A Unique Learning Approach in Information Technology

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ABSTRACT

This paper discusses the various issues and factors involved in planning and implementing of a unique learning approach to Information Technology (IT) in University General Requirements Unit (UGRU) of United Arab Emirates (UAE) University. The new learning approach challenges some of the existing hypotheses and suggests useful indicators to right path for the future. The planning and implementation scheme is analyzed. The training program, teaching style and classroom management processes were evaluated. The study also highlighted the university management, faculty members and students' viewpoints on the introduction of this new method of learning in IT program. The study showed that UAE University has successfully integrated the new learning approach into the UGRU's IT curriculum replacing a traditional style of learning IT with a student-centered learning environment rich in collaborative activities. The students involved in the IT Academic Excellence Program (AEP) demonstrated conclusively that they could learn IT successfully, in a collaborative, student-centered, problem orientated environment. In fact, they proved that they could be asked to work at a higher level in this manner and achieve more. New teaching and learning styles and strategies with a blending of E-Learning and distant education paradigm produce value based higher level IT education for students of Arab universities in particular and global universities in general. It will lead us to a new future horizon.

INTRODUCTION

It is a fact that computers are used in every aspect of modern Islamic society in the Arab World. As a result, to make students computer literate, Information Technology (IT) has rapidly become established as part of the curriculum in most secondary schools in the United Arab Emirates (UAE) and University General Requirements Unit (UGRU) of United Arab Emirates University. However, the mere availability of computers and the introduction of IT courses in schools and universities do not necessarily provide a guarantee that, ultimately, students will be computer literate. Lecturers must be appropriately trained and willing to change their attitudes in making use of the classroom management techniques and teaching methodology which the new learning approach demands. In partnership with collaborative learning strategies [1-2], IT studies can become more challenging, engaging, and meaningful.

IT is an examination subject for the 16+ levels in the developed world [3-6] also. IT has been taught as an examination subject at the 16+ level for well over 30 years in the British curriculum [1].

In contrast, most Arab countries have made an extremely slow start in the use of IT. There are a number of reasons for the lack of widespread use of IT in the Arab world. Among other reasons, a lack of local expertise and shortage of finance are important.

With the educational expertise available from American, British, and Asian countries it is possible to introduce latest IT practices. This will be extremely beneficial for students entering higher education in university, for those studying abroad and for those working in various sectors of business, service, industries and education. It is also assumed that students who do not become versed in IT will be at a disadvantage once they graduate.

The adoption and development of a successfully functional IT program in universities depend upon a number of factors. The availability of adequate financial resources, good courseware, application-oriented software, and complete cooperation of university authorities are some of the factors which must be dealt with [7-9].

This paper describes the implementation scheme and performance analysis of the introduction of a unique learning approach in IT in an undergraduate program of an Arab university.

RESEARCH OBJECTIVES

To describe the work of this research project, we use a modified version of the five-stage model used by Khan and Sharma [8]. As shown in Figure 1, the five stages for adoption, implementation, and evaluation of a unique learning approach in IT at United Arab Emirates University include inception, resources, adoption, implementation, and assessment of outcome.

The research project was carried out to assess the effect of the following factors in implementing a unique learning approach in an undergraduate IT program of an Arab university.

(A) Implementation scheme for a unique learning approach in IT program.
(B) Preparing and training lecturers for new IT program.
(C) A unique method of learning IT (AEP Pilot Project).
(D) Viewpoints of students about new learning approach in IT.
(E) Teaching style and its effect on learning new IT program.
(F) Curriculum and Classroom management process.
(G) Viewpoints of lecturers.
(H) Students' performance in new IT program.
(I) Viewpoints of University management.

This study enabled us to highlight the various issues, choices, problems and situations to be tackled for the successful implementation of a unique learning approach in IT program. It also enabled us to assess the situation with regard to university resources and the students' performance. Finally, we presented suggestions for a model to enable the educators to prepare a strategy for the implementation of new learning approach.

THE RESEARCH DESIGN

Context

In the UAE there are two main types of universities: a government controlled public university, and several privately funded universities.

