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5. Latest publications of the main author/s (Limit: 3 per author):
   


6. Field of research of the main author/s (3-6 keywords per author) *: e-learning, digital students, web 2.0 technologies, multimedia technologies

B. Full paper*

Please insert your full paper (Limit: 2500 words excluding references):

The Development of a Virtual Campus for Digital Students (ViCaDiS)

Introduction

For the generation born after 1980 the digital world is even more present and pervasive than for the rest of us: for them it is the only world they know. They are the ‘digital’ or ‘Net’ Generation (Tapscott, 1998): children or teenagers who have lived all their lives in a changing but (from their perspective) a predominantly digital world. Significantly, most students in higher education now belong to this group. We have identified these students as a special group due to their characteristics (Andone, Boyne, Dron, & Pemberton, 2005a) and we consider that this community has different learning habits from students of previous generations.

This paper describes a collaborative project between 6 universities from European Union to develop a common online learning environment enhanced with web 2.0 tools for supporting the online international co-operation at
academic level. The environment is named ViCaDiS – Virtual Campus for Digital Students and is supported by the EU Lifelong Learning Erasmus Virtual Campus Programme (www.vicadis.net).

The project is based on the article of faith that underpins our work that technology makes it possible to design learning situations that actively engage and guide learners while allowing them to choose their style of learning and organize their knowledge outcomes. This conceptualization of the learning environment allows learners to make the transition from learning in a physical space such as the lab or lecture theatre, to learning in a student-centred learning environment in cyberspace. Technology can change the education setting from a physical one to a virtual one. Virtual spaces may be in constant flux: they can be instantaneous, deliberate, mobile, synchronous and asynchronous. The student's relationship with virtual space can shift rapidly and they may co-exist in several spaces at a time. These virtual spaces can play a bigger role in all aspects of higher education through the use and integration of technology (laptops, handhelds, mobile phones) and communication (wiki, blogs, SMS, podcasting, etc).

The final target of the project is to build and test an eLearning environment targeted at their needs, based on the assumption of an ‘ecology’ of learning (Seely Brown & Duguid, 2000) and which will complement their usual online environments from each university by allowing them to connect, study, work and get together at international level.

Digital Students

The full results of the earlier studies are presented in (Andone, Dron, Boyne, & Pemberton, 2006a), The main characteristics of the digital student were identified as a result of this research. The characteristics of the technological confident digital students were found to include a strong need for instantaneity, a desire to control their environment and to have a technology based social life (or – to communicate socially by an extensive use of technology).

From our perspective, 'digital students' are defined as young adult students who have grown up with active participation in technology as an everyday feature of their lives. Among the characteristics that define digital students are that they take the availability of email, instant messaging and text messaging for granted, and use unlimited online resources. The digital world has had a significant impact on their habits and behaviour (Barone, 2003). They tend to use the Internet to search both for educational purposes and for information about their hobbies and interests. They use SMS (mobile text messaging) extensively for contacting their friends and colleagues, as well as IM - instant messaging. These results show that the use of multiple media and technologies is directly connected to their use in education, home and entertainment (Andone, Dron, Boyne, & Pemberton, 2006b).

Though lagging very slightly behind their UK and Finnish counterparts, the students from Eastern European countries are becoming stronger in their ICT use and understanding and have jumped several technological steps. They started using the computer, the Internet and the mobile phone at around the same time, and after just a few years they are using similar tools (SMS, Instant messaging, search engines, online playing) at much the same level as their Western colleagues (Andone, Dron, Boyne, & Pemberton, 2006a). They use the Internet for research, collaboration with other students, and as a resource for information passed on to them by other students or teachers.

A large number of desirable attributes for e-learning environment emerged from the research, some of them contradictory. For instance, while participants generally want to have ‘things coming to them’ in a ‘rapid, fast way’, receiving un-requested learning objects disturbs them. It was clear that no single approach would be likely to satisfy all requirements, and an e-learning environment for digital student will need to use complementary methods and technology and leave the power of choice of the ‘right one’ to the student. The results were correlated with other research (Beasley, 2004; Dillman, 2000; Eurostat, 2003 , 2004; Livingstone & Bovill, 2001; Oblinger & Oblinger, 2005; Rettie, 2002; Woods, 2002).

