

# Introducing Information Technology to Palestinian Schools

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## Abstract

The paper presents the two perspectives of IT in the Palestinian schools. The basic IT literacy – based courses have been introduced in most of private schools since 1985, and formally started in all public as well private schools in 1999. This covers eight grades from the fifth up to the twelfth. An additional two classes per week have been introduced to the weekly school program. The main objective is to create a new technological-mentality generation that understand, use, explore, and involve in the highly demanded field. Students will be facilitated with the basic IT skills to understand, use, and promote their studies in effectively understanding, searching, reporting, and documenting. Teachers badly need IT paradigms to boost their instructional materials and teaching aids. In addition to the workshops, an Arabic language-based web site will be constructed to assist schoolteachers, administrators, and students etc. in learning technology online an offline. Further more, a collaborative Palestinian School Teachers Network (PSNET), dedicated to support teachers in developing, and enhancing computer-based instructional materials and educational aids.

Using the IT techniques in presenting instructional materials is still in its infant stage. To meet the highly demand in IT profession, higher educational institutions are badly required to update their curriculum and provide their graduates with advanced IT skills.

**Keywords:** IT, IT Skills, Instructional Material, K-12, Schoolteachers.

## Introduction

With the recent releasing of the latest Information and Communications Technology, ICT, at an affordable price, and an enhanceable Multimedia technology, Information Technology, IT, based applications are becoming more and more feasible mainly in the developing countries. Rarely, we find an application or a field that is not related or based on IT. Education is one of these potential applications. The remarkable interest being shown in the potential role of IT in education may be due to a series of developments that can be traced back over more than three decades. These include, invention of hypertext concept; building of the physical network connections that have given rise to the world wide Internet; development of more versatile software tools for courseware authoring; development of systems for supporting the range of teaching and learning processes that comprise a complete educational program; and improvements in multimedia technology-enhanced microprocessors, computer memory, and disk technology that have enabled the sophistication of the tasks that can be carried out by computers to be greatly increased (Potashnik, 1996, Philips 1997, Arafeh 1999).

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The currently available Media & Technologies include, Print Correspondence, CD-ROM's Interactive Disks; Instructional Radio Television / Videotape & Interactive TV; Interactive Videodisc; Teleconferencing such as Audio teleconferencing, Audiographic, teleconferencing, and Video teleconferencing; Computer Networking; and Courseware

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(Baker 1997, Daniel 1996, Taylor 1996, Arafah 1998, Ingles, Ling, and Joosten 1999). Basing upon this review, the technology plays an essential and a vital role in the educational activities, including course design and delivery, interaction and learning, management and organization.

Among the Palestinians, who seek jobs locally, regionally and globally, education plays a vital role in their life and tradition. This is mainly due to the facts including the occupation and the lack of natural resources. To cope with the recent advancement in the IT fields and its applications, mainly in the developed nations, Palestinians in the occupied West Bank of Jordan, Currently, Palestinian Authority, have adopted IT based and related topics in their schools' curriculums. This adoption goes back to the last two decades as illustrated in the Table I. Private schools that are governed by mainly Non Governmental Organizations, NGOs, were the pioneers in introducing, providing, adopting computer facilities and services to their students. These IT services have been used as indicators and positive marketing measures that reflect the quality of teaching schools offer (Arafah, 1999).

Two major folds were considered while introducing IT to schools. The first one is to introduce literacy basic skills for students to understand and utilize IT. After which, students will be able to use computers

Period	IT Services	Teaching IT Skills	Using IT in Education	Local Accredited IT Programs	Political Status	Comments
1985 to 1991	PCs	DOS, BASIC, Word Processors, Spreadsheets Problem Solving using computers	Very few bought English Language-based Programs used for demonstration, simple developed administrative programs	One B.Sc. Program Four 2-year Diploma	Under Occupation	Private Schools, Students' Age is 14 to 16 Years, Non-standard Syllabus
1991 to 1994	PCs, Networks	DOS, Windows, BASIC, Word Processors, Spreadsheets, Database, Problem Solving using computers	Bought English Language-based Programs used in teaching Math, English Language, menu-driven developed administrative programs	Two B.Sc. Programs Eight 2-year Diploma	Under Occupation	Private Schools, Students' Age is 10-16 Years, Non-standard Syllabus
1994 to 2001	PCs, Networks, Internet	Windows, C, Visual BASIC, Word Processors, Spreadsheets, Database, Internet Browsers, Web Page developing packages, Problem Solving using computers	Mainly bought, & few developed Arabic / English Multimedia-based Programs used in teaching Science, Math, A/E Languages, etc. User-friendly administrative programs	Five B.Sc., one M.Sc. Programs Sixteen 2-year Diploma	Palestinian Authority	Private Schools, Nurseries, and Students' Age is 8-16 Years Public Schools, Regular Students' Age is 10-12 Years, and technical Students' Age is 16-18 Years, Partially standard Syllabus
2002 to 2005	PCs, Networks, Internet, PSNET	Windows, C, Java, Visual BASIC, Word Processors, Spreadsheets, Database, Email, Graphics, Internet Browsers, Web Page developing packages, OO Problem Solving approach	Few bought, & mainly Collaborate-developed Arabic / English Programs used for teaching Arts, Science, Math, A/E Languages, etc.	Six B.Sc., Two M.Sc. Programs Twenty 2-year Diploma	Palestinian State (hopefully)	Private Schools, Nurseries, Students' Age is 8-18 Years Public, Regular Students' Age is 10-18 Years, and technical Students' Age is 16-18 Years, Mainly Standard Syllabus