Figure 1. Five-Stage Model for Implementing and Evaluating a Unique Learning Approach in IT in an Arab University [8]
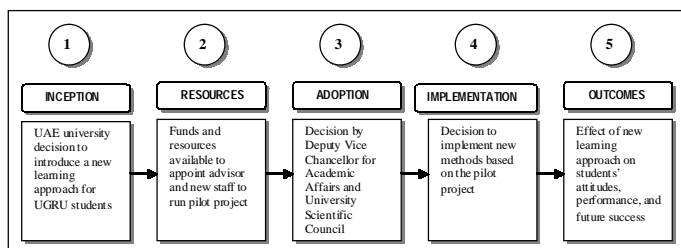
This study deals with the public university situated in Al Ain. At the initiative of the late President His Highness Sheik Zayed Bin Sultan Al Nahyan, the UAE University was inaugurated in November 1977. This federal university with Gulf, Arab and Islamic dimensions is meant to be a fountainhead of knowledge, culture, and sciences and to contribute to building a modern state by utilizing all available resources.

The UAE University has about 17,000 students. It consists of the following colleges: (i) College of Humanities and Social Sciences, (ii) College of Food Systems, (iii) College of Science, (iv) College of Education, (v) College of Engineering, (vi) College of Shari'ah and Law, (vii) College of Business and Economics, (viii) College of Medicine and Health Sciences, and (ix) College of Information Technology. In most of the courses the medium of instruction is English [11].

The University General Requirements Unit (UGRU) monitors and prepares students for all nine university colleges. It is a foundation year program. The UGRU program was founded in 1990 as the *Basic University Education Center (BUEC)* [18]. It provides a bridge between the Ministry of Education and its schools on the one hand and the university colleges on the other hand. Students come with no formal computer background [17]. UGRU's University Initiatives Steering Committee (UISC) states that a student completing the programs should be able to demonstrate: (i) Linguistic skills to communicate effectively in both Arabic and English; (ii) Research skills to gather information, judge its validity, and organize it; (iii) Technology skills to support communication and research; (iv) The skills necessary to work both independently and collaboratively; and (v) Thinking skills to form and express an opinion.

Over the past seven years, the UAE University has carried out a fully-fledged review of all its academic programs and plans to use modern methodology and international criteria suitable for its circumstances in all its colleges. The university pays special attention to the quality of its programs, teaching methods and updated learning resources in an attempt to promote self-learning and creative thinking, and to help learners absorb modern technology.

Research and Methodology
Interviews, presentations, group meetings, questionnaires, 'laboratory' experiments, analysis of student assignments and examination responses, and observations in the university were the primary means of data collection. Some information was obtained from the university administration from written documents concerning UGRU activities and the 'pilot project [10].' Under the direction of Dr. Khalifa Ali Alsuwaidi, the UGRU Initiatives Steering Committee (UISC) was formed, and the pilot project initiated as a means of designing, implementing and evaluating the success of such a style of teaching and learning IT within UGRU. Dr. Richard Karas, then Advisor, and Dr. Abdullah Al Khanbashi, then Deputy Director UGRU, played a leading role in this project. This research study covered a period of more than three years. The relevant information was collected in the areas outlined under the research objectives.

FINDINGS AND DISCUSSIONS

(A) Implementation Scheme for a Unique Learning Approach in IT Program
In the late 1970s, while working on the problem of high failure rates of minority students in an undergraduate calculus course, Uri Treisman at the University of California, Berkeley found that students "[came] to Berkeley highly motivated and under great pressure to succeed." Nevertheless, anecdotal evidence blamed the high failure rates on the students' lack of motivation, lack of educational background, and lack of family emphasis on education. Treisman's work challenged the above hypotheses, and replaced the remedial approaches with an honors program that encouraged students to collaborate on challenging problems in an environment of high expectations [13].

Similarly, in early 2000, Dr. Richard Karas at the UAE University, Al Ain, while working on the problem of low achievement of Arab students in Arabic, English, Mathematics, and IT courses, noticed a need for important organizing principles. Lessons learned from experiences with curriculum development led Dr. Karas to remember Miel's counsel: There is a need for goals "that give broad direction to the individual," goals should be "within the present capabilities of individuals and groups [and] should be flexibly held so that they can be re-examined frequently and revised if need be [19]."

The Academic Excellence Program (AEP - UGRU Pilot Project) for IT was initiated in the fall of 2000, under the auspices of the UISC. The UISC principles were as follows: (1) Conformity with UGRU Educational Goals[1]; (2) An established set of learning objectives; (3) A curriculum based on the learning objectives and planned in its entirety so that course content in all areas is coordinated; (4) Frequent clear reports to students regarding their progress at every stage in their studies founded upon clear articulation of student's responsibilities for attaining learning objectives; (5) Optimum use of student's weekly contact hours to increase language skills (in English, Arabic, Mathematics and IT); (6) A foundation experience that introduces students to possible fields of study in the University's faculties and that requires students to independently obtain information, analyse it, synthesize and present their own views, using skills they have acquired in all areas of their UGRU studies; (7) Higher standards of student learning achievement, consistently applied with alternatives for those who do not achieve the standards in a specified length of study; and (8) Clear assessment of the outcomes of the pilot program including selection of a group of student participants who are representative of the entire UGRU student body, and comparison with the entire UGRU student body.

