The Usage of ICT in Interactive Learning:
A Case Study of the Intel® Learn Program

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Abstract—Today, new communication technology, such as video conferencing, the Internet, and mobile conferencing, is widely used in all areas of life. It is therefore essential to examine how this technology can be utilized in early educational settings in order to provide new generations with the fundamental skills needed to function in today’s world. This paper will offer a few perspectives on the usage of ICT in pre-university education in the UK, Mexico and Korea. A case study of the Intel® Learn Program used in a learning initiative from 2006 to 2007 at El-Shahed El-Gendi Public School in Shebin El Kom, Egypt will be reviewed.

I. INTRODUCTION

We cannot imagine life today without ICT. Millions of people around the world use this technology every day, at every moment. The pervasiveness of ICT raises questions about its accessibility and applications. How can we use it in education? How much will it cost? We know that ICT is very expensive, and new developments appear constantly.

At the beginning of this paper, I will briefly explore some perspectives on the importance of utilizing and updating ICT in educational settings the UK, Mexico and Korea. These views were expressed by speakers at the first International Conference on ICT in Pre-University Education held in Cairo, from April 22nd – 24th, 2007.

I will then expose a case study I conducted on the usage of ICT at El-Shahed El-Gendi Public School in Shebin El Kom, Egypt from 2006 to 2007. I will discuss how the students utilized ICT to work on various projects with the Intel® Learn Program. This initiative allowed students the opportunity to work in teams and to collaborate on resolving problems and issues within their local communities.

II. VARIOUS APPLICATIONS OF ICT

ICT is no longer perceived by the educational system at large as a dispensable or irrelevant accessory. Today, it has become an important, even necessary tool with multiple applications in various educational settings. Academic research, video conferencing for educational purposes, information sharing and web-based learning to reduce education costs, are but a few examples of the usefulness of ICT. Gone are the days when, for instance, to learn about Chinese history and culture, students had limited choices, such as receiving instruction from an authority on the subject or going to China to study, to name a few. Today, we can search the Internet or academic databases to find information, or we can communicate with schools and knowledgeable experts at a distance for reliable information on a great range of topics. It is currently understood that investing in ICT in education should extend well beyond simply installing and upgrading facilities such as labs. As we know, innovative developments in ICT emerge around the world every day. The following brief description of ICT in education in some countries will give us a glimpse at how this technology is utilized and some of the challenges and concerns around ICT. The speakers below presented at the first International Conference on ICT in Pre-University Education held in Cairo.

2.1 Mexico

Dr. Raul Medina-Mora holds a Ph.D. in Computer Science and is CEO of Vision Mexico, a Management and IT consultancy. Dr. Medina-Mora presented a project entitled "Encyclomedia", which proposes using different types of mass media such as films and music in an interactive educational setting. This accessible and appealing learning tool can be applied to a great variety of learning situations.

2.2 The UK

Dr. Ray Barker is director of the British Educational Suppliers Association (BESA). He is known for his work in bringing technology and literacy together. Dr. Barker suggested that today, we need to reconsider how computer technology is utilized in schools, given that more and more students bring their own technology, such as PDAs, mobiles and laptops, to the classroom, while the school itself supplies often limited and outdated computer technology. Schools often channel funds into creating more computer labs but have difficulty keeping up with new software and systems. Dr. Barker used the metaphor of oases and deserts. In the past, the availability of computer technology at schools was akin to an oasis in a desert of limited computer accessibility in many communities. Today, on the contrary, many students have their own laptops; the school environment, in contrast, has become a desert due to the scarcity of funding for technology. He proposed a practical solution to this problem. Educators can encourage students to use their own computers at school for research, thus reducing the need for investing in computer labs. This implies that funding should be directed toward setting up wireless communication technology at schools rather than establishing new computer labs. Students can then collaborate on group projects using their own computers along with a few more computers provided by the school.
Dr. Takashi Sakamoto is President of the Japanese Association of Educational Technology Society and currently President of Tokyo Future University. Dr. Sakamoto stated that the usage of ICT in education is well established in Korea. Korea is one of the leading countries in its usage of the Internet and high-speed networking in many learning environments. He spoke about two educational systems employed in Korea: EDUNET and CHLS. EDUNET, designed to be used in a classroom or public library setting, is an online educational information system that offers a vast array of teaching and learning resources to teachers, learners and the public. CHLS, or Cyber Home Learning System, is an online educational information system used primarily for elementary and middle school education to improve the quality of public education while reducing expenses. It provides students with virtual classes or assignments to be done online at home.

