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ANALYZING ‘JOB SATISFACTION’ OF A TEACHER IN AN INSTITUTION

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ABSTRACT

The trend of ‘self financing’ (Un-aided) institutions has implemented for the last twenty two years in Maharashtra state and other parts of India. The Government does not financially support these institutions. The ‘job satisfaction’ of teachers working in such institutions is always questionable, particularly in those institutions that are situated in rural part of India. It causes a large amount of turnover of teachers. Here, we have attempted to analyze this question by making use of structural equation modeling. Such type of work is useful to institutions to retain their teachers and increase their involvement in institution. It also helps to determine quality of education.

Key Words: Structural equation modeling; Non measurable parameters; Statistical Technique.

I. INTRODUCTION

In early days, the higher education system of India was well supported by the Government. The salary and ‘non salary’ expenditures of the institutions were borne by the Government. But soon, Government realizes that it is beyond their capacity to provide higher education to everyone. So, a scheme of ‘self financing’ institutions was proposed by various State Governments of India [1]. Since then, many new colleges have come up with no financial support from Governments. Particularly, professional higher education colleges such as Engineering, Medical, Management, Computer and Information Technology colleges have come up in a very large number. In Maharashtra State itself, there are more than 500 institutions [2] that are not supported by Government. Because of these institutions, more number of students can get admissions to professional courses. It is found that teachers working in such institutions are frequently changing the institution [3]. It happens because of lack of job satisfaction. It ultimately affects on teaching and their involvement in institution.

Structural Equation Modeling (SEM) provides the ability to accommodate multiple interrelated dependence relationships in a single model [4]. The complex relationship between variables can be modeled by using SEM. The variables for which direct measurement is not possible can be approximated by measurable variables. It can be used in Educational Science as well [5]. ‘Job satisfaction’ is a kind of non-measurable variable. SEM can be used to estimate ‘job satisfaction’ of a teacher working in an institution.

II DATABASE

Here, we have considered a case study of a college [3]. The data of teachers working in college on following variables is collected. All the observations are independent. Out of available data, 10 random samples are selected. Table 1 shows the database.

Dependent variable: Job satisfaction (Y₁). Range: 0-100.
Independent variables: Coworker Attitude (X₁) Range: 0-100 and Work Environment (X₂) Range: 0-100.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>X₁</th>
<th>X₂</th>
<th>Y₁</th>
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<tr>
<td>1</td>
<td>80</td>
<td>75</td>
<td>60</td>
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<tr>
<td>2</td>
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<td>85</td>
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<td>5</td>
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<td>80</td>
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III. PATH DIAGRAMS

Here, we have selected causal modeling, or path analysis, which hypothesizes causal relationships among variables. Causal models can involve manifest variables, latent variables, or both. Path diagrams can show the relationships between different variables. Figure 1 shows the path diagram.

The path diagrams are the basis for the path analysis. The straight lines depict the impact of independent variables on dependent variables. The curved arrows depict the correlation among variables.

IV. PATH ANALYSIS

In path analysis, we determine empirical estimation of the strength of each relationship (paths) depicted in path diagram. Path analysis calculates the strength of the relationship using only correlation matrix as input. The simple correlation between any two variables can be represented as the sum of compound paths connecting these points. Table 2 shows correlation matrix.

<table>
<thead>
<tr>
<th></th>
<th>X1</th>
<th>X2</th>
<th>Y1</th>
</tr>
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<tbody>
<tr>
<td>X1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X2</td>
<td>0.756725</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Y1</td>
<td>0.221466</td>
<td>0.294876</td>
<td>1</td>
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Table 2: Correlation Matrix

From Table 2, we observe that, variable X2 has highest correlation to variable X1. Structural equation can be written as:

\[ Y_1 = b_1 X_1 + b_2 X_2 \]

In this equation \( b_1 \) and \( b_2 \) can be found out as follows:

\[
R_{X1X2} = A \\
R_{X1Y1} = B + A C \\
R_{X2Y1} = C + A B 
\]
Substituting the values from table 2, we get:

\[ 0.756725 = A \]
\[ 0.221466 = B + AC \]
\[ 0.294876 = C + AB \]

After solving these equations, we get values of B and C.

\[ B (b_1) = -0.00392 \]
\[ C (b_2) = 0.297839 \]

The structural equation can be written as:

\[ Y_1 = -0.00392 X_1 + 0.297839 X_2 \]

VI. CONCLUSIONS
In Structural Equation Modeling, path analysis can be used to any system of relationship. All the relationships in path diagram can be estimated to quantify the effects between dependent and independent variables. In this paper, we have estimated structural equation for ‘job satisfaction’.

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HISTORY OF HIGHER EDUCATION Provision for the Deaf in Turkey
And Current Applications at the Anadolu University

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ABSTRACT
The aim of this presentation is to summarize the history of deaf education in Turkey. The problems that deaf students face in their educational life with special reference to higher education will be discussed. Properties of educational settings and university entrance requirements will be explained. Within this general concept, Anadolu University experience will be explained by giving two distinct but related provisions offered to deaf students in Turkey: Education and Research Centre for Hearing-Impaired Children (İÇEM) and Integrated College for the Disabled. İÇEM offers education from preschool to high school.

The aim of the centre is to enable students to acquire spoken language skills in a natural language environment using aural/oral approach and to help prepare them to the university entrance examinations.

Integrated College for the Disabled was founded in 1993 and offers two year pre-degree programs in computing and building construction and four year degree programs in ceramic arts and graphic arts. These two institutes will be introduced and their programs will be discussed.

Keywords: Deaf, Hearing-Impaired Education, Turkey

INTRODUCTION OF EDUCATIONAL PROGRAMME for the Hearing-Impaired Students in Turkey.

The opening of the first school for the deaf-mute was initiated by an Austrian, Monsieur Grati (Grati Effendi) in 1881, who applied to the Minister of Education of that time Münif Paşa, for his consent to open a special school. Consent was granted and the school opened during the 1891-1892 academic year. (Gök, 1958, p. 11).

In another source it was mentioned that the first studies in the field of educating children with special needs was initiated in 1889, by the Director of a Commerce School in Istanbul, Grati Effendi with the opening of the School for the Deaf-mute for the education of children of some upper class civil servants. The number of students was set at 30 and it was suggested that students between the ages of 6-20 were to be accepted for a 4-year-long educational program. The school was a daytime school and its program was based on the French educational program for deaf students. Sign language was adopted as the educational method. (Special Educational Institutions, 1987, Enç, Çağlar and Özsoy, 1975, p. 97).

This school, known to be the first school for the deaf in the Turkish History of Special Education, and others which opened at later dates were transferred from the Ministry of Health and Social Services to the Ministry of Education in 1951.

In 1952, foreign experts who specialized in the field of special education were recruited and a programme to train native teachers, who either already worked in this field or who would be working in this field, was started. In the first year of this teacher training program Harriot L. Mclaughlin, the Headmaster of the 47th School for the Deaf in New York, and in the second year Adolf Fronthaller from Austria were invited to give lectures.

To this end, a school for Special Education had been opened at Gazi Educational Institute, however it was closed down after 2 terms of education (Special Educational Institutions, 1987, Enç, Çağlar and Özsoy, 1975, p. 97). This attempt can be considered as a significant step in the Turkish History of Special Education. The first foreign instructors of the time worked in this school and they, indeed, started to train the teachers who would be working in this field. In the following years the opening of schools for the Blind and the Deaf continued. In 1955, the first Psychological Clinic (now known as the Guidance and Research Centre) was brought into service in Ankara. The main aims of this clinic was to establish special classes for the mentally defective students with an educable level, to select the students to be educated, to analyze and guide other children in need of special education.

A special education field was developed under the authority of the Elementary School General Directorate within the framework of the Ministry of Education. The sixth branch which was established under the body of the Elementary School General Directorate not only carried out studies about the maintenance, education and
development of children in need of protection staying at the orphanages but also undertook the responsibilities of the educational services of the children in need of special education. These studies were carried out under the presidency of Remzi Pamir, later on sixth branch was divided into two different branches after Orhan Çaplı returned to Turkey during the 1957-58 academic year, having completed his studies in the special education field in America. In this way, a special educational branch under the body of Ministry of Education was established for the first time. Orhan Çaplı was appointed as the first director of this branch (Danišoğlu, 1991).

THE PRESENT SITUATION CONCERNING THE EDUCATION OF THE HEARING-IMPAIRED CHILDREN

Article 42 of the Constitution of the Republic of Turkey states that “Nobody shall be deprived from the right to have education and training. Government shall take necessary precautions for the ones in need of special education to make them useful human beings for their society.” In addition, the article 61 of the Constitution states that” The government shall take necessary precautions for the protection of the disabled and their adaptation to the social life.” (The Constitution of the Turkish Republic dated 9 November 1998 and numbered 2709)

The basic article of Turkish Constitution stating that “Each Turkish citizens shall have the right to basic education” constitutes the fundamental of the Code for Children in need of Special Education dated 1983 and numbered 2916 which today regulates the social rights and educational program for the hearing-impaired. This code aims to implement the regulations essential for the education of the children in need of special education according to the basic principles of Turkish National Education and to help them have jobs and professions and to provide them the necessary education in order to help them adapt themselves to their environments and society. With a view to reaching these aims, the Regulation for Guidance and Research Centre and Special Educational Schools was put into action.

Article 3 of the Code for Children in need of Special Education states that children between the ages of 4-8 who can not benefit from the ongoing educational services due to their physical, physiological, social and medical differences shall constitute the children in need of special education. However, this definition does not cover the hearing-impaired children between the ages of 0-4, which is a very critical period in proper language acquisition.

The article 12 of this code envisages that families, individuals and associations in question shall report the children in need of special education to the institutions in charge. However, it is observed that this article is not implemented properly today (Commission Report on the Education of the Hearing-impaired Children, 1991, Ankara, p.1113)

Paragraph (a) of article 16 in the Regulation for Guidance and Research Centre, which was put into force in accordance with the code numbered, 2916 entitles institutions to conduct analysis among the physically, emotionality and sociality maladjusted children and place them in the special educational institutions, vocational training services and to provide them educational support (The Code and Regulations on the Special Education, Milli Eğitim Printing Office, 1986, p.32)

The government is entitled to provide education for the hearing-impaired in accordance with the article 42 of the constitution. At the same time, article 22 of the Basic Code for the National Education requires that the children between the ages of 6-14 shall have education. Article 8 of this code envisages that special precaution shall be taken in order to provide the necessary education for the children in need of special education (Basic Code for the National Education numbered 1739 and dated 24 June 1973 and the Official Gazette numbered 14574, p.8600).

The government is entitled to provide education for the hearing-impaired in accordance with the article 42 of the constitution. At the same time, article 22 of the Basic Code for the National Education requires that the children between the ages of 6-14 shall have education. Article 8 of this code envisages that special precaution shall be taken in order to provide the necessary education for the children in need of special education (Basic Code for the National Education numbered 1739 and dated 24 June 1973 and the Official Gazette numbered 14574, p.8600).

Along with these codes, article 4 of the code 2916 not only highlighted the importance of educating handicapped children in special institutions but also pointed out that by taking the necessary precautions the handicapped children whose situation is suitable for the normal schools shall have their education in these schools to which their peers attend.

In Turkey, it is not obligatory to get high school or university education because the codes on education limit the obligatory education age to 14. However, article 31 of the Basic Code for the National Education states, “The ones who finish high school or the like shall gain the right to apply to the higher education institutions.” According to this article, a hearing-impaired child who has finished high school or an equivalent school gains the right to further education. The hearing-impaired students who are successful in the university entrance examinations gain the right to have university education.
Article 42 of the Constitution of the Turkish Republic states that “Working is the right and duty of all the citizens.” This article covers the hearing-impaired individuals too. The articles gathered under the “General Principles of Special Education” entitle the Ministry of Education to provide continuous vocational training to children in need of special education. In addition to this code, the article 39 of the Apprenticeship and Vocational Training Code appointed the Ministry of Education to arrange courses for the individuals in need of special education to get ready for the working life.

It is important that hearing-impaired children are fitted with suitable hearing-aids. Articles 19 of the code “Children in need of Special Education” points out that the special educational materials to be used in the education and training of these children shall be supplied by the Ministry of Education. However this code does not include the provision of individual hearing aids which are very important for their education. Working families acquire these hearing aids through their social security agencies. Article 2 of the Social Insurance Association Code number 3279 states that all the expenses concerning the maintenance and repair of the equipments and prosthesis supplied to the handicapped children shall be funded by the Social Insurance Association (MEB, 2005). However, the rights of the civil servants insured by the Pension Funds are limited, and only small percentage of the cost of hearing aids is refunded. The hearing-impaired individuals not covered by any of these two agencies are deprived of such rights.

THE EDUCATION SYSTEM IN TURKEY
Following the foundation of the Turkish Republic, as in other fields, reforms were also undertaken in education. Under the law for the Unification of Education, which was enforced in 1924, all schools were annexed to the Ministry of Education. The Ministry of Education was charged with the task of implementing a contemporary mode of education for Turkish citizens. by opening primary and secondary schools and other institutes and arranging courses within the framework of the educational policies decided upon. Today the Ministry also meets the requirements of these institutions in the way of teachers and administrators and draws up the respective rules, regulations and programs. It also arranges educational programs for children of school age who are needy or require special care.

EDUCATIONAL INSTITUTIONS IN TURKEY
Pre-School Training
Compulsory education is 8 years, between the ages of 7-14. Pre-school training is not compulsory but for all infants, especially for the hearing-impaired infants, the first four years are crucial for their language acquisition.

Pre-School Training for Hearing-Impaired Children
According to the statistics of the Ministry of Education; covering the period up to 2003-2004 academic year, there are 14 pre-school classes in 8 of the hearing-impaired schools and 104 hearing-impaired children are educated in these schools (www.orgem.mep.gov.tr/OzelEgitim_dosyalar/dergiicin17042003.htm). Besides these pre-school classes there is only one pre-school which has 24 hearing-impaired students and 4 teachers. As you seen from these statistics the number of hearing impaired children in pre-school training is limited.

Primary School and Secondary School Education
These are national educational institutions, governed by the State to train and educate boys and girls through the compulsory 8-year education between the ages of 7-14. Primary school education is 5 years and secondary school education is 3-years. In recent years primary and secondary schools have been united the name of primary school education. Some of these schools provide special and auxiliary classes for children requiring special education.

Primary Schools and Secondary Schools for Hearing-Impaired Children
Compulsory primary education starts at the age of 7, and this is also true for the primary schools for the hearing impaired children. According to the curriculum, oral approach is used in these schools. As mentioned before, early education is crucial for acquiring fluent oral communication skills. Therefore the primary school starting age of 7 for the hearing impaired children is a big disadvantage for their language development. As a result this, most of the hearing impaired children leave school with a reduced level of reading, writing and oral communication skills.

In 2003-2004 academic year, there were 5756 students and 811 teachers in 48 hearing-impaired primary schools within the Ministry of Education system (www.orgem.mep.gov.tr/OzelEgitim_dosyalar/dergiicin17042003.htm).
General Lycees
3 year Lycees education is not compulsory and caters for the 15-17 age group. Main aim of Lycees education is to prepare students for higher education. Lycees graduates leave school with a good level of economic, social and cultural awareness combined with a developed sense of responsibility towards the community.

Because of the inherent communication and attained level of education problems of the hearing-impaired 15-17 year old students, their integration in the mainstream Lycees is limited.

Technical Lycees
These Lycees provide a 3 year vocational training. Their syllabus is a combination of mainstream Lycees science syllabus and a variety of technical subjects. Subjects such as computing, electronics, chemistry, technical drawing etc constitute the technical syllabus of these Lycees.

Hearing-impaired students who are mainstreaming in Lycees mostly choose technical Lycees but they experience the same problems that other hearing-impaired students do in their age group.

Technical Lycees for Hearing-Impaired Children
In 2003-2004 academic year, there were 1173 students enrolled in 14 hearing-impaired lycees within the Ministry of Education systems and 128 teachers were working in these schools (www.orgem.mep.gov.tr/OzelEgitim_dosyalar/dergiicin17042003.htm). Out of 266 hearing-impaired technical lycees graduates who took the Student Selection Examination, only 11 of them won places on 4-year university diploma courses and 12 students won places on 2 year certificate courses. Besides these, 47 students were granted direct entry to universities without going through the student selection procedure.

Main Streaming in Turkey
Special Education and Guidance Services provide back up to those hearing-impaired students who are continuing their education in main stream schools. During 2003-2004 academic year there were 1579 hearing-impaired students educated in these schools (www.orgem.mep.gov.tr/OzelEgitim_dosyalar/dergiicin17042003.htm).

The population of Turkey in 2002 was 70 million. 16 million, or approximately 23% of the population, were students in primary and secondary schools. According to the Ministry of Education statistics, out of 16 million students, 58,351 of them were students with disabilities. This is equivalent to 1% of the student population and well below the WHO estimate of people with disabilities (WHO,2005).

Higher Education
The purpose of higher education is to provide training for individuals based on contemporary teaching methods, to meet the needs of the nation and country in the fields of training and education, scientific research, press and consulting services.