During the Fall 2001 semester, Dr. Richard Karas, UGRU Advisor and Dr. Abdullah Al Khanbashi, then Deputy Director UGRU, interviewed each and every dean to obtain feedback on the Standards and Objectives. The interviews included the following questions: (i) Is there anything missing from the IT Standards and Objectives that your college needs? (ii) Is there anything in the IT Standards and Objectives that is superfluous? (iii) Is the level of the standards for the last course in IT adequate for your needs?

In general, all of the deans expressed satisfaction with the support for the Standards and Objectives. Most expressed scepticism that the standards could be achieved. During the Spring 2001 semester, UGRU conducted a comprehensive survey of the UAE University colleges to determine the actual skills and levels of mastery expected of students beginning work in their respective majors. Standards and objectives were completed for all levels of Arabic, English, Math and IT after review of drafts by members of the colleges of Engineering and Business [10].

(B) Preparing and Training Lecturers for New IT Program
During the 2000/2001 academic years, close observation of IT lecturers in their classrooms and of the lessons, assignments, and exams they were producing indicated a severe need for professional development, especially considering the new IT program: (i) Most of the lecturers in IT had never received any formal training in teaching (in other words, they

had been hired for their research or applied experience in their fields); (ii) Almost none of the IT lecturers had any training in teaching their subjects using the English language to students who were almost entirely lacking English proficiency [20]; (iii) Due to shortage of IT lecturers, UGRU used existing math lecturers to teach the new IT courses; (iv) There were about 25 students in each IT class; (v) Faculty do not have offices, only cubicles within an office area; and (vi) Almost no clerical support is available [17].

In order to remedy the above deficiencies and also prepare lecturers for new IT program, UGRU decided to implement 'Train the Trainer' program for IT lecturers.

(C) A Unique Method of Learning IT (AEP Pilot Project)
For the first week of every semester new IT students have an *Orientation Week*. The emphasis is on thinking skills, independent learning, and how to study IT. Students also get copies of the UGRU orientation booklet[2].

In September 2001, the authors of this paper carried out a classroom survey to assess the computing background and expectations of new students. Students were randomly selected from all the major areas of study: Business, Art, and Science. Questions were asked about their computing backgrounds and expectations from the IT course. Table 1 shows the responses of UAE university students.

At the start of the Spring 2001 semester, UGRU selected a group of students who had "failed" all four of their placement tests to take part in an experimental program (the "Academic Excellence Program," also known as the "Pilot Project"). The program made use of a new curriculum, new materials, and new pedagogy (learner-centered, rather than teacher-centered). For the most part, the project succeeded: students took exams and homework assignments requiring a higher level of mastery than those administered in the regular program. The lessons learned from the project were used to upgrade the content, assessment, and teaching throughout UGRU for the 2001-2002 academic years. The pilot project suggested some changes in some of the key policies and procedures, for example: (i) *Placement exams* - Students must now sit for all four exams before they are allowed to register for classes; (ii) *Limited repeating of courses* - If a student fails an UGRU course three times; he or she must leave the University; (iii) *Enrolment in ESP (English for Specific Purposes)* is compulsory within one year of completing English 3; (iv) *Grading* - UGRU classes now use new grading systems that decrease the weight of the midterm and final exams and place greater emphasis on tests, quizzes, homework, and portfolios; and (v) *Registration* - Until and through the 2000/2001 academic years, student registration ("hand" and "Internet scheduling") were problematic[3]. Beginning in fall 2001, schedules were created by computers, which satisfied students as well as lecturers. The procedure was completed within 2 weeks.

(D) Viewpoints of Students About New Learning Approach in IT
It was important to assess the feelings of the students about this new learning approach in IT. From the questionnaire, it was clear that the students were not satisfied with the syllabus they had to study in a given semester. Most of the time their observation was that it was too difficult. A careful study of Table 1 indicated that the majority of the students (from 73.91 to 90.00%) considered computers would influence their lives or future careers, or felt it was a useful subject for study. Thus, the students also felt like the educators in believing that the IT course would have an effect on their future or they would be disadvantaged by not taking this course. The students felt that programming, word-processing and spreadsheet-based practical parts were easy and interesting, but that the theory part was difficult and boring. These feelings could be attributed to a number of factors. The most obvious factor was that the IT syllabus was very abstract in its approach; the emphasis was on

rote- learning, not on applications. The lack of appropriate textbooks was another factor.