III. ICT & INTERACTIVE LEARNING

As we can see, many ICT learning systems and educational projects have already become an integral part of learning worldwide. In the following paragraphs, I will describe how one interactive learning program, Intel® Learn, was used in a particular learning context, and I will offer my viewpoint on its effectiveness. Intel® Learn is intended for children ranging from ages 8 to 16 and it is currently being implemented in nine countries in the world, among them Egypt. For more information, you may visit the Intel web site at http://www.intel.com/education/Learn/.

The main objective of this program is to train students in digital literacy with a collaborative, community based, project-centered focus. It represents a complete shift from traditional methods in education to an interactive approach, fostering a spirit of teamwork while introducing students to computer technology skills. Through this program, each group of students is asked to create and carry out a project of their own. The TAC component of the Intel® Learn Program was used at El- Shahed El-Gendi Public School from October 2006 to June 2007. Both the TAC and TAW units were used from June 2007 to September 2007. Two hundred and thirty three (233) learners participated in the TAC program (158 girls and 75 boys). Eighty-five (85) learners participated in the TAW program (45 girls and 40 boys).

IV. WHAT PRECISELY IS INTEL® LEARN? 4

The Intel® Learn Program is described as follows at the official Intel web site:
http://www.intel.com/education/Learn/curriculum.htm

“The Intel® Learn Program is a hands-on, interactive curriculum comprised of two 30-hour units entitled Technology and Community (TAC) and Technology at Work (TAW). These units are designed to tap into children's interest in their own communities while nourishing their curiosity with creative, technology-driven projects. A trained community-center staff member guides learners through the program activities in a series of two-hour sessions.”

4.1 Technology and Community (TAC) 4

“Using a project-based approach, the curriculum's activities and projects demonstrate to learners how technology can contribute to and help improve their communities. For instance, using word processing and graphics software, learners create a calendar of notable events in their community, as well as community news articles. Using multimedia software, they create presentations that address community issues. Learners not only develop new technology skills and learn about their communities, they develop critical thinking skills as they collaborate to collect information, analyze that information, and finally, present it to their fellow learners, families, and community leaders. To facilitate this combination of technical and critical thinking skills, each lesson is divided into sections entitled "Plan it", "Do It," "Review it," and "Share it."

V. NUMBER OF STUDENTS

The TAC component of the Intel® Learn Program was implemented at El- Shahed El-Gendi Public School from October 2006 to June 2007. Both the TAC and TAW units were used from June 2007 to September 2007. Two hundred and thirty three (233) learners participated in the TAC program (158 girls and 75 boys). Eighty-five (85) learners participated in the TAW program (45 girls and 40 boys).

VI. FINAL PROJECT THEMES PROPOSED BY THE INTEL® LEARN PROGRAM

In the following section, I will outline the final project themes proposed by the program in the Technology and Community (TAC) and the Technology at Work (TAW) units. The TAC and TAW units are divided into five sections each.

6.1 Final Project Themes for TAC: The theme-based focus of the program helps students think about current problems in their community while enabling them to explore possible solutions with the assistance of technology. The five themes are as follows:

6.1.1 Traveling. This section encourages students to develop ways of attracting people to their city or local community. It is well known that the Menoufia Governorate where the school is located is not one of the touristic governorates in Egypt, so this section had
very few real and practical applications. However, the participants demonstrated innovation in the visual display and presentation of the project.

6.1.2 The Public Garden. This fictitious public garden created by students includes park installations and other services. The complete garden is portrayed in a diagram prepared in a Power Point format. It includes the location of the garden, directions on how to reach it and all the services students would like to see there.

6.1.3 Natural Phenomena. In this section, students create a registry of the natural disasters that have taken place in their city. They create a historical synopsis of the events and provide advice on ways the population can avoid dangers and protect itself.

