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# Strategic Planning for Information and Communication Technologies in Education: The Case of the United Arab Emirates

*Vasilios Makrakis*

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# Strategic Planning for Information and Communication Technologies in Education: The Case of the United Arab Emirates

Vasilios Makrakis[1]
University of Crete and Ministry of Education, United Arab Emirates
makrakis@edc.uoc.gr

**SUMMARY**
*This paper deals with the issue of strategic planning for ICT in education, with special reference to the United Arab Emirates (UAE). ICT strategic planning provides a road map for the integration and implementation of innovative educational technologies in teaching and learning and can result in more efficient expenditure of limited resources and higher teaching/learning effectiveness. To organize a three-year strategic planning for the UAE, a framework consisting of seven components has been developed and a situation analysis has been carried out. It has been concluded that strategic planning is unlikely to be effective or even realized, unless there is strong leadership support, proper organizational climate, commitment, funding, consideration of time and context. Besides that, strategic planning needs to be framed on needs identification and analysis, using both qualitative and quantitative research approaches.*

**KEYWORDS:** *Strategic planning, ICT in education, United Arab Emirates.*

## INTRODUCTION

In the last two decades, there has been a substantial increase of interest from policy makers, researchers and educators concerning the integration of Information and Communication Technologies (ICT) in teaching and learning. In most Western countries large sums have been spent on providing ICT to schools, but the policy has been largely driven from the top down and has tended to have a technical rather than a pedagogical focus (Makrakis, 2000; Makrakis, 1997). The same trend is also evidenced in the Arab world (Sultan, 2002). This trend may be one of the major causes for the limited use of ICT in classrooms. Evaluation reviews have shown that the extent of ICT use in schools is poor in relation to national expectations and the high level of investment (Flouris, 2001; Makrakis, 1997). Despite its disappointing record, technology now has the potential to exert a much stronger impact on teaching and learning in schools. As Means and Olson (1994) argue, the greater potential is not due solely to technological advances per se- the exciting new capabilities like multimedia and wireless communication, the increasing accessibility of technology, and the beginning of a national information infrastructure. A more important basis

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for optimism is progress in educational reform. The world experience shows that what is needed is policy that is concerned with the process as well as the substance of change leading to: a) changes in the way teaching and learning occur in schools, b) changes in the organization and internal features of schools and c) changes in the relationships between schools and their communities (Mawgood, 2000). This, however, necessitates strategic planning, guided by well-grounded principles and research data. In general, planning is an ongoing process that translates organizational, public policy, and ICT needs into concrete actions. ICT strategic planning provides a road map for the implementation of innovative educational technologies and can result in more efficient expenditure of limited resources and higher learning effectiveness.

Undertaking ICT strategic planning and integration are both complex processes that require consideration of context and time. Often planners behave as if they are working in a vacuum without trying to understand the broader context and the time dimension. This is more evidenced in developing or newly developed countries, which are largely based on technology transfer (Hill et al. 1998). The degree of success in implementing ICT in schools will depend, in part, on the effectiveness of strategic plan. A strategic plan should be holistic, covering all interacting constituents and participatory, including all interest parties and firmly rooted to research evidence. Strategic planning should also not be approached as an end in itself, but as a process that moves from vision to reality, from planning to action.

## UAEs VISION TO ICT IN EDUCATION

The United Arab Emirates (UAE) is a federation of seven emirates or states, situating in the Eastern of the Arab World and covering an area of 83,600 sq. km, including about 200 islands. It overlooks the Gulf of Oman to the East and the Arabian Gulf to the North. The official language of the UAE is Arabic. Other languages spoken are English, Hindi, and Farsi. A large number of expatriate populations are from the sub-continent (India and Pakistan), Philippines, Iran etc. Though an Arab-Islamic country, UAE is one of the most liberal societies among all the other Arab nations. The population of the UAE according to 1998 figures is 2.8 million. UAE is a major oil-producer country with a per capita income of 20 500 US$. Confronting the development challenges imposed by the knowledge upsurge in the information society, the Government of the UAE allocated considerable funds for developing education at all levels and sectors. Highly keen on reforming education to cope with rapid developments in the world, the Ministry of Education developed a significant strategic document stating its vision for education throughout the period for 2000 to 2020. The Vision2020 blue print emphasizes the importance of ICT as a national priority. The same document urges that teachers have to abandon teaching methods based on rote learning and behaviourism. Instead they should adopt more active, authentic and constructivist approaches to teaching and learning. ICT has to be then used for fostering such skills and as a means of delivering multimedia-based instructional materials. More specifically, the Ministry of Education defined its goals as.

