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Culture, content and learning for development

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About the journal

The International Journal of Education and Development using Information and Communication Technology (IJEDICT) is an e-journal that provides free and open access to all of its content.

Regional economies and communities are facing increasing economic, social and cultural hardship in many parts of the world as economies adjust to the demands of the new orders of commerce and governance. A part of this is the paradox that regional economies and communities can be either enhanced or disadvantaged by information and communication technologies (ICT) products and services. The potential enhancement comes from the increased social, economic and cultural capital that comes from harnessing ICT products and services in a community sense. The disadvantage comes from the power that ICT products and services have in centralizing commerce, service provision and governance away from the regional community.

Unless we get a greater level of access AND adoption of information and communication technology (ICT) for education and development at community level, we will miss the opportunity to turn the "digital divide into a digital opportunity for all, particularly for those who risk being left behind and being further marginalised" ("Declaration of Principles", WSIS-03/Geneva/Doc/4-E, Principle 10). The International Journal of Education and Development using Information and Communication Technology (IJEDICT) is an e-journal, with free and open access, that seeks to address this issue.

IJEDICT aims to strengthen links between research and practice in ICT in education and development in hitherto less developed parts of the world, e.g., developing countries (especially small states), and

rural and remote regions of developed countries. The emphasis is on providing a space for researchers, practitioners and theoreticians to jointly explore ideas using an eclectic mix of research methods and disciplines. It brings together research, action research and case studies in order to assist in the transfer of best practice, the development of policy and the creation of theory. Thus, IJEDICT is of interest to a wide-ranging audience of researchers, policy-makers, practitioners, government officers and other professionals involved in education or development in communities throughout the world.

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IJEDICT has a major emphasis on the use of ICT in education and development in hitherto less developed parts of the world. The journal includes descriptive case studies about ICT projects in developing countries and in rural and remote regions of developed countries, as well research articles evaluating such projects, developing policy or creating theory. Topics covered include, but are not limited to, the following areas:

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This section includes brief descriptions (500-1000 words) of education and development projects that utilise ICT.

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This section contains the editorial written by the editors for the specific issue.

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- o Submissions can be in Microsoft Word, Rich Text Format (RTF), equivalent Open Source document file format, or HTML format.
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> Marshall, S., Taylor, W., & Yu, X. (eds.) (2003), Closing the Digital Divide: Transforming Regional Economies and Communities with Information Technology, Greenwood Publishing, Westport CT.

o   Citations in the text should include the author's name and year of publication where you use the source in the text, as in the following examples:

> In this way, information technology can be seen to effect and influence changes in organisational structure (Orlikowski & Robey 1991).

> Edwards (1995, p.250) views the globalising of distance education as "invested with the uniform cultural messages of modernity".

> Globalisation, especially in relation to open and distance education, will reduce the tolerance of difference and so "how can local issues and contexts be addressed?" (Evans 1995, p.314).

o   Further information about the Harvard editorial style can be found at:

> http://lisweb.curtin.edu.au/referencing/harvard.html
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Editorial: Culture, content and learning for development

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Welcome to the first issue of volume 2 of the International Journal of Education and Development using Information and Communication Technology (IJEDICT) - an e-journal that provides free and open access to all of its content. This issue deals with culture, content and learning for development, and brings articles from and/or about India, Syria, Southern Africa and Australia.

Four articles in this issue come from India. Ratnam, Krishna Reddy and Reddy, in their article "eSagu: An IT based personalized agricultural extension system prototype – analysis of 51 Farmers' case studies" describe the "eSagu system - an IT-based personalized agricultural extension system to improve agricultural productivity by disseminating expert agricultural advice to the farmers, both in a timely and personalized manner. The authors provide an analysis of 51 registered farmers' regarding compliance of advice and corresponding effect. Their analysis showed that about fifty percent of farmers followed the practices which increase yield and reduce input cost. A high positive correlation was observed between the compliance rate and the yields.

Ashok Patel in the article "Education through multimedia among Agricultural Diploma school students: An impact study" describes a study conducted in the Gujarat State of India to measure the effectiveness of a multimedia on paddy cultivation on gain and retention of knowledge of students of Agricultural Diploma school. The results indicated that the knowledge level before viewing the multimedia was correlated with some of the personal characteristics of the students; while no such correlation was observed with the level of knowledge after viewing the multimedia. Similar results were also observed at the level of retention.

The article "eNRICH: Archiving and accessing local information" by Sarita Sharma describes ethnographic action research undertaken in a site in urban north India using information and communication technologies (ICTs) towards development of the local community. It discusses the usage of eNRICH[2], a web based browser. It includes experiences about how the software can be used in the given field situation and the challenges towards the consistent functionality of such software in an ICT initiative meant to reach the poor and the marginalised. Since the software facilitates recording and archiving of content, the article also briefly touches upon issues of local content development, the cornerstone of ICTs for development.

In "ICT learning: Is it more valuable for the young?" Savithri Subramanian describes ethnographic action research undertaken from early 2003 to July 2005 in a rural area of Tamil Nadu, India. Small centres were set up in the houses of women in the villages in order to create access to ICTs for these rural women. While women have learnt to use some of these modern ICTs and do make use of them, increasingly it is the young boys and girls of the community who more often access the centres. The paper explores some of the socio-cultural factors that may be leading to this subtle but definite change.

In "Cultural perceptions: The missing element in the implementation of ICT in developing

countries", Abdulkafi Albirini describes a study that explored the cultural perceptions of high school EFL (English as a Foreign Language) teachers in Syria toward ICT. The findings point to a notable conservatism in participants' perception of ICT in education and society at large. Teachers were mainly concerned about the morally damaging effect of ICT (particularly the Internet), its inattentiveness to their cultural and language needs, and its growing primacy at the expense of other societal needs. Hence, participants urged for the creation of local computers and software that would better serve Syrian identity and culture.

From Southern Africa, in "Information Literacy Skills Course delivery through WebCT: The University of Botswana Library experience", Edward Lumande, Ayo Ojedokun and Babakisi Fidzani describe a user-education programme designed to address the problems of large classes, assessment of students in relation to large number of scripts to mark, shortage of staff, timetable clashes, and the need for consistency in delivery of content. The implementation of the pilot by the library started in 2003 with the first year social science students. Their article shares the library's experiences during implementation.

From Australia, in "Investigating ethical crimes" Edward Morris and Catherine Zuluaga describe how they devised a five-step procedure based on a standard investigative procedure used at crime scenes to improve final year information technology undergraduate students' ability to analyse ethical issues. They evaluated the success of their ethical 'crime' investigation procedure by comparison with previous student cohorts given the same issues to analyse. To help online students learn to investigate ethical issues, they used object oriented learning methodology to design a class of learning objects. This facilitates dynamic instantiation of an individualised learning object for, or by, a student during a lesson. This enables the lesson to be not only more highly interactive but also far less predetermined in its sequence of activities for each student.

Finally, Ed Brandon in "Commitment or Public Relations?" reviews the book *Empowering Children: Children's Rights Education as a Pathway to Citizenship*, by R. Brian Howe and Katherine Covell. He points out that the book deals with an issue in development that is potentially one of the most far-reaching that can be seriously considered, and one that will require extensive and unavoidable educational action. Although the book does not invoke ICT – apart from a couple of remarks to the effect that a government's putting some material on a web-page is hardly an adequate fulfillment of its responsibilities in this area – ICT-enhanced educational activity can certainly form a significant part of any adequate response.

IJEDICT provides open access to all of its content on the principle that making research freely available to the public supports a greater global exchange of knowledge. In this way, IJEDICT seeks to support the community of researchers and practitioners involved in ICT for education and development, and we welcome feedback and suggestions as to how the journal can better serve this community.