**Table I: Summary of IT in Schools**

to enhance their studies in searching, reporting, documenting, etc. The second fold is to train teachers how to enhance their instructional materials and teaching aids using IT tools and paradigm.

## Standardized IT Courses

A ten-year project, sponsored by the EC, has been implemented by the Ministry of Education Curriculum Development Department to rewrite and update all schools' syllabus and textbooks; and introduce the technology related topics to the Palestinian public schools starting from the 5<sup>th</sup> grade up to the 12<sup>th</sup> one. Two-hour consecutive classes per week have been (approximately 6% of the total classes taken by students) introduced to the weekly school timetable. The main objective is to create a new technological-mentality generation that understand, use, explore, and develop. The core of the curriculum covers several major topics including Computer Science concepts and applications, Energy, Drawing, Disassembly and Assembly, Design and Science Fiction, Communication, and Projects. The IT-based topics consume approximately 60-70% of the total topics to be covered. The various stages in developing IT related school textbooks include:

1. Setting up the very clearly major objectives and a scope and sequence for the skills that are to be taught and curriculum outlines for the eight grades. All these are grade and age specific. This stage includes establishing the Technology National Curriculum Committee, reviewing the curriculum by a technical reviewing committee, approving the outlines by the Ministry of Education, and setting a plan for developing School Textbooks.
2. Starting with developing fifth, sixth, and seventh grades textbooks. Currently, we are developing concurrently, the eighth, ninth, and tenth grades textbooks. This stage includes iterative writing new instructional materials, reviewing them technically, syntactically, and grammatically, designing textbooks, publishing and distributing them to schools.
3. Performing several introductory workshops every year dedicated towards teachers who will teach the technology topics in schools.
4. By the end of the year, 2002, all technology textbooks to all grades will be provided.
5. Comments and feedback notes coming from various users of these textbooks along with updating parts of the material will be taken into account in the next print versions.

## IT School Website

A dedicated Arabic language-based web site is intended to construct in order to assist schoolteachers (K-12 teachers), administrators, and students etc. in learning tools technology synchronously and asynchronously. Several electronic-based resources, tools, software support, tutorials and manuals will be included in this web site. Thus, it will enable some of the academic processes and help establish an academy to train teachers on IT skills and how to use the Internet in enhancing the teaching process.

The various features and claimed advantages of enhancing instructional materials with IT tools include (Lochte 1993, Daniel 1996, Agnew 1996, Potashnik 1996, Baker 1997, Hazemi, 1998, Arafeh 1999), Demonstrable improvements in student academic achievement; More cost-effective applications of technology; Innovative solutions to current and instantaneous challenges; Ensured consistency, reliability, and quality in instruction, assessment, and feedback; Reduced learning time; On-demand learning; Increased achievement; Greater flexibility and seamless access; Faster revision; Student controlled; Maintained and published easily; Very close to Natural Interface (Face - to -Face Communications).

There are two modes of delivery, the synchronous (Real time / Online) such as Chatting, Conferencing (Audio/Video), and Whiteboard to share text and diagrams; the second mode is the Asynchronous (Offline / Students' own times), such as Telephone, Fax, Mail; CD-ROM Interactive Disks Bulletin Board;

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Email; Newsgroup, and Mailing Lists; Internet Downloading Materials. The various IT related topics and tools that might be included are as listed in Table II (Arafeh 2001).