- Each pre-school will provide a computer ratio of 1:10 children, primary 1:4 pupils, lower secondary 1:2 pupils and upper secondary 1:1 students.
- Stressing mastery of problem solving techniques for students to be able to deal with the age of information and adapt the fast changing world.
- Introducing teachers with modern techniques in designing, preparing and producing instructional materials
- Shifting focus from teacher to learner, from teaching to learning, from memorization to thinking and from teaching methods to learning processes.

- Providing schools with computer labs connected with school learning centres to improve quality and assist students in self-learning, self-achievement and self-exploration.
- Improvement of pre-service teacher education by defining technical and professional criteria and standards for all teacher education institutions in the country.
- Identifying the technical status of teachers to diagnose their level in terms of specialization, command of modern teaching techniques and modern educational media.
- Designing and developing educational curricula to start introducing "computers" as a subject and means of education.

## A STRATEGIC PLANNING FRAMEWORK FOR ICT IN UAE EDUCATION

In September 2001 a mission was given to the author by the Minister of Education to develop a strategic planning for ICT in UAE education. To organize this strategic planning, I have developed a framework consisting of seven components, as guiding reference for ICT strategic planning (Figure 1).

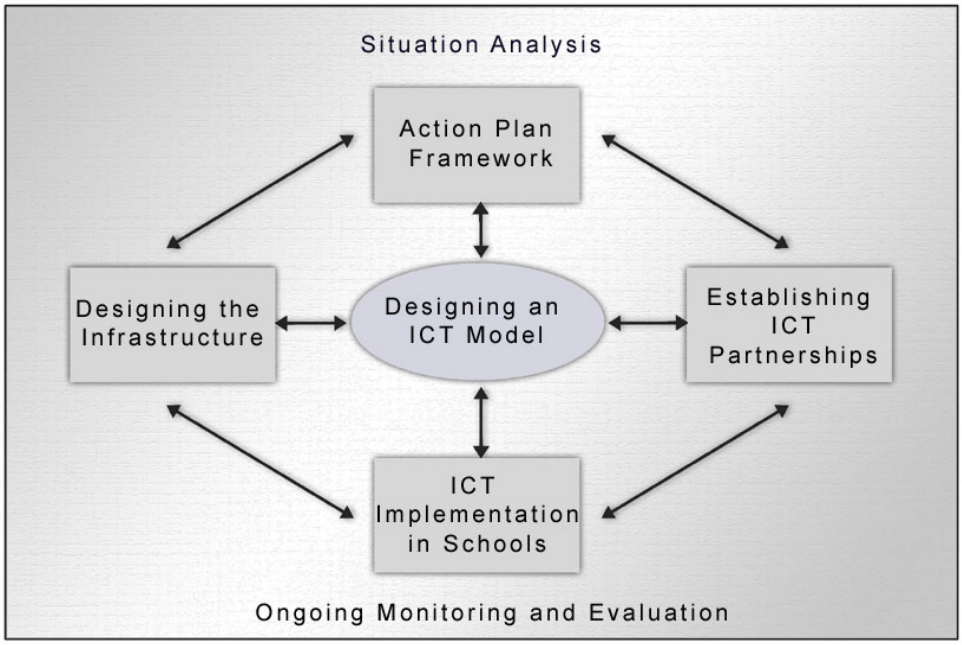


***Figure 1:*** A framework for strategic planning for the Introduction and Use of ICT in Education

These components are not steps in a linear process, but areas of consideration that function dialectically. The diagram also points out that five of these components should be undertaken against a backdrop of the situation analysis that largely refers to the context of planning as well as a system of ongoing monitoring, follow-up and evaluation. Each component is defined by certain tasks that could be subdivided into several follow-up activities.

