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e-Learning Today

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Higher education in the technical area has special features and requirements, more difficult to fulfill in a classical long–distance education system: development of laboratory related skills, integrated project design work, interactive seminars oriented towards problem based learning. The students studying for an engineering degree in the University POLITEHNICA of Bucharest benefit from the presence of two learning management systems: an open source application (Moodle), a software package for producing Internet-based courses and web sites and a proprietary portal (AeL LCMS), an innovative and integrated e–Learning solution, supporting most of the education processes: teaching–learning, testing and evaluation, content management, managing and monitoring of the entire educational process. Undergraduate and postgraduate students having access to these facilities were interviewed in connection to their usage of electronic resources deposited in the two LMS, as well as other ICT instruments they might employ for their on–line and off–line learning activities.

1. Introduction

e–Learning practice has achieved a momentum that will make it a central part of future education. The vast bulk of literature in e-Learning is practice-based and is typically presented in a descriptive format (Oliver et al., 2005, Padron et al., 2005). Unfortunately the use of technology in education has tended to be technology–led rather than theory–led (Ravenscroft 2001). With Computed Aided Instruction (CAI), students can learn at their own pace, as with programmed instruction. Because the student interacts with the computer, it is believed by many to be a more dynamic learning device. Educational alternatives can be quickly selected to suit the student's capabilities, and performance can be monitored continuously. As instruction proceeds, data are gathered for monitoring and improving performance.
The students studying for an engineering degree in the University POLITEHNICA of Bucharest benefit from the presence of two learning management systems: the open source application Moodle <www.moodle.org>, a software package for producing Internet-based courses and web sites, and the proprietary portal AeL LCMS <www.advancedelearning.ro>, an innovative and integrated e-Learning solution,

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supporting most of the education processes: teaching-learning, testing and evaluation, content management, managing and monitoring of the entire educational process.
Since the academic staff point of view was thoroughly investigated (Josceanu et al., 2006), the student attitude towards the use of CAI in academic training is now reported.

2. Survey Results

The survey carried out on a 237 people sample revealed the position of different categories of students: undergraduates, aged 18 – 22, and postgraduate students, studying for a masters' degree, aged 24 – 55. In the mature students category there was a special lot formed by educators involved in primary and high school education; they were enrolled in a complementary–type continuing education master program and showed rather similar opinions in connection to the main educational issues. Figure 1 shows the age distribution of the respondents considered.

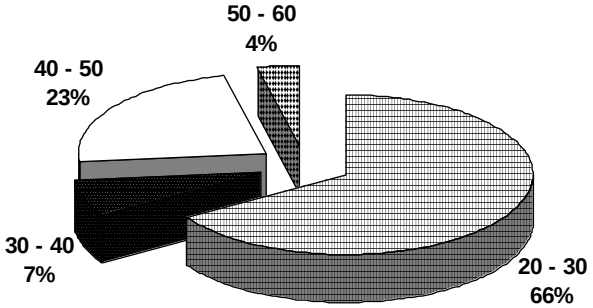

Figure 1: Age distribution for the student population involved in the survey

The dominant feeling among the student population is that computer aided instruction is very useful in modern pedagogy for all teaching levels, higher education included. As regards the direct link between the technology and pedagogy, 93 % of the students agree that pedagogy should be defined according to the chosen technology.
Two trends in the pedagogical approach were considered: constructivism and instructivism. According to the constructivist theory, the learner constructs new knowledge through a process of analyzing new information and comparing it to previous knowledge. Student–centered, rather than teacher–centered, the constructivist theory is best exemplified by instructors who provide guidance, rather than spoon feeding knowledge to the student in the lecture hall. The student is in control of whether or not he or she learns, not the instructor. Constructivism helps students comprehend how they understand or know a topic. Interactions with a learning environment provide the stimulus for learning through cognitive conflict as learners continually compare new knowledge with old knowledge and make a determination concerning which is more valuable. Building a model, designing a chart, and completing a project are all examples constructivist learning activities.
Knowledge exists independently of the learner as instructivism demonstrates, and is transferred to the student by the teacher. As a teacher–centered model, the instructivist

view is exhibited by the dispensing of information to the student through the lecture format.