The syllabus was significantly changed in response to the dissatisfaction expressed with the existing syllabus by students and different university lecturers (the authors were very much involved in this process) throughout the UGRU. In the new IT syllabus increased emphasis was placed on the development of practical activities for handling real life projects in a group environment [20].

(E) Teaching Style and Its Effect on Learning New IT Program
The various approaches to teaching an IT course and its effect on learning have been described by Griffin [1]. A number of pointers for the teaching of IT courses were deduced. To identify the teaching styles and strategies followed in UGRU, the lecturers from different IT, Arabic, Mathematics, and English courses were observed and interviewed. The choice of teaching style and methodology by lecturers is the result of experimentation through piloting operations, personal experience, and knowledge of new and innovative international developments.

The lecturers, in general, followed a traditional approach. They invariably took the syllabus as a teaching plan and covered all topics sequentially. It was also observed that the lecturers adopted the following techniques: (a) the introduction of a topic by relating it to every day life, example/experience – learning in context; (b) review of the previous topic, giving a new concept and relating it to previous knowledge – spiral curriculum and concept formation; (c) following of a prescribed text supplemented with hand-outs; and (d) speaking rather than writing on the whiteboard.

Because of the heavy emphasis on technology in the IT Program, all the classes are held in computer labs with a maximum of twenty-five students, each student having access to a computer. To facilitate teaching, broadcasting software is available in all labs. This allows lecturers to display their screen to each station in the lab. In addition, overhead, and data show projectors allow the lecturer to demonstrate his screen while students continue to have control of their own stations. The IT lecturers, in particular, were observed relating the everyday applications of IT to the topic under discussion. As the classes were held

Table 1. Responses of UAE University Students About IT

Response	Major		
	Art	Business	Science
	%	%	%
Have you ever used computer before?			
Yes	45.65	80.00	80.00
No	54.35	20.00	20.00
Are you familiar with Windows 2000?			
Yes	13.04	40.00	35.00
No	86.96	60.00	65.00
Have you ever used the Internet?			
Yes	26.09	60.00	47.50
No	73.91	40.00	52.50
Use of Internet for?			
Looking for Information	23.91	46.67	37.50
E-Mail	8.70	53.33	25.00
Chatting	4.35	46.67	17.50
Buying/Selling things	0	0	0
Downloading programs and files	2.17	46.67	7.50
Other (location/Music/Arabic news/games/etc.)	6.52	6.67	12.50
What do you expect to learn from this course (IT1)?			
Structure of the computer. Use computers and necessary programs.	47.83	40.00	25.00
Windows 2000, Word, Excel, Access, PowerPoint, and Internet	8.70	26.67	25.00
Windows 2000, typing, English, business programs and Internet.	8.70	13.33	30.00
Printers, computer parts, Internet, downloading programs and files.	6.52	0	0
No comments	28.25	20.00	20.00
What do you think we use a computer for?			
Look for information, studies, research, and E-mail.	36.96	13.33	15.00
They are everywhere and control the world. Very useful for our life, country and future. We can get information about people and places quickly.	19.57	20.00	32.50
Computers make life fast, and work easy and right. Save time and money.	2.17	13.33	25.00
Help people to work and play. For typing, getting news. Used in schools, hospitals, universities, hotels, airports, supermarket, and companies, etc.	13.04	13.33	10.00
For business. Information search, Chat, E-mail, Loading and saving files.	2.17	20.00	7.50
No comments	26.09	20.00	10.00

Use of Application Software?

Expertise Level	Art			Business			Science		
	Word	Excel	PowerPoint	Word	Excel	PowerPoint	Word	Excel	PowerPoint
Familiar	17.39	15.22	17.39	20.00	13.33	13.33	25.00	35.00	50.00
Medium	10.87	0	4.34	20.00	20.00	40.00	22.50	2.50	12.50
Strong	2.17	2.17	8.70	20.00	6.67	6.67	5.00	0	2.50
Not used	69.57	82.61	69.57	40.00	60.00	40.00	47.50	62.50	35.00

in the computer laboratory, the function and uses of the peripheral devices were shown practically. Difficult concepts such as database design, data series, queries, nested IF and graphing, etc., were explained with colored diagrams and related to the manual processing system of everyday activities. The lecturers encouraged student feedback. For example, students were encouraged to ask and answer questions, work on the white board, explain a point to the whole class, come with their own problems and construct review sheets for their colleagues etc. The IT courses demand that students produce a project in which they integrate their knowledge, skills and problem solving capabilities. Thus, it could be argued that within the constraints of a traditional abstract syllabus the teaching approach was appropriate and fairly successful.

