

# A survey on academic teachers' perceptions about ICT in education

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**Abstract** – In this paper we present the analysis, conclusions derived from a universities/faculties survey, concerning the use and perception of ICT in education. It has been conducted during the third year of implementation of the EU project “Integrating E-Learning across Teachers Curriculum”. Our objectives were to understand the attitude the current faculty members have towards educational technology, and to determine how it is affecting their teaching practices. Our belief is that this information will be useful for the universities/faculties to build up their future policies.

More specifically, we evaluated the following issues:

- Faculty perceptions and priorities with respect to educational technology
- Faculty experiences with and problems using educational technologies
- Faculty preferences regarding technology support and education

**Keywords** – Teachers survey, ICT in education, ICT perceptions

## 1. Introduction

Within our project we have been working with the teachers and students at the Teacher Training faculties in the broader terms. Those are: four Pedagogical faculties that are educating teachers for pre-school and primary schools; a Faculty for natural sciences and mathematics educating subject teachers for secondary schools; and a Teacher training faculty that educates language teachers for secondary schools. All institutions are from R. Macedonia (MK). Our EU project partners were University of Groningen, The Netherlands, Catholic University of Leuven, Belgium and University of Edinburgh, UK. The broader goal of the project was to involve the teachers at teachers' training faculties in MK into the technology enhanced teaching, to reconstruct curriculums respecting our EU partners' practices and following the basic hypothesis that only critical adoption of appropriate technologies within the

curriculum can make the good teaching more efficient and better.

The target group in this survey was the teachers at the teachers' training faculties in R. Macedonia. Through the project the teachers were exposed to many different technologies, software tools and new hardware. Some of them were very excited, some were just trying to support by technologies the traditional teaching methods, and some were very successful in being creative in their teaching with technologies.

Little research has been done to investigate the impact of digital technology on the working environments of those who teach student teachers, at universities in MK [1]. This survey is our contribution toward that goal.

## 2. Methodology

The survey contained 10 closed and 3 open-ended questions. The approach in this process involves a systematic item writing, revision process and implementation method. We used methodologies of similar surveys by prominent EU and USA universities [2], [3] [4] and [8].

Most of the data are presented as percentage. In some questions we use mean of means of the answer to appropriate questions. This statistics represents the average rating given by all survey respondents to all possible answers to that question. We use a scale from 1 to 4, where 4 is “Large degree”, 3 is “Moderate degree”, 2 is “Small degree” and 1 is “Not at all”. We also display the highest and the lowest ranked answers to each question as determined by the mean score. The number of items in the highest/lowest sets was determined by natural breaks in the data, e.g., three answers that are noticeably above or below the mean of means for that question. If there were no natural breaks, we have tried to provide as much data as possible. Finally, we provide

information about the distribution of responses where appropriate. The range of mean scores for a question indicates how tightly or loosely clustered respondents' ratings of items in the question were. For instance, a wide range indicates that some of the listed factors attracted them much more to the use of educational technology than the others.

### 2.1 Survey sample

A total of 78 teachers of different ranks participated in the survey. The overall response rate was 82%. From the Teacher training faculties, partners in the project participated 58 and the rest are from other faculties: Faculty of Economics, Faculty of Languages and Faculty of Informatics. The last groups, although not directly involved in the project, volunteered in this survey since during the project period many teachers of these faculties participated in our workshops and other training events. It is interesting that, since we started to use course management software Moodle as a part of the project activities for the Teacher Training faculties, the whole University became attracted to the idea. Our target was initially to put on this platform the list of 14 courses from the Teacher Training faculties, but at this moment 77 courses from different disciplines are using online facilities. The survey results presented here may represent the views and experiences of the other group of teachers (not from the Teacher Training faculties) somewhat less well since their number in our target group is smaller. The division of teachers by ranks was: Full professors 17, Associate professors 48 and Teaching assistants 13.

### 2.2 Survey and analysis – highlights

In this section, we present and analyze responses to selected survey questions.

**Question 1:** “Of the following options, what are the three items to which you think it most important for your University/Faculty to allocate resources?”

