

## The Role of the Internet in Computer-Aided Education

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**Abstract:** *The ever-increasing spread of the use of the Internet in intelligence technologies has begun to revolutionise the entire economy (from production to commerce, tourism to publishing) and all phases of education; briefly, all aspects of life. As a consequence of the impact of rapid growth of use of the Internet on education, the idea of "Net-Aided Education" has become common and its application has increased.*

*The fact that Net-Aided Education (NAE) has numerous advantages over conventional methods has impelled a number of educational institutions to reorganise accordingly.*

*This research has been conducted using the course management system Moodle portal for Department of Electronics and Computer at Faculty of Technical Education of University of Selçuk, to compare NAE with the conventional method for the subject of Technical Drawing. Statistical analysis and evaluation of NAE and conventional methods have been carried out. Consequently, success rates of the group that learned using NAE and the group that learned using conventional methods have been compared. The statistical analyses have indicated a major gap in favour of the group that learned using NAE.*

**Key Words:** *Net-Aided Education, Technical Drawing, Course Management System, Moodle*

### INTRODUCTION

Progress in the field of the Internet is bringing about progress in the field of education. Net-Aided Education (NAE), contrary to common educational technologies, emerges as a new educational model in the field of education as an able rival of conventional methods.

NAE is recognised as a real-time target-behaviour developing process that utilises net-based web applications in its infrastructure and that suggests that the one that teaches and the one that is taught are in different circumstances in terms of place and time [1]. NAE provides the teachers and learners with a suitable environment by keeping in mind the variations of learning style and capabilities of individuals and by making it possible for learning process to continue anywhere and anytime other than regular lessons [2].

Besides, because there exist fewer teaching professionals than necessary and more students than can be assisted individually in many educational institutions in our country, a desired level of regular teaching can not be achieved. As the employment of NAE spreads, it makes it possible for institutions that have a sufficient number of teaching professional to teach the students of the institutions that are in need [3].

With NAE applied on a concrete example, as an addition to regular classes, it is possible to create a supplementary environment independent of time and place, using such utilities as online tests, surveys, demonstrations and animated education, which are provided by course management system.

### NET-AIDED EDUCATION

NAE disposes the educators of the problem of time and place, which are the two greatest restrictions of conventional methods. The most important problem of education (i.e. of lack of time, place and educators) makes such methods as NAE an indispensable companion of conventional methods. Learning that is based on the Internet equips the students with the opportunity to access information, without having to conform to a designated time and place. Additionally, NAE affects the students' level of education positively by also teaching them how to keep their knowledge updated all through their lives [4].

In conventional education, speeches made in the classroom are supported by body language and sentence intonation. It is not easy to achieve this via NAE, nevertheless, the students have the opportunity to think over as long as they like before answering to a question, or individuals that are timid can put forward their thoughts in a relaxed manner. In on-line education, students can also go back in history and revise at will. In NAE, the educator is more of a person that points to information rather than one that distributes it.

It is strongly emphasised that computer is not an option to replace the educator, but a means to support and reinforce the current system. Thanks to the devices and methods employed, learning environment is enriched and the attention and interest of the students are kept alive for a long while.

### **E-LEARNING AND TEACHING DESIGN**

Distribution of information through the Internet is made possible by e-learning portals. These applications, also known as 'course management systems,' are software that can handle automatically such services as teaching design, sharing and debating in many forms, registering to classes, undertaking research tasks, doing exams, going back in history to review researches and exams, arranging teaching designs, keeping records of learner, educator and the system and displaying reports all through the Internet [5,6].

Education through the Internet emerges generally in the form of web-based remote Access [7]. Web designing tools have developed in time and become easier to use for the benefit of designers. On the other hand, it is quite important to design the content of the subject that is intended to be carried out in the form of web-based remote teaching. It is impossible for a mere web designer to cope, as his profession is based on a totally separate area of education. At this point, appears open-source software, which is costless and user-friendly. A piece of this software is Moodle Course Management System [8].

### **MOODLE COURSE MANAGEMENT SYSTEM**

The software known as Moodle (Modular Object-Oriented Dynamic Learning Environment), is a free, open-source and easy-to-use e-learning teaching design and administration system. Moodle is application-infrastructure software that can be customised to suit the educational goals of schools/students and convey teaching designs to learners [9].