(F) Curriculum and Classroom Management Process
The Program finds itself continually confronted with dilemmas in this regard because of a variety of factors. Firstly, it finds itself sandwiched between the high schools on the one hand and the University on the other, and must therefore, provide a bridge between them. This would not be too difficult a problem were it not for the fact that the boundary between these two jurisdictions is an ever changing one, a natural consequence of the dynamics of a nation which is, educationally speaking, young and progressing. Secondly, IT requires continuous updating of the curriculum in order to keep abreast of the latest developments. Finally there is the question of the sheer volume of work, which must be undertaken to keep the curriculum in shape.

In the old curriculum system the IT Program has devised three streams to better meet the demands of the different Colleges; these are labeled: Arts, Business, and Science. Each discipline within a stream is called a track, which contains two courses: Level 1 and 2. The duration of each course is for one semester and is taught for an average of 4.5 contact hours per week. Each course is of 1.5 Credit Hours [17].

The new Standards and Objectives for IT developed during the Spring 2001 semester called for collapsing the previous three tracks into a single one (IT1). Whereas the previous first semester courses focused on learning the mechanical functions and operations of Microsoft Office applications software (e.g., formatting commands, simple mathematical functions, etc.) as course objectives in themselves, the new curriculum treats these rote-learned items as tools that can be used for more far-reaching objectives: (i) Finding, obtaining, and validating information; (ii) Analysing information, solving problems, and forming opinions and perspectives; and (iii) Effectively communicating information, opinions, and perspectives.

The syllabus for IT1 was exclusively rewritten for spring 2002 – it features less emphasis on arcane technical features of the applications programs (e.g., conditional formatting in MS Excel), less time spent on what is commonly called "computer literacy" (e.g., definitions for RAM, ROM, bits and bytes) and more on effective, valid, and accurate use of technology (e.g., the principles of page layout for effective communication, appropriate, honest and accurate graphical representation of quantitative information). Tests, quizzes, homework, and projects are being rewritten to require that students demonstrate not just rote-learned technical skills, but that they also understand and can apply these skills to solve problems.

The curriculum of the three second-level courses remains largely unchanged from that of the 2000/2001 academic years because of the lack of new Standards and Objectives, which were in turn delayed because early feedback from the Deans of the Colleges indicated that teaching Visual Basic programming (the main parts of ITS and ITB) is superfluous and that the Business, Engineering, IT, and Sciences colleges would appreciate more coursework in problem solving, simulations, and communications using technology instead [20]. The latest ICDL (International Computer Driving License) based curriculum emphasizes on E-learning and uses tools like blackboard, WebCT, and Computer Generated Examinations, etc.

The class management practice was influenced by the students' periodical assessment and grading policy and lecturers' guidelines for conduct-

ing classes. The lecturers of Arabic, English, Mathematics, and IT were interviewed using a standard questionnaire format. The following were the highlights of the interview: (a) most of the lecturers do not remember their students by name; (b) a few problems were solved in the classroom in each topic and another set of problems were given as home assignments; (c) a number of periodical tests, mid term and final examinations were conducted in each subject. The lecturers kept records of test scores. Most lecturers gave special attention to weaker students and sometimes discussed remedial approaches with students. Thus, classroom management practices were of the same pattern in different subjects. It was found that the number of periods per week for IT are comparable to those in other subjects.

Furthermore, we observed the computing activities conducted in the classroom. The computer uses in the university could be classified under three broad headings: tutor, tool and tutee [8]. As tutor, the university used a set of educational programs, such as TypingMaster. They served as drill and practice activities in the classroom. The university also utilized drill and practice programs for learning Arabic, Mathematics, and English. The word-processing and graphics packages were the two most popular tools used in the classroom. It was observed that students prepared some class assignments in other subjects, using the word-processor and graphics packages. By far the most important use was in the tutee mode. The machine was the tutee and the students were the tutor. The student became the tutor by programming the computer in Visual BASIC to solve problems. In this mode, the students learned more about the functions and operations of the computer and its peripherals. On the whole, it was found that the students enjoyed the practical classes compared to the abstract concept forming theory classes. However, it is interesting to note that the university administration is working on updating the syllabus to reflect current trends in teaching the courses through applications [10].