Scale is “Most important”, “Next most important” and “Third most important” (Figure 1).

The desire for faculty technology support is evident. Nearly 60% of the respondents cited it as one of the top three items. Then, respondents also cited faculty technology development assistance, but it was noticeably ranked lower (below 40%). What is

interesting they have lowest ranked the support for the students (below 30%).

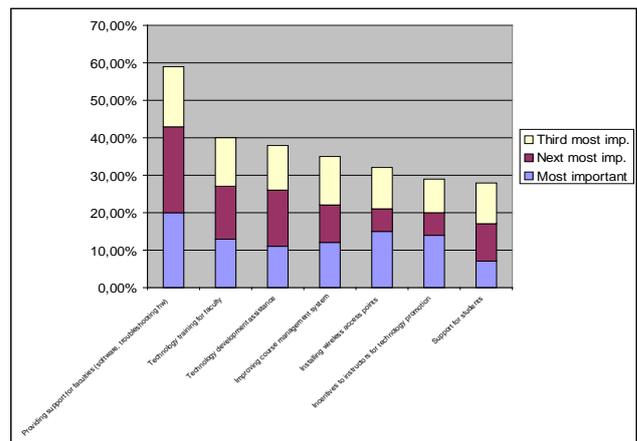


Figure 1. Results from question 1.

**Question 2:** “Imagine a classroom that is technologically ideal for your teaching. Which of the following would that classroom contain?” (Figures 2 and 3).

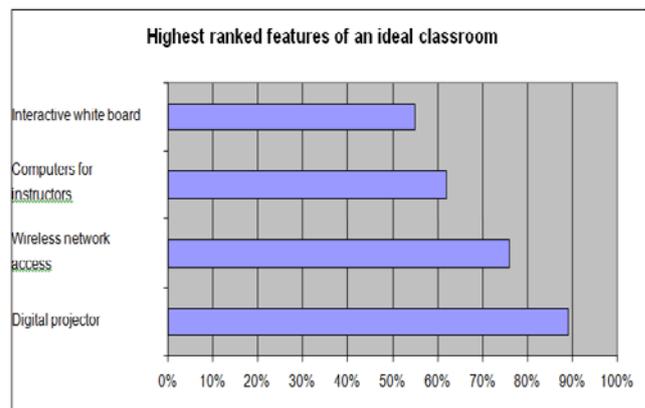


Figure 2. Results from question 2.

Respondents inclined toward wanting their ideal classroom to contain technologies for their own, but not for their students' use, and they choose technologies that can be used primarily to deliver information. But, on the other hand, the interactive white boards, a completely new technology introduced within the project, that encourages interactive way of teaching and learning, became a very attractive and useful technology almost instantaneously. Most of the teachers developed some lectures which were really imaginative. Although the respondents could choose all the listed technologies, they showed little interest in technology for students, nor in videotaping their classes. Several respondents indicated that they

wanted computers and Internet access for students, but controllable by professors.

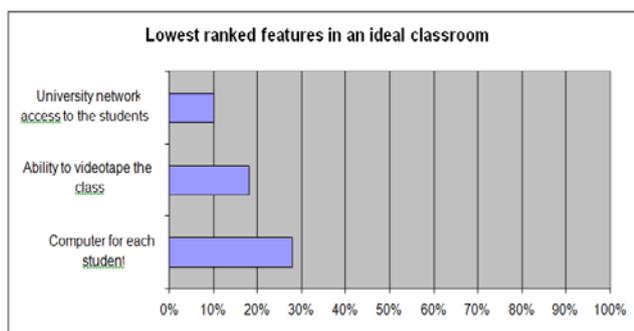


Figure 3. Results from question 2.

**Question 3:** “What are the factors that attract you to the use of the educational technology in your teaching?” (Figures 4 and 5).