Stewart Marshall and Wal Taylor
Chief Editors, IJEDICT

Original article at: http://ijedict.dec.uwi.edu//viewarticle.php?id=164&layout=html

Education through multimedia among Agricultural Diploma school students: An impact study

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ABSTRACT

The present study was conducted in the Gujarat State of India to measure the effectiveness of a multimedia on paddy cultivation on gain and retention of knowledge of students of Agricultural Diploma school. There was a substantial net gain in as well as retention of knowledge about the topic by students at selected agricultural diploma schools on viewing the multimedia. The results indicated that the knowledge level before viewing the multimedia was correlated with some of the personal characteristics of the students; while no such correlation was observed with the level of knowledge after viewing the multimedia. Similar results were also observed at the level of retention.

Keywords: India; multimedia; agriculture; personal characteristics; knowledge gain.

INTRODUCTION

Rapid agricultural growth will continue to be the key to poverty reduction and overall economic development in India. The Green Revolution has been the cornerstone of India's agricultural achievement, transforming the country from food deficiency to self-sufficiency.

At the present time, the technologies required to address total farming systems are knowledge intensive. In the wake of globalization and liberalization of agricultural trade, the farmers are now becoming more diversified in terms of cropping systems, more conscious about the quality of products and more market oriented. To help ensure success in these uncertain times, it is essential to effectively communicate useful agricultural technologies to the farmers. For this, they should also need to be able to access the expertise in the field of agriculture. In the same way, the Agricultural Diploma School students, who will in future be the key transfer of technology (TOT) agents; are also required to be updated about the latest technological developments. Such institutions cannot bear the cost of employing experts from various disciplines of agriculture. However, the use of information and communication technologies can serve the same purpose. The correct communication media, used effectively, can be a useful tool for teaching the students in a more effective way. Multimedia can be one such tool that can be helpful in enhancing the communication capabilities of teachers in the educational system as well as of the TOT experts working in the extension system of India.

Among all the means of mass communication, multimedia is one of the most versatile audiovisual mediums of communication (Brun & Mangstl, 2001). Multimedia instructional material allows the learner actually to see, hear, and use the content to be learned (Roden, 1991). Interactive Multimedia Compact Disks can be used as an effective tool for the transfer of technology (Senthil, et.al., 2003). Hooper (1986) also stressed the utility of multimedia in education. It would be an ideal tool to transmit information to the huge illiterate section of the Indian population, especially the farmers, on whom such an audiovisual medium could have a profound impact. It is also an effective tool for the students studying at below college level. It can reproduce an experience with its sound and motions simultaneously and thereby creates an excellent learning effect. Not only

can it be used at the convenience of the user, but it has an added advantage in being demand driven.

Beside the preparation and use of multimedia, its evaluation in terms of its effectiveness is also essential to justify investment and to demonstrate results (benefits). A multimedia compact disk (CD) on paddy cultivation has been developed by the Cyber Extension Cell of Gujarat Agricultural University (GAU) in the Gujarati language; which can be used in an equally effective way for the farmers as well as for the students studying in the vernacular language. To evaluate the effectiveness of multimedia in the educational system, the present study was undertaken with the following objectives:

1. To measure the knowledge level before and after viewing the multimedia as well as the retention of knowledge of the students of selected agricultural diploma schools about the seedling raising of paddy crop.

2. To find out the relationship between selected personal characteristics of the respondents and their knowledge level.

RESEARCH METHODOLOGY

The agricultural diploma course is run by the GAU through 14 agricultural schools spread over the Gujarat State. Out of these, four schools - i.e., Anand, Chharodi, Dahod and Vadodara - are in the Anand zone of GAU. Two schools of the Anand zone of GAU - namely Vadodara and Anand - were selected purposively for the purpose of this study since computer facilities were available only at the two schools.

The students studying in the second year of the diploma course, who have already studied the paddy crop course during their educational syllabus, were selected. The total numbers of respondents selected from the two schools were 66. An interview schedule was prepared in Gujarati to collect information regarding the knowledge level of students about paddy seedling raising. Questions and statements on every aspect of the study were framed with maximum accuracy, clarity and objectivity. Help of experts in the field was obtained for the purpose.

The study was conducted in the year 2003. The classroom settings were utilized for interviewing the respondents. The interview schedule was supplied to the respondents and sufficient time was given to fill it in for measuring the level of knowledge before viewing the multimedia. They were then allowed to view the paddy seedling raising part of the multimedia CD. After six hours of viewing the CD, data for part II of the schedule were again retrieved to measure the level of knowledge after viewing the multimedia. Further, to measure the retention of that knowledge, part II of schedule was again distributed the respondents after a gap of 30 days.

The scoring was done on the basis of the procedure prescribed by Jha & Singh (1970). A score of one was given for a correct response, while a score of zero was given for an incorrect answer. The data were analyzed by using mean, standard deviation, per cent and paired 't' tests? The co–efficient of correlation '*r*' was used to find out the relationship of selected personal characteristics with the knowledge level of the respondents at different times.

RESULTS AND DISCUSSION

Level of knowledge

The level of knowledge of the respondents regarding the seedling raising of paddy crops was measured three times: i.e., before viewing the multimedia, after six hours of viewing the multimedia and after 30 days. All the scores were taken into consideration and on the basis of means and standard deviations; the respondents were classified into three groups of low, medium and high levels of knowledge. The data in this regard are presented in Table 1.

Table 1 : *Distribution of respondents on the basis of knowledge levels before and after viewing the multimedia as well as after one month*

Level of knowledge	Before viewing		After viewing		After one month (Retention)	
	No. Of R[*]	Per cent	No. Of R[*]	Per cent	No. Of R[*]	Per cent
Low (≤7)	35	53.00	0	0.00	2	3.00
Medium (8 to 24)	31	47.00	44	67.00	50	76.00
High (25 to 40)	0	0.00	22	33.00	14	21.00
Total	**66**	**100**	**66**	**100**	**66**	**100**

R* - Respondents

It is obvious from the data that there was no respondent in the group having a high level of knowledge before viewing the multimedia. More than 50 per cent possessed a low level of knowledge, whereas the remainder possessed a medium level of knowledge. By contrast, after viewing the multimedia, there was not a single student having a low level of knowledge and almost 33 per cent possessed a high level of knowledge. Further, the level of knowledge after one month also indicated that only three per cent of the respondents had a low level of knowledge; while more than one fifth had a high level of knowledge. Thus, it can be stated that multimedia not only facilitates the increased knowledge of the viewers, but also assists in the retention of the knowledge gained.

Gains in knowledge

To assess the gains in knowledge, the data regarding level of knowledge of individual respondents for before and after viewing the multimedia as well as after one month were analyzed. Net increase in knowledge was calculated for both the levels for each respondent. They were then classified as low, medium and high gains in knowledge.

The data in these regards are presented in Table 2, which clearly indicated that nearly one fourth of respondents had a low gain in knowledge (an increase in knowledge of up to 35 per cent). Those respondents who had a medium gain in knowledge by viewing the multimedia (a 35.01 to 64.99 per cent increase in knowledge) were 53 per cent, while almost 20 per cent of respondents could gain more than 65 per cent in their level of knowledge by viewing the multimedia. The results are quite encouraging and one could conclude that the multimedia can play an important role in generating knowledge.

Table 2: Distribution of respondents according to an increase in and retention of knowledge owing to exposure to multimedia

Increase in knowledge	After viewing		After one month (Retention)	
	No. of Respondents	Per cent	No. of Respondents	Per cent
Low (≤ 35 per cent)	18	27.30	36	54.55
Medium (35.01 to 64.99 per cent)	35	53.00	27	40.90
High (≥ 65.00 per cent)	13	19.70	03	4.55
Total	**66**	**100.00**	**66**	**100.00**

Similarly, the retention of the knowledge gained was also measured. The data indicate that almost five per cent of viewers had high retention, while nearly 41 per cent had a medium increase in knowledge even after one month. There were almost 55 per cent respondents who had a low increase in knowledge after one month (retention level), which show that the knowledge gained was retained even after one month.

Further, the researcher tried also to calculate the significance of the difference in the level of knowledge before and after viewing the multimedia as well as after one month by applying the paired 't' test. The data in Table 3 clearly point out that there is a highly significant increase in the level of knowledge of the respondents as a result of viewing the multimedia. On the other hand, the significant value of the 't' test between the post-test and the retention level implies a significant decrease in knowledge level at the time of retention. However, the highly significant increase in the level of knowledge of the respondents at the time of retention over the pre-test indicates that, though there is little loss of knowledge over the post-test, there is a net increased retention of knowledge even after one month of exposure to the multimedia.