They simply ‘think differently’.

ViCaDiS environment

In ViCaDiS (Virtual Campus for Digital Students) a wide range of ODL actors from EU and CEE countries (ViCaDiS, 2009) focus on developing an innovative approach for enhancing international eLearning by moving the strength from the institutional learning environment to the personal learning environment (PLE) which focuses on students. It produces an instructional or pedagogical shift inside universities eLearning moving the focus from the education materials and technology to the user-student, to user generated content.
The goal of ViCaDiS is to create an attractive environment for all students within the European Union states, using already existing tools which will be enhanced with new tools wanted by the new generation of students. An innovative multilingual ICT-based environment unique in Europe (as an international virtual campus), it will incorporate several open educational resources (library, glossary, external links, student projects, course activities), open educational tools (wiki, blog, forum, calendar, podcasting, instant messaging communication, audio-video conferencing over IP, RSS, mobile text messaging, mobile accessibility to ViCaDiS) and to promote social networking as an instructional method.

![ViCaDiS structure diagram](image)

**Figure 1.** The ViCaDiS structure

### Mobile technologies development

ViCaDiS Project carried out two questionnaires to create shared understanding about the needs and possibilities related to educational use of mobile technologies. *Mobile Technologies* are related to mobile phones, multimedia phones, personal digital assistant (PDA) devices etc. and services tailored for mobile devices. *Mobile technology related learning resources* consist of functionalities, contents and pedagogical paradigms adapted to benefit from the use of mobile technologies. *The quality of e-learning solutions* is based on three factors: (1) teaching and learning competencies, (2) educational paradigms and paradigms shifts, (3) infrastructure, used technology and educational resources (Kurkela, 2008). *To benefit from mobile technologies we must decide:* How to be aware of mobile technology related possibilities? How to evaluate the educational potential of those possibilities for institutional and personal learning environments? How to implement selected technologies? How to support the use of mobile technologies?

In the development of learning and teaching related competencies the following aspects should be considered: What are the current competencies related to mobile and non-mobile learning and teaching? How should those competencies be developed? How to use those competencies in a purposeful way?

In the development of paradigms and planning of pedagogical paradigm shifts the following aspects should be considered: What are the benefits and restrictions of current paradigms? How to evaluate the potential of new paradigms? How to evaluate the need of paradigm changes? How to conduct a paradigm shift in a successful way?

We should start the implementation process from technologies with greatest potential for m-learning. The most important finding in the 1st ViCaDiS mobile technology related questionnaire came out when the answers were grouped by roles. Teachers with e-learning experience (N=71) evaluated WAP 2.0 related potential much higher
compared to IT-specialists (N=37). There exists a clear need of communication between these groups! See Figure 2 which is in the normalized form (ZEF, 2009).

Figure 2: Clear need for Communication

In figure 2 there are WAP 2.0 related results of Teachers with eLearning Experience and IT Specialists. The Potential for eLearning and Probability to be Used were evaluated from the following viewpoints: 1) Web browsing with Mobile Devices. 2) Secure Login to Web Pages, Learning Environments and Social Web Services. 3) Web Based Calendar and Calendar Activities. 4) RSS Feeds from Calendar Activities. 5) Timed Messages from Calendar Activities. 6) RSS-feed for WAP 2.0 Services.

According to the 1st questionnaire (all roles included) the first implementation steps of mobile learning technology should concentrate on questions which have achieved top scores in the top-right quarter of the normalized diagrams: VoIP – Voice over Internet Protocol: Audio and Video Communication and Conferences with Mobile Devices. WAP 2.0 – Wireless Application Protocol: Secure Login to Web Pages, Learning Environments and Social Web Services. Web Browsing with Mobile Services. Web Based Calendar and Calendar Activities. Timed Messages from Calendar Activities. PoC – Push to Talk over Cellular: Immediate Sharing of Documents. MMS – Multimedia Messaging Service: Dual Device Option: Mobile Devices and/or email. SMS – Short Message Service: Rich Content Download Services (ViCaDiS Quest, 2008). The 2nd questionnaire was targeted to find out what kind of devices and services are used and how fast the device base is renewed. What kind of mobile applications are needed? (ViCaDiS Quest, 2008).

