

## A Novel Approach for the Use of Technology in Education

“... raised its lid, and the terrible afflictions with which the vase had been filled escaped and spread over the earth. Hope alone did not fly away” (the Pandora Box)

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### Abstract

Whether we are conscious or not, technology has made an important impact in our daily life. Like in all other areas, education has been transformed and more active learning methods are now being implemented. This paper is attempting to describe a novel approach for using modern technology. This paper is attempting to describe a novel approach for using modern technology. This approach expects that learners prepare their own materials on line while the final evaluation is based on their portfolios.

### Introduction

At the very start we wish to pay homage to Plato, by bringing in one quotation from the Republic. “The sciences which they learned without any order in their early education will be brought together and they will be able to see the natural relationship of sciences to one another and to true being” (Republic, VII 537). Similarly Kant (1999) was one of the many thinkers that throughout the centuries were involved in the enhancement of education. In his view, the art of education brings human “nature one step nearer to perfection”. He provided many recommendations for the physical, cultural, personal, moral and practical education of youth: “man can only become a man by education”.

It was Kelly (2002) that saw all people as "personal scientists" in anticipating the world. His first corollary -the construction corollary- states "*A person anticipates events by construing their replications*". Thus an education system should develop the ability of *self- learning* and applying various tools to problems that require the use of resources for the convenience of men. Unfortunately the fact that textbooks are written along disciplinary lines puts barriers between disciplines. When students are to be allowed to make their decisions regarding their education, fitting education to their abilities, counseling systems must be implemented (Yerlici,1987).

These have been the sources of inspiration for the author during the last decade, as he became more and more dissatisfied with the methods implemented in the educational institutions he was affiliated. In this work we summarize the earlier experiences gained in the field of “technology for education” since the beginnings of the 1980s and the current work done to address the need to enhance the quality of learning rather than teaching. Hopefully the implementation of the suggestions made at the end of this work, will contribute in providing an environment where education will eventually develop the creative skills of the learners.

### Earlier Experiences

During the last two decades the author has gained experience in using educational technology with young students as well as adults (İnelmen et al., 1999). During this period students were empowered to help the instructor in creating an environment where *learning was given primacy* (İnelmen, 1999). Learners were encouraged to prepare projects on cultural issues with the aim of showing how technology could be used to enhance understanding across nations (İnelmen, 2000).

Experience with school students in regions affected by the recent earthquakes showed that if young learners are allowed, they are very willing to experiment with technology and discover the “rules of the game” on their own (Akpınar et al., 2001). A mobile bus furnished with 18 personal computers made weekly visits to schools in the area. Here primary and secondary students encountered hands on experience in the use of modern technology.

As the material prepared for teaching BASIC programming language using computers -inspired from Pascal language notation system- (see Exhibit 1) was not received with enthusiasm by the students, new strategies were developed (İnelmen, 2001). The instructor had now to a) set new goals, b) evaluate results, c) praise efforts, d) warn mistakes, e) request views, f) seek support, g) assure autonomy, h) encourage reflective learning, i) develop program, course and lectures and j) expect the learners to be polite, reliable, assertive, confident, flexible, and dedicated.

The performance of the learners gave the instructor confidence in the educational approach adopted and gradually increased the responsibilities of the students in the class. The instructor became the coach and the technology mediator where all parties were expected to participate actively (Eldem and İnelmen, 2000). Since in the real working setting, people are required to collaborate with each other, the idea of “team work” was introduced at the middle of the semester (İnelmen, 2000).

The following is a listing of websites designed by the author of this project as the students progressed in the use of web tools and “project based approach”. The web site now under construction -hopefully we will have more material available as reference for the students- can be seen at:

- <http://hamlin.cc.boun.edu.tr/~Inelmen/cethamlin.html>
- <http://hamlin.cc.boun.edu.tr/~Inelmen/car.ppt>
- <http://hamlin.cc.boun.edu.tr/~Inelmen/edupubl.html>

UNESCO report named “Learning: The Treasure Within” prepared by a commission headed by Jacques Delors published in the year 1996: describes the four pillars of education -learning to know, learning to be, learning to do and learning to share- that administration staff must point to improve the present conditions if we are looking for a better future in this our planet (UNESCO, 1996).