Table 3: Extent of increase in and retention of knowledge owing to exposure to multimedia

Test	Average level of knowledge
Pre-test i.e., knowledge level before viewing the multimedia	6.9091
Post-test i.e., knowledge level after viewing the multimedia	22.2576
Retention i.e., knowledge level at 30 days after viewing the multimedia	18.3030
Pair of observation	**'t' value**
Pre-test and Post–test	18.5563**
Post-test and Retention	5.2065**
Pre-test and Retention	13.9895**

** Significant at 0.01 level of probability

The findings of this study were in conformity with the findings of Pahad (1998) and Kumar, Gupta and Gupta (2000), who found a significant gain in knowledge after the respondents were exposed to video. Patel (1996) also observed that the combination of different teaching methods has a significant impact on gains in knowledge in classroom teaching. Similar results were observed by Thakur, Verna and Verna (1996) and Madan, Verna and Jain (1996), even in non-classroom settings. The results are also in line with the results of Agarwal and Kumar (2001) for the research study related to nutrition education through video film. Studies (Carlson & Falk, 1989; Roden, 1991) have shown that superior academic performance was achieved when multimedia forms of instruction were utilized.

The Comsell Company found that multimedia students move through the learning experience 30 per cent faster than in a traditional classroom (Roden, 1991). A Department of Defense study (cited in Amthor, 1991) also provided favorable findings for multimedia. When interactive video instruction was compared to more traditional methods of instruction, achievement was improved by over 38 per cent, while the time needed to teach the subject matter decreased by 31 per cent.

Marrison and Frick (1993) found that computer multimedia instruction had no significant effect on students' achievement in agricultural economics when used as a supplementary study tool. It is the researcher's contention, however, that, since the computer multimedia module was strongly patterned after the lecture material, the module proved to be well modeled after the concepts learned in lectures. However, students' learning time was decreased by 32 per cent with the use of the multimedia module.

Relationship between independent and dependent variables

To find out the relationship between independent and dependent variables, the correlation of the selected independent variables with the knowledge level of the respondents regarding seedling raising of paddy crop was measured. The correlation was measured for all the three conditions: i.e., before viewing the multimedia, after viewing the multimedia and after 30 days after viewing the multimedia. In order to study the simple relationship between these independent and dependent variables, the zero order correlation co-efficient was computed for each independent variable. The values of correlation co-efficient (r) were then tested for their statistical significance. It is apparent from Table 4 that the co-efficient of correlation value of three independent variables (caste, type of family and reading habit) was found to be significantly correlated with the knowledge level of raising of seedling before viewing the multimedia. This shows that, before viewing the multimedia, the caste, the type of family and reading habits influenced the level of knowledge.

By contrast, none of the personal characteristics was found to be correlated with the level of knowledge of the respondents after viewing the multimedia. Even at the level of retention, i.e., 30 days after viewing the multimedia, there was no correlation with any of the personal characteristics. This implies that the multimedia viewing helps eliminating the impact of personal characteristics of the respondents on their level of knowledge.

This represents a great opportunity for using multimedia in the educational system so that the impact of barriers like caste, type of family and even reading habits can be reduced and the knowledge of the students can be escalated by using the multimedia.

Table 4: Relationship of independent variables with knowledge levels of respondents before and after viewing the multimedia and at the time of measuring retention

Serial No.	Independent variables	Correlation co-efficient (r)		
		Before viewing multimedia	After viewing multimedia	At the time of retention
1	Age	- 0.13292	- 0.11258	-0.10435
2.	Caste	0.27764 *	0.14822	0.12780
3.	Rural/Urban background	- 0.04873	- 0.09114	0.18178
4.	Percentage in Secondary School Certificate (SSC) examination	- 0.12298	0.02539	0.04551
5.	Studied agriculture subjects in secondary school	0.05283	0.05878	0.16136
6.	Type of family	0.24505 *	- 0.05201	-0.16364
7.	Participation in extra curricular activities	0.19956	0.00952	-0.00507
8.	Land holding of the family	- 0.00211	0.20289	0.03340
9.	Occupation of the father	- 0.14302	0.03901	-0.08431
10.	Farming experience	- 0.07212	0.07792	0.01138
11.	Growing paddy crops at home	0.01898	- 0.08909	-0.19848
12.	Educational status of the family	- 0.10188	0.01550	-0.05748
13.	Reading habits	0.31177 *	0.02644	-0.01062

* Significant at 0.05 level of probability

CONCLUSION

It can be reiterated that there was no respondent in the high scoring group before viewing the multimedia, while after viewing the multimedia there was not a single student having a low level of knowledge. A majority of students possessed a medium level of knowledge regarding the paddy crop with special reference to seedling raising. A majority of the respondents had a medium gain in knowledge by viewing the multimedia. Variables like caste, family type and reading habits were positively correlated with knowledge level before viewing the multimedia. By contrast, immediately after viewing the multimedia, as well as at the level of retention, i.e., 30 days after viewing the multimedia, not a single independent variable was found to be correlated with the knowledge level of the respondents. It could be concluded not only that the viewing of the multimedia has increased the level of knowledge of the students but also that it helps eliminating the impact of personal characteristics on knowledge gain, thus providing a common learning platform for all the students.

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ICT learning: Is it more valuable for the young? [1]

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ABSTRACT

The paper is based on ethnographic action research undertaken in a rural area of Tamil Nadu,
India. Small centres are set up in the houses of women in the villages, in order to create access
to ICTs (information and communication technology) for these rural women. While women have
learnt to use some of these modern ICTs and do make use of them, increasingly it is the young
boys and girls of the community who more often access the centres. The paper explores some of
the socio-cultural factors that may be leading to this subtle but definite change.

The paper is based on findings from ethnographic action research[2] done in community-based
initiatives aimed at reaching ICTs to the poor and marginalised. The research was conducted
from early 2003 to July 2005. It attempts to explore the question of why in some contexts children
and youth may be preferred over adult members by the community for learning ICTs.

Keywords: *India; ethnographic action research; women; poverty alleviation.*

BACKGROUND

The pilot initiatives that the paper deals with are supported by UNESCO and are located in Tamil
Nadu in south India. The centres were set up by TANUVAS, an agricultural and veterinary
sciences university and are presently being facilitated by Madras University. Tamil Nadu is the
southern-most and one of the largest and most populous states in India, on the shores of the Bay
of Bengal and the Indian Ocean. The language Tamil is widely spoken and is one of the 18 official
languages of the country.

The project is located in the districts of Chennai (urban), Kancheepuram (with semi-urban
characteristics) and Cuddalore (rural). The paper focuses on the findings from the Cuddalore
district. Yet, its arguments gain support also from the research findings at the centers in the two
other districts. The initiative seeks to reach the most marginalised sections and in the context of
Cuddalore district it is the poor, illiterate, low caste women[3] in the villages.

Cuddalore district is located around 200 kilometres away from Chennai city, the capital of Tamil
Nadu. It has got 6 *taluks* (sub-districts), and 16 town *panchayats* (bodies for local self-
government). It has a total population of approximately 2.28 millions, out of which the female
population is 1.13 million. The literacy rate of the district is 71.85%, close to that of the state at
73.47%. The female literacy rate is remarkably low at 60.86%, showing gender disparities in
access to educational opportunities. The main occupation of the people in this district is
agriculture. A private firm, EID Parry Ltd has a sugar mill in Nellikuppam, Cuddalore District and
has established Parry's Corner (telecentres) in 30 villages mainly for the use of cane growers and
for capacity building of the rural people.

Experiences from such interventions revealed that women's participation in telecentres is low.
One of the significant factors for this seemed to be their location in public spaces in a context
where there are mobility restrictions on women. There are relatively more men than women
present in public spaces. Thus, in this initiative the ICT centers draw upon the existing networks

of self-help groups (SHG)[4] to create access for women. Each center is located in a separate enclosed space in the residence of one of the SHG's members.