(G) Viewpoints of Lecturers
Most of the lecturers adhere to the traditional school of thought that teaching could only be done the way they have been taught. The new concept of learning outlined above has certainly shaken their conviction and faith. Some are cooperating only half-heartedly. The biggest problem is a lack of a sufficient number of lecturers to handle the responsibilities of an enrollment of this size, so mostly they are busy doing overtime and complaining instead of adapting to the new concepts.

(H) Students' Performance in New IT Program
Analysis of Course Results helps the IT Program to review and adjust exam methodologies, course material and contents according to analysis result. An extensive summative evaluation was conducted of the IT program and student performance, using appropriate comparison groups. Table 2 summarizes the results of a statistical comparison between Fall 2000 and Fall 2001 for IT.

As discussed earlier, under heading C, in the Spring 2001 semester, UGRU invited students to participate in the AEP. This program was designed so that the resulting samples be as representative as possible of the UGRU student population thus avoiding any dependence on the level of the students. Therefore the program was aimed at selecting a group of students who reflect a very 'ordinary' profile with regard to the student body at large. To achieve that, the UGRU enrolment data of the 1998-1999 and 1999-2000 Spring Terms was checked as a first step towards the construction of the selection process and the variables to be involved. The analysis gave the profile described in the document: "Recent Years Second Semester Enrolment Data Analysis". Although there are certain majority tendencies (for some of the variables), the Statistics (in the same document) indicate the presence of heterogeneity. We expect the spring 2001 enrolment data to exhibit such heterogeneity, motivating therefore the use of stratification based on the variables therein. The samples were then extracted from the strata proportionally to their sizes. The sample sizes were: 20 for the boys, and 40 (2x20) for the girls, and the variables that were used for the strata

Table 2. Statistical Comparisons of Past Classes and Outcome of AEP

The Statistical comparisons of Fall 2000/Fall 2001 UGRU Classes.			
Grades	**Absences**	**Scores and Absences**	**Final Exams & Activities Scores**
Average grades for male students increased; average grades for females decreased slightly. For example in the first level classes: 		F00	F01
M	1.8	2.1
F	2.5	2.1		Reported absences for both male and female students increased. For example, in the first level classes, average absence rates were: |	F00	F01
M	6.1	7.1
F	3.6	4.7	 The percentage of males coming within 1 absence of the 15% limit doubled: from 12.5% to 26%.	+For females, there was little change in grades and Final Exam scores as a function of absence. These measures declined with increasing absence, but in F00 and F01, average grades remained in the passing range as students reached the 15% absence limit. +For males, grades tended to be one half grade higher in F01 than they were in F00 for the same level of absence. +For both male and female students, Midterm Exam scores tended to be significantly higher (4-5 points) in F01 than they had been in F00, and Midterm Exam scores tended to decrease less with increasing absences…this suggests that the F01 Midterm Exam might have been easy or covered less material than its F00 equivalent.	+For female students, final exam scores moved lower from F00 to F01 (i.e., for the same activities score, the average Final Exam score was 8-9 points lower). Since average Activities scores remained almost unchanged from F00 to F01 in spite of the increase in lesser-prepared students, it may be concluded that: (i) The Eid holiday that preceded final exams may have caused the students to forget some of the skills and knowledge they needed, or (ii) The Final Exam may have been more rigorous than in the preceding year, or (iii) homework and quizzes may be easy. Review of the actual final exam instrument suggests that the Final Exams were indeed more rigorous. The (i) and (iii) factors need further study.
The students who passed AEP and first class course in IT.			
Result	**Male**	**Female**	**Total**
Participating AEP Students	18	25	43
Passed	15	21	36
%	83.33	84.00	83.72

construction are: (i) Gender (Male, Female); (ii) College Code (Art = 'ED' or 'SL' or 'HS', non-Art = the rest); (iii) Placement Test Score (Lower and Upper bounds); (iv) Nationality (UAE, non-UAE); and (v) Emirate of Secondary School (Abu Dhabi, non-Abu Dhabi).

The students were selected on the basis of having been placed in Level 1 on all four-placement exams. Table 2 shows the students who passed in AEP and first class course with their genders.