**Current Work**

The first research project in 1985 on the use educational technology in the university -where the author is currently affiliated- revealed that poor computer literacy was a barrier to the development of modern tools. Although two five-floor buildings were constructed for the development of educational technology material in the year 1987, no important contributions were made and the offices were redistributed for other purposes.

PROGRAM	= <STATEMENT> ...
*STATEMENT	= <NUMBER> <INSTRUCTION>
*INSTRUCTION	= <RESERVED.WORD> <PARAMETER>
...	
REM	<STRING>
DIM	<VARIABLE> ( <NUMBER> , <NUMBER> , <NUMBER> )
INPUT	<VARIABLE>, ...
RESTORE	
READ	<VARIABLE>, ...
DATA	<STRING>, ...
LET	<VARIABLE> = <EXPRESION>
PRINT	<STRING>, <VARIABLE>, ...
IF	<EXPRESION> THEN <INSTRUCTION>
GOTO	<NUMBER>
ON	<VARIABLE> GOTO <NUMBER>
FOR	<VARIABLE> = <EXPRESION> TO <EXPRESION>
	<STATEMENT> ....
NEXT	<VARIABLE>
GOSUB	<NUMBER>
	<STATEMENT> ...
RETURN	
END	
**NUMBER	= <DIGIT> ...
STRING	= <LETTER> + <DIGIT> ...
VARIABLE	= <LETTER> <DIGIT>
EXPRESION	= <VARIABLE> <OPERATOR> ...
OPERATOR	= <MATH> + <LOGIC> + <RELAT> + <FUNC>
MATH	= <+> + <-> + <*> + </>
LOGIC	= <AND> + <OR> + <NOT>
REL	= < > > + < < > + < <> >
	+ < = >

FUNC <SQR>	= <INT> + <RND> + <ABS> +
LETTER	= <A ... Z>
DIGIT	= <0 ... 9>
SET	= (JAN ... DEC)
PROCEDURE	= (IF R2 THEN MACKA)

Exhibit1. Extract from the basic language teaching program

After having completed this early project, the author worked on another project on distance education in 1999 sponsored again by the Research Fund of the university. During the research it became clear that there were three different views about the future of distance education. On one side, those who were sceptic to the idea opposed any new investment. On the other side, were those who welcomed the use of advanced technologies including video-streaming.

A small minority at the university considered the use of web-based education could be a feasible solution to the need to incorporate to the network facilities -already available on the campus- in the teaching process. Unfortunately in all three cases there was a strong feeling for continuing the tradition of the supremacy of teaching and theory exposure. We quote:

*There is, therefore, every reason to place renewed emphasis on the moral and cultural dimensions of education, enabling each person to grasp the individuality of other people and to understand the world's erratic progression towards a certain unity; but this process must begin with self-understanding through an inner voyage whose milestones are knowledge, meditation and the practice of self-criticism (UNESCO, 1996).*

Nevertheless, the author continued on with the concept that education is about “doing” and worked to develop the support of a student who happened to work in the computer centre. This environment allows significant interaction between instructors and learners by presenting their respective “scripts”. To ensure that all learners participated and profited from the individual works the final examination was devoted to the discussions about the assignments.

<b>CET 201.01 Instruction Materials for Education</b>
<b>Instructor</b> Assist.Prof.Erol İNELMEN (PhD)
<b>Objective:</b> Use computers to prepare oral presentations. See <a href="#">example &amp; publications &amp; format</a>

<u>Week #</u>	<u>Date</u>	<u>Project</u>	<u>....</u>	<u>Week #</u>	<u>Date</u>	<u>Project</u>
0	23.09. 02	Objective		6		Introduction
1		Key-words		7		Background
2		Roadmap		8		Findings
3		Statements		9		Conclusion
4		Conjunctions		10		Flash
5		Links		11		Animation
<b>Assignments:</b> (see your grades here)				<b>Schedule:</b>		
40% Class-work (short exams end of class)				(see <a href="#">time table</a> )		
40% Project				<b>E-mail:</b>		
20% Final				Send your e-mail to <a href="mailto:İnelmen@boun.edu.tr">İnelmen@boun.edu.tr</a>		
<b>Rules:</b>				<b>SEND FILES:</b>		
No make-ups				use “Save as” to send your work (add ftp)		
AA is 90/100				Folder “home” and then folder “eng1011”		
Late (-1 points per minute)				(dates are attached to your files)		
Minimum 40/100 average for each assignment				<b>Roadmap:</b>		
Objection within grades 15 days by e-mail				<i>Education      Technology</i>		
<b>Help:</b>				Psychology      Word		
Asks always for HELP + <i>BE</i>				Learning      Power		
<b>Lecture:</b>				Counseling      Basic		