6.1.4 The Future. In this section, students are encouraged to examine the recent past and link it to the present by highlighting recent technological progress and inventions. Students are also invited to predict what technological advances will occur in the next ten years.

6.1.5 Problems in the Surrounding Environment. In this section, students are encouraged to explore current issues of concern in their community, such as health issues or poverty, and to suggest suitable solutions from their point of view.

6.2 Final Project Themes for TAW: These themes enable learners to gain skills in using ICT in order to find and share information about work, to discover how computers can be useful in the workplace, to think like the creator of a project, and to make financial plans for their own projects. The five themes are as follows:

6.2.1 Computer Solutions. In this section, students need to think about how computers would be useful in helping professionals solve work-related problems. The professions explored might include lawyers, doctors, pharmacists, farmers and skilled workers.

6.2.2 Strategy Plans. In this section, students learn to develop investment plans for new projects or businesses. They might choose to seek business partners or investors to participate in their enterprise depending on the project.

6.2.3 Usage of the Internet. This section allows students to look at how to establish an Internet café in their city (in this case, Shebin El Kom) with 20 PCs provided by the government. Students are asked to prepare a presentation on this project that would be presented to a governmental committee for approval. The presentation includes how they would use these 20 PCs for instance, to help other students, to train people in computer skills, and so on.

6.2.4 Information about Careers. Students are encouraged to do online research on careers of specific interest to them. They gather information on the educational requirements for the job of their dreams. They also learn about the skills and tasks involved in that particular career, the salary they would make and the current demand for such positions. This process helps them develop essential skills that will enable them to make better choices for themselves in the future.

6.2.5 Immigration to Find Jobs. Students are asked to reflect upon immigration and the workplace. They examine the positive and negative aspects of immigrating to another country. They explore questions such as why immigration is attractive to youths, the role of immigrants in their new place of residence, how ICT allows immigrants to communicate with their families, and so on.

VII. THE BEST PROJECTS IN TAC & TAW

Among all the projects presented by participating students at Shahed El-Gendi Public School in Shebin El Kom, Egypt, the following projects were chosen by a committee as the most successful and well designed. All these projects are presented in PowerPoint show.

7.1 The Best Projects in TAC
7.1.1 The Bird Flu Project
7.1.2 The Initiative of a Computer for Every Home 2010
7.1.3 The Reading Project
7.1.4 The Sources of Energy in Egypt
7.1.5 Problems with Sewage and Drains
7.1.6 A Comparison of Large and Small Families
7.1.7 The City Bridge

There were two categories of students. The first category was composed of students from ages 8 to 12, and is referred to as (A). The second category was composed of students from ages 12 to 16 and is referred to as (B).

7.1.1 The Bird Flu Project: A group of students from (B) designed and carried out this project under the theme of “Problems in the Surrounding Environment”. The project illustrated the causes of the disease, and provided a message of warning message and methods for protecting people from infection, using photos in a Power Point presentation. In addition, it included cartoon images that showed the resulting losses of poultry for farm owners and the impact of this disease on public health.

7.1.2 The Initiative of a Computer for Every Home 2010: This project was designed and carried out by a group of students from (A) under the theme of “The Future”. The objective of this project was to enact the roles of a businessman, a member of the Ministry of Education, and a member of the Ministry of Communications and Information Technology. These people composed a committee that would have the authority to endorse a plan to provide a computer to each student’s home. The members of the committee interviewed other students at school and classed them
as two types of users. One type was interested in games and entertainment and this is all he or she knew about computers. Another type was interested in education and individual or group learning with no objection to having some entertainment since it provides an enjoyable break from work. Based on the results of the interviews, the committee approved the project.

7.1.3 The Reading Project: A group composed of students from categories (A) and (B) designed and carried out this project, under the theme of “Problems in the Surrounding Environment”. The objective was to focus on the role of books and libraries in learning. This group hoped to interest businessmen in donating funds to the General Book Institution, a governmental organization, for the creation of new libraries or for the acquisition of specialized books within existing libraries. In addition, they hoped to raise the interest of publishing houses in children’s stories and teen literature for ages 10 to 16, particularly in republishing and pricing books to make them more affordable for all readers. The group also prepared a letter addressed to the esteemed Mrs. Suzan Moubarak, First Lady of Egypt and sponsor of the Festival of Reading for All. This nation-wide festival promotes literacy and reading for everyone, with a special focus on literacy for children. In the letter, the students requested that this festival be extended throughout the year rather than being limited to the summer months only.