All universities and schools of higher education are affiliated to the Higher Education Council established in 1981. The Council is an autonomous public juridical body with the authority and responsibility to administer the activities of all institutions of higher education. It annexes to itself the following: the Higher Supervisory Board, the Student Selection and Placement Centre and other sections related to planning, research, development, evaluation, budgets, investment and coordination.

In 1992 there were 54 universities with 396 faculties, 64 high schools, 174 professional high schools and 211 institutes all attached to the Higher Education Council. (www.columbia.edu/cultsaltr-info/edu. system.html).

Hearing-impaired teacher training programs are offered at the following universities:

1. Anadolu University
2. Ondokuz Mayis University
3. Karadeniz Technical University

Anadolu University
Anadolu University is one of the pioneer universities in education of hearing-impaired children and hearing-impaired teacher training programs. Hearing-Impaired children education program started in 1979 for the purpose of research and as a model school. Hearing-impaired teachers’ training program was opened at the Faculty of Education in 1981. Also an undergraduate college for hearing-impaired students was opened in 1993.
EDUCATION AND RESEARCH CENTRE FOR HEARING IMPAIRED CHILDREN (İÇEM)
This centre, abbreviated as İÇEM, was set up by the Anadolu University as a progressive auditory/oral educational program for hearing impaired children with an aim to be a model school of its kind. Starting in 1979 as a very small pre-school program, it has gradually developed into a fully comprehensive service, encompassing early diagnosis of deafness, hearing aid fitting and maintenance, cochlear implant pre and post assessment and programming, parent guidance, integration facilities and a special school with nursery, primary, secondary schools and general lycées departments leading to university entrance.

At present, two professionally trained audiologists, 43 teachers, 11 assistant teachers are full time members of staff. 134 hearing impaired and 37 hearing - a total of 171 students attend the school on a regular basis. The two aetiology clinics provide diagnostic service for referrals made from all parts of Turkey.

İÇEM, with all its clinics and departments is an institution on its own, but at the same time provide practicum experience for the students from the Faculty of Education who are being trained to become teachers of the hearing-impaired. İÇEM teaching staff members also lecture at the Faculty of Education on their 4-year teacher training program.

Short term, in-service training programs are run by the members of the Centre for teachers of the deaf employed by the Ministry of Education. İÇEM has also attracted visitors from abroad, mainly from Japan, Equator, and Singapore where schools wish to develop similar programs.

School for the Handicapped
This program was established in 1993. There are 150 deaf students enrolled at this school. Sign Language is not used within the university however students are free to communicate in sign language.

This two-year degree program is modified to accommodate deaf students who are allowed to complete the program in three or four years. There are currently four career choices: Computers, Ceramic Arts, Graphic Arts, and CAD.

School for the Handicapped started during 1993 academic year. The aim of the school is to offer special education for the handicapped in vocational programs and thus enabling them to become productive members of the community. The Department of Applied Fine Arts offers undergraduate programs in both ceramic arts and graphic arts. Department of Administrative Vocations and the Department of Architecture offer two-year degree programs in computer operator training and architectural drawing. These departments are equipped with the necessary technological aids to accommodate the educational needs of the hearing impaired.

Department of Administrative Vocations
Computer Technology and Programming
This program aims to prepare the students for future business life by equipping them with all the computer technology tools. All aspects of computer technology, organisational and business practices are taught in this program. Students are provided with the latest audio visual teaching aids, PC and MAC laboratories and access to the internet.

Department of Architecture
Department of Architecture offers an undergraduate program in architecture and a two-year degree program in architectural drawing. Program in architecture has been suspended since the 1999-2000 academic year.

Construction
In this program students are trained to become technical assistants capable of drawing architectural and constructional designs as well as electrical and mechanical system designs. They are also expected to be able to make model buildings and do their inspections based on the projects. Students are taught in drawing workshops using visual and technological materials. They are provided with Internet access and Computer Aided Drawing (CAD) software in computer laboratories.

Department of Applied Fine Arts
Ceramic Arts
In this program students are taught ceramic design, ceramic technology and industrial ceramic design. Besides these core topics students are also offered supplementary courses in History of Art, Theory and Methods of Ceramic Surface design etc. They are provided with Internet access and Computer Aided Drawing (CAD) software in computer laboratories.
Graphic Arts
Students in this program are taught desktop publishing, photography, printmaking, advertising and production techniques. Visual aids are used extensively in the applied courses taught in drawing studios, printmaking studios, logography studios and MAC laboratories. Students also have access to the Internet.

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KNOWLEDGE MANAGEMENT AND ONLINE COMMUNITIES OF PRACTICE IN TEACHER EDUCATION

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ABSTRACT
Research on teachers’ professional development is gaining popularity among educators since changes in society require teachers to improve their skills and knowledge.

Rather than transmitting information to teachers, knowledge sharing through emerging tacit knowledge among them has gained more importance. Because of new information and communication technologies, knowledge sharing among educators is becoming easier. This article examines the relationship among three important topics; teachers’ professional development, knowledge management and online communities of practice. Furthermore, some online learning communities of practice environments are introduced.

Keywords: communities of practice, knowledge management, teacher education, professional development

1. INTRODUCTION
All over the world establishing settings for communities of practice has become an important focus within teachers’ professional development projects, and it seems to an effective solution to provide lifelong learning opportunities for teachers. A community of practice can provide both tacit and explicit knowledge sharing opportunities among teachers. In this vein, teachers can produce useful documentation, tools, and procedures and share these documents with other novel teachers. Cagiltay, et al (2001) propose the use of virtual communities facilities in which teachers share their experiences and practices with other teachers to provide lifelong learning opportunities. According to Coffman (2004) who studying on to what extent K-12 teacher transfer lessons learned in a professional development module to effectively integrate technology in their classroom, online virtual communities definitely have a place in professional development for teachers.

There are some research studies on communities of practice in the world while in Turkey this is a very new concept. Therefore, in this article we want to take attention to online learning communities in teachers’ professional development. So, first of all the article begins with the history of teacher education. Then, theoretical framework of Communities of Practice (CoP) is discussed and finally some examples from both Turkey and abroad are presented.

2. HISTORY OF TEACHER EDUCATION AND LIFE- LONG LEARNING IN TEACHER EDUCATION
In Turkey, formal education composes pre-school education, primary education and secondary education. Services related to Pre-school education are given by kindergartens and foremost by the Ministry of National Education. Primary education is compulsory for all citizens, boys or girls between 6 to14, and is free of charge in public schools. Secondary education includes all of the general, vocational and technical education institutions that provide at least three years of education after primary school. There are currently 16,090,785 students in 5,612 schools at the levels of pre-primary, primary and secondary education. The number of teachers employed is 578,805 (MEB, 2001). The responsible institution arranging professional development for teachers is the Department of In-service Training under the Ministry of Education. This unit was known as “The Bureau of Teacher Training” in 1960s and later it was renamed as Department of In-Service Training in 1975. There are six institutions which provide in-service training and accommodation since 1982 for teachers from all over Turkey. These institutions are located in Ankara, Aksaray, Mersin, Rize, Van and Yalova. In-service training had a central structure. That is, only the Department of In-service Training was in charge of arranging all in-service courses. After that, as this department failed to meet teachers’ professional development needs, National Education Directorates in provinces were also given authorization to prepare and administrate in-service training programs locally. In 1980s, there have been teachers who had secondary education level. Therefore, the Ministry of National Education made complementary training compulsory to increase the quality of teachers. This complementary training was offered by distance education because of time limitation and the number of teachers. By cooperating with Anadolu University a 2-year higher education program was initiated in 1985-86 academic year. Within 4 years, 117,618 teachers participated in the programs. In 1990s, an undergraduate completion programs was initiated for teachers having 2 year higher education. Again, by distance education, teachers earned undergraduate degree. In 1992, laboratory school model required new skills for teachers since
this system emphasized student centered education and importance of technology in education. (Ozer, 2004). From 1995 to 2001, a new program was created by The Ministry of National Education for novel teachers. The duration of the program is 1-year. In this program, novel teachers were under the control of experienced teachers’ guidance. Since 1998, teachers who want to be a school administrator, educational administrator and primary school inspector have to accomplish a test and if they are successful they have to attend an in-service training program lasting 120- teaching hours. Additionally, teachers, administrators and assistant inspectors wanting to be promoted have to attend in-service training programs (Ozer, 2004). As it can be seen, the Ministry of National Education stipulates an in-service training program for promoting or to be appointment for a new administrator vacancy. According to Ministry of Education’s regulation, the aim of in-service training is

- Familiarize teachers coming from pre-service education with the regulations and rules of the Ministry of Education,
- To make teachers knowledgeable about the aim and principles of the Turkish national education,
- Make them competent in their profession,
- Introduce innovations in the field of education and help them gain necessary skills,
- To develop teachers’ understanding of professional competency,
- To promote teachers who are enthusiastic and talented,
- To provide supplementary education for people who have different background,
- To make sure every teacher understand application of fundamental principles and techniques,
- To support improvement of educational system.

In Turkey, teachers mainly get their professional knowledge during their university education and they have limited training opportunity after graduation. According to World Bank (2003), traditional education methods are ill suited to provide teachers with the skills they need (Table 1). New learning context implies a different role for teachers. Today, they need to learn new skills and become lifelong learners to keep up to date with new knowledge, pedagogical ideas, and technology. Lifelong learning “encompasses formal learning (schools, universities); non-formal learning (structured on the job learning); and informal learning (skills learned from family members or people in a community)” (p. vii).

### Table 1.
Differences between traditional learning and lifelong learning (Worldbank, 2003)

<table>
<thead>
<tr>
<th>Traditional learning</th>
<th>Lifelong learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teacher is the source of knowledge</td>
<td>Educator are guides to source of knowledge</td>
</tr>
<tr>
<td>Learners receive knowledge from the teacher</td>
<td>People learn by doing</td>
</tr>
<tr>
<td>Learners work by themselves</td>
<td>People learn in groups and from one other</td>
</tr>
<tr>
<td>Tests are given to prevent progress until students have completely mastered a set of skills and to ration access to further learning</td>
<td>Assessment is used to guide learning strategies and identify pathways for future learning</td>
</tr>
<tr>
<td>All learners do the same thing</td>
<td>Educators develop individualized learning plans</td>
</tr>
<tr>
<td>Teachers receive initial training plus ad hoc in-service training</td>
<td>Educators are lifelong learners. Initial training and ongoing professional development are linked.</td>
</tr>
<tr>
<td>“Good” learners are identified and permitted to continue their education</td>
<td>People have access to learning opportunities over a lifetime</td>
</tr>
</tbody>
</table>

It can be seen from the history of in-service training in Turkey that during to history there had been important changes in Turkish educational policies. All these changes has required new teacher training programs. Today, as a result of new curriculum change the educational system also faces with the need of a new teacher training. Therefore, teachers’ professional development has gained importance. In the following part, an alternative solution of online communities of practice environments for teachers’ professional training will be discussed.

### 3. COMMUNITIES OF PRACTICE

21st century has been called as “knowledge age”. In this age, how to access knowledge and ways of knowing are changing with the complexity of knowledge. So, the issues of knowledge management have been gaining more attention among researchers.

Before discussing the meaning of knowledge management and its connection with teacher education, it is important to discriminate the term of knowledge from information. Though these terms sometimes can be used interchangeable, essentially they have completely different meanings. First of all, Information is unprocessed...
knowledge and need to be processed by human beings to be able to become knowledge. We can exemplify information as unripe data in a survey. According to a dictionary (http://www.webster.com) knowledge is defined “the fact or condition of knowing something with familiarity gained through experience or association”. That is, knowledge interpreted the information. In Greek, knowledge was classified into 4 categories.

- **Know what**
- **Know why**
- **Know how**
- **Know who**

Know what is related to facts in the world. As mentioned above, it is close to information. Related to teacher education, learning theories which presenting descriptive information such as how learning occurs is an example of know what. Owing to this type of knowing teachers obtain information about what learning theories are. Know why and know how are more complex knowledge types than know what. Know why is related to principles and laws while know how is related to skills and ability to do something. In their daily life teachers know why they should measure their students. Further, know how is that teachers judge possible results of a new application for instruction. Lastly, know who refers to information about who know and who know what to do. This knowledge type is related to teachers knowing who they can consult when they encounter with a problem. (OECD, 2000).

In teacher education, educators are mainly interested in whether knowledge has gained or not. Therefore, it is important to understand the process of knowledge creation.

According to Polanyi (1966), There are 2 types of human knowledge, explicit (codified knowledge) or tacit. Polanyi makes difference among these knowledge types with these words “we can know more than we can tell (cited in Nonaka 1994, p.16). Tacit knowledge is a kind of knowledge that is hard to take a shape and transmit to other people. It has both cognitive and technical elements. Cognitive elements provide human beings to understand and perceive their world while technical elements are related to crafts and skills can be applied in specific context. Explicit knowledge is more simple knowledge type. These two dimensions of knowledge creation have an important role by interaction of people working in an organization. (Nonaka, 1994).

Knowledge management is a term originally coming from business and there are lots of web sites and books about it. However, there isn’t any constant definition of it. Barron (2000) defined knowledge management by citing from a conference board as “an integrated, systematic approach to identifying, managing, and sharing all of an enterprise’s information assets, including databases, documents, policies, and procedures, as well as previously unarticulated expertise and experience held by individual workers (p.3)”. In education, knowledge management has been placed in teachers’ professional developments. A novel teacher as a worker is appointed a school (an organization) after graduation and she/he begins to manage explicit and tacit knowledge in his/her school. That is, teachers learn their profession in practice by communicating with their peers. So, in professional development terms, schools are organizations and teachers are workers of this organization.

Investigated the ways of obtaining knowledge in schools, teachers obtain explicit knowledge by reading books, handouts, regulations, etc and they construct tacit knowledge by imitating, observing, or chatting in a social environment. (Brown & Duguid, 1991). Therefore, it is clear that socialization has a critical role to obtain tacit knowledge. In that point, theoretical framework of communities of practice based on situated theories provides in detailed knowledge to understand how learning is achieved in social environments. Brown and Duguid (2000) said that “Only by engaging in work and talking about the work from inside the practice, one can learn to be a competent practitioner. Practice is an effective teacher and community of practice is an ideal learning environment” (cited in Schlager & Fusco, 2003, p. 203).

First of all, it is important to explain place of online environment for knowledge management. With developing information technologies, online environments allow user to communicate in an interactive environment, synchronously or asynchronously. Therefore, online environments have been popular knowledge management places with portals including interactivity.

Before focusing on communities of practice, it is better to introduce some terms to describe new forms of this social learning. These are learning communities, communities of learners, learning circles, learning organizations, knowledge communities, communities of practice, professional community. (Riel & Polin, 2004). These terms are used interchangeably by some although they have slightly different meaning. That is, communities of practice having different aspect of collaborative learning is only one of these terms describing
social learning. In terms of online environments, Riel and Polin (2002) describe 3 different but sometimes overlapping types of learning communities to provide a common language for understanding the different forms of social organizations. These are task based, knowledge based, and practice based learning communities. They examined the types of learning communities according to their membership features, task features, participation structures, and reproduction and growth mechanism (Figure 1).

![Figure 1. Types of learning communities (Riel & Polin, 2004, p.40)](image)

Firstly, task based learning community aims to produce a product or outcome and their members know each other. These are generally temporary groups whose members try to accomplish well-specified tasks. A small group’s interaction occurs among members of the group. Secondly, knowledge based learning communities. The aim of this type of learning communities is to compose knowledge based on a specific area. Members of it may or may not know each other personally. There is a long-term commitment to construct knowledge base. Thirdly, practice based learning community differs from task based community mainly by voluntary participation. There is a shared activity among members of the community to produce knowledge. Tacit knowledge is shared among members.