The following working plans or tasks are integrated into the seven components of the strategic planning framework depicted in Figure 1, which has a three-year timetable.

*Situation Analysis*

- Identifying needs, requirements, supports, and barriers in ICT contextual areas
- Relating, supporting and integrating ICT needs and requirements to educational, social and economic reform plans
- Developing an ICT unit at the central, regional and school level

*Action Plan Framework*

- Analysis and specification of ICT innovation in education
- Creating a vision, goals, expected outcomes and action areas to meet ICT goals

*Designing an ICT Model*

- ICT in schools: an international review
- An ICT model for UAEs schools
- Designing and costing the ICT model

*Developing the Infrastructure*

- Professional development plan
- Software management plan
- Hardware management plan
- Networking management plan
- Maintenance management plan

*Establishing ICT Partnerships*

- Developing strategies to meet public support
- Developing strategies to connect public support
- Funding strategies for the ICT plan

*ICT Implementation in Schools*

- Evaluating, acquiring and delivering educational software
- Emiratization (localization) of international educational software
- Developing appropriate educational software
- Evaluating, acquiring and delivering hardware and networking equipment
- Developing and implementing curriculum training for teacher trainers
- Developing and implementing curriculum training for ICT resource teachers
- Developing and implementing ccurriculum training for tteachers

*Ongoing Monitoring and Evaluation*

- Organizational mechanism for the monitoring, follow-up and evaluation of the ICT plan
- Formative/summative evaluation
- Carrying out a study for the dissemination and the further exploitation of the outcomes

Situation analysis is regarded as the basis for developing all components of the strategic plan framework. Through situation analysis planning can be better customized to the particular context and can also help to anticipate problems in order to minimize setbacks. Undoubtedly, the results of

the situation analysis will inevitably justify and rationalize actions taken at the later steps or processes of the strategic planning.

## SITUATION ANALYSIS

To carry out a situation analysis, an ICT needs assessment matrix has been developed in order to gather relevant data. At a first phase, data has been collected through the methods of interviewing, observing and analysing documentation. Indeed, to gain concrete insight into ICT strategic planning and implementation in UAE schools, seven case studies were carried out, using these sources of information. The seven schools chosen represent all the three levels: primary, lower secondary and upper secondary. Provision has been made to include evenly schools on differed characteristics such as type of the school, educational level. location and gender. The selection process was not guided by examples of good ICT practice or best practice, since the objective of the needs assessment research was to relate everyday variance in ICT implementation to change processes. The main variables that were explored are presented under the four topics of interest: 1) infrastructure, 2) staff development, 3) curriculum and 4) management. Semi-structured interviews were held in the seven case studies schools with a representative of the school board, school leadership, the ICT teacher of the school and two or three teachers. Interviews were also contacted with officials from the following Ministry Departments: Bureau for Institutional Planning, Development and Evaluation, Information Statistics and Institutional Research, Curriculum and Learning Resources, Human Resource Development, Educational Technology and Learning Resources and the National Centre for Education Testing, Measurement and Evaluation. The resulting information was analysed qualitatively to reveal structural aspects according to different criteria. Whenever possible, issues addressed in Ministry Departments and schools were brought and discussed among teachers and education administrators to check for consistency and mutual validity of identified structures.

At a second phase, a national survey has been carried out that included 106 schools from the three educational levels, randomly sampled and 2480 teachers that represent the whole country (23 400). A questionnaire survey was designed and piloted consisted of seven sections:

1. *Demographic information*: details on teachers' name of school, educational zone, emirate, school level, gender, age, number of years working as teacher, subject specialization, nationality.

2. *Sources and finance of training*: those teachers who answered that had some computer knowledge were presented with eight potential sources of acquiring their knowledge, such as, self-taught, through a friend, university, the computer teacher at school, private training centres, ministry. After indicated the source, they were asked to indicate who has financed their training (e.g., school, ministry, themselves).

3. *Frequency of ICT use in the home and the school*: once teachers indicated whether they had access to ICT (computer, Internet and e-mail) at home and/or at school, they then were asked to indicate how frequently they used a computer in these two domains on a Likert-type scale ranging from 1 to 5 (where 1= never, 2= less than monthly, 3= monthly, 4= weekly and 5= everyday).