The results indicate strong overall attraction to use technologies into teaching. Among other, it is conceivable that respondents choose student-instructor communication option because they want to use technology to initiate a dialogue about course material. But the heavy emphasis on information delivery makes it more likely that the communication has to do with easy making materials available to students, and to stick to the traditional way of teaching by presentation. Although Moodle as a learning platform was put into place right at the beginning of the 3-years project, the options for discussions and collaborative work were hardly used, either by the teachers or by the students.

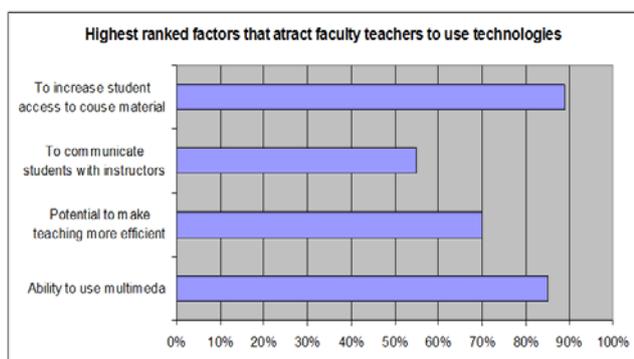


Figure 4. Results from question 3.

It is also worth noting that the high ranking given to “Ability to use multimedia” parallels our findings that this is the strongest teachers’ interest.

“Students demands for technology” is among the lowest ranked options. This indicates that the

teachers are not motivated by a real demand of the students, which is very discouraging because in reality the students are driving force for changes and use of technologies.

“Ability to use games and simulations” is lowest ranked for two reasons: Many responders think that games are not suitable for educational purposes, and for the simulations they lack specific skills and resources.

What is also striking is the wide range in the ratings given to items, indicating substantial differences to which the items attract responders to the use of technology.

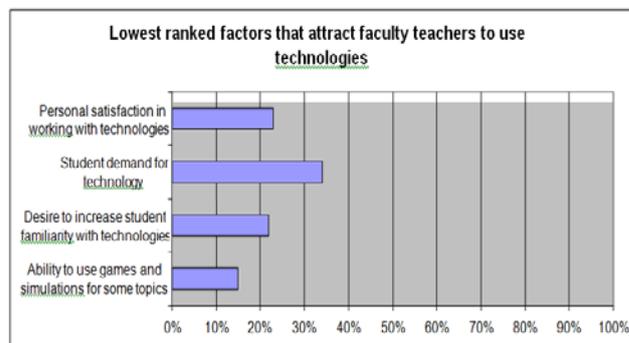


Figure 5. Results from question 3.

**Question 4:** “How effective or ineffective do you think educational technology is for implementing each of the following teaching techniques?” (Figures 6 and 7).

There is an evident difference in the ranks between the highest and the lowest ranked technology supported teaching techniques. Again we see a significant emphasis on delivering information, also on students being active themselves by presenting their work. Teaching techniques that involve student-student discussions, collaborative work through peer reviews and group assignments are near the bottom, even though these techniques are well established as effective technology-enhanced learning practices in the literature.

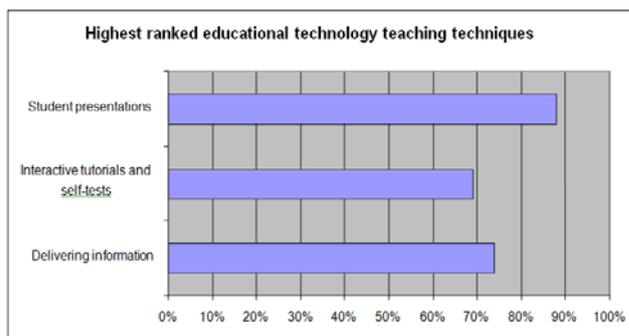


Figure 6. Results from question 4.

During our project workshops and working sessions we also put a lot of effort to encourage these types of activities, but both the teachers and the students didn't find it very useful. We isolated one factor that is certainly behind this attitude. That is the time constraints they have in fulfilling the goals of a certain teaching unit, or task. This disparity simply reflects faculty members' perception that delivering information with technology is simple and reliable, while interaction is, relatively speaking, more complex and time consuming.