While practice-based communities are described as one type of learning communities by Riel and Polin (2004), it is used interchangeably with learning communities. The term “Community of Practice” was coined by Lave and Wenger (1991) in their discussion of the social nature of learning. The basic argument made by Jean Lave and Etienne Wenger is that communities of practice are everywhere and that we are generally involved in a number of them - whether that is at work, school, home, or in our civic and leisure interests. In some groups we are core members, in others we are more at the margins (Wenger, 1998). Wenger (2002) describes the Communities of Practice as

> Groups of people who share a concern, a set of problems, or a passion, about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis (p.4)

Barab, Makinster and Scheckler (2004) define CoP as A persistent, sustained social network of individuals who share and develop an overlapping knowledge base, set of beliefs, values, history, and experience focused on a common practice an/or mutual enterprise (p.55)

Barab and Duffy (2001) define characteristics of community of practice as 1) common cultural and historical heritage, 2) interdependent system, and 3) reproduction cycle. They seem that these characteristics are requisites for communities of practice (p.36) as can be seen in Table 2. Barab, Makinster and Scheckler (2004) add new characteristics on them; 4) a common practice and mutual enterprise, 5) opportunities for interactions and participation, 6) meaningful relationships, 7) respect for diverse perspectives and minority views. Indeed, many of these ideas are based on the works of Wenger (1998 and 2001).
Table 2. Characteristic of a community (Barab & Duffy, 2000, p. 37)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Cultural and Historical Heritage</td>
<td>Communities go beyond the simple coming together for particular moment in response to a specific need. Successful communities have a common cultural and historical heritage that partially captures the socially negotiated meanings. This includes shared goals, meanings, and practices. However, unlike the social negotiation of practice fields that primarily occur on the fly, in communities of practice new members inherit much of these goals, meanings, and practices from previous community members’ experiences in which they were hypothesized, tested, and socially agreed on.</td>
</tr>
<tr>
<td>Interdependent System</td>
<td>Individuals are a part of something larger as they work within the context and become interconnected to the community, which is also a part of something larger (the society through which it has meaning or value). This helps provide a sense of shared purpose, as well as an identity, for the individual and the larger community.</td>
</tr>
<tr>
<td>Reproduction Cycle</td>
<td>It is important that communities have the ability to reproduce as new members engage in mature practice with near peers and exemplars of mature practice. Overtime, these newcomers come to embody the communal practice (and rituals) and may even replace old timers.</td>
</tr>
</tbody>
</table>

Recently, there has been increasing number of research studies on online communities of practice environments. They focus on dynamics of CoP. One of the studies aims to investigate challenges in development of an online community of practice for mathematics and science teachers. To it, indeed, designing for virtual communities involves balancing and leveraging complex dualities from the “inside” rather than applying some set of design principles from the “outside.” (Barab, Makinster & Scheckler, 2004). In another study, five design dualities stated by the researcher during the design of an online communities of practice environment. These dualities, purpose, boundaries, social, usability and design emerged and characterized the interactions between teachers and the site designers (Baek & Barab, 2005). There are also some research studies on pre-service teacher education. One of them focuses on a model of delivery of professional experience courses whose purpose was to assist the development of a reflective approach in pre-service teachers. The researcher evaluated that the model of the course is a substantial teaching experience in a secondary school (Sim, 2006).

4. ONLINE COMMUNITIES OF PRACTICE EXAMPLES

With the development of new Information and Communication Technologies, the idea of using them in the establishment of communities of practice for teachers’ professional development has gained more importance in instructional technology. As a result of this, many online communities of practice environments have emerged. Some well known examples are Harvard’s Education with New Technologies1, SRI International’s Tapped In2, Learning Circles3, The Math Forum4 and Indiana University’s Inquiry Learning Forum (ILF)5. Middle East Technical University’s Professional Development Circle (PDC) is another example from Turkey. In this part of the paper, these online communities are introduced.

Harvard’s Education with New Technologies is an online learning community which aims to help educators how they effectively integrate new technologies in their classroom. It composes of mainly 5 parts. Learning center is one of the places in which the participants learn more about the use of new technologies. Workshop part includes tools to support their use of new technologies. Furthermore, meeting hall is a place the participants talk with their colleagues and library part includes resources related to improving education with new technologies. Final part is gallery that the participants can see examples of classroom practice using new technologies.

Tapped In is a web-based learning environment created by SRI International to transform teachers’ professional development into social learning environment by professional development providers and educators. Tapped In enables providers to offer high-quality online professional development experiences and support more teachers in a cost-effective way. Through Tapped In, educators can extend their professional growth beyond courses or workshops the online tools, resources, colleagues, and support they need to implement effective, classroom-centered learning activities.

1 Harward’s Education with New Technologies web site: http://learnweb.harvard.edu/ent/home/index.cfm
2 Tapped in website: http://tappedin.org
3 Learning cycle web site: http://www.iearn.org/circles
4 MathForum website: www.mathforum.org
5 Inquiry Learning Forum web site http://ilf.crlt.indiana.edu/
1 Professional Development Circle web site http://mgc.metu.edu
Learning Circles are highly interactive, project-based partnerships among a small number of schools located throughout the world. To join iEARN Learning Circles, you must be complete an iEARN Learning Circle placement form before the session. The aim of this learning environment is to produce powerful student projects with the partnership of different schools on the world.

The Math Forum is an online place for mathematics educators. It aims to provide resources, materials, activities, interactions among its members. It allows enriching mathematic teaching and learning.

The Inquiry Learning Forum (ILF) is an online community created by Indiana University for K-12 teachers and administrators, pre-service teachers, and university teacher educators. Their aims are to work together to share and improve learner-centered classrooms. The forum was designed for Indiana math and science teachers. It has resources available for all grades and content areas.

Professional Development Circle (Mesleki Gelisim Cemberi) is a web based learning environment created by Middle East Technical University for K-12 mathematics teachers, teacher candidates and academicians who want to work together, to share their knowledge and to improve their skills related to their profession. The PDC is designed especially for people interested in mathematics education. According to Riel and Polin’s classification, the nature of this learning community changes depending on how it is used. Turkish mathematics educators can use it to support their school practice course or to compose a community among different university teacher candidates. That is, it can be used both as a task based learning community and knowledge based learning community. Furthermore, PDC took attention of teachers in practice. It has 211 members, recently. PDC have a way of being practice based learning community. There are monthly discussions in PDC by the electronic list. The discussion topic is selected among hot topics in mathematics education such as drama in geometry education, fractions or students’ attitudes toward mathematics. Within the PDC, the participants can obtain or share their lesson plans, watch video examples of expert or novel teachers discuss them, engage in online discussions and communicate with other members through the electronic list (Figure 2).

The PDC portal has four main parts. These are library, videos, communication and forum. Any instructor authenticated by the system can compose different classes for his/her lesson. Library section of the portal includes materials related to math education. New Turkish mathematics curriculum, academic papers, electronic materials, mathematics software, lesson plans and activities for K12 are located in the library. Materials are provided by academicians, teachers and other participants. In video section of the portal, the members can watch other teachers’ real classroom environments. The participants can discuss about these videos and lesson plans. Communication section lets the members to communicate with other members of the portal. Finally, forum section includes some discussion topics both related to practical experience and videos of the portal.

![Figure 2. Home page of the PDC](image-url)
5. CONCLUSION
Online settings as professional development environments seem a promising solution for teachers when the number of teachers and the lack of professional development opportunities are taken into consideration. Such settings have an advantage of providing synchronous and asynchronous interaction opportunities for people. In global world, it also allows users to share their knowledge (tacit or explicit) or resources. These and other features of online settings have made them an important knowledge management tool.

As stated before, the number of online communities of practice environments for teachers is rapidly increasing even if some of them have dispersed. Some of them are planned and controlled online communities of practice environments (CoP) while most of them are the outcome of individual works made by teachers. This may be considered as a sign that the teachers who need to share their practice or to obtain materials or resources for their classes have created their own learning environments on the Internet. According to our PDC portal experience, some teachers are eager to learn new things and improve their field knowledge. These teachers search information related to their profession on the Internet and as soon as they find an online community related to their interest area they join it. If they get what they need from such resources, this affects the length of teachers’ community membership period.

Although there are some researches studies on CoP which are introduced in this article, these studies do not provide complete picture on why CoPs disperse, why CoPs are established or which factors are important to take attention of teachers in the evolution of a community. Apart from these questions, there are still many questions left to be answered (Barab, Kling & Gray, 2004). The answer for these issues will give instructional designers valid CoP design principles. Since establishing a community is not as easy as the blink of an eye, it requires patience and a variety of strategies to be used in different times. In sum, CoP needs more research and in the following years, we may learn more about it.

6. REFERENCES


ONLINE PROFESSIONAL DEVELOPMENT FOR UNIVERSITY TEACHING IN TURKEY: A PROPOSAL

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ABSTRACT
The following article discusses the worldwide need for professional development in university teaching and the kinds of initiative that are being introduced in some countries. It examines the case for adopting such measures in the Turkish higher education system to ensure quality in all forms of teaching and learning, both on-campus and off-campus. It also considers the barriers to achieving systemic professional development for university teaching and suggests that the solution could lie in professional development via the internet/web and encouraging and supporting an online professional development community.

Keywords: professional development – university teaching and learning – online professional development – online learning community

PROFESSIONAL DEVELOPMENT FOR UNIVERSITY TEACHING – AN INTERNATIONAL OVERVIEW
Before considering professional development issues in Turkish universities, it may be useful to consider the worldwide developments that are occurring as a consequence of changing expectations of universities and faculty.

With the exponential expansion of higher education, faculty are expected to teach larger classes and students from non-traditional backgrounds with a wide range of motivations and abilities. Governments, employers and students expect faculty to be more accountable for quality in teaching and learning and seek improvements in completion rates and grades. In some institutions, teaching portfolios are required for appointment and promotion. In some countries, universities are also being audited and then ranked, in part in according to their teaching quality. Universities are expected to provide different kinds of degree pathways to provide lifelong learning for adult learners. New understandings of human cognition and social-constructivist approaches to adult learning (Vygotsky, 1978; Slavin, 1996) are leading to a greater emphasis on learners assuming greater responsibility for their own learning and case-based, collaborative learning in which learners engage in problem-solving and open dialogue (Hausfather, 1996). In such learning contexts, faculty are expected to change from being 'instructors' to providing guidance for the learners, acting as 'resource specialists' and 'response specialists'. Faculty are also expected to embrace new forms of educational delivery such as open, distance, blended, and work-based learning and master the latest tools and methodologies of information and communications technology. And all of this is expected to occur without commensurate increases in funding and in most cases, adequate training provision.

Murray (1999) suggests that to be effective, faculty development needs to have institutional support, be formalized, structured and goal-oriented, link faculty development and recognition and reward, promote a sense of ownership among faculty and evidence the fact that quality teaching is valued by the senior managers. Steinert (2000) suggests that professional development needs to relate to the institutional context and culture, be concerned with overcoming common problems, employ diverse strategies and incorporate the principles and theory of adult learning.

The corporate world accepts that the better trained and qualified the employees, the more productive and efficient the organization and that those organizations that invest in maximizing their staffs’ capabilities are the best positioned and the longest lasting in the marketplace. In general, such thinking is slow to come to the universities. With some notable exceptions, there is little in the way of systemic professional development to help faculty tackle the challenges outlined above. All too often, as Dearn, Fraser & Ryan (2003) observe in Australian universities, faculty are neither trained nor qualified to do what they mostly do — teach. Ironically, the very persons who accredit graduates to engage in professional practice have no formal training or accreditation for their own practice in this area.

Some universities have established centralized professional development, acknowledging the value of a high profile one-stop shop of educational and technology expertise, services and resources that symbolizes the institution's commitment to change (see for example, Latchem & Moran, 1998). Others have opted for a devolved model – arguing that professional development needs to be responsive to, and embedded in, the
specific disciplines, cultures and operations of the schools/departments. Many more institutions have ignored the issue, often on economic grounds. Even in the best of institutions, time, resources and money for professional development are limited and all too often, the workshops and other training events prove to be ineffectual. And there is little evidence of rigorous self-reflective practice or research informing teaching. The majority of staff – including the enormous and ever-increasing number of sessional staff – are unwilling to grant time and effort to learning about the practice and theory of university teaching. Having to be largely self-reliant, they often revert to the face-to-face teaching practices of yesteryear that they themselves were exposed to.

There is clearly need for universal, systemic and formal and informal professional development within the universities. At India’s Indira Gandhi National Open University (IGNOU), Koul and Murugan (1989) established that professional development was essential for three groups:

- **Policy-makers, planners and administrators** needed to learn about managing the academic, organizational and administrative aspects of teaching and learning.
- **Academic staff** needed to learn about developing and delivering courses and programs and supporting student learning.
- **Non-academic and technical staff** needed to be guided in dovetailing their expertise with the teaching and learning requirements.

It was also found that professional development was needed in three forms at IGNOU:

- **Short-term orientation** to meet the immediate needs of teaching staff, policy-makers and planners.
- **Medium-term training** ranging from basic principles and operations to advanced levels and special themes.
- **Long-term human resource development** based upon perceptions of future needs.

Introducing distance education into Institut Teknologi MARA (ITM), Malaysia, Abdullah (1998) identified three categories of staff need. Some teachers had difficulty understanding the new concepts and requirements. These could be helped through workshops. Others were concerned about their lack of knowledge and skills in course and materials development. Here attachment to course teams was found to be more appropriate. Others had difficulty in dealing with ITM’s off-campus mature-aged learners. Here student survey findings were used to help these staff recognize the positive aspects of these learners, the circumstances under which they were learning, and how they might be helped in their studies.

These findings indicate that far more is needed that once-off, occasional training sessions without any follow-up to help lecturers implement and evaluate the new approaches that are being advocated. Latchem & Lockwood (1998) suggest that professional development requires a multi-modal approach involving:

- Centrally-provided workshops and seminars.
- Training, mentoring and support at the school/department level.
- Self-study/online learning.
- Individual and collaborative action research and reflective practice.
- Showcasing best practice.
- Face-to-face and online communities of practice.
- Sabbaticals, secondments, exchanges and shadowing.
- Presentations by visiting experts.
- Formal study.
- Participation in off-campus conferences and in-house teaching and learning forums.

Reviewing the state of professional development in Australian higher education, Dearn, Fraser & Ryan (2003) recommended that:

- All staff new to university teaching – including all sessional staff - should be required to complete a formal preparation program in university teaching and/or present a portfolio evidencing their teaching competences as part of their probation requirements.
- The minimum standard required for professional practice as a university teacher should be a Graduate Certificate in Higher Education, accredited at a national level with a new body, the Australian University Teaching Quality Council, comprising practitioners, student representatives and industrial bodies, as the mechanism for benchmarking, peer review and quality assurance.
Formal teaching qualifications/portfolios should be portable and flexible in curriculum and delivery to allow for the needs and characteristics of different institutions and disciplines.

Preparation programs for sessional teaching staff should comprise components of the Graduate Certificate of Higher Education so that those part-timers wishing to gain formal teaching qualifications could do so.

There should be comprehensive ongoing professional development programs.

Universities should either provide, or facilitate access to, further formal studies in higher education teaching, building on the Graduate Certificate...

Universities should be specifically funded (from a Teaching Quality Fund) for the time release and other resources needed for such development programs.

There should be encouragement for schemes such as the Fellowships of the Higher Education, Research and Development Society of Australia (HERDSA) which are granted to individuals demonstrating excellence in their teaching.

The UK has gone further in advancing the higher education teaching and professional development agenda by establishing the Higher Education Academy (http://www.heacademy.ac.uk/) whose mission is to help institutions, discipline groups and all staff to provide the best possible learning experience for their students. It does this by:

- Leading, supporting and informing the professional development and recognition of staff in higher education.
- Providing an authoritative and independent voice on policies that influence the student learning experience.
- Improving the standing and recognition of higher education professionals by maintaining a register of accredited practitioners.
- Accrediting higher education institutions' professional development programs in teaching and learning.

PROFESSIONAL DEVELOPMENT FOR UNIVERSITY TEACHING IN TURKEY

As an emerging country aspiring to be a member of the EU, Turkey needs to achieve best practice in its university teaching and learning and faculty need help in improving their teaching, research and management abilities, adapting to new technology and coping with the changing work conditions. There is clearly need for professional development for all faculty, regardless of rank, location or personal circumstances. However, it may be some time before Turkish faculty are able to take advantage of the full range of approaches described in the previous section. Professional development for faculty is a novel concept in Turkey universities where, as Aydin (2003) observes, human resource development receives a low priority. Very few lecturers – save those in the faculties of education – have undertaken formal training in teaching and learning and the only academic development system that currently operates uses a master-apprentice model and applies only to research assistants. These research assistants – who represent 49% of the 54,823 faculty in the Turkish higher education system - enter the system under the tutelage of more senior members of faculty, most of whose schooling took place many years earlier. The only compulsory training that the Higher Education Council (Yuksek Oğretim Kurulu or YOK) requires all doctoral students to undergo – save those in education - are two short non-credit courses in planning and evaluating instruction and development and learning offered by the educational sciences institutes in their universities (Odabaşi, 2005). There has been no formal evaluation of these courses but anecdotal evidence suggests that the doctoral students are dissatisfied with these mandatory courses (Aydin, 2003). A recent review of the needs of research assistants in Turkish educational faculties in Turkey shows that they are highly desirous of training professional development and personal development, instructional development and institutional development (Kabakchi, 2005). After receiving their PhDs, the graduate assistants immediately embark on teaching, mainly learning through trial and error and observing faculty members. As assistant professors they receive no further training in teaching and their portfolios are solely concerned with research and publishing.

Such a system clearly falls short of what is needed to ensure quality and achieve the paradigm shifts needed to bring teaching and learning in Turkish universities in line with the highest international standards. Not surprisingly, many faculty do not regard teaching as seriously as they should. However, there is evidence to suggest that some Turkish faculty are aware of the need for professional development. A small-scale study at Anadolu University (Odabasi, 2003) showed that a number of faculty would be interested in learning about how to teach more effectively and make more effective use of technology and felt that professional development should be available on a regular basis to all teaching staff. Their preferred modes of learning were through workshops and seminars and from other faculty with proven expertise. They also saw need for these activities to be provided through a faculty development centre.

In an earlier study in Turkish universities, Odabaşi (2000) found that faculty acknowledged the increasing availability of information and communications technology, the growing interest of the students its applications...
and its potential to enhance teaching and learning. It was shown that they were currently more familiar with such traditional technologies as video, radio and film and that their use of the newer technology tended to be limited to such traditional functions as preparing course, presentation and examination and materials. They therefore indicated that they would welcome in-service training and time to help them harness the new technology to new ways of teaching and learning.