System administrators, via Moodle's web-based user interface, can carry out registration procedures, control logins and logouts to system, convey educational content to users and all kinds of reporting and inspecting services related to these services without needing to have any knowledge of programming [10].

Administrators can also append new questions and build tests using Moodle's web-based user interface. It is even possible to build up a corpus of tests (multiple choice, comment-based, completion etc.), the degree of difficulty of which can be predefined. If the test is a time-critical one, the learner can learn his mark immediately after he takes the test, the result of which is computed by the system. The learner has the advantage of seeing which questions he failed to answer correctly and what their answers should have been. Even more, thanks to the forum integrated into the system, users can communicate their ideas among themselves and/or comment on topics related to the class and thus share information.

### **MATERIAL AND METHOD**

In this research, a PC-Server (Debian Linux 3.1 STABLE Operating System that runs on an Intel Pentium IV 1.9 GHz microprocessor, 512Mb of RAM and a 80Gb hdd drive), Moodle Course Management System, SPSS v13 statistics application and a 30-PC computer laboratory have been used.

In the first phase of the research, Debian Linux 3.1 STABLE Operating System was installed on the PC and then ftp, mysql, apache and php components of the operating system were enabled. Moodle Course Management System was installed and all modules activated. (<http://www.sutef.gen.tr>) A registry for the class Technical Drawing, which is being taught at Grade 1 at the Department of Electronics and Computer at Faculty of Technical Education of University of Selçuk, was created. A 14-week period of teaching was designated. All research tasks, exams and documents were included in the process as planned. Access rights were granted to an educator and his assistant to enable them to

oversee the educational process. A screen capture of the portal that was created is given in Figure 1.

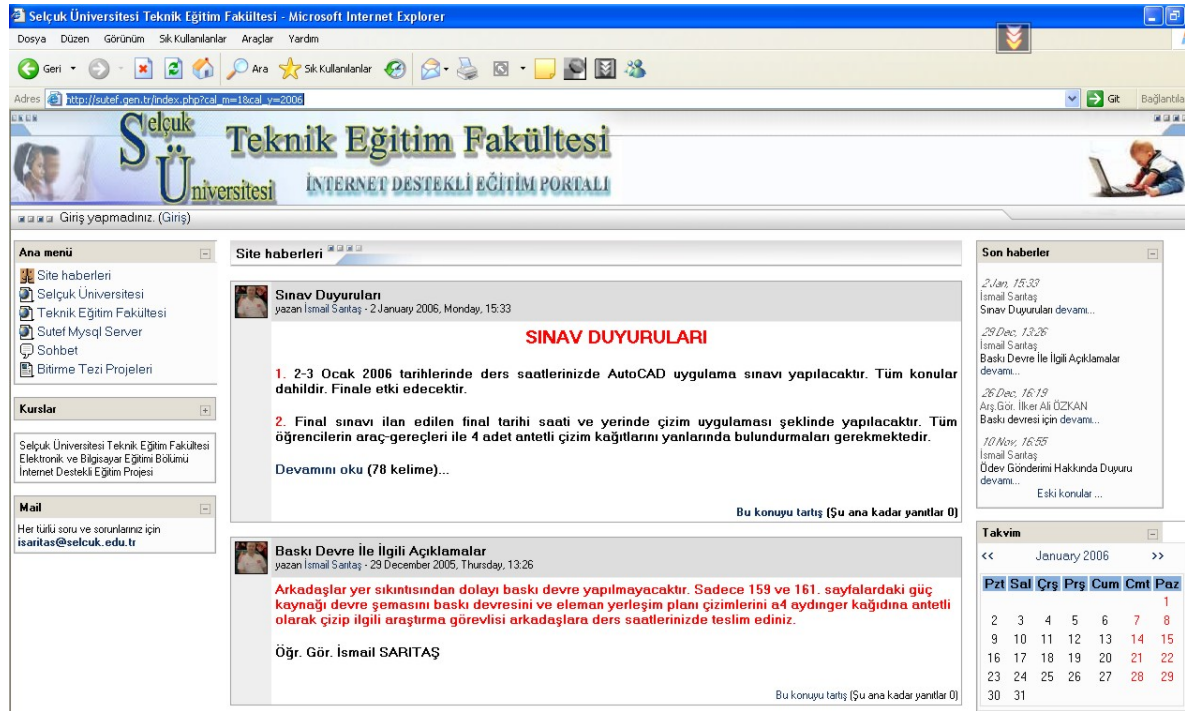


Figure 1. A Screen Capture of Course Management System

In Figure 2 are given the 14-week educational period, documents, exams, research tasks surveys and a part of the plans.