HANG your assignments at the start of class	Administration Java
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Exhibit2. Rules and outline for the course offered by instructor

### Experience Gained

An “exploratory learning” approach was implemented and students were expected to prepare and submit their own material for approval. The instructor role primarily involved that of guidance and mentoring. While students took the initiative in preparing the electronic environment, they were strongly advised that learning should be based on free discussions and sharing of information. Drafts for home page, news page and student registration page were prepared and students shared their “discoveries” with great enthusiasm.

Turkish History (1860-1960) was selected as the class general topic, each student sharing a specific subject matter. The objective was to encourage students to develop their own learning material following a weekly schedule, which included the description of the key words, the roadmap of the presentation, the preparation of the presentation material using animation techniques. See Exhibit 3 for the classification of topics covered in the course.

The students prepared drafts on paper for the presentation slides and then transferred the approved material to the computer followed whenever possible by oral presentations. Make-ups were not allowed and grades were reduced for late presentations. The “standard grading system” generally accepted was adopted as the basis for the final assessment. Students not familiar with this “project centered learning” approach had difficulties in adopting to this during the first weeks. Nevertheless, performance improved as pride increased. Students were evidently not focusing anymore on the grade as their main concern.

Although collaboration between students was not encouraged, in some cases it was inevitable. For the sake of checking the authenticity of the work, short examinations were given whenever possible. By the end of the semester students were requested to make one peer-evaluation and prepared the final own examination questions.

<b>Ideology</b>	<b>Relations</b>
Secularism (mutlu)	Germany (evci)
Republicanism (bulut)	Japan (sendogan)
Nationalism (oksuz)	URSS (recepoglu)
Populism (cinar)	
Etatisme (kapucu)	<b>Pacts</b>
Revolutionism (gonullu)	Capitulations (kirbi)
	Mondros (tigdemir)
<b>Reforms</b>	Lausanne (yasar)
Hat (gunoz)	Nato (hocaoglu)
Education (cetin)	
Constitution (yazlik)	<b>Conflicts</b>
Democracy (arin)	Canakkale (ozcelik)
Language (akbay)	Sakarya (baltali)
Early (yilmaz)	WW-II (baltali)
	Cyprus (metin)
<b>Gatherings</b>	
Amasya (bayhan)	<b>People</b>
Erzurum (degirmenci)	Enver (akpinar)
sivas(bayraktar)	Inonu (ince)
	Bayar (yalcin)
<b>Events</b>	
Caliphate (ozturk)	<b>Groups</b>
March 31 <sup>st</sup> (gocmen)	New-Osman (uyrum)
1950 (yucel)	Jon-Turk (kunduz)
	Tanzimat (ispir)
	Kadro (aslan)

Exhibit 3. Topics covered in a computers course on Turkish History.

Results obtained at the end of the semester are very encouraging. Students in many cases confessed that they were unfamiliar with some of the themes of their own history. Presenting their contributions in class demanded

effort to develop both written and oral presentation skills. This experience showed the need for a publication that would give learners a step-by-step method in public presentation. The importance of clear regulations for unique projects should be stressed.

**Future Plans**

Although there is lack of interest in most of the university faculty about the positive results obtained from the novel approach presented in the previous section the author has continued on his efforts (See Appendix A). The results are being reported in different publications and there is still hope that the life-long-learning centre ([www.buyem.boun.edu.tr](http://www.buyem.boun.edu.tr)) will be willing to start a special program that is summarized in Appendix B. The new program envisions the implementation of a “technology mediated learning” approach.

Our views on traditional authoring systems –now developed under “learning management systems” banner- are that they are very expensive and not flexible. Teachers are reluctant to implement the new techniques and are putting many barriers to the development. Still we are constructing new buildings, when universities are being launched fully on line: Jones International University is now operating in Turkey (<http://jiu-web-a.jonesinternational.edu/eprise/main/JIU/home.html>).