Professionalizing faculty’s teaching role, providing systemic and universal professional development programs, and linking these to recognition and reward systems are clearly agendas that need to be addressed by YOK and the universities. However, such changes would have major political and economic implications and advancing and gaining acceptance of these ideas within the Turkish higher education system cannot be expected to occur overnight. It is equally unrealistic to expect professional development centres to be created in all universities, not least because of the difficulty of finding faculty with the necessary experience and expertise to run these centres. Also, time is a precious commodity, which makes the provision of face-to-face training for everyone an impossibility. However, one strategy which can be immediately applied, and has been successfully adopted in US, UK, Australian and other universities, is the provision of professional development through self-study materials and collaborative learning via the internet/web, supported by tutoring and mentoring, and through this, the fostering of an online professional development community.

One Turkish university that has explored such online professional development is Anadolu University (Aydin, C.H., 2003; Kuzu & Odabaş, 2004; and Kabakoğlu & Odabaş, 2004). In 1999-2000, the College of Education initiated a two-week, eight hours a day, face-to-face training program to help assistant professors improve their knowledge and skills in course design, uses of educational media, assessment and evaluation and academic counselling. In the event, the full-time attendance requirement and condensed nature of the course caused the participants to refuse to join any future activities. In 1999-2000, the Educational Communications and Technology Centre or Eğitim İletişimi ve Teknolojisi Birimi (EİT) and College of Education at Anadolu decided to trial a WebCT-based faculty development program to see whether this might prove more effective. Opportunities for asynchronous online study were provided through:

- An information desk – featuring online articles about different aspects of university teaching and links to online resources.
- A development program – short-term online courses for faculty members and in particular, assistant professors.
- An online learning community – enabling all faculty members to share experiences, ideas and resources.

The second of these components, the development program, was launched in 2003-2004. Through a series of one-week modules and a mix of research assignments, reflection and application, the staff learned about the changes in university teaching, presentational technology in the classroom, and educational applications of the internet. The modules were so designed as to encourage and support three types of interaction - participant-participant, participant-facilitator and participant-content and the tools for these included email, forum, chat and announcements.

Participation was voluntary but the courses were certificated and the certificates were acceptable for academic promotion. Significantly, although this program was conceived as an in-house initiative, applications were received from other universities and private institutions, indicating interest in this form of professional development. In the event, the courses were only made available to Anadolu staff but in time they could be opened up to other institutions.

In evaluating the program, it was found that the time commitment and workload factors weighed heavily on the participants’ willingness to enrol in and continue with this form of professional development. It was found that some face-to-face elements would have been desirable as well as more frequent social interaction online. It was concluded that rather than making such programs available at a specific time in the university calendar, a ‘kanban’ approach wherein each faculty member could access advice and information ‘just in time’ for their needs might be more appropriate. Promoting the online program was also found to be problematic. It was published on the Anadolu University website but the assumption that faculty members regularly checked out this website proved to be ill-based.

PROPOSALS FOR AN ONLINE PROFESSIONAL DEVELOPMENT SYSTEM AND CREATION OF AN ONLINE LEARNING COMMUNITY

What is proposed below is an online professional development system which uses the multimedia and interactive capacities of the Internet/Web, CDs and DVDs and is designed to:
• Improve the quality of university teaching and learning in Turkey
• Extend the use of technology in teaching and learning.
• Provide information, advice and training in easily-digested modular form.
• Provide a flexible learning environment that is responsive to faculty members’ needs.
• Encourage a network of committed staff across the Turkish higher education system who will share experiences, opinions, ideas and findings, learn collaboratively and support the resolution of commonly experienced problems.

This system would give a high profile to professional development and the national commitment to access, equity and new forms of delivery. It would also familiarize staff with the new technologies and methodologies and their benefits. All faculty members, in all regions, at all institutions and at all times, would be able to receive ‘just in time, just for me and just for now’ information and training material of a uniform standard that is easily updatable. Faculty would be enabled to assume greater responsibility for their own personal/professional development. They could use the Internet to interact and collaborate with their peers within other institutions and even internationally, thus experiencing the kinds of social-constructivist learning they could then introduce into their own teaching. In the longer term, such a system could be used to provide formal study in higher education teaching and learning, equitably and flexibly across the entire Turkish sector.

There would be three main components to the system:

ANNOUNCEMENTS
• A homepage
• A training programs/resources index
• A noticeboard
• A newsletter

INFORMATION AND TRAINING MATERIALS
• Information and training resources developed by Turkish faculty
• PowerPoint presentations, lecture transcripts and audio/video recordings of presentations by visiting experts
• Examples of courses and courseware
• Links to other professional development resources on the internet
• Frequently asked questions (FAQs) and answers

COMMUNICATIONS
• Email
• Asynchronous conferencing tools
• Asynchronous collaboration tools
• Chat/discussion boards
• Videoconferencing and audioconferencing
• A Help Desk
• Forum

As far as the content is concerned, the topics covered must ultimately be determined by the needs and interests of Turkish faculty. However, given the experience in other countries, it is anticipated that they would include:

• An introduction to the theory and practice of university teaching and learning
• Learners and their learning
• Curriculum and course design
• Lecturing
• Conducting tutorials
• Laboratory, practical and fieldwork studies
• Improving students’ writing skills
• Student assessment
• Postgraduate teaching
• Open and distance learning
• Information and communications technology
• Materials design and development
• Learner support
• Copyright and plagiarism
• Researching higher education teaching and learning
• Change management

Turkish faculty could be encouraged to identify or create materials that could be added to this website. There are also excellent, freely accessible, professional development materials on the web. There could therefore be links to such Australian sources as the EdNA online database of web-based resources for teaching and learning (http://www.edna.edu.au/edna/) and Flinders University’s Teaching for Learning materials (http://adminwww.flinders.edu.au/teach/t4l/cour_des/index.htm) and in the UK, the London Guildhall University’s DeLiberations (http://www.city.londonmet.ac.uk/deliberations/home.html), a resource for managers and faculty, with material arranged by discipline and educational issue, and the wealth of material available through the Commonwealth of Learning on developing, delivering, managing, researching and evaluating open and distance learning courses and programs (http://www.col.org). There could also be links to free online journals such as the International Research Review of Distance Learning (www.irrodl.org) and the Turkish Online Journal of Distance Education (TOJDE) (http://tojde.anadolu.edu.tr/tojde).

The majority of the materials and interactions are likely to be in the form of text, but technically, it would also be possible to include digital audio and digital TV components where these are appropriate.

CONCLUSION

The article has shown that there is great need for professional development to help faculty improve the quality of teaching and learning in Turkish universities and to ensure that this is up to world standards. It has also shown that there is currently little systemic provision of such activities and that the majority of faculty lack formal training or qualifications in teaching or education.

Given the methodologies and technologies of open and distance learning, it is possible to provide professional development online or via CDs or DVDs for those without online access, albeit with some face-to-face elements of training. The learning can be interactive, it can combine self-study and collaborative work, and the materials can be developed in the Turkish universities and adopted or adapted from overseas.

The costs of setting up and maintaining such an online system would not be excessive. If YOK could be persuaded to invest in it, there would be enormous educational and cost benefits.

The system would require a part-time co-ordinator and a management committee comprising Turkish faculty representatives committed to improving the quality or teaching and learning. There would also be need for a full-time research assistant who would be responsible for organizing the web-based content, chat/conferencing and other features. There would also be need for technical support for the website. Given Anadolu University’s extensive experience in providing open and distance education, moving into e-learning and developing online professional development and range of the technical facilities and support persons it can bring to these tasks, this institution may be an appropriate base for this initiative. However, this is a matter requiring further discussion and in any case, in the establishment and day-to-day operations, it is important that the Turkish higher education community has strong sense of ownership in system. The success of such an enterprise stands or falls by the commitment and inputs of Turkish faculty.

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PRESERVICE COMPUTER TEACHERS AS HYPERMEDIA DESIGNERS: THE IMPACT OF HYPERMEDIA AUTHORING ON KNOWLEDGE ACQUISITION AND RETENTION

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ABSTRACT
This study aims to assess the impact of hypermedia designing as a cognitive tool on knowledge acquisition and retention in comparison to traditional instruction. A pretest-posttest control group design was used. The study included 48 second-year preservice computer teachers who enrolled in “Instructional Technology and Material Preparation” course at one of the universities in Turkey. The subjects were assigned to experimental and control groups through “matched-pair technique.” Both groups were given a pretest to measure their prior achievement level in “Instructional Technology & Material Preparation” course content. While the control group was exposed to traditional instruction, the experimental group developed hypermedia on the course content in a constructivist learning context for 14 weeks. A posttest was given at the end of the treatment, and a retention test was given eight weeks after the treatment to both groups. The results showed that the use of hypermedia as a cognitive tool resulted in similar level of student achievement as traditional instruction.

Keywords: Hypermedia, Cognitive tools, Computer teachers

INTRODUCTION
Computers and other related technology systems such as multimedia/hypermedia, World Wide Web and virtual reality are used in the field of education through a variety of approaches. Revees (1999a) examines these approaches in two categories. In the first, students learn from interactive learning systems (computer-based instruction, traditional conception of use of computers) whereas in the second, students learn with interactive learning systems (cognitive tools). In the from approach, the content is encoded in the software programs, and it is assumed that communicating with this content, students will learn it. In the with approach, interactive tools are used by students as cognitive tools to analyze, access, interpret, organize, and represent information. As a result of this interaction, cognitive tools are expected to promote critical thinking and higher order learning in students.

The computer technologies as cognitive tools represent a significant departure from traditional conceptions of technologies. In cognitive tools, information or solutions of problems are not encoded in the educational material to be learned, which are designed to transmit the knowledge to the learners effectively. With cognitive tools, learners function as designers and problem solvers in using the computers as tools for analyzing, accessing, interpreting and organizing their personal knowledge. In this process, computers become cognitive or mental tool helping learners’ thinking in performing the learning task (Jonassen, 2000; Kozma, 1992; Mayes, 1992; Reeves, 1999a; Toomey et al., 1995). Jonassen, Carr and Yueh (1998), and Reeves (1999b) state that when computers are used by learners to represent what they know, this procedure necessarily engages them in critical thinking and higher order learning about the content they are studying. In other words, they require students to think about what they know, and learn in different and meaningful ways.

Hypermedia interactive systems can be used in both to learn from and to learn with (cognitive tools) approaches. The literature points out that when students learn from hypermedia, multiple representational formats such as combination of text, video, graphics, pictures and animations in a content domain through multimedia contribute to students’ learning, self competence and motivation (Kafai, Ching and Marshall, 1997). However, learning from hypermedia is not problem free. For example, it may not be effective in supporting learning; learners may not always select the right link for effective learning; it may be inefficient if there is no guide; engagement and interactivity which is essential for learning may not be provided in an effective way; discovery learning may be questionable through browsing; and lastly disorientation and cognitive overload may create problems in learning through hypermedia (Mayes, 1993).

According to Jonassen and Reeves (1996), Jonassen (2000), and Dalgarno (2001), the use of hypermedia as a cognitive tool places students in the author’s seat so that they may construct their own understanding, rather than interpreting the teacher’s understanding of the environment, and they suggest that it is more efficient using hypermedia not as a source of knowledge to learn from but rather as a cognitive tool to construct and to learn.
with. They argue that knowledge acquisition in the design can be facilitated when learners are actively engaged in designing knowledge rather than interpreting and decoding it. Learners become designers when they focus on the purpose of acquiring information, hypermedia’s underlying structure, and using the arguments required by the subject matter to justify the design. Hypermedia can be a powerful tool for engaging and supporting these activities. Therefore, providing appropriate learning environments for learners to design and present their own understanding of the subject through designing hypermedia can be an effective learning experience (Reeves, 1999a). In addition, based on their research study, Kafai, Ching and Marshall (1997) indicate that designing and creating hypermedia is a complex task and most of the time requires collaboration and teamwork, and therefore using hypermedia as a cognitive tool promotes students’ collaboration and project management skills. Accordingly, Reeves (1999a) acknowledged that “using multimedia construction programs as cognitive tools engages many skills in learners such as: project management skills, research skills, organization and representation skills, presentation skills, and reflection skills” (paragraph 7).

Jonassen (1998) and Reeves (1999b) state that using technology as cognitive tool and learning with technology in effective and efficient ways require constructivist-learning context. “Constructivism is based on the fundamental assumption that learning is in the activity of the learner. Learning is in the doing” (Duffy and Orrill, 2001, p.1). They add that the teacher’s role in this approach is to provide appropriate learning environments and guide and facilitate for learning. As it is cited in Oliver and Herrington (2003), Cunningham, Duffy and Knuth (1993) indicated that constructivist learning contexts provide experience, realistic contexts, social experience appreciation for multiple perspectives and multiple modes of representation, promote ownership, and encourage self-awareness in the knowledge formation process. Constructivist approach can be implemented best at advance level learning (Jonassen, Mayes and McAlessi, 1993). They indicate that in the learning process there are three main phases: introductory, advanced and expert learning phases.

Introductory learning occurs when learners have little directly transferable prior knowledge about a skill or content area. It represents the initial stages of schema assembly and integration. At advanced learning phase, learners acquire more advanced knowledge in order to solve more complex domain or context-dependent problems. Experts have more internally coherent and more richly interconnected knowledge structure (p. 1).

They declare that initial knowledge acquisition phase is better served by classical instructional design while constructivist learning environments are generally more viable for the second, advanced knowledge acquisition phase. Universities and secondary education institutions exist to foster advanced knowledge acquisition with a transition to constructivist approach that represents complexity and ill-structuredness as the learner acquires more knowledge (Jonassen, Mayes and McAlessi, 1993). It can be concluded from these statements that using hypermedia as a cognitive tool in a constructivist learning context can be facilitated better at upper secondary and university education levels.

The literature indicates that use of hypermedia as a cognitive tool is effective for critical thinking, higher order learning, project management skills, reflection skills, and presentation skills (Jonassen, 2000; Jonassen & Reeves, 1996; Lehrer, 1993; Mayes, 1993). Although numerous research studies offered evidence on the positive impact of hypermedia as cognitive tools on variety of students’ skills, the literature seems to be insufficient in explaining the impact of hypermedia on knowledge acquisition and retention when hypermedia is used as a cognitive tool in a constructivist learning context at teacher education level. Since teachers are the ones who integrate technology into teaching and learning process, how hypermedia as a cognitive tool contributes to knowledge acquisition and retention in educational process needs to be explored at teacher education level as well. Additionally, in Turkey, the Higher Education Council (HEC) redesigned the curricula of teacher-education institutions to improve their quality, and to integrate information and communication technology (ICT) into these programs in 1998 (HEC, 1998). However, integration of ICT into teacher education programs has been implemented mostly at computer literacy level. Therefore, this study aims to assess the effect of use of hypermedia when it is used as a cognitive tool in comparison to traditional classroom instruction on knowledge acquisition and retention of preservice computer teachers. The following research questions guided this study.

(1) Is there a significant mean difference in knowledge acquisition between the experimental group who used hypermedia as a cognitive tool and the control group who were exposed to traditional instruction?
(2) Is there a significant mean difference in knowledge retention between the experimental group who used hypermedia as a cognitive tool and the control group who were exposed to traditional instruction?
METHOD

Design
A pre-test/post-test control group design was used in this study. Control variables of the study were prior achievement, gender and type of high school the participants graduated from; the independent variable was the treatment (hypermedia learning environment vs. traditional instruction); the dependent variables were the post-test and retention test performance of the subjects. Below, the details on the participants, the instrument and the procedures of the study are presented.

Participants
The study design included a total of 48 second-year Computer Education & Instructional Technology Education students who enrolled in “Instructional Technology and Material Preparation” course at one of the universities in Turkey, and lasted 14 weeks (two hours a week). The students in the Department of Computer Education & Instructional Technology Education are trained to be computer teachers for K-12 schools and experts in the field of instructional technology. Majority of the students graduated from computer departments of vocational or technical high schools. The students had the basic knowledge in variety of computer applications and in designing hypermedia prior to the experiment. They were assigned to experimental and control groups through “matched-pair technique” based on gender, cumulative GPA scores and the types of high schools they graduated from. From each pair, one student was assigned to the experimental group, the other was assigned to the control group randomly. By using this technique, equal representation in terms of gender, prior achievement, and prior education in both control and experimental groups was established. In the beginning of the study, the experimental group included 28 (24 males and 4 females), and the control group included 28 (24 males and 4 females) subjects. The distribution of males and females in these groups represents closely the distribution by gender in the department. During the experiment, four students in the experimental group did not participate in the majority of the activities, therefore they, together with their pairs in the control group (total of eight students), were eliminated from the analysis of the data. As a result, 24 (20 males and 4 females) students in the control group, and 24 (20 males and 4 females) students in the experimental group participated in all phases of the study.