The Initiative

SHGs were identified through interactions with non-governmental NGOs, social workers, banks/insurance companies, and government agencies such as District Rural Development Agency and Tamilnadu Co-operative for the Development of Women. Selection was done of groups with relatively lower socio-economic status and which were more marginalised and on the basis of questionnaire-based interviews.

There are two centres in Cuddalore district. Each centre primarily consists of a computer with internet connectivity, printer and various relevant software and content CDs. Each centre has an animator-instructor who helps to encourage and facilitate women's participation. The instructor trains the people coming to the centre on computers and different software, is responsible for general upkeep of the equipments and also provides support to the community members who visit to use the facility for other purposes such as printing or making a phone call. Each of the centres was initially accessed by the 15 members of the particular self-help group with which it is associated. But gradually as the word spread, over 20 women (age range 23-45) who were not all members of that SHG visited the centre. The number of youth and children (age range 7-22) visiting in a day is higher, around 30 and is even higher than 50 occasionally. While some of them visit with a specific purpose - to attend classes, to type some document and so on - there are many who visit just to try working on the computer or for practice.

Research methodology

Ethnographic action research is employed in the project and aims to integrate qualitative research methods within project development. Action researchers are trained to use the normal repertoire of ethnographic research (interviews, participant observation, diaries, surveys) to understand the dynamic structures of both poverty and media use in their locality. Ethnographic research also ensures that any interpretation is done in the context of the given cultural context and there is an emphasis on the everyday lives of the people.

Researchers seek to understand how poverty is experienced and dealt with in the everyday by their target groups rather than to approach it through measurement or indicators. Understanding the 'communicative ecology' of the area helps to investigate the full range of means of communication that are employed and the local social networks through which information and communication flow. This gives them the detailed understanding necessary to see how ICT interventions fit into local poverty and communication networks, and how these interventions might be more effective.

The methodology used in this particular site is as follows. Initially a sample survey was done to gather background information for planning the intervention. Mapping of resources and communication networks was also done. Once the centre was set up, fieldnotes have become the main research tool. Apart from this, group discussions and interviews are held periodically to assess changes taking place as a result of the intervention and in order to gain better understanding of the context and people's lives in it. One of other significant tools that the intervention used is centre-based user feedback. Taken in a structured format, this really helped in understanding the users' perceptions of the centre and what they needed from it.

This paper explores an area that emerged from the research being undertaken at a site and to which the intervention has adapted itself. In order to comprehend the context better, the paper

begins with a discussion on some dimensions of poverty in this site before embarking on the main arguments.

POVERTY IN THE COMMUNITY

It would be stating the obvious to point out that poverty is experienced in complex and inter-related ways. That is, often poverty may deprive individuals in more than one ways that reinforce each other and intensify this condition.

Definition

Some women's voices[5]:

> Poverty is……….
> *Widowhood, illiteracy, hunger, unemployment, old age not knowing English, lack of relatives, lack of water, lack of rain, drunkard father*…. (Children's Day group discussion)
>
> *"Those who are living without three meals a day and don't have a house to live. Those who have too many children without having any property. But I am not living in extreme poverty because I am having three meals a day out of my hard work. But now I have the fear and feel insecure, how many days can I work like this? "* (In-depth interview)
>
> *"We think, if we have money we don't have any problem, but more than that living without freedom under a drunkard husband is poverty".* (In-depth interview)
>
> *"Limited opportunities for women to explore their talents is poverty".* (In-depth interview)
>
> *"Living without a husband in a young age and depending on sister and brothers for everything, denial of participating in public functions and any good event, always having fear in the mind how to talk, how to laugh… and not having courage to overcome all these can be called as poverty".* (In-depth interview)
>
> *"No choice to choose big items in life, like government job, expect agriculture work because of illiteracy and lack of wealth".* (In-depth interview)
> (Excerpts from fieldnotes and in-depth interviews)

A lack of resources to fulfil basic needs and also, other desires comes out of their narratives over and over again. The gender dimensions of their experience of poverty also repeatedly emerge as seen in the following sub-section as well.

Gender

Gender and the exploitation that may result out of being a woman often pervade these experiences.

> *I had been to Kancheepuram information centre. Mrs. Kanchana was taking care of the center. Electricity failure is the main problem. I have planned to go to Mrs. Anitha's house .Her husband also was there. She was engaged with cooking work. She told me, that she got some dress materials from friends and neighbours for stitching. I asked her husband about his Passport and Visa. He was trying to go to Malaysia for mechanic work. He said that he has spent Rs. 1000/-and gave 16 passport size photos with visa application. He complained that the officials repeatedly asked him to bring another set of photos. He has taken seven passport size photos for 4 times. He spent Rs.60/- on each and every time. He added that his friend who is having office at Malaysia is helping him to get the job for five*

years contract period. Mrs. Anitha was worrying about this. They are unable to pay children school fees. Her husband is also not getting regular job and the family income is not sufficient to run the family.

Mrs. Anitha told if her husband goes to Malaysia for job they can provide good education to their children. Mrs. Anitha told that her daughter is requesting her to teach computer. I asked her why she is not teaching her daughter on basics of computer. She is studying in first standard. If she does anything wrong, mishandle the computer or damage the computer unknowingly other members will scold us. So that I do not want to bring my children to the centre. I encouraged Mrs. Anitha to teaches her children to use the computer during her presence. She agreed to my suggestion.
(Action researcher's fieldnotes)

Allocation of Resources

The cultural context shapes what is considered a priority in terms of expenditure and may further push them deeper into the vortex of poverty:

- How much are you saving through sangam?
Rs.10/- per week
- Do you have any other saving habit other than sangam?
Yes I am saving Rs.150/- per month
- For what purpose you are saving that money?
Every month I am paying Rs.150 to a private person. He will give 4 grams gold coin and 35 grams silver and half KG sweet and crackers for Rs.200/- during Deepavali festival
A famous lighting festival celebrated in India during October or November. People use to take new dresses for their family members and enjoy with their friends and relatives with sweets and crackers. She told that the gold coin would be useful during her daughter marriage in future.
Members are not only interested on their children education and they are particular on their children future. Mrs Parameshwari told that she is not in a position to buy gold for a huge amount. So she is saving gold for her daughter marriage through the above said scheme. She is also saving money through sangam. She bought loan and gave it to her husband for business. He is repaying money to her.
(Excerpts from an in-depth interview)

Getting daughters married is considered a huge responsibility and dowry is a strong and even growing and increasingly commercialised practice as a number of studies and the media have reported (Epstein, 1963 and 1972, Sharma, 1984). Dowry is the expenditure on a daughter's wedding and includes all the gifts given by the girl's family to the groom and his relatives. Many narratives from the site point to the concern women have about the impending expenditure at the time of a daughter's marriage and the burden increases where there are more than one daughters.

Because they anticipate this huge expenditure they are often less willing to spend on any other aspect of their daughter's future. Thus, in this context and especially among the poor, women have few opportunities for education and to learn livelihood skills (Author, 2002). What often adds to these difficult life circumstances is that in many households in the area the men who are the sole earners prioritise their personal expenditure – whether smoking, liquor or any other and give a small share for fulfilling basic needs of the family members. This has been reported in other sociological literature such as Mencher (1988). The centres established in Tamil Nadu aimed at creating access for these dispriviledged women to ICTs.

RESULTS AND DISCUSSION: ICT LEARNING AND THE YOUNG

A number of women and other members of the community expressing a general curiosity initially visited the centres. Women from the selected SHG that was responsible to run the centre and some other women too in these early days came to the centre regularly and picked up some computing skills – MS Word and more often than not, Paintbrush were the applications that they learnt.

However, only a few moved beyond this level because another interesting change was happening at the time. Women started coming less frequently to the centre and even when they did, they stayed for shorter time periods. Instead children of these women and children from other poor and marginalised families in the village expressed interest in learning computers. This paper explores the process and the reasons for this change.