The graph in Figure 1 has two axes: (a) the x-axis shows each student's total score in the first class (in this case, AEP IT1); (b) the y-axis shows the student's total score in the next class taken in the same subject. If the student passed the AEP class, his or her data point will lie to the right of the vertical "60" line; if not, it will lie to the left (which means that the student's next class will be a repeat of the first class). If the student passed the second class, his or her data point will lie above the horizontal "60" line; if not, it will lie below the line. The most desirable outcome would be for all students' data points to lie in the upper right quadrant of this point; this would mean that all passed the first course and all passed the second course. Perhaps the least desirable result would be to have a large number of students whose data points lay in the lower right quadrant: they passed the AEP course and failed the second-level course. One would also like not to see many data points in the lower left quadrant: these students would have failed the first course two times. 83.72% students in the AEP IT1 class passed AEP and first class course. The Figure 1 also shows comparison of IT performance with English, Mathematics, and Arabic.
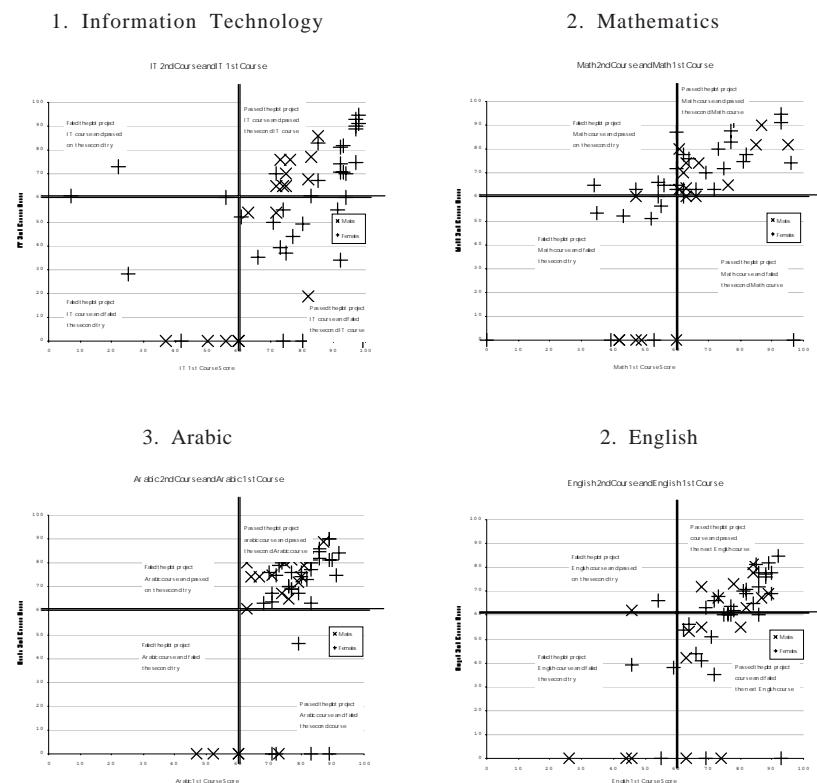
An extensive summative evaluation was conducted of IT Programs and student performance, using appropriate comparison groups. Specifically, the evaluation examined the relationship between background characteristics (e.g., race, sex, high school rank in class, etc.) and achievement in IT [20].

Figure 1. Comparison of IT Performance with Mathematics, Arabic, and English

1. Information Technology

2. Mathematics

3. Arabic

2. English

(I) Viewpoints of University Management

Despite the widespread and varied use of computers in society and the growing number of personal or home computers in general use, management, and staff of many universities still view computers with a great deal of suspicion. The positive attitude of the Director and university management greatly influences the development of successful, functional computer studies and computer assisted instruction programs in the institutions curriculum [14]. The UAE University management was not completely satisfied with the introduction and running of new learning approach in IT. Indeed a section of management felt that subjects like Arabic, English and Mathematics were more important than IT courses. They thought a policy of gradual introduction was preferable and funding could be better utilized for urgent alternative purposes. The lecturers with prior experience in curriculum reform and management felt that UGRU needs to be slow and methodical.. But now the situation is changing.

The recent visit of Academic Advisory Board (AAB) members was very encouraging. As AAB writes in their latest report: "The Academic Advisory Board is very impressed with the accomplishments of UGRU over the past 18 months. AAB believe that universities throughout the world have much to learn from UGRU, and that UGRU's continuing reform efforts would also benefit from regular interactions with the international community of scholars who are working to improve programs for first-year university students. AAB want to encourage UGRU to become a part of that international conversation, both for UGRU's sake and so that others can learn from you as AAB have during their visit [21]".

CONCLUSION

The AEP research project identified the various issues, factors and problems involved in introducing new learning approach in IT into Arabian university environment. The success of the program is clear from Table 2 and Figure 1 where the success rate is phenomenal. The teaching style and classroom management techniques in IT were commensurate with the university requirements and were comparable to those in other subjects.