Data collection instrument
An achievement test was used to assess the students’ achievement on “instructional material development” subject before the experiment, after the experiment, and eight weeks after the experiment. The achievement test was developed by the researcher, and consisted of 44 multiple-choice questions on “instructional material development” subject. First, a table of specifications on the basis of learning objectives stated in the textbook Instructional Media and Technologies for Learning (Heinich, Molenda, Russell, & Smaldino, 2002) used in this course was constructed. Based on the table of specifications, the questions were written to establish the content validity of the test. So that lower and higher cognitive levels such as knowledge (recalling the learned subject), comprehension (understanding the meaning of the subject), application (using the learned subject in new situations) and analysis (understanding the underlying structure of the subject) were included in the achievement test. After the test was developed, two experts (a test construction specialist and a subject area specialist) assessed the test in terms of validity and relevance to the subject matter. Based on their suggestions the test was revised. After revisions, the test was piloted with a group of students (n=29) who had been taken the same course in the previous semester to check whether the items were clear and understood correctly. Afterwards, an item analysis was carried out on the test. The results of this analysis proved that one of the items in the test was too difficult for the subjects. Since the course content related to this specific item was new in the course and in the textbook used in the course, the item was not eliminated from the test. The Cronbach alpha reliability of the questionnaire was .78.

Procedures
The procedures and data analysis used in this study are presented in Table 1. At the beginning of the study, both experimental and control groups were given an achievement test to assess their prior achievement level in the course content.
Table 1: Data collection and analysis procedures

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pretest</th>
<th>Treatment</th>
<th>Posttest (given at the end of treatment)</th>
<th>Retention test (given 8 weeks after treatment)</th>
<th>Data analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (24 students)</td>
<td>Achievement test</td>
<td>Traditional classroom instruction (14 weeks)</td>
<td>Achievement test</td>
<td>Achievement test</td>
<td>Means, standard deviations, and t test.</td>
</tr>
<tr>
<td>Experimental (24 students)</td>
<td>Achievement test</td>
<td>Hypermedia as a cognitive tool (Hypermedia development by students on the course content, 14 weeks)</td>
<td>Achievement test</td>
<td>Achievement test</td>
<td>Means, standard deviations, and t test.</td>
</tr>
</tbody>
</table>

Then, students in the experimental group were informed of the procedures of the course that the course was going to precede in a constructivist context, and hypermedia was to be used as a cognitive tool. A constructivist learning environment in which students acted as designers of hypermedia learning environments was established to have learners work in groups through social interactions as suggested by Vygotsky (1978), and construct their own knowledge in the field of “instructional technology and material preparation.” To create constructivist learning environment, situated learning environment guidelines recommended by Herrington & Oliver (2000) were considered. By creating a hypermedia learning environment on the course content for preservice computer teachers, authentic context and activities were facilitated. Students had access to the expert knowledge through weekly discussions with the instructor on the hypermedia content and template. A reflective environment was created through writing weekly reflective journal on the hypermedia content, receiving feedback on these journals, and discussing within groups both the content and design of the hypermedia. Through out the process, the group members had variety of roles such as instructional designers, programmers, project managers and etc. Through out this collaborative process, the instructor provided guidance for the students.

Throughout the semester, the students in groups had to develop hypermedia as an instructional material in “instructional technology and material preparation” subject for other preservice teachers, and they covered most of the course content in that material. The instructor did not present the course content to the students didactically, but promoted a constructivist-learning context in which she facilitated, coached and guided. During the experiment, in order to guide the students effectively, predetermined stages, namely planning, content formation, template design, hypermedia development, evaluation, and presentation were followed by the students. In the beginning of the semester, the students in the experimental group performed planning activities. In planning they were requested to form their project groups for two to five students. In the groups, they determined the tasks they need to perform throughout the hypermedia construction process, negotiated each group member’s roles, and made task schedules to be followed in the hypermedia development process. As a result of their planning activities each group handed a group contract to the instructor. After planning, they started content formation of hypermedia learning environment. To determine the content of the hypermedia, the students wrote weekly reflective journals about the assigned subjects of the course content for about eight weeks, and received weekly feedback from the instructor on their journals. Based on the instructor’s feedback, the groups made some revisions on their hypermedia content. While preparing their journals they used the textbook, World Wide Web, assigned resources from the university library, and related materials from other courses. During this period, they also participated in group discussions and activities held in class. This process helped them investigate the subject area deeply and decide on which information to include in the hypermedia. Parallel to content formation process, they designed the templates of the hypermedia they were to develop. While developing their hypermedia learning environment template, each group’s template was discussed in class in terms of effective design principles, and each group had their classmates and instructor’s assessment of their template design. In this process they decide on the structure of the hypermedia, how to present information, how to link nodes. After they finished content formation and template design, by the end of the semester they developed the hypermedia learning environment. The groups used MS FrontPage, Java Scripts, Flash, PHP, and other similar tools to develop their hypermedia projects. Then they evaluated the hypermedia they developed to check if it is running properly without any problem, and made revisions. At the end of the semester they presented their hypermedia in class to share their projects with others.
The control group continued learning the “Instructional Technology and Material Preparation Course” content with regular classroom instruction mostly based on PowerPoint presentations supported by question-answer strategy (traditional instruction) while the experimental group developed hypermedia about the course content. The treatment continued 14 weeks. At the end of the treatment, the achievement test used as pre-test was given to the students in both groups as post-test. Eight weeks after the experiment, the same achievement test was given to both groups once again to measure the level of knowledge retention. The data collected through pretest, posttest and retention test were analyzed by descriptive and inferential statistics such as means, standard deviation and $t$-test.

**RESULTS**

**Pretest results**

Pretest results showed that in the beginning of the experiment the experimental group who used hypermedia as a cognitive tool had higher scores from the control group that was subjected to traditional classroom instruction ($M=15.04$ and $12.75$ respectively) (see Table 2). However, $t$-test results indicated that the difference in the pretest mean score was not statistically significant ($p>.05$).

| Table 2: Pretest mean score results of experimental and control groups |
|-----------------|-----------------|-----------------|
| **N** | **Mean** | **Std. Deviation** |
| Experimental Group | 24 | 15.0417 | 4.0269 |
| Control Group | 24 | 12.7500 | 4.3564 |

$t(46)=1.89$, $p=.065$

**Posttest results**

As it is presented in Table 3, posttest results showed that at the end of the experiment, students in the experimental group who were exposed to hypermedia as a cognitive tool scored higher than the students in the control group who participated in traditional classroom instruction ($M=36.83$ and $35.79$ respectively). However, $t$-test results indicated that the difference in the postest mean score was not statistically significant ($p>.05$), (see Table 3).

| Table 3: Posttest mean score results of experimental and control groups |
|-----------------|-----------------|-----------------|
| **N** | **Mean** | **Std. Deviation** |
| Experimental Group | 24 | 36.8333 | 4.0931 |
| Control Group | 24 | 35.7917 | 7.0955 |

$t(46)=.62$, $p=.53$

**Retention test results**

Retention test results (eight weeks after the experiment) showed that the students in the experimental group scored slightly higher than the students did in the control group ($M=29.79$ and $28.41$ respectively; Table 4). However, $t$-test results indicated that the posttest-retention test gained scores mean difference of experimental and control groups ($M=-7.04$ and $-7.37$ respectively) was not statistically significant ($p>.05$), (see Table 5).

| Table 4: Retention test mean score results |
|-----------------|-----------------|-----------------|
| **N** | **Mean** | **Std. Deviation** |
| Experimental Group | 24 | 29.7917 | 3.7181 |
| Control Group | 24 | 28.4167 | 6.1285 |
Table 5: Posttest-retention test gained-score means of experimental and control groups

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>24</td>
<td>-7.0417</td>
<td>4.4573</td>
</tr>
<tr>
<td>Control Group</td>
<td>24</td>
<td>-7.3750</td>
<td>4.9150</td>
</tr>
</tbody>
</table>

t(46)=.24, p=.80

CONCLUSION

Posttest and retention test results showed that the second year preservice computer teachers in both experimental and control groups acquired and retained similar levels of knowledge in the area of “instructional technology and material development.” It can be concluded from these results that the two approaches do not differ from each other significantly in regard to knowledge acquisition and retention. Literature indicates that using hypermedia as a cognitive tool helps learners analyze, access, interpret and integrate information, and facilitate reflective thinking, critical thinking and higher order learning (Jonassen, 2000; Jonassen & Reeves, 1996; Lehrer, 1993; Mayes, 1993). To achieve all these skills, of course, one must have the knowledge base in the content area. So the assumption would then be that hypermedia, as a cognitive tool would contribute to knowledge acquisition and retention more effectively than the traditional instruction. The results of this study prove otherwise.

Several explanations can be offered in interpreting the results of this study. One of the reasons for this result may be related to the learning and study habits of the participants. The participants of this study were the second year preservice teacher education students in Turkey. Turkey’s educational system is quite traditional. Throughout their school years, students might have received direct instruction most of the time. The students might have carried these study habits from the past, and developing hypermedia about the subject to be learned might be a new learning approach for them. The demanding instruction/learning process and in adapting to this new strategy might have negatively affected their knowledge acquisition and retention.

This study lasted 14 weeks, which was a long period of time. Duration of the project was consistent with the literature stating that through project-based learning, learners concentrate on complex, integrated modules of long-term instruction (Krajcik et al., 1994 cited in Jonassen 1998). However working in a group for a long period of time was a new experience for the majority of the students in the experimental group. This might have also affected their performance negatively in the post-test and retention test.

This study provides valuable information as to whether designing hypermedia as a cognitive tool in comparison with traditional classroom instruction leads to learning and to what degree. Based on the results, it can be suggested that hypermedia can be integrated into “Instructional Technology and Material Preparation” course as a cognitive tool, to provide practice opportunities in instructional material development process for prospective computer teachers. The results of this study may help practitioners gain perspective into using hypermedia as a cognitive tool in their classes, and understand what to expect in terms of knowledge acquisition and retention in teacher education context. The results of this study may also help instructional material designers/developers and those who use the material in educational settings in understanding the potential contribution and limitation of hypermedia as a cognitive tool in a constructivist learning context.


In order to interpret the findings of this study, some of the limitations need to be taken into account. In this study, small sample size was the most important limitation of the study. The number of the participants in the study was limited to the number of second year students at Instructional Technology & Computer Education Department. The students had the necessary knowledge and skills in hypermedia development, and they did not get any orientation or training in hypermedia development area. Therefore one needs to be cautious in generalizing the results of this study. Despite these limitations, this study provides valuable contribution with regard to relationship between knowledge acquisition and retention, and use of hypermedia as a cognitive tool in teacher education institutions.
In further studies, in addition to the knowledge acquisition and retention, investigations to assess other skills and gains of the students from use of hypermedia as a cognitive tool can be suggested. It is recommended that to be able to see the contribution of hypermedia for learning as a cognitive tool, further research studies in different subject area, with different learners groups, and with different time periods are needed.

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ABSTRACT
The aim of this study is to find out the preferences of students at Balıkesir University, Gönen Vocational School of Higher Education on computer using and whether there is a difference on the variables to set the preferences. According to the findings from questionnaires, the students at Gönen Vocational School of Higher Education use computers to access the Internet and to communicate with other people through the Internet. They do not prefer to use the computer for improving themselves on such objectives as to learn a foreign language, to study and to prepare a project for academic reasons. Among the factors not to use a computer, however, are shown the obstacles like they do not own a computer, the economic conditions and lack of time. By means of the study we have found that there is a meaningful relation between the students’ preferences to use a computer and the variables like gender, grades and own a computer.

Key Words: Preference to use a computer, Obstacles, Vocational Schools

ÖZET

Anahtar kelimeler: Bilgisayar kullanım tercihleri, Engeller, Meslek Yüksekokulardı

INTRODUCTION
Today computers and the Internet using are getting more and more common at an incredible speed around the world. This is, undoubtedly, because of the services they provide, which are easily available. These two technology wonders, which become an indispensable part of our lives, have turned out to be a passion especially among young generation. Computers which had been away from the public life until recently because of their huge structures and usages which require proficiency had developed incredibly since the mid-1980s and created a technological revolution in Turkey at the end of 1990s (Börü, 2001).

The rapid change in technology has affected education system and also brought innovations together. The widespread use of computers has led to great change on education for the last 20 years (Akkoyunlu, 2000). Similarly, using computer in university education has an important role for students to become successful after starting their career. It is certain that the students who add computer using to their professional training have an advantage in working life in which there is a great competition (Davis et al, 1999). However, computer using may show some differences according to individuals’ personal characteristics, demographic features and the fields of study (Palmer, 2000: 141-154 ; Hawkins ve Paris, 1997: 147-158 ; Igbaria ve Iivari, 1995: 587-605). After these differences have been determined, students’ computer training can be made more effective because computer using may create positive effects on students’ daily life and education in many aspects (Croxall ve Cummings, 2000:9-18). The more students improve their ability to use technology, the more confident they will become and, at the same time, the less anxious they will be about employment in the future. From this point of view, determining the variables that affect students’ computer using will play an important role in giving efficient computer training. Orienting students to use computer in the areas especially where they can improve themselves will not only provide the success of educational institutions but will also improve national economy.
This study was carried out on the students at Gonen Vocational School, Balikesir University. The data were analysed and the findings were compared with the related literature. The results were discussed in the Conclusion and evaluated in accordance.

METHOD
The Aim and Importance of the Study
The aim of this study is to determine the preferences of Balikesir University, Vocational High School of Gonen students for computer use and the factors, if any, underlying these preferences. Providing that computer courses are essential in training technician, this study is important in educational institutions’ regarding computer courses as competitive advantages in finding jobs and evaluating students in this respect. Some hypotheses put forward in terms of the main goals of the study are:

H1: There are statistically significant differences between the preferences of the male and female students in the use of computer.
H2: There are statistically significant differences among the preferences of the students for using computer according to their grades.
H3: There are statistically significant differences in students’ computer use preferences due to owning a computer or not.
H4: There are statistically significant differences in students’ computer use preferences according to at which departments they are.

Sampling and Data Collection Methods
Questionnaires were given to the participants of the study, who are the students of Balikesir University, Vocational High School of Gönen, in face-to-face settings. Cluster sampling was used. In this sense, there are four different departments in The Vocational High School of Gönen. The first and second-year students were grouped as the day and evening groups and questionnaires were conducted to these students in a simple random sampling method. 180 of the 511 students were given the questionnaires and 6 questionnaires were extracted because of being faulty. The representation rate of the sample of the universe is 34.1%.

In the research, primary and secondary data were used. As a primary data collection instrument, the questionnaires were prepared in parallel with the current literature. The questionnaire consists of the 25 items taken from the similar study of Gölge and Arlı (2002). The questionnaire has two sections. In the first section, is aimed to learn some features of the students, their frequency of computer using, and the factors affecting their use of computer. In the second section, by a five-optioned Likert scale, it is aimed to find out for what purposes the students use computers. The internal reliability (Cronbach’s Alpha) is 0.89. Whether there are significant differences among the students due to independent variables was measured through T and One Way ANOVA tests.

Data Analysis
In the analysis of the data obtained by the questionnaires, SPSS 11.0 for Windows was used. In the analyses, the techniques of frequency, mean, comparable table summaries, T-test, and the one-way ANOVA test were used.

FINDINGS AND EVALUATION
The distribution of the participants of the questionnaires according to their gender was shown in Table 1. According to the data, the rate of males is 69.5%, and the rate of females is 30.5%. The reason for this can be explained by the absence of female students at the departments of Sanitary/Pipe Installation Systems and Natural Gas and Climatization and Freezing.

Table 1 The Frequency and Percentiles About General Information and Some Personal Features of Participants

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency (n)</th>
<th>Percentile (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Girls</td>
<td>53</td>
<td>30.5</td>
</tr>
<tr>
<td>Boys</td>
<td>121</td>
<td>69.5</td>
</tr>
<tr>
<td>Total</td>
<td>174</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Income</th>
<th>Frequency (n)</th>
<th>Percentile (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 250 YTL</td>
<td>97</td>
<td>55.7</td>
</tr>
<tr>
<td>251-500 YTL</td>
<td>62</td>
<td>35.6</td>
</tr>
<tr>
<td>501-750 YTL</td>
<td>13</td>
<td>7.5</td>
</tr>
<tr>
<td>Over 750 YTL</td>
<td>2</td>
<td>1.1</td>
</tr>
</tbody>
</table>
When considered the distribution of the students according to their incomes, it was seen that most of the students, 55.7%, have incomes under/below 250 NTLs (New Turkish Liras). The students having incomes between 251 and 500 NTLs follow this group with the percentage of 35.6%. Then the group whose incomes are between 501 and 750 NTLs, 7.5%, comes. Students whose incomes are 750 NTLs and above was determined to have the rate of 1.1%. In their study, Dündar and Kıyıcı (2004) found out that most of the students’ income rates are below the 250 NTLs. The aim of determining students’ rates of income is that computer use is thought to be closely related to the rates of income. 59.8 of the participants were determined to be in the first year and 40.2 in the second year of the school. The reason why the number of the second year students is low was the absence of the evening classes in this group. When looked at the distribution of students in terms different programs, it is seen that the Department of Heating Installation and Natural comes first with the rate of 33.9%. Accounting, 31.6%; Tourism and Hotel Management, 25.9%; and, Climatization and Freezing, 8.6% follow this department.