The research data reveals that there are three possible reasons for this change and these are discussed below.

Firstly, many women's views were as follows: After having learnt the basics of computing and sometimes often even before starting the process of learning, they say they cannot gain much from the exposure, as they are uneducated or illiterate. Having only limited literacy, the women considered that they would be unable to learn ICT skills or benefit from it.

> *- Why do you not feel confident to work on it?*
> *I have forgotten the little bit I learnt.*
> *Action researcher: Why didn't you continue learning?*
> *I am illiterate, what will I understand? This is meant for educated people. I don't feel confident to learn all this.*
> (Excerpts from an interview with a 45-year old woman SHG member)
>
> *"I have such low education, even if I learn this. It will not help me particularly." Says another 35-year-old woman.*
>
> *"My hands tremble when I touch the mouse, this is too overwhelming for me. It is good if the children can learn." Says a 37-year-old SHG member*
> (Action researcher's fieldnotes)

When asked about its usefulness one woman in her forties says, "my children and my sister's children are learning. That is good enough."

These different narratives point to not only the lack of education among many of these rural women but also poor self-confidence resulting out their lack of education as many of the women themselves state (Jeffery, 1989, Ganesh, 1993). Social norms emphasising women's inability to learn technical skills and earn an income from it creates further barriers. Services provided at the centres, such as typing or printing, are also viewed as being more useful for the youth.

Secondly, in this context of poverty, a sense of 'lack' is experienced – lack of resources, opportunities, means for livelihood - so they choose to prioritise children's needs over their own. Anthropological studies have reported that in the cultural ethos characterising Indian society and particularly among women this is often the case (Jain, 1975, Uberoi, 1993). There is an emphasis on creating opportunities for children and a strong concern about their future. And given limited resources, if someone's needs have to be prioritised it is often those of the men and children.

This was discussed earlier in the section on poverty. Women are preoccupied with fulfilling the expectations of their children and all the other members of the household often overlooking their own needs. And they are less willing to spend on a daughter than a son because even fulfilling the traditional expectation of dowry proves to be a burden. They are, thus, aware that they are unable to give their daughters any other opportunities. The ICT centre in the context may present that rare opportunity.

> *Visali is one of the SHG member who is living in Kancheepuram .She is keen on her children's education.*
> *- What do you think about your children education?*
> *I want to give good education to them*
> *- What is your wish regarding your children education?*
> *I have hope on them. They should get job out of their education.*
> *- What is your children's wish?*
> *They want to become teacher*
> *- Do you want to consult anybody for their education?*
> *I will consult my elder brother for my children education. Even though my husband is not giving money I will educate my children with my earnings.*
> *- Are they studying well?*
> *I am worrying about my children education. They are not reading well. My husband and myself used to help them in their studies.*
> *- Are they going to a special coaching class?*
> *My daughter is going to tuition*
> *- How much do you pay as a special coaching class fees?*
> *Rs. 40 /per month*
> (Excerpts from in-depth interview)

Kapadia (1996) and others note that the Brahmins who are traditionally considered as the upper caste have always sought high levels of education. Yet, there is an increasing emphasis on education even among the traditionally lower castes of Tamil Nadu in order to achieve upward social mobility and better living standards. Yet, the studies also note that often the many reinforcing structures of marginalisation do now allow the 'lower' castes to benefit much from new educational opportunities. For instance, they many not be able to afford the education or the associated costs or in cases where they do get educated in the absence of the right resources they may be unable to find jobs or start an enterprise of their own. Despite this the attraction for modern education and white-collar jobs is strong.

Slater and Tacchi (2004, p. 43) on analysing the research findings from the ICT initiatives in Tamil Nadu and other sites say, "ICTs are increasingly seen as an essential skill for employment, further education and everyday survival in the modern world. More negatively, these associations often mean that ICTs and centres are seen as largely for young people, as part of their education and general preparation for the modern world, and therefore as not being for those who are older and beyond education, or who have fallen more completely out of education." This need is further highlighted among the poor and marginalised groups.

Thirdly, in so far as women have gained from the exposure they felt this has even more potential for their children.

For the women who regularly attended the training and came to the centre there is notable positive impact from learning computers. The villagers, government officials, NGOs, bankers and the other SHGs identify the selected SHGs as "Computer Group". This has contributed positively to the responses towards them - such as requests for loans and has contributed to their increasing self-esteem. These SHG members have started participating in the Block level (an unit

in the Indian administrative set-up) coordination committee meeting which helps them to voice their views on many development issues of the area.

Figure 1: *Young children at one of the centres expressing their amazement at the computer by worshipping it with folded hands*

Some of the women have compiled and documented their SHG savings and loan details in MS Excel. They also manage to organise their own finances better through this. The SHGs have tied up with NGOs and technical training institutes to further the opportunities for gaining livelihood skills and income for themselves

Efforts to benefit the women and make the facilities more useful to them are constantly being made as given below.

> *We started our training programme on screen-printing at 11.30 A.M. I introduced Mr.Gunnasekar the trainer and the participants introduced themselves. It is a four-day training programme. It was a new experience for the women. The method of teaching was informal. He explained each and everything. Women were very sharp to clarify their doubts on the last day. The trained members printed visiting cards, New year cards, Marriage cards, etc themselves.* (Action researcher's fieldnotes)

But even in these programmes relatively younger women participated and expressed their views thus:

> *Raji:*
> *Raji is 17 years old. She finished diploma in typing and Short hand stenography. Her mother is a member of the SHG. She is a widow. Raji is the eldest member in the family. Her mother has educated her with great difficulties. She has undergone training. I asked her to write about the training. She wrote:*

"First I like to thank my mother who always think about my career improvement. Next Mrs. Vijaya who is leading our SHG. Whenever I see some greetings, marriage cards I used get amazed to see the design. I used to think, how beautiful these cards are! But I never think, "Why can't I do that? I felt that it is all machine and need more education and big printing machine. I scared to come for the training because I thought it will be very difficult. Really I am lucky to learn screen-printing. My mother gave up her opportunity and asked me to attend the training. It gives me hope that I too can do some work. I have benefited through sangam. I touched the computer and learned to type. I typed a book.
I got Rs. 250/- from the centre. With this I have started my studies - Going to the typing class – higher – typing. If I do screen printing along with others I can earn money as well as I can do my studies. I like to thank Mr. Gunasekaran, who has taught us many things. I like to learn DTP – to improve techniques Screen-printing."

Vijaya:
She is the leader of the Kandrakottai Malar SHG. She is a young widow. Her husband died two years ago. She has one daughter, studying 5th Std. She is living with her sister. She only asked me to arrange for screen-printing training. She has taken all the effort to bring the women for training. She writes about the training programme:

"I like to thank Dr. Sheriff and the TANUVAS and the UNESCO for this great opportunity to learn screen printing. Whenever I see visiting card and marriage card I always think when I am going to learn this printing skill? I thought It will involve more money and it is beyond our capacity. When I attended special training for SHG leaders they talked about Screen printing. I have picked up the word screen printing there. Other than that I didn't know anything else.

When madam said about screen printing I was very happy. We can use the computer and the internet for our work. Now I should learn the search engine to trace some figures for screen printing. After learning screen printing technique I am not able to believe myself that even I too can print greetings cards. I have distributed the cards which we have printed during the training period to our neighbours. One old woman asked me, "can women do all this?" even she added that world has changed much and women are also learning the work carried out by men. Those days men only do all this work. But don't give up this work. Do it. It will be a good lesson for the future generation."

Vijayalakshimi:
"I am a young girl. I am happy that I have learnt this skill before my marriage. I can earn money by residing at home. I should learn some business skills to improve my earning capacity. I have visited the Olympic Centre and Pantruti and enquired about the card. I found that card is costly there. I should do the enquiry in Villupuram and Cuddalore. If the course is for a week we will be more confident to do this.