The students were found to enjoy the practical, application-oriented, laboratory part compared to

the abstract, concept-oriented theory part of the IT courses. Another strong and salient feature of the IT program is the curriculum, both its design and its heavy reliance on modern technology. The curriculum gets away from rote-learning and emphasizes critical thinking, problem solving, investigation, self-learning and creativity. An interactive classroom environment is used. It was interesting to note that the UAE University management understood the situation and updated the syllabus. It was observed that UGRU was successfully reached the final stage % the course having an effect on students' attitude towards computing. The students in general felt that these courses would have an influence on their future career and in higher education.

The study clearly established that the impact of new IT program will benefit students' performance day by day. Hence other Arabian Universities should follow the example of UAE University and introduce new IT courses in their university education. At the initial, introductory phase, assistance could be obtained from other local institutions. If such assistance could not be obtained, the experience and expertise of the developed countries could be utilized by following a strategy of educational computing technology transfer as suggested by Galvis [12]. Further validation of research in new teaching and learning styles and strategies with blending of E-Learning and distance education paradigm will produce value-based higher level IT education for students of Arab universities in particular and global universities in general.

Finally it was concluded that an IT program should be an integral part of the university national curriculum and that this study would be a useful guide for other Arabian universities as the impact of computer technology increases day by day in society and in the lives of people in the Arab world.

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REFERENCES

1.   Griffin J., Computer Studies for the General Certificate of Secondary Education: teaching through applications. *Computers Educ.* 12, 443-451 (1988).
2.   Chomienne M., Educational computing implementation: the case of Quebec. *Computers Educ.* 12, 85-90 (1988).
3.   Lockheed M. E. *et al.*, An empirical study of some determinants of microcomputer literacy in high school students. Report, Educational Testing Service, Princeton (1983).
4.   Plomp T. and Carleer G., Towards strategy for the introduction of information and computer literacy courses. *Computers Educ.* 11, 53-62 (1987).
5.   Coburn P., Kelman P., Roberts N., Watt D. H. and Weiner C., *Practical Guide to Computers in Education.* Addison-Wesley, Reading, Mass. (1982).
6.   Bullough Sr R. V. and Beatty L. F., *Classroom Applications of Microcomputers.* Merril, Ohio (1987).
7.   Khan E. H. and Sharma A. K., *Computer and Data Processing with BASIC.* Oxford and IBH, New Delhi, India (1987).
8.   Khan E. H. and Sharma A. K., Implementation And Evaluation Of Computer Science In An Indian Secondary School. *Computers Educ.,* 14, 343-355 (1990).
9.   U.A.E. University Faculty Handbook 2001.
10.   Karas, R., Pilot Project – U.A.E. University (2001).
11.   U.A.E. University, U.G.R.U. Handbook 1999.
12.   Galvis A. H., Educational computing technology transfer: towards a non-magical approach, *Computers Educ.* 11, 197-204 (1987).
13.   Treisman, U., Studying students studying calculus: A look at the lives of minority mathematics students in college. College Mathematics Journal 23(5), 362-372 (1992).
14.   Chandra P., Bliss J. and Cox M., Introducing computers into a school- management issues. *Computers Educ.* 12, 57-61 (1988).
15.   Lilly S., Gillam A., Mahoney C., Norris C., Sawaie M., *An Evaluation of The Undergraduate General Requirements Unit (UGRU) United Arab Emirates University, April* (2000).
16.   Norris C., *Report on the Computer Applications Program of the General Requirements Unit United Arab Emirates University, April* (2000).
17.   Zelmer G., *Self-Assessment Report Academic Year 1999-2000,* Mathematics and Computer Applications Program (2000).
18.   Khalifa A. A., *The Future of Higher Education in the United Arab Emirates*, PhD Thesis, University of Southern California, Los Angeles (1993).
19.   Tanner D. and Tanner L., Curriculum Development Theory into Practice, Englewood Cliffs, New Jersey (1995).
20.   Karas, R., First Annual Progress Report – U.A.E. University (2002).
21.   Lilly S., Mahoney C., Smith M., Swing R., An Evaluation of The University General Requirements Unit (UGRU) United Arab Emirates University, April (2004).

ENDNOTES

[1]   UGRU Educational Goals, published in Spring 2000.
[2]   The UGRU orientation booklet contains general information about attendance, examinations, grades, etc.
[3]   The Internet registration process, for example, caused so much adding and dropping of classes that scheduling was not completed until several weeks of the semester had elapsed.

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