Considering the importance of computer use in this age, it is inevitable to expertise on computer using in order to have a profession. In this respect, it is necessary to know to what extents the students can use computers and for what purposes they use them. In order to determine the purposes of students in using computers, a questionnaire consisting of 14 items and suitable to 5-optioned Likert scale was prepared and students were asked to mark the options which best express their thoughts. When looked at the Table 2, taking account the means, the five first computer using purposes can be listed as:

1. To connect to the internet
2. To communicate via computer (using e-mail, messenger, chat programs, etc.)
3. To spend their spare times
4. To access information, to download files
5. To listen to music

<table>
<thead>
<tr>
<th>The students use computers;</th>
<th>Frequency</th>
<th>Standard Deviation</th>
<th>arithmetic average</th>
<th>AOS*</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Access the Internet</td>
<td>174</td>
<td>1.4989</td>
<td>2.62</td>
<td>1</td>
</tr>
<tr>
<td>To communicate with others (e.g. email, chat)</td>
<td>174</td>
<td>1.6288</td>
<td>2.99</td>
<td>2</td>
</tr>
<tr>
<td>To fill in their free time</td>
<td>174</td>
<td>1.5408</td>
<td>3.040</td>
<td>3</td>
</tr>
<tr>
<td>To Access information, download files</td>
<td>174</td>
<td>1.5190</td>
<td>3.126</td>
<td>4</td>
</tr>
<tr>
<td>To listen to music</td>
<td>174</td>
<td>1.7141</td>
<td>3.270</td>
<td>5</td>
</tr>
<tr>
<td>To search for individual reasons (Project, homework)</td>
<td>174</td>
<td>1.3588</td>
<td>3.517</td>
<td>6</td>
</tr>
<tr>
<td>To store information</td>
<td>174</td>
<td>1.6247</td>
<td>3.569</td>
<td>7</td>
</tr>
<tr>
<td>To study</td>
<td>174</td>
<td>1.4119</td>
<td>3.747</td>
<td>8</td>
</tr>
<tr>
<td>To play games</td>
<td>174</td>
<td>1.5031</td>
<td>3.747</td>
<td>9</td>
</tr>
<tr>
<td>To write thesis or Project for commercial reasons</td>
<td>174</td>
<td>1.3845</td>
<td>3.954</td>
<td>10</td>
</tr>
<tr>
<td>To watch TV/video</td>
<td>174</td>
<td>1.3761</td>
<td>4.046</td>
<td>11</td>
</tr>
<tr>
<td>To draw sth.</td>
<td>174</td>
<td>1.2418</td>
<td>4.229</td>
<td>12</td>
</tr>
<tr>
<td>To learn a foreign language</td>
<td>174</td>
<td>1.2593</td>
<td>4.417</td>
<td>13</td>
</tr>
<tr>
<td>To design a web page/site</td>
<td>174</td>
<td>1.1160</td>
<td>4.505</td>
<td>14</td>
</tr>
</tbody>
</table>

Scale Values: 1= often 2= sometimes 3=rarely 4= hardly 5= never

*AOS: Range for Arithmetic Average
According to these results, it was determined that students of Vocational High School of Gönen use computers to connect to the internet and utilize it to communicate with other people via it. As a result of the study, regarding the order of means of frequencies, it is observed that students do not use computers very frequently, and the ones who use them focus on chatting, mailing, etc. It was determined that most of the students marked the option “rarely” and that they did not tend to use computers in the areas that would improve them such as making research, studying lessons, or learning foreign languages and so on. Another question given to the students in the study was how often they use computers. According to the answers taken for this question, it was seen that the frequency of females’ computer use was lower than the rate of males. In this respect, since there are fewer women who work in Türkiye than men and they can make great contributions to the economy of Türkiye, motivating them to use computer would be useful in their employance in the future.

### Table 3: Comparison of Frequency to Use Computers with Gender

<table>
<thead>
<tr>
<th>FREQUENCY TO USE A COMPUTER</th>
<th>Everyday</th>
<th>A few times a week</th>
<th>Once a week</th>
<th>Once a month</th>
<th>Less often</th>
<th>Never</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>8</td>
<td>10</td>
<td>11</td>
<td>19</td>
<td>2</td>
<td>3</td>
<td>53</td>
</tr>
<tr>
<td>Male</td>
<td>40</td>
<td>30</td>
<td>27</td>
<td>13</td>
<td>9</td>
<td>2</td>
<td>121</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>40</td>
<td>38</td>
<td>32</td>
<td>11</td>
<td>5</td>
<td>174</td>
</tr>
</tbody>
</table>

In the study, some questions aiming to find out the factors inhibiting the use of computers by students were asked to students and the answers were presented in Table 4. According to these results, the most important factor hindering the students’ use of computer is their not owing a computer. Accordingly, the second important factor is dependent on economic factors. Insufficient facilities within the school, time constraints are other factors the students emphasize. In the study of McMahan et al. (1999) on 800 university students, factors influencing computer use by students were investigated and, as a result, education, time, and access to computers were determined to be very important in spreading the use of computer. In this study, it can be seen a positive result that lack of knowledge is a less effective factor. Accordingly, it can be inferred that if the economic problems can be decreased and more opportunities can be provided within the school, the rate of students’ computer use will increase.

### Table 4: Ranking of the inhibits for students’ computer usage

<table>
<thead>
<tr>
<th>Barriers for students’ computer usage</th>
<th>1. Rank</th>
<th>2. Rank</th>
<th>3. Rank</th>
<th>4. Rank</th>
<th>5. Rank</th>
<th>Average Mark * and Average Rate *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Do not have computer</td>
<td>51</td>
<td>31.9</td>
<td>44</td>
<td>31.7</td>
<td>22</td>
<td>17.0</td>
</tr>
<tr>
<td>Economical situation</td>
<td>40</td>
<td>25.0</td>
<td>26</td>
<td>18.7</td>
<td>16</td>
<td>12.4</td>
</tr>
<tr>
<td>Insufficient facilities at the school</td>
<td>25</td>
<td>15.6</td>
<td>27</td>
<td>19.4</td>
<td>32</td>
<td>24.8</td>
</tr>
<tr>
<td>Time consuming</td>
<td>24</td>
<td>15.0</td>
<td>29</td>
<td>20.8</td>
<td>31</td>
<td>24.1</td>
</tr>
<tr>
<td>Insufficient computer knowledge</td>
<td>20</td>
<td>12.5</td>
<td>13</td>
<td>9.4</td>
<td>28</td>
<td>21.7</td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>100</td>
<td>139</td>
<td>100</td>
<td>129</td>
<td>100</td>
</tr>
</tbody>
</table>

Average Mark = 1st rank frequency x 5 + 2nd rank frequency x 4 + 3rd rank frequency x 3 + 4th rank frequency x 2 + 5th rank frequency x 1
Average Rate = (Average Mark / Total Average Mark) x 100

When the students are asked about their rates of income and whether they have their own computers, the influence of the economic factors mentioned above becomes clearer. Depending on the data obtained from table 5, it is possible to say that 74.2 of the students having incomes of 250 NTLs and below do not possess computers and just 25.8 of them have their own computers, and accordingly, those whose incomes are low have difficulties in computer use due to economic reasons. When the rate of student income increases the rate of computer use increases as well, and the importance of other factors influencing computer use decreases.
Table 5: Comparison of the Students’ Income and Whether They Have Computer or Not

<table>
<thead>
<tr>
<th>Income</th>
<th>Do you have your computer?</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>250 YTL and below</td>
<td>25</td>
<td>72</td>
</tr>
<tr>
<td>251-500 YTL</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>501-750 YTL</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>750 YTL and above</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>109</td>
</tr>
</tbody>
</table>

University students make use of computer programs and the internet at the level of global knowledge during their high school, university and pre-service education in order to find a job (Sarı and Erdem, 2005). In terms of hypotheses put forward in this study, whether independent factors have effects on students’ computer use was investigated through T and One-way ANOVA tests. In Table 6, the variables influencing student preferences in using computers are shown.

Table 6: T Test for Students Computer Usage Preferences

<table>
<thead>
<tr>
<th>Statements to determine for students computer usage preferences</th>
<th>Gender</th>
<th>N</th>
<th>X</th>
<th>S</th>
<th>sd</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>To access the Internet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>53</td>
<td>3.16</td>
<td>1.59</td>
<td>172</td>
<td>3.251</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>121</td>
<td>2.38</td>
<td>1.39</td>
<td>172</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To play games</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>53</td>
<td>4.26</td>
<td>1.22</td>
<td>172</td>
<td>3.075</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>121</td>
<td>3.52</td>
<td>1.56</td>
<td>172</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To access information, download files</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>53</td>
<td>3.66</td>
<td>1.45</td>
<td>172</td>
<td>3.146</td>
<td>.002</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>121</td>
<td>2.89</td>
<td>1.49</td>
<td>172</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To draw sth.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>53</td>
<td>4.71</td>
<td>.817</td>
<td>172</td>
<td>3.536</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>121</td>
<td>4.01</td>
<td>1.33</td>
<td>172</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To write thesis or Project for commercial reasons</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>53</td>
<td>4.37</td>
<td>1.13</td>
<td>172</td>
<td>2.718</td>
<td>.003</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>121</td>
<td>3.76</td>
<td>1.44</td>
<td>172</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>According to education year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To write thesis or Project for commercial reasons</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st year</td>
<td>104</td>
<td>4.27</td>
<td>1.15</td>
<td>172</td>
<td>3.926</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>2nd year</td>
<td>70</td>
<td>3.47</td>
<td>1.55</td>
<td>172</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To search for individual reasons (Project, homework)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st year</td>
<td>104</td>
<td>3.74</td>
<td>1.15</td>
<td>172</td>
<td>2.687</td>
<td>.008</td>
<td></td>
</tr>
<tr>
<td>2nd year</td>
<td>70</td>
<td>3.18</td>
<td>1.55</td>
<td>172</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If they have own computer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To search for individual reasons (Project, homework)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>65</td>
<td>3.20</td>
<td>1.15</td>
<td>172</td>
<td>2.411</td>
<td>.017</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>109</td>
<td>3.00</td>
<td>1.55</td>
<td>172</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To listen to music</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>65</td>
<td>2.26</td>
<td>1.58</td>
<td>172</td>
<td>6.714</td>
<td>.000</td>
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<tr>
<td>No</td>
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<td>3.87</td>
<td>1.49</td>
<td>172</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To access the Internet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>65</td>
<td>1.39</td>
<td>1.48</td>
<td>172</td>
<td>3.765</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>109</td>
<td>3.68</td>
<td>1.36</td>
<td>172</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To learn a foreign language</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Yes</td>
<td>65</td>
<td>4.47</td>
<td>1.05</td>
<td>172</td>
<td>3.211</td>
<td>.002</td>
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</tr>
<tr>
<td>No</td>
<td>109</td>
<td>3.86</td>
<td>1.47</td>
<td>172</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To play games</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>65</td>
<td>3.24</td>
<td>1.63</td>
<td>172</td>
<td>3.504</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>109</td>
<td>4.04</td>
<td>1.33</td>
<td>172</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To watch TV/ video</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
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<td>1.53</td>
<td>172</td>
<td>4.433</td>
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</tr>
<tr>
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<td>3.38</td>
<td>1.15</td>
<td>172</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>To fill in their free time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>65</td>
<td>2.47</td>
<td>1.48</td>
<td>172</td>
<td>3.872</td>
<td>.000</td>
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<tr>
<td>No</td>
<td>109</td>
<td>3.37</td>
<td>1.48</td>
<td>172</td>
<td></td>
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</tr>
<tr>
<td>To communicate with others (e.g. email, chat)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Yes</td>
<td>65</td>
<td>2.30</td>
<td>1.45</td>
<td>172</td>
<td>4.529</td>
<td>.000</td>
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<td>1.59</td>
<td>172</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>To store information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>65</td>
<td>3.30</td>
<td>1.59</td>
<td>172</td>
<td>4.133</td>
<td>.000</td>
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<td>109</td>
<td>3.94</td>
<td>1.52</td>
<td>172</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To access information, download files</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>65</td>
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<td>1.34</td>
<td>172</td>
<td>4.360</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>109</td>
<td>3.49</td>
<td>1.50</td>
<td>172</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Considering this table, the need to determine the factor causing this difference appears. Male students significantly differ from females in using computers for connecting to the internet, playing games, downloading files, drawing, writing homework or thesis, and for trading purposes. In these areas, males use computers more than females. According to these results, considering also the fact that Gönen is a small town, female students cannot go to the internet cafes as comfortably as males, and use computers less than them due to economic factors and lack of computers. In this sense, it is assumed that, especially in the Vocational High Schools in small towns far away from the city centres, improving the opportunities and facilities within the school will be very effective in increasing the computer use by the students. No significant differences were found between the genders in terms of other factors.

Another significant difference was found according to in which grades the students are. In this respect, the second hypothesis is also accepted. Herein, differences were recognized between the first and second year students in their using computer for trade, thesis and homework writing, personal research. It was observed that the second year students use computers for these purposes more than those which are in the first year of the school. According to these data, it can said that the second year students can contribute their own budgets by using computer in the writing of the newcomer students’ homework and in other trading purposes thanks to their knowledge of computer and experience. At the same time, they are more experienced in using computer for their personal goals.

In Table 6, it was tried to determine whether there are significant differences between students’ possessing their own computers and the dependent variables. By these results, the third hypothesis is accepted as well. Students who have computers differ from the others in doing personal research, listening to music, connecting to the internet, learning a foreign language, playing games, watching television/video, spending spare times, communicating, saving data and downloading, etc. When looked at the Table 6, it is seen computer owners have advantages in the given areas in relation to the others. As mentioned above, students having computers can utilize many different using preferences, whereas those who do not own computers cannot improve themselves and are constrained in their computer using preferences due to not having much opportunity at the school and not being able to go to internet cafes because of economic problems. It was tried to determine H4 by using One-way ANOVA test. However, it is that there is no significant difference among students according to programmes they are (p>0.05). Therefore, there is not enough evidence to accept the fourth hypothesis.

CONCLUSION
The main results of this study, in which the purposes for which the students of Balıkesir University, The Vocational High School of Gönen use computers and these students’ thoughts on the computer classes they took were researched can be summarized as follows; the students at The Vocational High School of Gönen prefer to computers everyday or several times a week. The number of the students who use computer once a week, or less or never use it is relatively lower. At the same time, males were determined to use computer more frequently than females. Students were also observed to use computers, in particular, to connect to the internet and, accordingly, to communicate. Besides being not very primary, students also assert that they use computers to spend their spare times. On the other hand, it was found out that students do not use computers for improving themselves, doing personal studies, learning a foreign language, etc... The factors inhibiting the more spread use of computer observed in former studies are encountered in this study as well. The students of The Vocational High School of Gönen show the factors such as not owning computers, economic problems, the insufficient facilities in the school, lack of time as important variables. They see the problem of not being able to use computer due to lack of knowledge as an inferior factor in relation to others.

Economic factors have great influence on whether students own computers or not. In this study, it was evidenced that students who are well off have computers and the others do not. Of course, the economic conditions reflect their parents’ economic conditions. To the question how they gain their incomes, 87.3% of the students answered that they take their income from their parents or relatives (n: 152), 12.7% of them asserted that they earn by working (n: 14). Today, there is room to debate the importance of using and owning computer to be successful in business. In this context, it was found out that 63% of the students did not have computers. A similar study in Istanbul University, Cerrahpaşa Faculty of Medicine parallels this result. It is emphasized that 67% (n: 176) of the newly enrolled 263 students studying Turkish did not have computers, just 33% of them had (Altan vd, 2003). A similar result is seen in the study of Gölge and Arlı (2002). Of the 107 university students who participated in the research, 26.2% had computers belonged to themselves or their parents. Herein, besides the effect of not being well of, when considered that, in our country, only 16.8% of the population between 16-74 years use computers, it can be said not using the technology of informatics’ is also very effective here. However, it is essential to ameliorate this condition by educational institutions. In particular, problems related to use of high technology in high education institutions should be studied in more detail.
In the study, independent variables which have influence on the computer use preferences of students were determined. It was seen that, in particular, gender caused great differences in students’ preferences of computer using. On the other hand, their grades in the school and having or not having computers were determined to be other important factors. According to these findings, it can be claimed that educational institutions should provide more sufficient conditions and facilities for the right and useful use of computers for their students and reinforce their computer uses. Considering the importance of computer and technology use in training qualified staff would help the solution of the service staff (ara eleman) problems. In this respect, helping the vocational high school students’ use of technology by decreasing economic problems and making them useful individuals for the development of Türkiye should be regarded as primary issues to be handled.

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TEACHER TRAINING ON SPECIAL EDUCATION IN TURKEY

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ABSTRACT
The important issue of special education services is the special education teacher who have been trained on instruction strategies for children with special needs. Special education teachers have been trained in short term in-service education programs and certificate programs in Turkey until 1983, after 1983 special education teachers are being trained by the universities in the undergraduate programs. There are ten undergraduate programs on special education in the universities for different special education categories in Turkey. The programs consist of 143-144 credit hours of courses offered in eight semesters. A minor program is also included in these programs. However, universities have master and doctorate programs on special education for professionals who have graduated teacher training program on special education and related with special education support programs.

Key words: special education, teacher training, higher education.