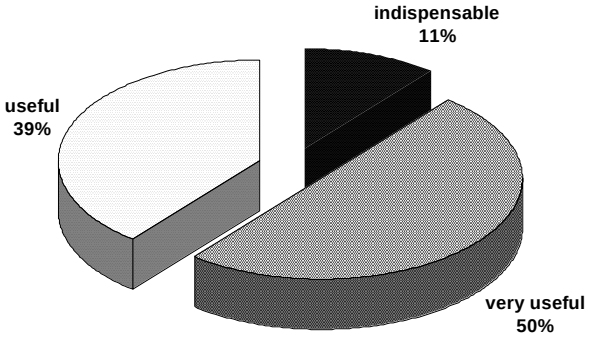

Figure 2: General attitude towards e-learning tools

This theory requires the student to passively accept information and knowledge as presented by the instructor. While this method has been the basis of education for centuries, it does have drawbacks, especially in the online class.

It is interesting to note that all participating mature students have expressed their preference for the constructivist approach, while half of the undergraduates (41 people) declared to be happier with an instructivistic education style.

We have identified a group of students enthusiastically adopting e–learning (Figure 2) to match their constructivistic preference for the educational process. There is a second group using gladly technology, but preferring a classical pedagogical approach. A third group is satisfied by a constructivistic approach in face–to–face educational activities, but does not see the advantage of using any ICT tools. Finally, a fourth group still does not acknowledge the potential of using e–learning as an interactive tool for teaching and learning, and therefore show deliberately no interest in testing computer aided instruction (Figure 3).

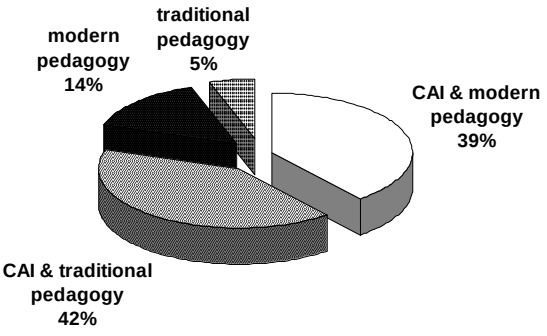

Figure 3: Pedagogical options for the educational process

We suspect a certain degree of inconsistency in choosing the appropriate pedagogical option, as the 84 % constructivistic fans do not match the 53 % supporters of modern pedagogy. The reduced experience in the pedagogical field (35 % second and third year

undergraduates in the sample population) seems a reasonable explanation for the behavior of our survey group.

Identified problems of e–learning are not about the quality of the software that launches, tracks, and reports on educational materials, but are linked to the educational materials themselves, and to the way they are created and delivered by the academic staff. There are usually no instructional activities that deeply engage the mind of the learners, and "interactivity" mostly consists of turning from one screen to another. This is especially problematic for the young generation, which has grown up with fast–paced videogames, movies, and television programs, as 98 % of our respondents agreed.

There are some basic skills that, in the students' opinion, are needed when using ICT for education:

- a level of comfort and familiarity with computers and learning software;
- ability to multi–task, as the virtual environments often require to pay attention and work with several dimensions of teaching at the same time;
- instructional design skills that emphasize the designing creation of interactive teaching activities.

As true exponents of the informatics age, 55 % of the interviewed students considered that ICT familiarity is crucial for computed aided education (Figure 4). This point of view contradicts the earlier reported academic staff opinion (Josceanu et al., 2006), centered on expertise in interactive education.

In addition to the different requirements of various learning tasks, our students identified other variables likely to influence learning success: learner's experience for the subject in question, background knowledge, learning preferences ("learning style/cognitive style/thinking style") and orientation, including his or her reaction towards technology, learner's sensory pathways and cognitive processing abilities, emotional state, gender and age differences, cultural/corporate/institutional/societal requirements and values, presence or absence of collaboration with other learners, learning environment, including "learning distracters", availability of human and technological resources, and whether an individual or a group is being taught to (Figure 5).

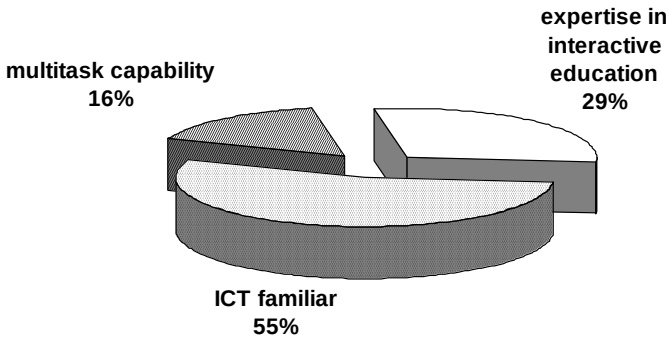

Figure 4: Required skills when using ITC technology.