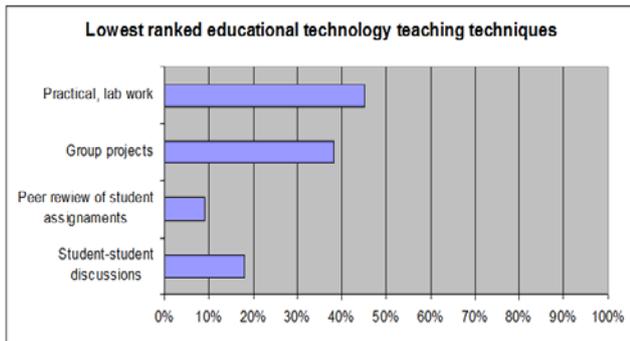


Figure 7. Results from question 4.

Also, a frustration that the students are generally more advanced, specifically in some technologies that involve communication and multimedia usage, is a factor of frustration among the more or less inexperienced teachers. They feel somehow exposed in front of the students, and that their authority is in question. We have seen such examples during the project time, when the students tried to teach the teachers how to use the more complicated multimedia options. Instantly and spontaneously the teachers tried to diminish the value of such a technology, and to reject it for some time.

**Question 5:** "Educational technology can be used either face-to-face in the classroom or in the laboratory (e.g. Power Point presentations), or online. What is your experience in using educational technology to enhance teaching?" (Figure 8).

It is good to see that only 8% of the respondents reported that they used neither digital nor online technology in their teaching. This indicates that, possibly as a result of our 3 years work on this project, the vast majority of teachers used technologies in some way to enhance their teaching.

On the basis of our experience it is reasonable to suppose that most of the 58% that declared using digital technologies are mostly Power Point users.

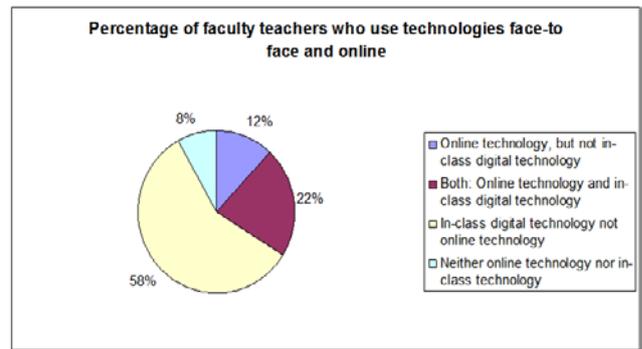


Figure 8. Results from question 5.

The penetration of a Learning Management System like Moodle, which we introduced in the project as a platform for online courses, made a whole difference from some previous surveys [5]. Now we have almost 20% of teachers using the online teaching, although with an emphasis on delivering information.

**Question 6:** "How much of a barrier has each of the following factors been to your use of digital technologies in conjunction with your teaching?" (Figures 9 and 10).

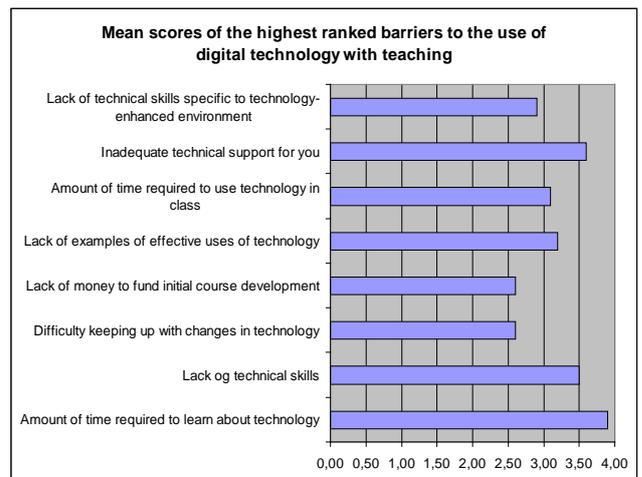


Figure 9. Results from question 6.