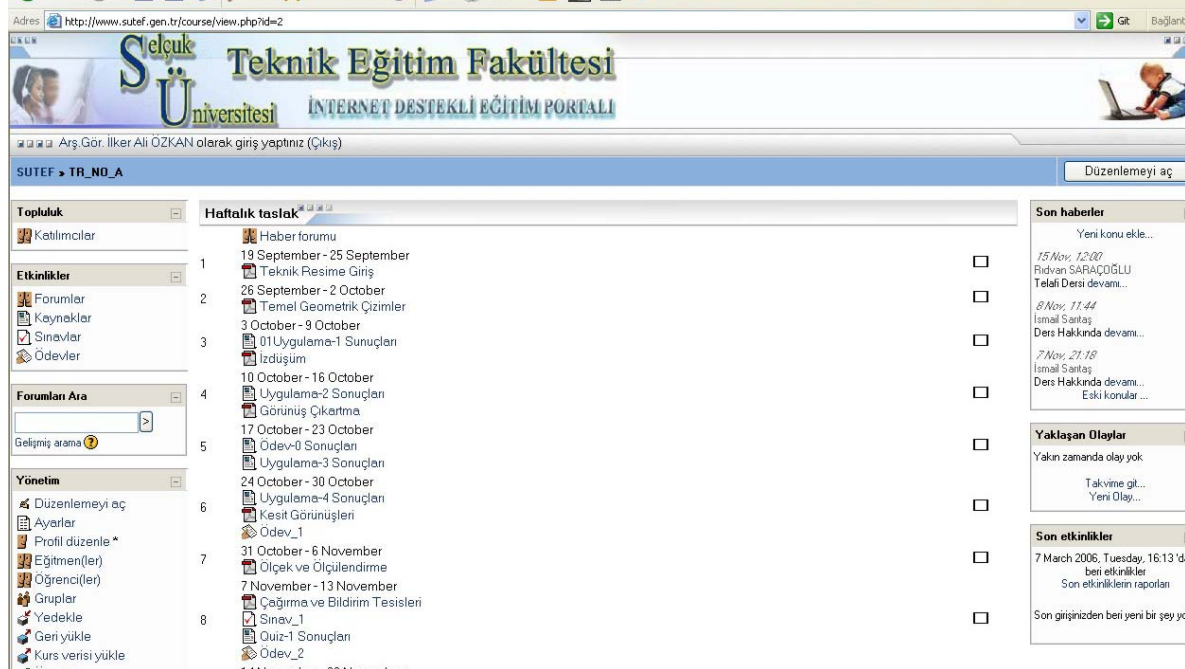


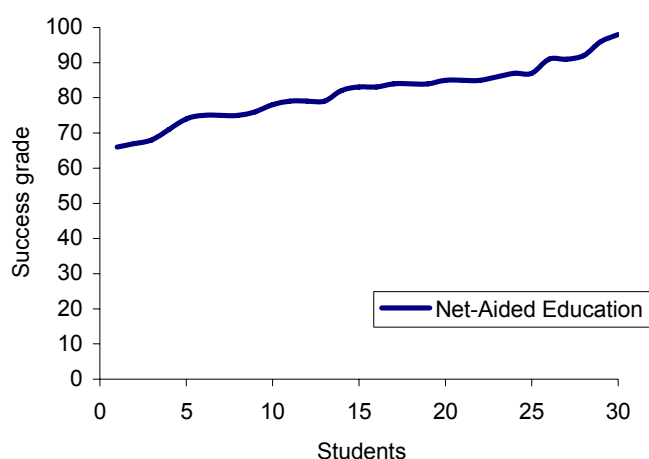
Figure 2. A View of Designated Teaching Process