7.1.4 The Sources of Energy in Egypt: This project was designed and carried out by a group of students from categories (A) and (B) under the theme of “The Future”. It consisted of a Power Point presentation illustrating different types of renewable and non-renewable energy sources and the best means of using this energy. They researched the topic and then showed many pictures and diagrams of renewable energy sources in an attractive and detailed presentation.

7.1.5 Problems with Sewage and Drains: A group of students from (A) designed and carried out this project under the theme of “Problems in the Surrounding Environment”. The objective was to examine how sewage pollutes the surrounding area because of problems with drains, and to show the resulting diseases sewage causes. It included a look at the negative effects of sewage on the land and communities in rural settings.

7.1.6 A Comparison of Large and Small Families: This project was designed and carried out by a group of students from (A) under the theme of “Problems in the Surrounding Environment”. The objective was to compare life in large families to life in smaller families with only two or three children, from a child’s perspective. The project elicited the creativity and imagination of the participants. The group imagined that they all belonged to one large family and wrote about what they thought their experience of this would be, and then they contrasted this with the reality of living in their own small families. This allowed them to explore issues such as poverty, overcrowding, and so on.

7.1.7 The City Bridge: This project was designed and carried out by group of students from (A) under the theme of “Problems in the Surrounding Environment”. They made a Power Point presentation and a video clip on what had happened to an important city bridge in Shebin El Kom after local authorities closed it due to instabilities in its structure. This bridge connects the east and west banks of Shebin El Kom in a central part of the city and is therefore a vital artery for all city dwellers. Its closure is disruptive to many lives and businesses.

The following projects were chosen by a committee as the best projects in their category.

7.2 The Best Projects in TAW
7.2.1 The Lighthouse
7.2.2 Immigration for Work

7.2.1 The Lighthouse: This project was designed and carried out by a group of students from (A) under the theme of “Information about Careers”. This project provides interesting information on lighthouses from the point of view of children aged 8 to 10. It describes the purpose that lighthouses serve, in addition to the responsibilities and duties of lighthouse keepers.

7.2.2 Immigration for Work: This project was designed and carried out by group of students from (B) under the theme of “Immigration to Find Jobs”. They reflected upon why youth sometimes dream about immigrating to other countries, the issues involved in immigration, such as obtaining a work visa, and how immigration might help solve some of their problems.

VIII. THE ACHIEVEMENTS OF THIS PROGRAM

It is clear that one of the central goals of this program is to help students develop communication and teamwork skills. At the end of the training process, I found that some of my students ended the program without any real progress in this area. This may be because they were already familiar with computer technology and did not find the medium particularly motivating, or they did not like teamwork but preferred to work on an individual basis without the benefits and challenges that collaborative effort entails.

When I first presented the Intel® Learn Program to the students, I asked them to fill out a questionnaire so I could assess what they really knew about teamwork and computer technology, and whether or not they liked the idea of collaborating on projects of this nature. After the program was completed, I asked them to fill out another questionnaire in order to evaluate their progress in teamwork and computer technology skills. In the first questionnaire, forty percent (40) % of the participants indicated they understood what teamwork was, but had
never engaged in collaborative work prior to the beginning of the program in October 2006. In the second questionnaire at the end of the training period, fifty-four percent (54%) of participants indicated that they had gained skills in teamwork and computer technology as well as a greater appreciation of collaborative work.

In my view, this indicates that overall, the program succeeded in helping participants acquire valuable experience in collaborative work through interactive learning strategies. The new and challenging structure of the program initiated them to a completely novel way of learning that differs greatly from what I consider to be the less effective traditional method of spoon-feeding children in a one-way transmission of knowledge. By involving themselves in the roles of presenter, planner, timer and team leader, the students learned critical thinking and technical skills that are essential for their future in education and in the workplace. For the most part, they worked diligently on their projects and discovered their own strengths, which in turn, enhanced their self-esteem. These are among the numerous benefits the students gained from their experience with the Intel® Learn Program.

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Published as submitted by the author(s).