4. *Extent of ICT knowledge/competence*: teachers were asked to indicate the extent of their knowledge on 25 items grouped into five sub-categories, namely: integration/developing, applications, higher order thinking skills, technology-oriented, social-oriented. The scale used was based on 4-point (1= never, 2=little, 3=much and 4=very much). Reliability analyses showed very high coefficients, ranging from

*Cronbach a*= 0.85 to 0.98. Teachers were also asked to indicate their own self-perception of knowledge on ICT, considering four categories: novice, average, above the average and expert.

5. *Frequency of ICT use in class*: teachers were presented with 14 statements mostly rewarded from knowledge statements, covering similar dimensions of ICT use. Teachers rated themselves on each item on a four-point scale ranging from never to very much. Reliability analysis of the scale showed a very high *Cronbach a*= 0.98.

6. *Attitudes towards computers*: teachers were presented with 19 statements, most of them divided into main three subscales: self-confidence, anxiety and usefulness. There were also two statements about cooperative practices and one statement about gender. Teachers' ratings were based on a four-point scale ranging from strongly disagree to strongly agree. Reliability analyses of the total attitude scale showed a relatively strong *Cronbach a*= 0.63. The reliability measures for the attitudinal sub-scales ranged from *a*= 0.57 to 0.70.

7. *Obstacles to using computers*: teachers were presented with 19 statements divided into four subscales: hardware, software, support, and skills. There are also two single items, one dealing with space in timetable and another concerning time availability to use/integrate computers in teaching. Teachers rated themselves on each item on a four-point scale ranging from never to very much. Reliability analyses of this scale and its sub-scales showed very strong measures, ranging from *Cronbach a*= 0.76 to 0.92.

## MAJOR SITUATION ANALYSIS FINDINGS

### A) Case Studies

The following results are drawn from the seven case studies. These results have also been used to frame the national ICT survey in schools.

- There is evidence that all ICT teachers and computer-using teachers in the schools investigated, lack training, support, communication and therefore proficiency to be fully effective in the use of ICT. Almost everyone interviewed highlighted this as one of the most important issues. Even, trainers and officials at the Department of Human Resources Development pointed the lack of proficient trainers who can match pedagogy and ICT technology.
- The formation of a network allowing teachers to exchange professional information was highlighted as a significant factor, which would affect developments in the field of ICT in education.
- Teachers are highly motivated to adopt ICT as a means for renovating teaching and learning for the benefit of the UAE youth.
- The current role of the ICT teacher is much more on teaching basic ICT literacy cantered on MS Office Applications.
- Teachers see pupils as a teaching and learning resource, allowing them not only to assist as peer tutors but also to transfer their own skills to them. This is a very positive development.
- Almost all class teachers have personal computers at school and at home, though they do not use educationally sound software that meets their own classroom and curriculum needs.

- All teachers expressed willingness to undertake ICT training, even at their own expense, especially if acquiring proper ICT skills.
- Training and suitable software based on pedagogical grounds were mentioned as the two crucial factors which would enable professional development and integration of ICT into everyday teaching.
- The training models used start solely with the technology, without considering the needs and interests of the learners and teachers.
- At the school level, none of the schools investigated has an ICT plan that meets certain goals and objectives.
- At the Ministry level, there is no any strategic plan developed yet, besides efforts to initiate the project of hardware provision to schools. Not any plans have been initiated for the development of educational software or teacher training.
- There is lack of clear learning objectives and strategies for the monitoring and assessment of learning using ICT, both at the central (Ministry) and local (zone, school) level.
- All of the schools have an adequate number of computers, comparatively higher than most Western countries. Some schools were found to have more hardware resources, distributed in classrooms, besides a central computer lab. Not all computer labs are networked and not all of schools have access to the Internet. Up to September 2001, the ratio of computers to students was 1:25 for primary schools, 1:16 for lower secondary schools and 1:3 for upper secondary schools. It is, however, envisioned that by the end of 2002, all schools will be equipped with computers along with connection to the Internet.
- Most of the students and teachers at all educational levels have access to computers and connection to the Internet from home.
- Development of ICT in schools has not been followed by any evaluation based on research. Only ICT supervisors provide some evidence about relevant developments.
- There is lack of cooperation between concerned departments at the Ministry and the schools. Some cooperation is mentioned between the Curriculum and Learning Resources Department with Higher Colleges of Technology. The Educational Technology Department collects teachers' multimedia presentations, but not any formal assessment has been performed due to lack of expertise in this field. The issue of compatibility concerning educational software and other learning resources imported, either from other Arabic states, has been stressed.
- The ICT model adopted in schools is basically tech-centric, although attempts have been taken and increased interest has been shown to a parallel integration of ICT across all school subjects. This is largely due to the lack of suitable educational software, especially integrated one that cuts across many subjects and school grades as well as lack of suitable skills of all school subject teachers.
- There is not any data bank or even plan for the development of ICT competencies for students at all school levels.
- Computers are found to be used for administrative purposes, especially for recording grades and students' absences and good contact.