I have learnt one skill now. With minimum capital we can start this work. Mr.Gunasekar personal experience and his sharing about this business helped me to plan for my business. I thank everybody who offered this chance to us."
(Notes from feedback, action researcher)

These examples bring out the fact that many of the older women want to give these limited opportunities to their daughters. This is despite the fact the emphasis on getting the daughter married at a young age and giving/taking dowry continues. Dube (1986) and Hooja (1969) discuss the strengthening trend of this practice. As the practice is considered traditional few families may make an explicit mention of giving/taking dowry but dowry continues to get stronger and commercialised making it an even bigger burden than before on girl's parents. While they

want to secure their son's future, the same is true for their daughter's future. And interventions such as this help in creating opportunities for the girls. Since ICT training in these centres is free and/or subsidised, parents consider sending their girls for it.

As one woman argues,

> *"I know how it is to be dependent for my and my children's survival on a man who could not care less about these things. I do not want my daughter's life to be at the mercy of some man. I have learnt a lesson from my experiences. I want my son to get opportunities but even more my daughter."*
>
> (Action researcher's fieldnotes)

CONCLUSIONS

Research findings from the two centres clearly bring out that the centres are mainly accessed by children and the young presently – to learn computers, attend the structured training programmes or for services such as photocopying and printing. While the initial plan for the initiative aimed to reach even older women in the area, gradually as discussed above there is a shift. Some of the possible reasons for more youth accessing the centre were discussed in the paper.

Given the particular cultural context and the limited opportunities resulting from poverty, women desire to use this rare and limited resource for the benefit of their children. In their perception, what is useful for the children may ultimately benefit the women. Because it is in their children that they see their futures secure. But this also raises some vexing questions – this trend may reinforce many existing inequalities and norms tied to these. This is because many of the women who have had no access to ICTs before continue to keep away from the centres. On the other hand, as Caplan (1985) has noted and has been evidenced through the ethnographic action research undertaken at other sites in this network (Author 2003), opening up avenues for the daughters may gradually introduce changes in the gender status quo in the future generations. Thus, by making such a choice these women may be positively contributing to gender equality.

It is the desire among the older people, especially women, to build the capacities of their daughters to be independent which the intervention has begun to focus on. While the target initially was older women, from the understanding gained from the research project teams consider it valuable even if the younger women and girls, along with some boys, get the opportunity to learn ICT skills at no costs. The direction in which the intervention will move towards is to give the younger women and girls more opportunities for learning livelihood skills along with ICT-related skills and through ICTs build their capacities to earn a livelihood and overcome their poverty.

It would also be useful to further probe some of the findings that have emerged from the data here. Three areas are suggested for further study. Firstly, in ICT interventions that set out to target one or more groups it is important to understand whether and why such a focussed approach may or may not work in the local context. Secondly, since the ethnographic action research provides understanding in order to make the interventions more responsive, innovative strategies can be devised to reach out more effectively to the older women. And whether these strategies have an impact can be studied. Finally, in ICT interventions, the content is equally, if not more important, than the tools used for the communication. It is critical to know if more relevant and useful content can bring in those groups in a community who may continue to stay away from the centres otherwise because of either cultural norms or economic reasons such as the women discussed in this paper.

Endnotes

[1] The article is based on findings from research undertaken in a network of ICT initiatives with support from UNESCO. The author is responsible for the choice and the presentation of the facts contained in the article and for the opinions expressed therein, which are not necessarily those of UNESCO and do not commit the Organisation.

[2] For more details refer to:
Tacchi, J, Slater, D, & Hearn, G. (2003), *Ethnographic Action Research: A User's Handbook,* UNESCO, New Delhi. http://unescodelhi.nic.in/publications/ear.pdf

[3] Tamil Nadu, like most other states of India, has not only had a history of caste hierarchy and discrimination but also caste-based politics and as Beteille (1969) points out the castes ranked as low traditionally have struggled to end their marginalisation though with mixed results.

[4] SHG is a small, economically homogenous, group of women voluntarily formed for small savings and credit to group members based on the decisions taken by the group itself. The group interactions and process also allows for greater participation by these women in their own development primarily through increasing awareness and promoting self-expression.

[5] All pieces of raw data, quotes from the field etc are italicised in the paper. These have not been edited and appear as they were recorded in the field. All names have been changed to protect the individual's identity.

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Investigating ethical crimes

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ABSTRACT

To improve final year information technology (IT) undergraduate students' ability to analyse ethical issues, we devised a five-step procedure, based on a standard investigative procedure used at crime scenes. The appeal to our students lies in associating the investigation of an ethical issue with the investigation of a crime, as portrayed in popular television crime shows that add modern forensic science to traditional 'whodunnit' mysteries.

We evaluated the success of our ethical 'crime' investigation procedure by comparison with previous student cohorts given the same issues to analyse. To leverage the strengths of our new approach, we scripted an ethical crime scenario for video production. The video depicts events surrounding a petty theft in a busy open plan office. Students investigate first the crime, then the underlying ethical issues.

To help online students learn to investigate ethical issues, we used our previously reported object oriented learning methodology (OOL) to design a class of learning objects, or learning object class (LOC). Class Investigator uses our ethical crime investigation procedure and example video. This LOC facilitates dynamic instantiation of an individualised learning object (LO) for, or by, a student during a lesson. This enables a LO lesson to be not only more highly interactive but also far less predetermined in its sequence of activities for each student.

Keywords: Computer ethics; learning object; object-oriented; online; software engineering.

1   INTRODUCTION

Computer ethics is an integral part of the computing curricula formulated by the joint task force (ACM, AIS, IEEE-CS (Association for Computing, 2005) for tertiary degree students in computer science (CS), computer engineering (CE), software engineering (SE) and information systems (IS). However, during 10 years' experience teaching computer ethics, we concluded that many information technology (IT) students (CS, CE, SE and IS) have difficulty applying a standard procedure (Morris, Zuluaga, R., Zuluaga.C., 2004) for systematically analysing a (computer) ethical issue.

Fortunately, one addition that benefits students learning the finer points of computer ethics is analogical thinking (Johnson, 2001). For example, the cyberspace ethics methodology (Morris, 1999) proposes a step-by-step procedure for analysing a cyberspace ethical issue *by analogy* with an issue in 'real' space. As this methodology had some success engaging IT students in cyberspace ethical issues (e.g., virtual rape), we report here on our continuation of this analogical approach as follows.

We developed a procedure for analysing ethical issues that is based on a standard investigative procedure used at crime scenes. The appeal to our students lies in associating the investigation of an ethical issue with the investigation of a crime, as portrayed in popular television crime shows that add modern forensic science to traditional 'whodunnit' mysteries.

Section 2 describes the difficulties our students formerly exhibited when analysing an ethical issue. Section 3 explains our ethical 'crime' investigation procedure and reports a preliminary evaluation of its benefits. Section 4 outlines a video we produced to illustrate a crime with underlying ethical issues. We show how students are first asked to investigate the crime, then encouraged to investigate similarly one or more underlying ethical issues.

Our video is useful not only in a face-to-face class; it can also be embedded in a learning object (LO) for delivery online or via CD-ROM or television broadcast. These media will be utilised when the course is delivered 75% online in Africa and 50% online in Vietnam, Singapore and Malaysia. Section 5 outlines the design of our ethical crime LO.

2   IT STUDENT DIFFICULTIES WITH ETHICAL ISSUES

2.1   IT student profile

Our computer ethics course is taken mostly by final year IT students (CS and SE included). These students are highly IT literate. At the start of the course, they are well aware of what IT can do, but the majority is not familiar with ethical issues raised by IT. Initial feedback indicates these students are *blasé* or *naïve* about the 'dark side of the IT force'. We observe that they focus on technical issues and largely ignore ethical and even legal aspects.

Almost all our students acknowledge that IT users in general are vulnerable to the 'dark side' of IT. However, the prevailing attitude among our students at the start of the course is that users need to become better informed, rather than that IT professionals need to do more to safeguard public interests. We challenged this perception with some success during the professional ethics component of the course.

A minority of our students are knowledgeable about hackers, viruses, spyware, etc – but still mostly the technical aspects. Our impression is that these students think that they know enough to defend themselves against such attacks, so they did not need to delve further.