INTRODUCTION
Regular education of Turkey included pre-school, primary school, secondary school, further education colleges, and higher education. Special education is an important part of Turkish education system. Ministry of Education is responsible for the organization both of regular education and special education in Turkey. The individuals in need of special education are protected by the Special Education Law 573. This law arranges the services of Special Education. According to the Special Education Law services in Turkey are planned and applied throughout the country by Special Education Guiding and Consulting Services Head Office under Ministry of Education. Special Education Services are provided by the teachers who are educated and trained at various educational institutions. However, within those teachers, the ones who are educated in the field of Special Education are certainly the most important ones for improving the special education services effectively.

The definitions of some important terms on special education are as follows: Special education is the education which aims to meet the educational needs of individuals who are in need of special education in an environment appropriate for the deficiencies and characteristics of those individuals using the specially developed educational programs and techniques provided by specially trained staff. Individual in need of special education: The individual who is at a significantly different level compared to his/her peers in terms of the individual characteristics and educational adequacy. According to the decree law no. 573 on special education, the basic principles of special education are as follows in line with the overall objectives regulating of Turkish National Education (KHK, 1997).

a) All the individuals who are in need of special education will benefit from the special education services in line with their interests, wishes, adequacies and abilities.
b) Education of the individuals who are in need of special education will start at an early age.
c) The special education services will be planned and provided without separating the individuals who are in need of special education from their social and physical environments as much as possible.
d) It will be a priority to educate those individuals who are in need of special education together with other individuals by taking those individuals’ educational performances into consideration and by making adaptations in the aim, content and teaching processes.
e) Cooperation will be established with the institutions and organizations that provide all types of rehabilitation for the education of individuals who are in need of special education to continue their education at all levels and with all types uninterruptedly.
f) Individualized education plans will be developed for the individuals who are in need of special education and the educational programs will be implemented as individualized.
g) Opinions of the organizations working for the individuals who are in need of special education will be asked for the development of special education policies.
h) The special education services will be planned so as to cover the social interaction and mutual adaptation process of the individuals who are in need of special education.
There are three services and opportunities in special education in Turkey: (1) special education is a formal education in special schools, (2) children with special education needs are educated in mainstream schools and special classrooms, (3) there are support services as physical therapy, speech therapy, occupational therapy in rehabilitation centers, etc. The services are related with education ministry, general directorate of special education and guidance, city organizations, special education and guidance centers. Special education alternatives in Turkey; Guidance and Research Centers, Special Classes in Regular Schools, Schools for Trainable Children, Primary Schools for Educable Children, Vocational Education Centers, Occupation Education Center, Residential Institutions, Private-special Schools, Private-Special Rehabilitation Centers, and University Affiliated Centers.

SPECIAL EDUCATION TEACHER TRAINING PROGRAMS IN TURKEY

In Turkey as it is throughout the world, the training of special education teachers can be at the undergraduate, graduate or doctorate levels. The teacher training of special education teachers started in 1952 at Gazi Institute of Education as a two year undergraduate program. In later years the needs of special education training has been met by short term certificate programs (Ataman, 2004). In addition to these certificate programs, the teachers from three year programs were taken into a one term graduate program; however, this program failed due to the fact that candidates did not complete the program. In the lights of these programs in the education of the handicapped, it became apparent that these certificate programs were only temporary solutions; and training qualified teachers for special education could only be solved through permanent programs (Konrot, 1991). As the need of demanded qualified teachers in the field, Anadolu University started its graduate program in special education in 1983. Initially, established as special education teacher training program at the department of educational sciences, psychological services in education. The program in later years became an independent program. Although, different universities had different special education curriculums, the reorganization of the higher education systems at the time through improvement and unification to the special education curriculum. But now, teacher training on special education apply by education faculties, department of special education of universities.

Special Education Department is a four-year teacher education program which aims to train special education teachers for the education of the students with special needs. Special Education Teacher Training Programs actively train teachers for different kinds of handicapped. Special Education Programs include Departments of Mentally Handicapped, Hearing Impaired, and Visually Impaired. Recently, the Teacher Training Program for Gifted Individuals is established.

The programs consist of 143-144 credit hours of courses offered in eight semesters. A minor program is also included in these programs. The Mentally-Handicapped Education Program undergraduate students, additionally, choose both Vocational Education or integration minor programs and starting from their third semester.

In both programs, the students need to take nine credit hours. On the other hand, Hearing-Impaired Education students need to choose science teaching, mathematics teaching, social science teaching, or Turkish language teaching as a minor and take courses related to that minor program starting from the second semester. However, Visually Impaired Teacher Training Program does not have minor program facilities (YOK, 1997).

As in all teacher training programs, contents of the courses and course descriptions are described, and sufficient amount of teacher training courses are provided in special education programs. In addition to these, the programs have general courses to help effective use of Turkish Language. Set aside from the rest of the Regular Education Programs, Special Education Programs do not include school experience courses. Nevertheless, teaching practice courses are provided extensively and the teaching practices, which are held in one semester in other programs, are given in two semesters.

The field courses in special education programs consist of special education, changing attitudes towards the handicapped, introduction to the education of mentally-handicapped children, education of the mentally handicapped, developing individualized education programs and evaluation, educational and behavioral assessment, integration and special education support services, behavior management, early childhood education for mentally handicapped children, training and guiding parents of the mentally handicapped children counseling and, training courses for various disciplines, and teaching practice courses. On Table 1, the program of teacher training program for children with mental retardation can be seen.
Table 1. Program in Education of the Mentally Disabled

<table>
<thead>
<tr>
<th>1. Semester</th>
<th>2. Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Fundamentals of Information Technology</td>
<td>* Music</td>
</tr>
<tr>
<td>* Introduction to Teacher Training</td>
<td>* Educational Research and Report Writing</td>
</tr>
<tr>
<td>* Health Science and First Aid</td>
<td>* Ataturk's Principles and History of Turkish Revolution II</td>
</tr>
<tr>
<td>* Ataturk's Principles and History of Turkish Revolution I</td>
<td>* Turkish II: Speaking Skills</td>
</tr>
<tr>
<td>* Turkish I: Writing Skills</td>
<td>* Introduction: Mentally Handicapped Children</td>
</tr>
<tr>
<td>* Special Education</td>
<td>* Changing Attitudes Towards the Handicapped</td>
</tr>
<tr>
<td></td>
<td>* Individual Differences and Psychological Approaches</td>
</tr>
<tr>
<td></td>
<td>* Foreign Language Courses</td>
</tr>
<tr>
<td>3. Semester</td>
<td>4. Semester</td>
</tr>
<tr>
<td>* Human Development and Learning</td>
<td>* Teaching Music to Mentally Handicapped</td>
</tr>
<tr>
<td>* Developing Individualized Education Programs and Evaluation</td>
<td>* Early Childhood Education for the Mentally Handicapped</td>
</tr>
<tr>
<td>* Education of the Mentally Handicapped</td>
<td>* Teaching Communication Skills to the Mentally Handicapped</td>
</tr>
<tr>
<td>* Language Development and Communication</td>
<td>* Teaching Concepts and Skills to the Mentally Handicapped</td>
</tr>
<tr>
<td>* Educational and Behavioral Assessment</td>
<td>* Behavior Management</td>
</tr>
<tr>
<td>* Integration and Special Education Support Services</td>
<td>* Elective Courses</td>
</tr>
<tr>
<td>* Elective Courses</td>
<td></td>
</tr>
<tr>
<td>5. semester</td>
<td>6. semester</td>
</tr>
<tr>
<td>* Use of Technology and Materials Development</td>
<td>* Classroom Management</td>
</tr>
<tr>
<td>* Teaching Reading and Writing to the Mentally Handicapped</td>
<td>* Teaching Turkish to the Mentally Handicapped</td>
</tr>
<tr>
<td>* Teaching Science to the Mentally Handicapped</td>
<td>* Teaching Social Sciences and Social Studies to the Mentally</td>
</tr>
<tr>
<td>* Teaching Mathematics to the Mentally Handicapped</td>
<td>* Teaching Games and Physical Education to the Mentally Handicapped</td>
</tr>
<tr>
<td>* Preparing Integration Programs</td>
<td>* Teaching Art to the Mentally Handicapped</td>
</tr>
<tr>
<td>* Elective Courses</td>
<td>* Teaching Self-Care Skills to the Mentally Handicapped</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>7. semester</td>
<td>8. semester</td>
</tr>
<tr>
<td>* Teaching Experience I (Field Base Experiences)</td>
<td>* Practicum Teaching Experience II (Field Base Experiences)</td>
</tr>
<tr>
<td>* Preparing and Implementing Assessment Tools for Students with MR.</td>
<td>* Developing Lesson Plans for the Trainable Mentally Handicapped</td>
</tr>
<tr>
<td>* Developing Measurement Materials to Determine the Performance Level</td>
<td>* Developing Instructional Materials for the Mentally Handicapped</td>
</tr>
<tr>
<td>* Training and Guiding Parents of the Mentally Handicapped Children.</td>
<td>* School Programming and Education Settings for the Mentally Handicapped</td>
</tr>
<tr>
<td></td>
<td>* Placing and Monitoring Trainable Mentally Handicapped</td>
</tr>
</tbody>
</table>

Teacher training programs on special education have intensively applied courses and practicum. Practicum courses, in the seventh semester includes Teaching Experience I (Field Base Experiences), Preparing and Implementing Assessment Tools for Students and Developing Measurement Materials to Determine the Performance Level, and in eighth semester the courses include Practicum Teaching Experience II (Field Base Experiences), Developing Lesson Plans for the Trainable Mentally Handicapped and Developing Instructional Materials for the Mentally Handicapped.

These three courses are planned in order to combine each other in the two semesters by the practicum professors. The practicum performances of the senior students are being observed and evaluated by the practicum professors, classroom teachers and the practicum coordinators in the schools. Depending on the course program, the practicum students are being placed into the appropriate classes in the practicum schools in the first week of their practicum by the professors. The classroom teachers guide the practicum students while they prepare the
program, and do the responsibilities determined by the professors and they also facilitates the environment in the classroom and school. In the teacher training program for education of children with mental retardation, the practicum students participate in different settings in the seventh and eighth semesters in order to work with different levels of retardation. When the students successfully complete the courses as well as the practicum courses they get the degree of teacher of children with mental retardation, hearing impairment and visual impairment according to their programs in the special education programs.

The teacher candidates can work in governmental special education schools as well as the private special education and rehabilitation centers as special education teachers. Teachers who graduate from the teacher training programs can also attend to graduate programs. In the educational science institutes in related universities there are graduate programs for both masters and doctoral degrees. There are 10 universities providing undergraduate programs in special education. Besides, Anadolu, Gazi and Ankara universities provide masters and doctoral degree, and Abant Izzet Baysal and Istanbul universities provide only masters degree programs.

EDUCATIONAL TECHNOLOGY AT THE SERVICE OF SPECIAL EDUCATION

Besides above graduate programs, there is an online graduate program especially for people who do not have special education teacher certificate which is called “Training Program for the Teachers of the Children with Developmental Deficiency” in Anadolu University. This program accepts graduates of teacher training programs, child development and education programs, psychology programs, social services programs, and guidance and psychological counseling programs. The graduate program consists three semesters for people who are graduated from special education departments and teacher training programs for children with mental retardation. People who are not graduated from the programs mentioned, have to take one semester preparation courses. The courses in this program can be seen on the Table 2 (Anadolu University, 2006).

<table>
<thead>
<tr>
<th>Table 2. Training Program for the Teachers of the Children with Developmental Deficiency</th>
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</thead>
<tbody>
<tr>
<td><strong>Preparation</strong></td>
</tr>
<tr>
<td><strong>Special Education Area</strong></td>
</tr>
<tr>
<td>Developing and Evaluation of Individualized Education Program</td>
</tr>
<tr>
<td>Practicum</td>
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</tbody>
</table>

Special education teachers who have their four years graduate degrees are being accepted to Training Program for the Teachers of the Children with Developmental Deficiency Masters Program. Graduate students who had their degrees from programs other than teacher training program for mental retardation has to attend a one semester preparation courses. The preparation students attend to two courses on the internet (online) and one semester practicum course in the research institute for the handicapped during summer. The students who complete the preparation courses, attend the courses for the following three semesters on the internet. The online courses give by WebCT software. The course contents develop by Macromedia Breeze software.

REFERENCES


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THE EFFECT OF COMPUTER ASSISTED AND COMPUTER BASED TEACHING METHODS ON COMPUTER COURSE SUCCESS AND COMPUTER USING ATTITUDES OF STUDENTS

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ÖZET

Anahtar Kelimeler: Bilgisayar destekli öğretim, bilgisayar temelli öğretim, Dick ve Carey modeli.

ABSTRACT
The purpose of this research was to investigate the effects of the computer-assisted and computer-based instructional methods on students achievement at computer classes and on their attitudes towards using computers. The study, which was completed in 6 weeks, was carried out with 94 sophomores studying in formal education program of Primary Teaching Department of Education Faculty at Trakya University. The participants were distributed into experimental and control groups by pre-test post-test control group design. A computer attitude scale, a level-designation test and a practice test were used to collect the data. To evaluate the data, t test was used in the program of SPSS 12.00. According to the study results, the students receiving computer-assisted instruction during their computer classes showed higher success on the practice test than the students taking classes with computer-based instructional methods. Additionally, a considerable difference has not been seen in the attitude of the students towards using computers from the other standpoints of the study.

Key words: Computer Assisted Education, Computer Based Education, Dick and Carey Model.

INTRODUCTION
Scientific and technological developments started a new period called “Information Age”. In this period information production has gained importance compared to goods and service by using information technologies profoundly. With changing conditions, present target of societies which are in competition and search in order to keep pace with new conditions is to be information society (Akkoyunlu, 1998). In contemporary societies called as “Information Societies” the way of individuals to reach information, their styles of learning and styles of applying information have rather changed compared to traditional societies.

In the last quarter of the 20th century, important developments seen in data processing, rapid changes that can be called as computer revolution have caused education systems to undergo a complete transformation taking but traditional forms. Education has the leading role among social institutions which will be most affected by increasingly changing process of information society (Yiğit, 2003).

Computers which are an important part of our daily life and which are very essential for many people, intitutions and establishments and also which are made use of in education considerably, are important tools for schools. In addition, computers are professions which people try to obtain for the future and their importance has increased more and more (Bozkurt, 2000).

Computers have become the basis of data processing technologies used in realizing information production, manipulating, storing, sharing and distributing processes. Since they address to more senses compared to other technological tools and make abstract and complicated concepts concrete digitally because of their extensive
multimedia properties, they are one of the most important technological tools which are made use of in educational and instructional process. At the same time they play an influential part in accomplishing many pedagogical functions such as measuring and evaluating knowledge and giving feedback, observing activities and performances of students, being independent from time and environment, providing students with motivation and participation to the lesson, considering individual differences regulating education level according to existing knowledge and progress of the students, and supporting instruction with such materials as graphics, pictures, animation and sound (Şahin and Yıldırım, 1999). In traditional teaching perspectives, they are tools which enable us to control many variables that are uncontrollable and effective in human learning. All these features of computers result from the fact that they are not only multifunctional display accessories which support the lesson such as overhead projectors, video or slides, but also they can be used as the basis of a method which focuses on students.

With contemporary teaching perspectives, some differences have occurred in teachers’ roles. Teaching principles in which learning is emphasized as a basis considering individuals learning and teaching is emphasized as a basis considering the person teaching have also changed. In traditional teaching, computers are tools which transfer information to students as teachers. In contemporary teaching, on the other hand, it is adopted that all of the students strive to learn, have efficient roles in education, and reach predetermined level of behavioral objectives regarding teaching products (Tandoğan, 1998). In accordance with changes in educational perspectives and new arrangements it has become compulsory for teachers to change themselves, gain new information and skills and apply these in the classrooms (Akkoyunlu, 1998).

In order to transfer new technological developments to classroom environment, varied teaching methods are needed. There are two main teaching methods which are carried out by computers today: Computer-Assisted Teaching Method and Computer-Based Teaching Method.

**Computer Assisted Teaching** is transferring instructional content and activities to students via computers. Here, computers are tools which complete and strengthen the system, they are not alternatives which replace teachers in teaching process (Demirel, 2003). In computer assisted teaching, computers are used to support education and instruction. Classroom teacher is the main teacher that teaches the subject, and determined objectives and attitudes. All of educational and instructional activities are performed by the teacher. In this method, computers are used by teachers in educational and instructional environment as only supplementary tools (İşman, 2003). In computer assisted teaching method, a teacher can use computers in different periods, places and ways while teaching according to hardware and software facilities she/he owns, characteristics of the students and the subjects she/he will teach and teaching objectives determined. According to Aşkar and Erden (1996), Keser (1998), the ways of using computers can be given as follows:

1. The teacher teaches the subject with traditional method in classroom. Students who miss the lesson by any reason or who are unsuccessful or in need for learning can have an opportunity to learn the subject via computers. Here the computer is private teacher.
2. After the teacher teaches the subject with traditional method, evaluation studies are made in the classroom by means of computers.
3. After the teacher teaches the subject in the classroom, exercises, applications, and evaluations are carried out by means of computers.
4. The subject is taught by computers. The teacher can compensate for learning deficiencies by means of discussion method; and correct the student’s mistakes by examining them.