<b>Computer Skills</b>	<b>Simple Required Software</b>	<b>Remarks</b>
<b>Basic Skills</b> Operating System Word Processing Spread Sheets Internet  Email  S/W Installation Simple HW Installation Simple Graphics Notebook	Windows (98, 2000, NT, XP) Word Excel Internet Explorer Navigator Outlook Messenger Windows Windows Paint (Windows) Calendar (Windows)	PCs' Operating Systems MS Office (97/2000/2002/ XP) MS Office MS Office Netscape Communicator MS Office Netscape Communicator 98, 2000, NT, XP 98, 2000, NT, XP 98, 2000, NT, XP 98, 2000, NT, XP
<b>Intermediate Skills</b> Programming in C, JAVA, FORTRAN, Visual BASIC. Compression	Suitable Compiler  Winzip	
<b>Special &amp; Advanced Skills</b>  CAD  Planning Presentations Statistics  Numerical analysis & Mathematical Equations CAL / CAI / CBT / CBL Developing Instructional Material Using Multimedia Techniques <ul style="list-style-type: none"> <li>o Text</li> <li>o Graphics</li> <li>o Images</li> <li>o Video</li> <li>o Animation</li> <li>o Virtual Reality</li> <li>o Sound</li> <li>o Simulation</li> <li>o Authoring Languages                CMC, Chat, Audio Conference,                Video Conference</li> <li>o Geography</li> </ul>	ORCAD  AUTOCAD MS Project Power Point SPSS / Minitab Matlab Matlab Matlab, Mathcad, Maple, Mathematica Bought CD-ROM Courses  Word Acrobat Reader/W PhotoDraw Photoshop Photo Editor Premier GifAnimator, Matlab Studio 3D Max Sound Recorder, SoundForge Director, and Matlab FrontPage, Director MS Netmeeting  GIS	Electronics Schematic & PCBs Layout Engineering Drawing MS Office MS Office Data Analysis    MS Office Adobe MS Office Adobe MS Office Adobe Windows Adobe  Macromedia, Matlab MS Office, Macromedia MS Office

**Table II: Basic, Intermediate, and advanced skills required by school administrators, teachers, and students.**

Basing upon these reviews and the highly demand on IT professionals, the Palestinian higher educational institutes have increased their IT-based programs as shown in table I. In fact, using IT techniques in education is still in its initial stage. Several local IT-based institutes and centers separately and collaborately with other educational institutions have started exploring and developing IT-based tutorials and instruc-

tional materials in both Arabic and English language. Several fields have been explored including Languages, Math, Physics, Chemistry, history, tourism, etc.

## PSNET

The last stage in this long-term project is to establish an Arabic collaborative Palestinian School Teachers Network (PSNET), dedicated to manage, utilize, and coordinate all efforts in developing computer-based instructional materials and educational aids. It is required to set up, gradually, IT labs for students in all public and private schools in Palestine. Teachers from different schools connect and communicate through Internet activities and discuss relevant issues. In fact, Teachers knowledgeable about options in the traditional classroom are often unfamiliar with the learning process options available on the web, and should be given time and support to explore these opportunities. Because of the diverse skills needed for effective IT-based course or simulation development, it is advisable to use a team. PSNET will offer a badly needed and reliable means for teachers to develop collaboratively, encourage and exchange views (Falk 1997, Hazemi 1998, Arafeh, Hachisho, NourEldin, 1999, Arafeh 1999). Currently, this stage is not feasible due to the limited communications options that might be implemented, as it is highly dependent on the political situation.

## Conclusion

Introducing Information Technology to schools provides students with various skills that enables them to understand and use IT means such as computers to enhance their studies in searching, reporting, documenting, etc. The teachers need IT means to make use of and enhance their instructional materials and teaching aids. IT has been first introduced in private schools in 1985. Up to 1994, IT has been adopted in some of Palestinian schools' courses in a non-standard format.

A long-term project sponsored by the EC, the Palestinian Authority has planned to introduce the technology topics to the Palestinian public schools starting from the 5<sup>th</sup> grade up to the 12<sup>th</sup> one. Approximately 6% of the total classes taken by students has been introduced to the weekly school program. The main objective is to create a new technological-mentality generation that understand, use, explore, and build. The first stage is concerned with developing textbooks, and performing several workshops for teachers who are supposed to teach the technology topics.

The next stage is to develop an Arabic language-based web site to assist schoolteachers, administrators, and students in learning technology online. Several electronic-based resources, tools, software support and manuals will be included in this web site.

The last stage in this long-term project is to establish a collaborative Palestinian School Teachers Network (PSNET), dedicated to manage, utilize, and coordinate all efforts in developing computer-based instructional materials and educational aids. Higher educational institutions must be aware of the IT facilities their graduates should have in order to meet the highly demanded IT professionals and facilitators.

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## Biography

**Labib Arafeh** received the B.E. degree in Electronics from the University of Bangalore, India, in 1980, the M.Sc. degree in Computer Studies from the University of Essex, UK, in 1984, and Ph.D. degree in Intelligent Systems, from the University of Manchester Institute of Science and Technology, (UMIST), UK, 1992. He was with Electrical and Computer Engineering Department, Palestine Polytechnic, Palestinian Authority, from 1982-1998. He joined Al-Quds Open University as the director of Technology and Applied Sciences, Jerusalem, in 1998-2000. Presently, he is the chairman of the Computer Engineering Department at Al-Quds University in Jerusalem, Palestine. His areas of interest include, Multimedia, Development of Instructional Materials, Intelligent Systems, and adopting of Neurofuzzy modeling techniques in various applications.