When these responses are compared to the answers in Question 3 where they were asked about the factors that attracted them to technology, and when mean of the means of those two are compared, it appears overall that respondents are much more attracted to use the technology than held back from it by barriers. In spite of some evident resistance, this fact is encouraging.

As can be seen, lack of time to learn about technologies is a dominant theme, also the amount of time required to use technology in the class. Many respondents described in detail their lack of time for training. Moreover, they emphasized the lack of time

to develop their own technology supported teaching material.

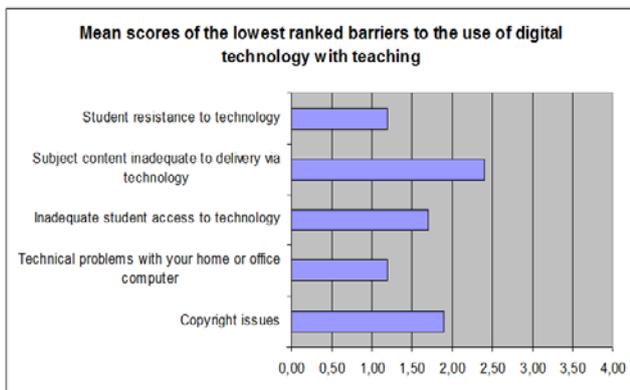


Figure 10. Results from question 6.

The need for technical support is also very highly ranked barrier factor, a result consistent with the desire for faculty technical support. Many respondents emphasized existence of well-trained staff as their back-up.

Teachers' insufficient mastering in technology supported teaching is among the highest barriers. Further, the high ranking given to the "Lack of models/examples of effective uses of technology" is consistent with their need to see what and how the other faculty members are doing with technology.

This demand for positive examples is also expressed in one of the following questions, when it comes to the specific technologies topics. But, what we also covered with questions not presented in this article is using complementary sources like manuals, documents, help functions, books for obtaining knowledge about the subject matters. The results were highly disappointing, but predictable. Only 12% of all the teachers involved in the project were low to moderate users of such complementary sources. The vast majority strongly relied on on-line help and most frequently asked for a face-to-face instruction.

It is not surprising at all to see Copyright issues among the lowest ranked barriers, since the law that treats these issues in MK is poorly enforced. That might also mean that faculty members tend to focus exclusively on educational purpose when considering whether their use of copyrighted material is a legal and an ethical issue.

Students' resistance to technology was also low in the ranking, which is interesting in light of how low-ranked student demand was in teachers answers in Question 3. One possible answer is that students neither demand, nor resist technology; another is that faculty members are simply not motivated by students' desires. In any case, pressure from students in either direction was not apparent in these survey results, where the teachers were the target group.

**Question 7:** "When you are developing course materials, how often do you use each of the following software tools?" (Figures 11 and 12).

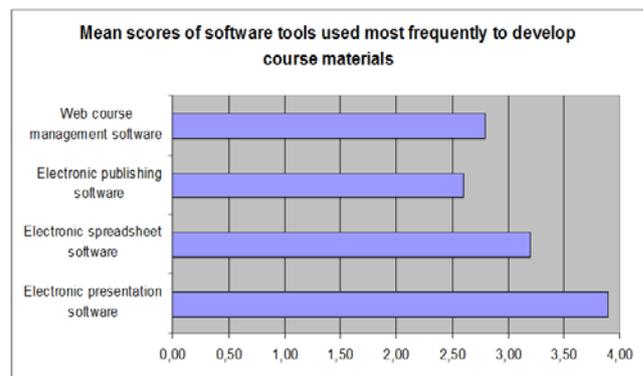


Figure 11. Results from question 7.

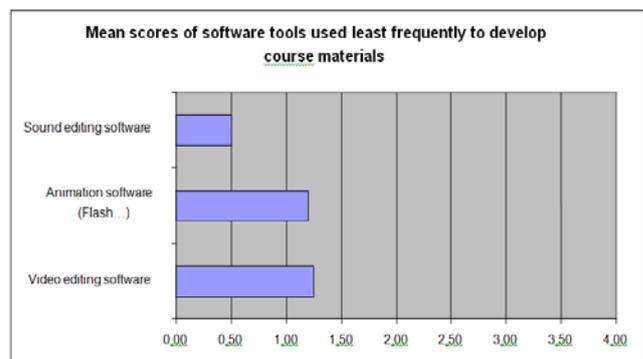


Figure 12. Results from question 7.