- The main issues revealed by all teachers, principals and other key officials at the Ministry are how to ensure that the use of ICT has a strong pedagogical foundation and is well integrated into the curriculum.
- There are differences found among schools on the basis of equipment, utilization of computers, connection to the Internet, as well as activities integrated with ICT. Some schools, for example, especially model ones; have invested much on hardware acquisition, due to private donations (parent organizations) and own funding. Highly motivated teachers in most of the schools have also invested time and effort to produce multimedia materials. In one model school, the class teacher has converted and enriched with interactive exercises a whole book.
- The role of ICT teacher in primary schools is played by the most experienced in ICT teachers; while in lower secondary and upper secondary schools, the ICT teachers have all background from computer sciences. By September 2001, 260 ICT teachers were appointed to lower (121 schools) and upper secondary schools (200 schools).
- Learning resource centres at schools seem to play a crucial role in ICT activities.
- It has been found that students' knowledge and skills on ICT are higher than those included into their ICT textbooks and they become bored and uninterested in them.

**B) National Survey (preliminary results)**

The following preliminary results are drawn from the national survey. These results are preliminary and descriptive in nature. A deeper analysis based on advanced statistics is underway.

- In general, 83 percent of the UAE teachers seem to have some knowledge on computers. Among them, 72 per cent have access to a computer at home and 49 per cent at school. 51 percent also have access to the Internet at home, but only 5 percent at school. Similarly, 37 percent have access to e-mail at home and only 4 percent at school. In terms of frequency, 40 percent use a computer at home everyday. The corresponding frequency at school is 26 percent. The next higher percentage falls into weekly use (28% at home and 30% at school).
- The highest rated sources of getting knowledge about computers fall on the self-taught category (37%), followed by private training centres (27%), a friend (25%) and a computer teacher at school (21%). The least rated sources are those of being trained by a student at school (1%), an experienced teacher at school (10%), the educational zone/Ministry (11%) and university courses (12%). 45 percent of the teachers indicated that they self-financed their computer training and for the 18 percent of teachers, their school provided some funding for their training. The combined contribution of self-finance and school-finance was 14 percent, while the Ministry contributed financially to 5 percent of the total number of teachers.
- Four categories of ICT competence/knowledge and ICT users were conceptualised. The ICT competence categories were: novice, average, above the average and expertise, and the corresponding four-category scale of ICT users was: prospective users, occasional users, engaged users and innovative users. Data analyses show that UAE teachers fall between prospective and occasional categories of users (Mean= 1.8) and the same trend has been revealed with respect to competence, that is, between novice and average (Mean= 1.6). Among the competence sub-scales/categories, the least rated was that of

higher order thinking skills (Mean= 1.4) and the highest that of technology-oriented (Mean= 1.9).

- Most of the inhibiting factors for UAE teachers to learn, use and integrate computers into their teaching are those of space in time-table to use computers, time, support, appropriate software and skills. On the average, the inhibiting factors fall close to the category of "much" (Mean= 2.8) on the four-point scale.