Few of our students feel disposed to explore IT ethical issues *per se* until they become aware of deeper aspects, which they were ill prepared to deal with, e.g., information privacy requirements in a network they might design, implement or administer. Our first job is to inform these budding professionals of their legal obligations and the underlying ethical considerations.

Once our students started showing enthusiasm to tackle IT ethical issues, it became clear that a significant cohort was not well prepared in terms of their educational backgrounds. Many of our students have a non- English speaking background (NESB). This can be a disadvantage when discussing or analysing ethical issues that generally involve complex vocabulary and grammar. Any legalities (or 'legalese') compound this disadvantage. And the average NESB student does not easily discern any use of subtlety or nuance in the English language.

An even larger deficit for most of our students is the lack of educational background in arts/humanities, e.g., literature, philosophy or history. Instead our students' extensive backgrounds in mathematics, sciences and engineering lead them to expect an ethical issue to be 'black and white' with a single solution.

In our experience the best way to assist our students to explore IT ethical issues is to provide structured problems, systematic procedures and analytic techniques wherever possible.

2.2 Basic procedure for analysing ethical issues

During the early years of our course, for the ethics component we asked our students to use the following procedure to analyse three IT ethical issues, each encapsulated in one of Johnson's scenarios (Johnson, 2001). This analysis procedure is loosely based on that of Kalliman and Grillo (1996), but we do not introduce the application of ethical theory until later in the course when we re-analyse the scenarios in greater depth.

For each ethical problem scenario, the initial analysis procedure is:

1. Identify the players in the scenario and their interests; i.e., identify the parties and specify the facts.

2. Explain the ethical problem faced by the players; i.e., define the moral dilemma.

3. List alternative solutions to the defined problem; i.e., formulate the options.

4. Clarify the principles at stake and their implications; i.e., highlight the values and their outcomes for the parties.

5. State your solution to the ethical problem; i.e., prioritise the values and outcomes, then select the most appropriate option. Also give a short rationale for your solution.

Although each scenario is necessarily artificial, and its ethical issue or problem is far simpler to analyse than a real one, many of our students found each step increasingly difficult.

In step 1, some students included every named person as a player. This was rarely wrong in these simple scenarios because each person is intended to be instrumental to the ethical issue. But few students distinguished main players. We observed that students did not realise in a real ethical issue that not every person is a main player or a player at all.

In step 2, quite a few students seemed to assume that all players had their own personal ethical issue, or at least their own perspective on it. So the issue was explained from the standpoint of a specific player. Or the issue was explained in terms of one player versus another player. It was apparently far harder for students to find the issue faced by all the players, and phrase it independently of the actual players, e.g., as "Is it right or wrong to …?" or "Is … good or bad?"

In step 3, many students struggled to find more than one or two solutions to each ethical problem. It was evident these students pre-judged to the extent that they could identify only solutions acceptable to them. It was as if they had (horse) blinkers on, blinding them to other alternatives. Students had to be reminded to put aside their prejudices (until step 5) and to consider any half reasonable solution. When presented with a solution they had not thought of, many students seemed genuinely surprised it was worth considering. The point had to be made that the 'worth' of each solution is evaluated only in steps 4 and 5, not before.

In step 4, most students were initially perplexed. This was to be expected until students were introduced later in the course to some ethical theories, and their basis in one or more intrinsic (rather than instrumental) values. Nevertheless, it seemed hard for students to recognise that if a solution embodied telling the truth, for example, then the underlying value (or outcome) of that solution is honesty.

In step 5, most students had little trouble selecting their preferred solution. It was generally the first solution they thought of (indicating their personal bias). However, it was hard for many students to prioritise the solutions, based on their ranking of the underlying values. Knowledge of ethical theories later in the course allowed students to improve steps 4 and 5 immensely.

3   CRIME AND ETHICS INVESTIGATION

Observing the difficulties faced by our students when analysing an ethical issue (section 2.2), we looked for ways to help their strengths overcome these weaknesses. Most of our students are strong in mathematics and sciences. They are inclined to investigate technical issues in a systematic way. Crimes are investigated scientifically these days, and most of our students are familiar with 'whodunnit' novels, police shows, detective stories, thrillers and mystery books. Anecdotal evidence suggests the recent spate of forensic crime investigation television shows (CSI, Cold Case, Without a Trace, Law and Order: Special Victims Unit) appeal to a large majority of our multicultural students.

We decided to introduce our students to a standard investigative procedure used by policing authorities to solve crimes in general (section 3.1). Then, arguing by analogy, we adapt the crime investigation procedure to investigate ethical 'crimes' (issues). Our ethical crime investigation procedure is detailed in section 3.2. We evaluate its success in section 3.3 and in section 3.4 we address perceived limitations in the analogy.

3.1   Crime investigation procedure

The following investigative procedure extends a standard five-step procedure used by policing authorities to reconstruct crime scenes (Baldwin, 2000): interview, examine, photograph, sketch and process. These steps are compressed into steps 1 to 3 below. Our step 3 extends the 'process' step to begin theorising as to what transpired and who is responsible (O'Connor, 2004). Our five steps are also an abstraction of the comprehensive procedure in the United States Department of Justice (2000) guide, Crime Scene Investigation.

1.   Recognise a crime may have occurred in a given situation

   - Secure the crime scene

   - Collect evidence

2.   Identify the victim(s), suspects, witnesses and bystanders

   - Collect statements

   - Locate any party who departed the scene

3.   Explain the facts of what happened

4.   Formulate alternative hypotheses (theories)

   - Include motive and means for each possible perpetrator

5.   Eliminate suspects and hypotheses

   - Charge most likely perpetrator(s)

We ask our students to apply the above procedure, actively or passively, while watching their favourite television crime show. The intention is to convince them that the procedure works, not only in television crime scripts but also for real criminal investigations.

Interestingly few students ask how to carry out the above steps. Apparently familiarity with crime fiction provides the relevant investigative skills! We seek to transfer this know-how to the investigation of ethical 'crimes'.

3.2   Ethical crime investigation procedure

We propose the following analogous investigative procedure to analyse an ethical issue:

1.   Recognise an ethical issue may exist in a given situation

- Quarantine the situation while under investigation

- Collect evidence, e.g., disputed normative claims

2.   Identify the participants, stakeholders and victims; i.e., identify the players or parties

- Collect statements, documents, facts

- Notify any relevant external parties

3.   Explain the ethical problem faced by the players; i.e., define the moral dilemma

4.   Formulate alternative solutions to the ethical problem; i.e., list the options

- Clarify the principles, values and outcomes underlying each solution

5.   Prioritise the alternative solutions in terms of their values and outcomes; i.e., state your preferred solution to the ethical problem

- Give a short rationale for your decision

- Generalise where possible

We set our students an assignment to apply the above procedure to analyse three IT ethical issues, each encapsulated in one of Johnson's scenarios (Johnson, 2001).

3.3   Evaluating our ethical crime investigation procedure

In section 2.2 we reported the difficulties our students formerly encountered when using a basic procedure for analysing an ethical issue. We now ask students to use the refined procedure in section 3.2 – our ethical crime investigation procedure. We discuss the results of a preliminary summative evaluation below.

We compared the results for two student cohorts on the same assignment, which analyses three IT ethical issues (see section 2.2). The 2003 cohort was the last to use the basic procedure described in section 2.2. The 2004 cohort was the first to use our ethical crime investigation procedure, as described in section 3.2. Apart from the change of investigation procedure, no other variable was intentionally altered between the two cohorts; i.e., assignment specification, duration, marking scheme and percentage contribution to total grade remained the same.

Each cohort contained over 300 students. The average grade gained by the 2004 cohort was 12% higher than the 2003 cohort. The 2004 cohort showed no similar improvement in other assessable components of the course. We tentatively conclude that our ethical crime investigation procedure is beneficial. However, confirmation will require further evaluation. After interviewing a random sample of twenty 2004 students, we attribute the improvement to students adopting a crime solving mind-set that emphasises an open-minded attitude while using scientific rigour to mount and test hypotheses.