Subjects of this research are Grade 1 students of Department of Electronics and Computer at Faculty of Technical Education of University of Selçuk. The research was carried out during the second semester of the 2005-2006 academic year. All of the subjects comply with the criteria of being within the interval of 333-347 points at ÖSS, not having had taken this course before, being of the same peer group and being able to use a

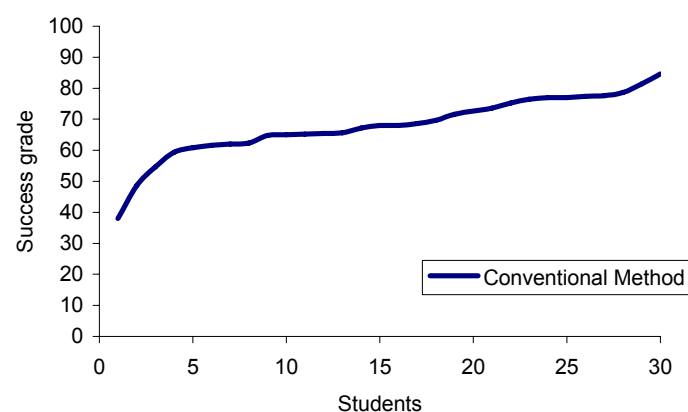
PC. Of 60 subjects, 30 were randomly picked to constitute the experimental group and the other 30 to constitute the control group.

Subjects of the experimental group were entered as students in Moodle Course Management System; later to register the class and be handed out user names and passwords that are necessary to log in to system. For the control group, the course-book titled "Technical and Vocational Drawing for Departments of Electronics and Computer" was chosen as material; and the same curriculum was applied to both groups.

After the 14-week period of education, class success rates of both groups were derived. The results are presented in Figure 3 and Figure 4.



**Figure 3.** Experimental Group (NAE)



**Figure 4.** Control Group (Conventional Method)

In order to determine the effect of NAE on success, a t-test was applied to the data obtained; that would reveal if there was a significant gap between the success rates of the two groups.

The results of the analysis made using SPSS v13 statistic application are shown in Table 1.

**Table 1.** The Result of the T-Test

	Number of subjects (n)	Mathematical Average (x)	Standart Deviation (SD)	t value	p value
Experimental Group	30	81,5	8,09747	5,791	0,000
Control Group	30	68	9,87159		

$p < 0.005$

## CONCLUSION

As a consequence of rapid development in intelligence technologies, application of computer-aided education has increased. Novelties in the area of networking have positive effects on education. Thanks to their contributions to the educational process, the number of NAE applications is increasing dramatically. A NAE application has been applied in this research. The statistical data generated by the research and evaluation of this data indicate a significant gap between the control group and the experimental group in favour of the experimental group. ( $p < 0.005$ ,  $t = 5.791$ )

Additionally, as the research was in progress, either from the forum, messages or mutual conversations, observations below were noted down.

- A meticulously prepared NAE course, due to its interactive features, is more efficient than compared to other methods.

- A more interactive environment can be achieved, as the learner and the educator can express thoughts.
- Animated teaching techniques on the Internet accelerate the learning process and help retain knowledge.
- Learners can benefit from the system anywhere and anytime they like; they do not have to get into a laboratory.
- NAE reduces the possibility of educator's making errors in testing and preparing materials to minimum, and therefore is more economical.
- Learners have the opportunity to rectify and renew their information in a very short time by interacting with the educator one on one.

There are also disadvantages, which are listed below.

- Inconsistencies in the connection may affect NEA negatively.
- Learners prefer to read the documents from printed materials rather than the screen.
- Sharing of high-resolution images and some other materials may affect caching time of web pages.
- It is not possible to protect the copyrights of the materials introduced by the educator; materials to which he devotes great efforts and considerable time.
- Body language, in which even a simple gesture or mimic is quite important, can not be used on the Internet; while with conventional methods, it can be.

A considerable increase in success has been observed in education carried out on Moodle portal. Moodle should be applied to other classes as well. It is believed that integration of all the schools into a common automated system will increase efficiency.

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