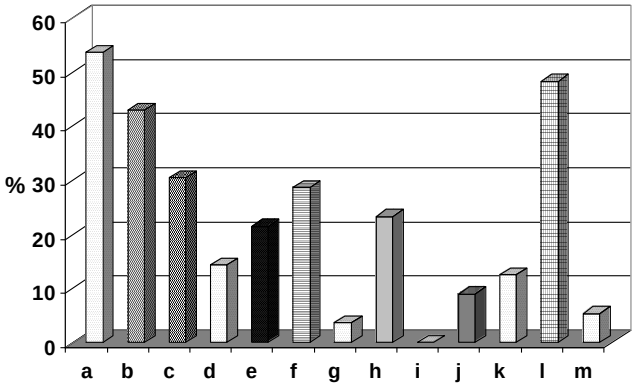

Figure 5: Main variables important for learners (a -experience in the subject; b - background knowledge; c-learning preferences; d-learning reaction towards technology; e - sensory pathways; f - cognitive processing abilities; g - emotional state; h - age differences; i - gender differences, j – cultural/ corporate /institutional societal values; k - collaboration with other learners; l - learning environment; m – none)

3. Evaluation of the platforms in use

Another purpose of the survey was to determine to what extent the two learning management systems fulfill the expectations of the studying population in the technical field. Several features were subjected to evaluation by the student population. The student population declared appreciation for the specialized info−documenting mediation carried out by the academic staff, well supported both in Moodle and AEL. Besides offering basic information for the on−going subjects, AEL tops up by creating a virtual library suitable for all level students.

The best chance for developing and/or improving technical communication skills rely on the videoconference and white board communication module in AEL. This feature implies additional infrastructure requirements for multi−channel communication (data, sound, image) and offers a good environment for team working and real time communication. The largest part of the subjects was pleased with the instant messaging and forum features available on both systems. As Figure 6 shows, there are three distinct groups of user preferences. Our complementary student−educators declared enthusiasm for the possibility of real time tracking of student activity and of resource importing (content packages, miscellaneous media files, archives/folders). They also raised concern about supporting SCORM, XML, MathML, SVG, demonstrated by each system. As potential resource creators, some of them were reluctant to using real time instruments for their own teaching, so that only 69 % of the group appreciated the chance of using the whiteboard and video conferencing facilities. This behavior is balanced by the undergraduates and the thoroughgoing postgraduates, who were entirely taken by the chance of exploiting multi−channel real time communication. Both groups were less encouraging about the possibility of being monitored during their on-line activities, as well as keeping records of their “in-term” activities.

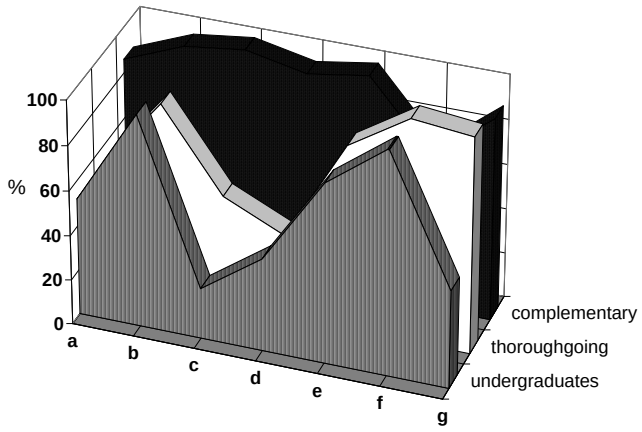

Figure 6: Evaluation of specific features offered by the LMS systems available in the university (a – resources import/export for easy redistribution, b-content delivery – broadcast server, c – monitoring of online student activity, d – instant progress tracker, e – teacher personal comments on a student, f – video conference and, whiteboard, g– a detailed "story" of each student involvement)

Postgraduate subjects showed moderate appreciation for the test creation and administration features in both systems. Instant access to test results are counterbalanced by the underdeveloped communication and synthesis skills acquired during the long term use of automatic testing. They are also not pleased by the workload involved in creating personalized tests.

4. Conclusions

The internet is now so embedded in our daily lives that all generations have become digitally fluent. This has had a massive impact on the way they acquire knowledge. The student population from UPB has shown preference for modern pedagogy, CAI, and multi–channel communication facilities. The e–learning systems available fulfill these requirements, though not all offered features are appreciated to their true value.

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