## IMPLICATIONS FOR POLICY MAKING AND PLANNING

These findings show that the overall implementation of ICT in schools is still in its early stages. The great majority of teachers have access to computers at home and almost half of them use the Internet. However, the corresponding figures at the school lag behind home use, especially with respect to Internet connectivity and e-mail use. In comparative terms, UAE teachers have a very high access to computers at home, something that has to be taken into account, especially for training. While most schools at the lower secondary and all schools at the upper secondary level possess computer equipment, there are infrastructure issues that have yet to be fully addressed. Luck of support, including insufficient training opportunities, administrative encouragement, and technical support, followed by lack of skills, especially lack of knowledge and skill to match technology with pedagogy were cited highly. There is thus need for developing innovative teacher training programmes as well as initiating policies for software development that meets the new pedagogy objectives spelled out in the Vision2020 document. There is also a strong need for a national ICT strategic planning supported by an established ICT Unit at the Ministry and an on-line database to be used as a resource and communication medium at various functions and levels. The situation analysis carried out may form a strong basis for developing effective and suitable policies that could be turn into action. Current initiatives to equip all schools with computers and Internet connection need to be matched with a number of policies aiming at:

- Establishing a coordinated and holistic strategic ICT plan, at the Ministry level.
- Establishing strategic ICT plans at every educational zone, school and training centre.
- Bottom-up and top-down convergence (combine central directives with local initiatives).
- Establishing ICT-specific professional development policies. Initiating the development of suitable educational software and the localization of carefully evaluated internationally developed software.
- Development of an on-line Data Base Centre - that will provide all interested parties (at the central, local and school level) with a mechanism for communication, exchange of information and delivery of multimedia resources.
- Effective technical back up and support to overcome any difficulties encountered.
- Clear identification of how ICT will be used to meet specific objectives across the curriculum to improve pupils' attainment.
- Adequate access to, and intensity of use of, the necessary equipment by pupils, teachers and educational administrators. Especially as it concerns the link of equipment and networking infrastructure, both to local area networks and wide area network.

As Hind (1999) points out strategic planning is a continuous and systematic process in which organizations make decisions about intended future outcomes, how outcomes are to be achieved,

and how success is measured and evaluated. The two critical success factors for strategic planning, according to Hind, are leadership support and proper organizational climate. Commitment, funding, time and context are also crucial factors to be considered. Without these factors strategic planning is unlikely to be effective.

## REFERENCES


Flouris, G. (2001). The uses of technology in teacher education. In V. Billeh & E. Mawgood (Eds.), *Education Development Through Utilization of Technology*. UNESCO & Ministry of Education & Youth, UAE. (pp.177-196).

Hill, C. et al., (1998). A qualitative assessment of Arab culture and information technology transfer. *Journal of Global Information Management*, Vol.6, No.3, pp.29-38.

Hind, I. (2000). Strategic planning for educational reform. In G.F. Welsh & E. Mawgood (Eds.), *Educational Reform in the United Arab Emirates: A Global Perspective.* Ministry of Education & Youth, UAE (pp.183-201).

Makrakis, V. (2000). *Hypermedia in Education: A Social-Constructivist Perspective.* Athens: Metechmio.

Makrakis, V. (1997). Perceived relevance of information technology courses to prospective teachers' professional needs: the case of Greece. *Journal of Information Technology for Teacher Education*, Vol. 6, No.2 (pp.157-167).

Mawgood, E. (2000). United Arab Emirates "Vision2020": An Overview. In G.F. Welsh & E. Mawgood (Eds.), *Educational Reform in the United Arab Emirates: A Global Perspective*. Ministry of Education & Youth, UAE (pp.5-38).

Means, B. & Olson, K. (1994). The link between technology and authentic learning. In www.ascd.org/readingroom/edlead/9404/means.html

Sultan, A. (2002). The need to go beyond "technocentrism" in educational technology: Implementing the electronic classroom in the Arab world. . In G.F. Welsh & E. Mawgood (Eds.), *Educational Reform in the United Arab Emirates: A Global Perspective.* Ministry of Education & Youth, UAE (pp.165-176).

United Arab Emirates Ministry of Education and Youth (2000). *Education Vision2020: Pillars, Strategic Objectives, for UAE Education Development.*

United Arab Emirates Ministry of Education and Youth (2001). *National Report on the Development of Education in the United Arab Emirates 1990/91–1999/200*0.The Department of Information, Statistics and Research.