Power Point is far most used tool. Video, sound and animation software are used much less frequently. Many of them have never used any of those tools. Overall, there is a clear division between the tools the respondents used reasonably often and those used by only several. It is not that they don't want or need to use them, but they are simply too complex to the most of them, for which they need an assistance. This strong division also tells us that there is a strong division into heavy users of certain tools, and complete nonusers. It is encouraging to see that Course management software, which was only introduced within our project, has a factor of over 2.5.

**Question 8:** “How helpful have you found each of the following ways of acquiring skills about educational technology?” (Figures 13 and 14).

The ranking shows that the respondents found many of the ways of learning listed here, at least somewhat helpful. Three out of four top-ranked options involved being face-to-face, and practically every method of learning about technology that puts a faculty member in the presence of another more skilled person was highly ranked. Online classes are not favorable way of learning. This topic is highly confusing. How could the teachers encourage the students to take on-line classes, if they are not enthusiastic when asked to follow, or prepare such lectures?

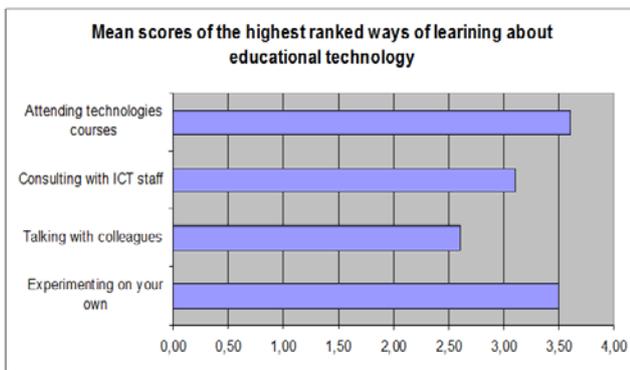


Figure 13. Results from question 8.

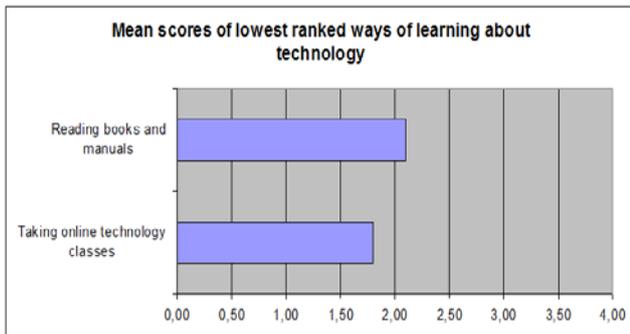


Figure 14. Results from question 8.

**Question 9:** “Suppose you had a time slot in which you can learn about educational technology. Which of the following topics is most interesting to you?” (Figures 15 and 16).

On a first glance, the prominent interest in information design is consistent with the perception of the educational technology primarily as a way of delivering information. On the other hand, their obvious concern with the pedagogy of teaching that also scores high could be somehow interpreted

differently. They are aware that educational technology provides them with excellent tools and possibilities to support other ways of teaching, like interaction with students, problem based teaching, individual and collaborative work, etc. They just lack time and lack skills to implement such teaching techniques.

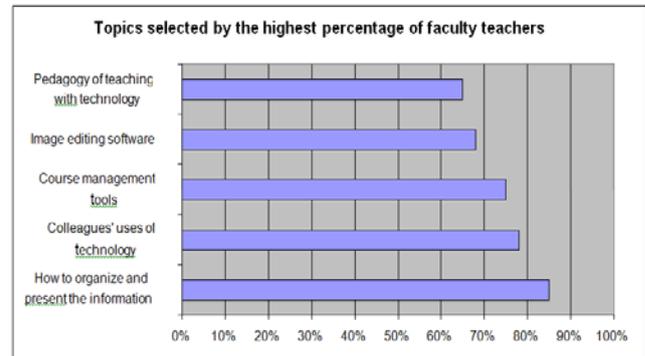


Figure 15. Results from question 9.