Meanwhile we are making plans to continue on improving the present set-up. We are adding a “welcome and farewell message” page, (<http://hamlin.cc.boun.edu.tr/~lnelmen/welcome02.html>) to warm up the relations with the students. Eventually all web pages have to be reorganized to fit all the changes that have been implemented during the years. In the future more emphasis will be given to “conceptual mapping”. Concept maps were recently introduced with modest gains (as can be seen from Exhibit 4).

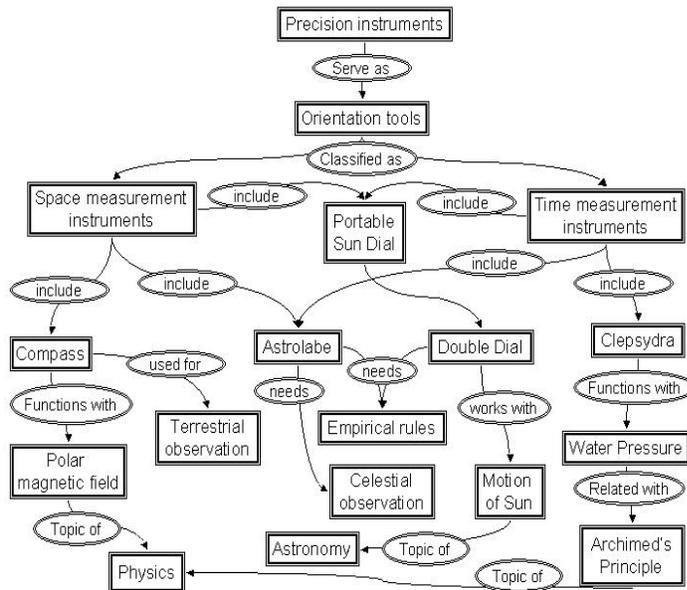


Exhibit 4. Example of concept map as prepared by Perolli (2002).

**Conclusion**

This works attempts to show that traditional educational technology applications where the learners is expected to follow the path given by the instructional design has no future. Here we suggest that learners should be empowered and expected to develop their own learning material. Since the assessment of the performance of the learners depends on the unique work they deliver a “modular schedule” must be adopted. Only one course should be delivered at a time by a team of instructors.

“Technology Mediated Communication” (TMC) is rapidly enhancing the way we do business and is also improving the way we learn. Technology can be used to make the learning process more enjoyable both to the teacher and the student. The emerging technologies and “project centered learning” techniques can bridge the expectations of the teachers and students. In our opinion it is more important to upgrade the computer skills of teachers, than the enhancement of hardware and software.

To make the necessary changes in the educational curriculum proposed here we encourage stakeholders to “join in” in the mission we are launching. National and international organizations have the responsibility of creating the platforms where change can be initiated. If these recommendations are implemented -in a carefully designed and fully holistic curriculum- future learners will be able to develop the skills necessary for team and creative work.

We conclude with the story of a traveller that amazed with the beauties he saw in the construction site of a new building, asked an artisan what he was doing. The artisan answered reluctantly that he was laying bricks. The traveller moved on and asked a second artisan the same question. The artisan answered that he was building the wall of a new headquarters. Exactly the same question was repeated to a seemingly more experienced artisan. The third artisan answered enthusiastically: "I am proud of working on the wall of a building that will be in the future the pride of our nation".

**Acknowledgment**

The help of my students in developing a new approach to learning is acknowledged.

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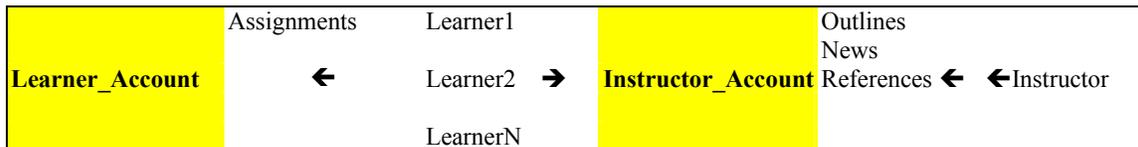
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**Appendix A: Implementation of a Technology Mediated Distance Education System**



**Appendix B: Implementation of a Knowledge Based System for Education**

