical advisors. For example, a teacher in Popular Customs and Techniques whose hobby was fruit-tree inoculation felt better about himself as an expert when he found (although with colleagues’ assistance) various information on Internet on the subject and even noticed certain gaps in the publications. At the IT exam (for re-qualification) he made a computer presentation on grafting and shared with the jury: *After presenting to my students things from the screen they wouldn’t be able to observe otherwise, I will bring them to the garden to see how grafting is done!*

Even if the teachers do not know some specific technical details, they could find a solution to a problem with the help of students who are technically more advanced.

However, practical observations show that the lack of adequate technical competence prevents teachers from daring to apply IT in their subjects. They do not have experience in situations when they would search for answers together with students, or even leave some questions unanswered. Thus, instead of gaining freedom and self-esteem due to the convenience for searching information on-line they actually lose self-confidence. This worsens the situation in an environment where it is expected that:

Myth 2: *The good teacher should know everything.*

Teachers often think that it is important to know all the details of a given software product (programming environment, software application, package) in order to teach with/about it. Surprisingly they think so even if their “knowledge” is based mainly on procedures learned by heart (e.g. *open this menu item and click on that option*). At the beginning of the courses most participants wanted to learn a specific product (even specific version). It took them some time to realize that the principles and the ideas are much more important than all other details which students can discover on their own.

One of the biggest benefits of teaching in an IT enhanced environment is

that educators shouldn't feel embarrassed if they do not know the answer of a problem as long as they know how to find a solution. In a nutshell – the more you know, the easier it is to say *I don't know* (Fig. 1).



Fig. 1. What is bigger – the computer or the book?

Another serious problem for teacher is considering the IT as an end in itself. Then we may well hear that:

Myth 3: *Students know more than their teachers!*

This belief is shared not only by parents, but also by policy makers. What is actually meant is that children are better accustomed to experimenting with new technologies, they are more skillful using peripheral devices and they are not afraid of making mistakes. As a result many teachers doubt if they are more competent than their students.

When we talk about teacher's competencies we must clearly define what we mean by this. In our rapidly changing society, the demand for competences is constantly changing. So, it is important that the key competences are defined in such a way that they can keep up with change. As it is formulated in the document on the EQF [4] *Competence is the proven ability to perform a task or operation to a predetermined standard. In order to be competent it is necessary to possess different types of competences in work or study situations. These include: cognitive competence, functional or methodological competence, personal competence and ethical competence.* Thus knowing how to react in various situations becomes more important than knowing all the technical details. In other words, a *competent teacher* is the one who stimulates students to ask difficult questions whose answers will be sought together; who acts as advisor and partner in the development of interesting projects; who inspires students to make their own discoveries and share their experience in a community of people who seek and appreciate knowledge.

The reason of using IT in education is not the presentation of facts and their reproduction by students. The most important role of technology is to support students to generate, justify and improve their ideas. Some technological tricks could be known by some students, but they lack the teacher's experience as a personality, as a specialist in a given domain and as a member of the society.

Often students are tempted to demonstrate technical skills which are not appropriate for a specific context. We have witnessed students' Power Point

presentations with mathematical symbols in different colors flying over the screen in various directions accompanied by drums. If a student is fluent with animation and sound effects does it mean that s/he knows better than the teacher how to make a presentation? The role of the teacher in this context is to cultivate the soft presentation skills needed for the content to reach the audience. When the teachers understand that a computer presentation is just a fragment of the complete presentation, they can fully demonstrate their knowledge and abilities (Fig.2).



Fig. 2. IT – just an element of the presentation.

Unfortunately we often see lessons in the style of a slide-show, whose authors proudly claim:

Myth 4: *I am an innovative teacher, because I use Power Point.*

During the relatively short courses for basic computer skills teachers use the popular Microsoft products Word, Excel and PowerPoint. After the exam they either give up using them (because of the huge amount of menus and options in a foreign language) or they feel obliged to prepare computer presentations for every lesson. Teachers assume that computer presentations guarantee students' interest. Even if the information is dynamic and special effects are being used, this is often at the expense of the content. We have seen math lessons where the presentation contains scanned pages from a math textbook or snapshots of some dynamic geometry software (instead of using the software itself), the students being much less active compared to a chalk-talk on the same topic.