Another interesting feature of responses is the dominance of non-technical topics among top-rated answers. Respondents appeared to be interested in learning about design, usability, and pedagogy to a greater extent than learning about the changing bits and peaces of technology. This is very satisfying result for the project results, since we were insisting on these priorities for modern teaching. Further, this evidence suggests that faculty interest in their colleagues’ uses of technology stems from desire to understand how to use educational technology well. All of this may point to a tendency among faculty members to focus on the educational rather than on the technical aspects of digital technology.

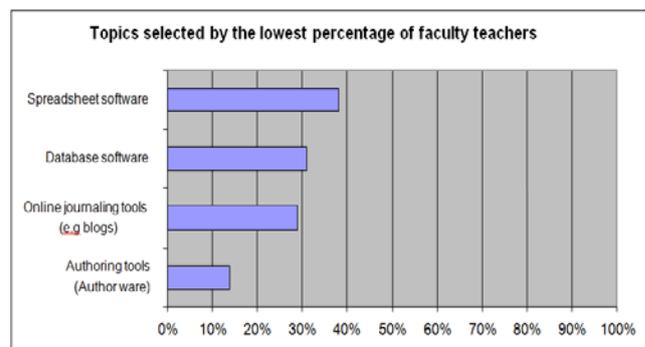


Figure 16. Results from question 9.

**Question 10:** “What are disciplines where technology supported learning is most efficient and applicable: Social sciences, Art/Music, Exact sciences, Languages?” (Figure 17).

The results are reflecting almost exactly our project experience, working with teachers that teach courses in the above categories. We were very satisfied with the response particularly in teachers teaching languages and arts. It kept surprising us all the time the lack of imagination of the teachers in sciences (math, physics, biology, chemistry...) to use enormous repositories with readymade objects, even if most of them are language independent, explaining via animations some very abstract phenomena, etc.

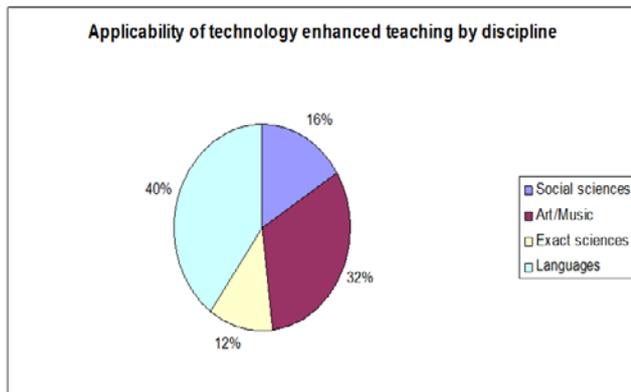


Figure 17. Results from question 10.

On the other hand, the teachers in arts and music were most creative and really felt that their teaching is made more efficient, attractive and rich with technologies.

**Question 11:** “What are the most interesting developments in educational technology that you are aware of (either now, or coming in the future)?”

Here are the different technologies ordered in decreasing priority, given by the respondents: Wikis, Blogs, Adobe suit, Virtual reality, Student response systems.

#### Analysis

Interestingly “Student response systems” was the single most common answer to this question, although this was not a popular answer to the question that asked respondents to imagine an ideal classroom. All these answers leads us to a conclusion, when we analyze the previous questions and answers, that the listed technologies above have a recognized value and potential for the future, but not what they actually use right now to enhance the teaching.

**Question 12:** “What are the most effective ways of using technology in your discipline?”

#### Analysis

Responses to this question varied widely and fit no easily to a certain pattern. One theme had to do with the use of non-text media, like animations, video and graphics. From one of the previous question answers, one can see that these technologies were poorly ranked in their usage. Conclusion might go into the direction that the majority of the teachers would be very keen to use them, only they lack skills and it seems to them as a complex problem. Group and individual student projects were also mentioned by many respondents.