The role of computer assisted teaching in learning and teaching is beyond dispute that its contributions in educational and instructional process are so significant. According to Doğanay (2002), the advantages supplied by this method are as follows.

1. It increases efficiency in education and instruction, it makes effectiveness easier in classroom.
2. It makes education and instruction enjoyable and attractive.
3. It motivates the students to the lesson by the help of sound- pictures and music.
4. It makes it easier to repeat complicated problems, concepts and processes many times.
5. It contributes to the student’s intelligence to develop.
6. It gives the students concrete experiences similar to real life.
7. It causes the students and researchers to reach rich information sources.
8. Mistakes in texts written can be corrected easily, and some additions and omissions can be made easily, too.
9. It gives the students courage, ambition and excitement and in this way it makes development and success of students easier.
10. It develops the students’ self-confidence.

Using computers is one of the most efficient ways to make the lessons audio-visual, to supply a fluent and effective education, to keep the students from memorization, to obtain speed and permanence in perception. Because computers address to more senses compared to other technological tools and make abstract and complicated concepts concrete digitally because of their extensive multimedia properties. According to Bagui (1998) if information is presented to the students in multienvironment, it will be easier to transfer it to the brain.

**Computer Based Teaching** means using computers to control some activities of computer systems such as planning teaching, measuring learning, recording data related to the students, making statistical analysis on learning data (Yalın, 1999). In computer based teaching, computers execute all of educational and instructional activities. In this way of teaching, computers are the main teacher that teaches the subject and determined objectives and attitudes. All of the educational and instructional activities are performed by computer programmes prepared. The teacher manages organizational activities by being of secondary importance (İşman, 2001). The students can learn all information by applying different activities in computers. The teacher can be a helper or guide in these activities (İşman, 2003). Computer based teaching is a system which is personally focused, follows an order, adjusts its own speed, supports repetition and uses animation effects extensively (Friend and Cole, 1999). There is an interaction between the students and teaching materials inserted in CDs, and the students learn the materials following the subjects in a supplied guided order. These subjects are usually presented with sounds and animations. Simulations and exercises are completed with repetition. Individual tests provide the students with feedback about their performances and this is followed by a compensation stage to decrease learning deficiencies. The structure of computer based teaching which supports animation, includes repetition and adjusts its speed is seen as teaching which enables the students to comment on their own learning processes, directs them to repetition, increases the transfer to cognitive awareness (Leuthold, 1999).

While performing computer based teaching, private teachers, exercises and repetition, association and some programmes for problem solving are made used of (Jacoby, 2005). Puts the benefits of computer based teaching which is performed by using these programmes in the following titles: Flexibility, adjusting personal speed, easy recording, decreasing the need for human teachers, the same information for everybody, information which is consistent and of good quality, unlimited repetition, confidentiality and motivation.

Today, both methods are used for different subjects and programmes in pre-schools, elementary and secondary schools, high schools and universities. However, some questions such as whether these methods can be used for every lesson, in which conditions these methods will be more effective are under debate. If these methods can be used for right place, age group, topic and subject effectively, it may be possible that more output can be obtained from the students, information can be permanent and practical, the attitudes of the students towards the lesson can be improved.

**THE OBJECTIVE**

In this study it is aimed at determining how computer assisted teaching and computer based teaching affect of students in computer lessons, and also the effect them on computer using attitudes of students. In accordance with this objective, the answers to the following questions are expected.

1. Is there a difference between the success of students who take computer courses with computer assisted teaching method and whose success is at information stage of cognitive domain, and the success of students who take computer courses with computer based teaching method and whose success is at information stage of cognitive domain?
2. Is there a difference between the success of students who take computer courses with computer assisted teaching method and whose success is at application stage of cognitive domain, and the success of students who take computer courses with computer based teaching method and whose success is at application stage of cognitive domain?
3. Is there a difference between computer using attitudes of the students who take computer course with computer assisted teaching method and the students who take computer course with computer based teaching method?

**HYPOTHESES**

1. The students gave real answers to the questions in attitude scale used in research.
2. Attitude scale questions used for research are in capacity of answering the questions directed by the research.
3. It is sufficient to teach subject through the computer based teaching method and the Cd “I am learning WORD” produced by the company named CDROM DATA and used by the group who have taken computer classes.

4. Variables which were not controlled affected the both group in the same way.

**LIMITATIONS**
This study has been limited with

1. 94 students who have studied at the second grade of the Primary Teaching Department of Education Faculty at Trakya University in formal education program,
2. Starting the Microsoft Word program of computer classes, studying with tool bars, studying menu, personalizing menu, moving the document, saving document, protecting the documents with password, determining choice in the document, putting characters into a form, saving changes, taking changes back organizing paragraphs, aligning texts, forming colour texts, numbering and using item marks, realizing imprint prewiev, adding lines and frames to the documents, using background, changing uppercase and lowercase, finding and changing text, adding special icons, adding a text from a different document, adding border and shade, forming tables, forming a table using chart toolbar, deleting lines and columns with eraser, moving in the table, changing the size of lines and columns, adding lines and columns, dividing or combining cells, using the feature of automatic fitting, using chart toolbar, using automatic figures, deleting figures, copying and transporting, wordart, studying with minor pictures and forming graph with Microsoft Graph,
3. Information and application steps of cognitive domain,
4. Six weeks period.

**METHOD**

**The Model of the Study**
The experimental /Testing Model was used in this study. Through this model, 94 students at second grade, Primary Teaching Department (formal education) of Education Faculty of Trakya University were included in this study. Forty-six of these students formed the experiment group who had taken computer classes with computer based teaching method and the rest forty-eight students formed the control group who had taken the same class with the computer asissted method. Pre-test and post-test control group pattern was used while forming sampling.

**Tools of Collecting Data**
In this study, a placement test including 60 questions and the topics of Word program used by the researcher was utilized to evaluate. The difficulty indexes of these test items have changed between 0,24 and 0,73. Additionally, the reliability coefficient of the test is 0,93. Considering the ability of the students for using Word program, an application test including 10 questions formed by the researcher was utilized as well. With the aim of evaluating the attitudes of using computers of the students, an attitude scale was used. The original form of this attitude scale was improved by Jones and Clark. It was translated into Turkish by Uzunboylu (1995) later. The realibility coefficient of this scale which covers 40 items has been found as 0,97.

Each student of experimental group used a computer. Later, the researcher distributed instructional CD’s named “I am learning Word” explaining Microsoft Word program. After the students had switched their computers on and made their Cds ready to work, the reseracher distributed the topic headings to be learnt from the CD “I am learning Word” and the worksheets covering the application to be realized. Students listened to the topics of that class from the instructional CD by wearing headphones and took notes when necessary. Students completed their studies in a four class hours each had been 50 minutes. The instructor picked up the disks which the students recorded their studies on at the end of class to evaluate. The disks were given back to the students again in the following class. Since the computer based teaching method requires, the instructor never answered any question asked by the students during the classes. Instructor didn’t made any contribution related to learning but helped them with only the problems resulting from hardware.

Before beginning to study with the students of control group, the instructor formed a teaching design related to the topics to be given by using Dick and Carey Model. The steps of the model are given below.
The one week study of the control group has four classes each one is 50 minutes. In the first two hours of the classes, students listened to the topics of that class accompanied by power point slides prepared by the researcher. They took notes when necessary while listening to the subject. In apposition to the study realized in experimental group, the researcher answered all the questions asked by the students and contributed while instructing this group. Because the computer is the basic teaching material used by the instructor in the computer assisted teaching method. Computer doesn’t replace the instructor but contributes the teaching. In the last 2 hours of the class, students were placed in a position that each would have a computer to study on. The same worksheets prepared for the experimental group were given to this group as well and made them apply the subject. On the contrary, the researcher who didn’t answer any questions and help in the application of the experimental group, answered all the the questions and helped the students to support them in this method.

**Application of Data Collection Tools**

The prepared placement test was applied to determine the levels of the students at the information step of cognitive domain considering the interest of the students about Microsoft Word before six week study period. Control and experimental group students answered the test at the same time. Students took this placement test again at the end of the study in order to see how they improved at the end of this six-week study period. This placement test was completed to see the permanence of the information students acquired.

Application test was given to both control and experimental group students at the same time before the six week study period. Students, who were placed as each one would have a computer, answered the questions on their own computers after they had taken the exam-question papers. They completed the test by saving the answers they gave on the disks which belonged to themselves. They delivered their disks to the instructor when they finished the exam.

The attitude scale improved by Jones and Clark and translated into Turkish by Uzunboylu (1995) was applied to the both groups at the same time in order to determine the attitudes of the students towards the computer usage of the students. This attitude scale was applied once more to the both groups after the study was completed. The reason of the application of the scale once more after the study is to determine the change in their computer usage attitude at the end of the teaching period.

**The Analysis of The Data**

The data gained from evaluation tools were analyzed using SPSS 12.00 statistic program.
FINDINGS

Table 1. Comparison of the points of placement test applied to the experimental and control groups before the study

<table>
<thead>
<tr>
<th>GROUP</th>
<th>N</th>
<th>Average</th>
<th>SS</th>
<th>sd</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>48</td>
<td>10,47</td>
<td>9,29</td>
<td>92</td>
<td>.219</td>
<td>.827</td>
</tr>
<tr>
<td>Experimental</td>
<td>46</td>
<td>10,93</td>
<td>10,88</td>
<td>92</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The values of t test which was applied to compare the results of the placement test realized before the six week study period of the experimental and control groups are given before. There is no considerable difference between the groups ($t(92)=.219; p>.05$).

Table 2. Comparison of the points of the placement test applied to the experimental and control groups before the study

<table>
<thead>
<tr>
<th>GROUP</th>
<th>N</th>
<th>Average</th>
<th>SS</th>
<th>sd</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRE-APPLICATION</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>48</td>
<td>0,89</td>
<td>3,54</td>
<td>92</td>
<td>.616</td>
<td>.539</td>
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<tr>
<td>Experimental</td>
<td>46</td>
<td>1,36</td>
<td>3,90</td>
<td>92</td>
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</tbody>
</table>

According to the values of t test given to compare the result of the application test given to the groups before the six-week study, there is not a considerable difference between the groups ($t(92)=.616; p>.05$).

Table 3. The effect of the applied method on the success of computer class t test values

<table>
<thead>
<tr>
<th>METHOD</th>
<th>N</th>
<th>Average</th>
<th>SS</th>
<th>sd</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRE-TEST</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Assisted Teaching</td>
<td>48</td>
<td>10,47</td>
<td>9,29</td>
<td>92</td>
<td>.21</td>
<td>.82</td>
</tr>
<tr>
<td>Computer Based Teaching</td>
<td>46</td>
<td>10,93</td>
<td>10,88</td>
<td>92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POST-TEST</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Assisted Teaching</td>
<td>48</td>
<td>43,54</td>
<td>8,05</td>
<td>92</td>
<td>.49</td>
<td>.61</td>
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<tr>
<td>Computer Based Teaching</td>
<td>46</td>
<td>42,71</td>
<td>7,94</td>
<td>92</td>
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<tr>
<td>PRE-APPLICATION</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Computer Assisted Teaching</td>
<td>48</td>
<td>.89</td>
<td>3,54</td>
<td>92</td>
<td>.61</td>
<td>.53</td>
</tr>
<tr>
<td>Computer Based Teaching</td>
<td>46</td>
<td>1,36</td>
<td>3,90</td>
<td>92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POST-APPLICATION</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Assisted Teaching</td>
<td>48</td>
<td>59,64</td>
<td>21,96</td>
<td>92</td>
<td>5,95</td>
<td>.00</td>
</tr>
<tr>
<td>Computer Based Teaching</td>
<td>46</td>
<td>36,02</td>
<td>16,13</td>
<td>92</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

t test was carried out in order to determine how the methods of computer assisted teaching and computer based teaching were effective on the success of the students in their computer classes. According to the obtained data, there is not a considerable difference ($t(92)=.21; p>.05$) between the points of pre-test of the students. Also, a considerable difference was not obtained between the post-test points of the students ($t(92)=.49; p>.05$). A considerable difference was not found between the points of the application test given before the study to the students ($t(92)=.61; p>.05$) whereas in the post application test applied after completing the study, a considerable difference was determined between the students ($t(92)=5,95; p<.05$). In order to determine this difference is more advantageous to which group, average values were taken into consideration. This value is 59,64 in the group who had computer assisted teaching while it is 36,02 in the group who had computer based teaching. It was determined that the group instructed via computer assisted teaching were more successful.

Table 4. The effect of the method applied to the attitude of the students towards computer usage t test values

<table>
<thead>
<tr>
<th>METHOD</th>
<th>N</th>
<th>Average</th>
<th>SS</th>
<th>sd</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRE-ATTITUDE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Assisted Teaching</td>
<td>48</td>
<td>144,33</td>
<td>15,25</td>
<td>92</td>
<td>.04</td>
<td>.96</td>
</tr>
<tr>
<td>Computer Based Teaching</td>
<td>46</td>
<td>144,47</td>
<td>14,11</td>
<td>92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POST-ATTITUDE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Assisted Teaching</td>
<td>48</td>
<td>147,77</td>
<td>14,29</td>
<td>92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Based Teaching</td>
<td>46</td>
<td>147,73</td>
<td>12,16</td>
<td>92</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It was determined that there was not a considerable difference between the groups when we take the effect of the applied method regarding the attitude towards computer usage into consideration ($t(92)=.04; p>.05$).

CONCLUSION AND PROPOSAL

According to findings about the effect of the method which was used in the research on students’ success, it was determined that the group to which computer assisted teaching method was applied was more successful in word application exam conducted after the 6 weeks studying programme. While average grade of the group which learned the Word program with computer assisted teaching method was 59,64 in the last application. This value
was 36.02 for the group learning with computer based teaching method. This may be caused by following variable: In computer assisted teaching, the agent that is responsible for teaching is the teacher. In this method, computers are the most important tools which help the teacher for teaching the subjects. The most important feature of the computer assisted teaching is making use of the computers. The group which studied with computer assisted teaching method continued their studies with both the guidance and the help of the instructor. In every stage of the lesson the students in this group and the instructor collaborated with each other. The instructor used Power Point presentations prepared by herself while teaching the subjects. In addition, in accordance with the teaching design model used, some deficiencies were tried to be compensated at the end of the lessons. When needed, for some lacking and incorrect information and actions, it was started from the beginning. On the other hand, the students who studied with computer based teaching method tried to learn the subjects with one-to-one teaching programme which they used in their computers. In this method, there was not any interaction between the instructor and the students in the group related to explanation of the subject. Besides, in the application stage of the topics taught the instructor didn’t give any support to the students. The instructor only intervened some problems that were seen in the computer and that the students could not manage. The student who studied with computer based teaching method found themselves without solutions in the subjects they could not understand. In addition, they weren’t warned by the computer for any mistake they made during the application. Because one-to-one teaching method which these students used was not interactive. It only consisted of the topic explanation supported by motions. The students realized the application of post stage of the subject by using hand-outs given by the instructor by being independent from this programme.

Clark (1985) thinks learning tools are of secondary importance in learning process and claims that “the tools do not affect learning in any case.” According to him “the tools do not make any contribution, and they only present information but do not affect the success of the students. This can be compared to trucks which carry our food but do not affect our nutrition.” During the last 20 years, education technology has improved considerably. The days which teaching tools have included only blackboard and books have been left behind and today’s technology has been started to use. Nowadays, we see the computer as a very important educational and instructional tool. In computer assisted teaching method, the main helper and learning tool is the computer. This study shows that if the instructor uses the computer appropriately and consciously, the students are affected by this situation positively if we consider their success.

For both of the methods, findings about the attitudes of the students towards using computers were investigated. It was found that the methods used did not cause any difference between the students’ attitudes. The instructor showed close interest to the students in the group which computer assisted teaching method was used. The instructor answered all of the questions of the students about the subject and helped them to compensate for lacking and incorrect points. Apart from this, the instructor tried to keep the students’ motivation as high as possible by means of lesson presentation. Whereas, the students who were applied computer based teaching method studied only in computer environment independent from the instructor during learning and application studies. The instructor in this method is the computer. The researcher motivated the students enough at the beginning of the class in computer assisted teaching. In addition the instructor prepared Power Point presentations for teaching Word program to the students through computer assisted teaching method. It can be accepted that these presentations are sufficient for learning. Even though computer assisted teaching has these positive conditions, features, the group who took the computer class via computer based teaching method, used Word teaching program which was well-designed caused a difference between the students regarding their attitude towards computer usage.

The following suggestions were developed according to the results obtained from this study:
1. This study can be carried out again by using an interactive teaching program, relieving the deficiency of the instructor.
2. Traditional teacher-centered teaching method and computer assisted teaching method were compared to each other at different school levels in the previous studies. But, computer based teaching method does not take place in these comparisons. In primary and high school levels, the differences of success and attitude of the methods of computer assisted teaching and computer based teaching in both computer classes and also other classes should be investigated.
3. This study can be developed as a comparison of computer assisted teaching method to internet assisted teaching method.

REFERENCES

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