We would like to emphasize that no textbook or software per se could guarantee successful teaching/learning. We have witnessed totally different lessons based on the same textbooks and software. The difference comes from the teaching style – student-centered or teacher-centered. The role of the teacher in forming the spirit of guided discovery learning is very essential. It is true that students must know how to reach the answer of a problem, but *life is not only answers*. It is more important to be able to formulate original questions whose answers could be a matter of future investigations. This exploratory spirit can be applied in various subjects (mathematics, arts, literature, etc.) In the information era it is crucial for the teachers to realize their role of *tutors* and *role models*. Their most important task is to cultivate proper attitude towards technologies and their applications. For many of them, however, the next principle still holds:

Myth 5: *In the information age the students' culture and behavior are not up to us!*

We often hear teachers and parents saying that their children know everything *about computers*. And somehow they are not impressed when the very same children: push away classmates in order to enter the computer room before them; use on-line material without permission and citation; initiate or resend chain letters to others; demonstrate their hacking and cracking skills; do not use proper language and behavior in communications; play computer games all the night at the expense of their health and duties; visit (or transmit information) about dangerous Internet sites.

And then the technical IT skills become less important than the piety for knowledge and life-long learning; the skills for searching information and for collaborative team work. These are all qualities that every good teacher should possess before getting technical IT qualification. But if it is so clear what a *good teacher* is:

Myth 6: *A recipe for good teaching exists!*

We try to demonstrate (not to “preach”) our understanding of “good teaching” [5]. However, we often face reactions of the kind: *You are wasting our time. Just tell us what we need to know so that we can write it down. And then you can test us on this...*

Such reactions are not incidental and paradoxically occur even in courses described as *Interactive teaching methods*. Some of the participants did not realize that the number of written pages during the lectures would hardly provoke an active attitude of the students. To achieve this they themselves had to experience what it is to be active in the *role of a student*.

Fortunately even the biggest opponents of the interactive methods got convinced of their advantages: *We've attended many courses about interactive methods, but now we finally experienced them. We have just applied them in the classroom and found that they worked. We managed to overcome the fear of work with computers. You gave us back our self-confidence and the respect of our children!*

These are words of vocational school in-service teachers after courses on new technologies and interactive teaching methods.

So far – so good. But how do we measure skills? At this point we reach the problem with the widest spread evaluation form – multiple-choice tests. This form is hardly an achievement in evaluating IT knowledge, but it is still considered that:

Myth 7: *The best way to evaluate IT skills is by multiple-choice tests.*

It is true, that teachers have a quota – the number of ratings per term for any style of examination (written or oral). In addition, the Ministry of Education in Bulgaria recommends using tests as means of adequate and trustful evaluation. But what is the purpose of evaluation – to reach required quota or *to rate* students' achievements?

We do not deny the test examination in principle, but it is suitable only in specific cases, such as the level of mastering the terminology. The real problem

arises when someone tries to rate skills or creative work. This problem is quite *evident in junior* high school where there are few terms and in order to reach the quota for the number of ratings teachers use tests to evaluate specific technical skills. Unfortunately the actual result is that the true achievements of the students are evaluated inadequately.

At the end of the course the teachers shared with us:

You made us rethink the way of evaluating the students; when the homework is tuned to your own interest you are motivated to do it, even if you are tired.

It is rather unimportant to know the size of A4 in cm or which button to press in a given situation. At the same time what matters is the final, completed product and result of student's work. The new arising world-wide practice is to rate the student based on her overall portfolio: this is the set of products demonstrating the development, the knowledge, the efforts and the achievements of the student [6].

3 Conclusion: *After everything is said and done, more is said than done*

Thanks to IT some of the traditional characteristics of the education underwent some modifications. The modern educational model includes (Fig. 3):

- Team work
- Project-based learning
- A new role of the teachers as facilitators of a research process.



Fig. 3. When working in teams teachers presented very delicious final product!

This means that we, as teachers, are expected to:

- Make available appropriate resources to our students and help them with the right choice;
- Be partners of our students in the role of researchers and show them in practice how to act in situations for which there is no ready recipe;
- Diagnose the problems and the needs of our students; help them *by becoming midwives of their ideas* [7].
- Evaluate our students based on their products of a project work, on the quality of their performance as team-members.
- Work individually or in a team with colleagues and peers; assign as official assistants students who are technically advanced in working with IT;
- Work in a team which could embrace members beyond the school, the town, and even the country.

Our hope is that we have successfully implemented all these requirements in the frames of the teacher training courses under discussion.

Working with IT offers a great variety of situations which are intellectual challenges for the teachers. However, thanks to this they could learn something new during the teaching process and thus – to show their students that *learning is not a preparation for life, that it is life itself*.

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