**Question 13:** “Do you have any further comments regarding educational technology at your university/faculty?”

#### Analysis

In responses to this question, many faculty members emphasized the need for support, provided by well trained staff members. General worries about the lack of standardization were mentioned as well, specifically concerns about cross-platform compatibility; different and changing course management systems; lack of centrally supported services and applications; lack of material in Macedonian language on the Web; variations in classroom technology; compatibility with the technology solutions in MK schools; lack of institutional strategy.

### 3. Results

We can summarize the following moderate encouraging picture from the results presented above:

- Teachers have moderate to strongly positive attitudes toward educational technologies
- They reported a relatively moderate rate of problems related to their use of educational technologies
- Strongly desired to learn more about educational technologies

- Believed that digital technology is educationally effective in a variety of contexts

#### *Technology as information delivery tool*

Faculty teachers appear to see educational technology primarily as a means for the efficient delivery of information. Respondents, unfortunately, consistently rated uses of technology that support collaboration, interaction, engagement, or games and simulations below uses that support information delivery, increased access to and effective information design of course materials, etc.

#### *Time factor*

Lack of time is an extremely important issue for faculty teachers. The “amount of time required to learn about technology” was among the highest barriers the respondents cited to their use of technology. Also the “amount of time required to use technology in class” was among the highest ranked. In their open discussions they describe in detail their shortage of time to learn, compared to time spent on administration, lectures, consultations with students and research. Most interesting is that most of them expressed preferences for services that involve others doing things for them (Web site setup and hosting, developing materials, etc.)

#### *Importance of examples/models*

Survey respondents indicated that one of the biggest barriers that affect their use of educational technologies is the lack of models and examples of effective use. Talking with colleagues followed only experimenting on one’s own as respondents preferred way of learning. Finally, vast majority reported that they want to learn more about how their colleagues use educational technology.

#### *Training and technical support*

Lack of technology support was one of the most important barriers respondents cited to their use of technology. Providing this support is their highest priority. They all emphasized the need for facilities accessible after the working hours and the need for well trained staff members.

#### *Pressure from students*

Faculty members are not motivated to use or not use educational technology by student demand or

resistance. We often think that student demand motivates faculty teachers to integrate technology into the teaching, which showed not to be exactly the case. The converse is expressed somewhat less frequently, namely that educators are sometimes reluctant to use certain technologies because of students’ resistance. It is interesting to note that neither of these ideas is supported by the data from this survey. Student demand for technology, in teachers prospective was very low on the list that attracts respondents to use of technology, and student resistance to technology likewise was very low on the list of barriers.

#### *Technology users and non-users*

Faculty members who do not use educational technologies are more concerned about their lack of skills, knowledge, and access to models, and have more doubts about its effectiveness.

For the purpose of this analysis, technology users were defined as respondents who reported having taught at least one course involving online educational technology uses more advanced technology into teaching. It was the vast majority of respondents (76%).

## **4. Conclusion**

Considering very carefully the findings from this survey, as well as the outcomes from the other research made within the project, a sound strategy was built up and successfully implemented through the following working packages:

- Revision, reconstruction and innovation of undergraduate and postgraduate curriculum at Tcaher Training Faculties in MK. Courses (non-ICT) were reconstructed, upgraded and new developed to integrate E-Learning into the teaching process, respecting the subject matter content and providing student-centered program
- E-Learning Expertise Centre (<http://elc.ugd.edu.mk>) was established that is: E-Learning Resource centre for all the Faculties of Pedagogy in our country with full technical support; Support of the teaching process; Support of the practical work of the staff and the students; Regional

E-Learning Help Centre for the schools in the region; Training Centre.

- Necessary E-Learning supporting teaching tools were developed (instructional and authoring software).
- A general model for E-Learning integration into the teaching process was developed, also applicable for other educational settings.
- System for Quality control and monitoring was developed and introduced.

The findings of the survey paved our way towards higher motivation from the teachers and the students, their critical adoption of technologies and changing their attitude towards the learning/teaching process in general.

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