Figure 3. E-learning and m-learning potential of some services

The diagram in Fig. 3 is in a normalized form from the ZEF methodology questionnaire. The first implementation steps of mobile learning technology should concentrate on services which have achieved top scores.
scores in the upper half of the normalized diagrams: To check and send e-mail messages, to receive reminder messages from your calendar, to receive information about changes in your calendar and to browse and update your internet calendars (personal and learning related).

The quality of e-learning is based on teaching and learning related competencies, pedagogical paradigms or solutions in use, proper non-mobile and mobile services, cost effective communication channels and the mobile device base of m-learners, teachers and tutors. ViCaDiS questionnaires pointed out that Flexible Mobile Communication is highly appreciated (VoIP, PoC), Dual Device Interface is important when applicable and WAP 2.0 has a great potential. The potential of NFC and GPS Technologies has not yet been recognized widely.

Students need mobile features that support them to keep on track of the learning process and changes in the learning process, and they should be used if they create added value to learners.

Evaluation

We are studying now the impact of the various ViCaDiS features on the experience of the new student generation. The environment is used in normal University course (Technical English) and during the Technical Placement in the Industry by groups of both “digital” and “non-digital” students. The usage made of the environment is measured, quantitative questionnaires using ZEF methodology (ZEF, 2009) and qualitative evaluation (interviews) are carried out to establish attitudes and preferences. We also evaluated the environment for its desirability to the study group of students (digital and non-digital). To evaluate the desirability we used a usability methodology developed by the Microsoft Usability Lab (Benedek, 2002) focussing on the ‘product reaction cards’ method. We developed a large set of word cards that formed the basis for a sorting exercise and more importantly a discussion about the use of the environment. Since there is a bias to give positive feedback in the university relations already established, we made sure that at least 40% of the set consisted of negative words and phrases and tried to make the set cover a wide variety of dimensions. Each word was placed on a separate card and the set was given to the students at the end of the course module. On the first round each of the students was asked to pick the words that best describe their “experience in using the ViCaDiS”. The evaluation process is still taking place until the end of May 2009, when the academic semester will end and the final evaluation.

Conclusions

The piloting of ViCaDiS is carried out in the project universities, but also in a synergy with the EU LL CBVE (Cross Border Virtual Entrepreneurship), coordinated by the EADTU, where the appropriateness of using web 2.0 technologies for encouraging entrepreneurship is studied.

The results indicate that an eLearning environment which has the described tools and involves student control leads to greater engagement in the learning process and a higher level of satisfaction of the group which we identified as digital students.

The study results played a key role in directing our eLearning environment development strategy and have influenced some major decisions. One such decision concerned the appropriateness of formal learning structures for Internet and Mobile phone based services.

References

Digital students are young adults who have grown up with digital technologies integrated as an everyday feature of their lives. Digital students use technology differently from previous generations.
of students, fluidly and often simultaneously using instant messengers, mobile phones, the Web, MP3 players, online games and more. The paper describes the development of an online - mobile phone environment - ViCaDiS – Virtual Campus for Digital Students, as a co-operation between 6 universities from European Union to develop a common online learning environment enhanced with web 2.0 tools for supporting the online international co-operation at academic level. It presents also the evaluation of this new learning environment for digital students.

D. Short description of the full paper for the programme booklet*
Please insert the short description for the programme booklet here (Limit: 60 words):

Universities in EU and CEE region joined international cooperation in an EU LLL project to develop a Virtual Campus for Digital Students (ViCaDiS) as an online-mobile phone environment.

E. Additional information*
Please provide us with a classification of your paper along the following three dimensions.

1. My paper is covering one or more of the following areas of education and training*
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