On average the 2004 cohort differentiated the players in step 2 better than the 2003 cohort did in their equivalent step 1. The facts collected in 2004 were also more complete, and included fewer irrelevancies than in 2003. Overall we felt the 2004 cohort was more clinically accurate. This was also evident in step 3, where the ethical issue was expressed more concisely and exactly. By

comparison, the 2003 cohort had difficulty isolating the main issue (in their step 2) from the various players' perspectives on it. The 2004 cohort certainly formulated alternative solutions to the ethical issue more comprehensively.

Admittedly both cohorts still have difficulty clarifying the principle or value underlying each solution, and hence prioritising the alternatives. This requires at least the following skills, which are introduced later in our course:

1.   Ability to conduct a dialectic

2.   Ability to discriminate between descriptive and normative claims

3.   Ability to discriminate between instrumental and intrinsic values underlying normative claims and

4.   Ability to incorporate one or more ethical theories.

Revisiting the same assignment, the students are asked to use the above skills to expand each of the five steps in our ethical crime investigation procedure, but this is beyond the scope of this paper.

3.4   Limitations of our ethical crime investigation procedure

We tell students there are limitations in the analogy between the investigation of crimes and ethical issues. The former is more concerned with descriptive claims (supported by evidence) and instrumental values (e.g., money). The latter is more concerned with normative claims (prescribing how people ought to act) and intrinsic values. Nevertheless we argue that normative claims are like the clues at a crime scene. Both can be found and analysed with a similar procedure (sections 3.1 and 3.2).

We tell students relatively little about how to carry out the steps in our ethical crime investigation procedure, relying on their knowledge of crime investigation procedure as a guide. We claim that answering how to recognise an ethical issue is similar to recognising a crime has occurred (step 1 in the analogous procedures). When neither the issue nor the crime is obvious, recognition comes from keen observation that detects some detail out of place, e.g., contradictory prescriptive statements.

It can be argued that crime investigation must be without fear or favour, whereas the investigation of an ethical issue must take the interests of stakeholders into account. We maintain that the respective stakes should be examined similarly to the motives and means of the suspects in a crime investigation. The cases made for and against should determine the outcome of an investigation, not the influence of any particular stakeholder or suspect.

We assert that the perceived limitations listed above in our analogy between the investigation of crimes and ethical issues are in fact strengths rather than weaknesses.

4   AN EXAMPLE OF CRIME AND ETHICS INVESTIGATION

As an exercise for students in applying our ethical crime investigation procedure (section 3.2), we scripted a scenario for video production (Zuluaga & McKay, 2004). The video depicts events surrounding a petty theft in a busy open plan office. We first investigate the crime (section 4.1) and then we similarly investigate underlying ethical issues (section 4.2). This video was not available during the evaluation of our ethical crime investigation procedure reported in section 3.3.

4.1 Crime investigation scenario

The video shows an employee, Sophie, at her office workstation starting her personal banking online, but she is called away. As the camera follows Sophie, the audience sees her colleagues, Holly, Sam and then Bill walk near her desk. Sophie returns to find $1,000 suddenly missing from her bank account.

The narrator then relates that Sophie reports the theft to her manager and describes what she saw. Holly, Sam and Bill immediately become suspects. Sophie's manager begins a preliminary investigation. Sophie's bank is asked to trace the transaction in question. Apparently Sophie's $1,000 was transferred to another account at the same bank, and has since been withdrawn, probably by an accomplice. This account is clearly under a false name and identity.

At intermission 1, the students are asked to start applying the crime investigation procedure in section 3.1, specifically steps 1, 2 and 3. The video resumes with Sophie's manager interviewing the suspects. The picture has four frames – one for each suspect and one for the manager who interviews them separately. As the narrator relates the interview with each suspect, the audience see that person's frame become active.

> Sam says he was having a conversation with Holly. He claims he never saw Sophie leave her workstation and was not aware of anyone approaching it. After the conversation with Holly, he returned to his own workstation. He thinks Holly went back to hers but can't be absolutely sure. He has no idea when Sophie arrived back in the office, as he claims he never knew that she had left it in the first place.
>
> Holly says she was talking to Sam. Like Sam, she claims she never saw Sophie leave her workstation or return to it. She did, however, notice Bill leaning over Sophie's desk.
> Bill says he didn't see Sophie leave the room but did see Holly and Sam talking near Sophie's desk. He admits to looking around Sophie's workstation for a yellow sticker pad so he could note down a reminder to phone his wife. He produces the yellow sticker with his wife's number on it.

At intermission 2, the students complete step 4 of the crime investigation procedure and they are asked what they need in order to complete step 5. The video resumes with Sophie's manager making telephone calls to check up on each suspect. As the narrator relates what the manager learns about each suspect, that person's portrait appears on screen.

> The audience learns that Holly was questioned about a previous theft two years before but no charges were laid, that Sam was a chronic latecomer to work and considered unreliable by a previous employer and that Bill was passed over for promotion three months ago and is known to be a heavy gambler.

Finally the students are asked to complete step 5 of the crime investigation procedure. All three suspects have circumstantial evidence against them, but a more thorough investigation will be needed if any incriminating proof is to be unearthed. Sophie's manager has to decide whether to call the police to conduct an official investigation, as there are reputations and jobs at stake, not to mention office morale.

4.2 Ethical crime investigation scenario

Next we ask the students if they recognise any ethical issues in the theft scenario and its investigation. To help them adapt to this new perspective, the three-part video is shown again. After each part, we prompt the students with questions such as the following.

Video 1 ethical issues:
Should Sophie do her personal banking online while at work? How responsible is Sophie for the ensuing theft? Is leaving her online banking account open like leaving her purse on the desk while she goes away? Or is her online account effectively pickpocketed while her attention is elsewhere? Does Sophie's degree of blame affect whether the theft should be investigated? Should Sophie's employer offer to repay her and let the matter drop? Or should the theft be investigated no matter what?

Video 2 ethical issues:
If investigation is warranted, who should conduct it – Sophie's manager, Sophie's bank or the police? Should Sophie's manager have authority to interrogate employees as witnesses and possible suspects? Or should Sophie's bank lead the investigation? If so, should the bank divulge what it finds out to Sophie's employer or only to Sophie? Or should the bank forward the result of their investigation only to the police and request them to investigate further? Should Sophie cooperate with the initial investigation by her manager (involving the bank) or should she simply report the theft to the police and expect them to conduct any further investigation?

Video 3 ethical issues:
Should Sophie's manager have authority to access employee records to check up on the suspects? Should any unearthed private information in employee records be divulged to Sophie, Sophie's bank or the police? Should Sophie, Sophie's employer, the bank or the police use any of the circumstantial evidence about the suspects against them?

In summary, we intend students to recognise at least the following ethical issue in each successive part of the video:

1. Has a crime been committed that is worth investigating?

2. Who should conduct any investigation(s)?

3. Should private information in employee records be used as circumstantial evidence?

Our students are asked to focus on one of these ethical issues and apply our ethical crime investigation procedure (section 3.2). So far only anecdotal evidence is available to suggest the video assists students to analyse better an ethical issue. At the very least, the video seems appreciated for the extra practice it provides.

5   AN ETHICAL CRIME LEARNING OBJECT

We outline below our use of the object oriented learning methodology (OOL) (Morris, 2005) to design a class of LOs or learning object class (LOC). The resulting LOC, Investigator, and its 'children' are intended to help online students learn to investigate ethical issues, using our ethical crime investigation procedure (section 3.2) and example video (section 4).

Section 5.1 briefly explains the OOL methodology and how it benefits the design of LOCs. Section 5.2 explains how a student can interact with LOs that are dynamically created instances of class Investigator's children. Section 5.3 explains the reusability of class Investigator and its children in future lessons.

5.1   Object oriented learning methodology

OOL applies object oriented software engineering (Pleeger, 2001) to the design of LOs. A prospective LO's attributes and activities are first 'abstracted' into a LOC. Figure 1 below depicts class Investigator's attributes (e.g., problem, players) and activities (e.g., recognise, identify).

```
 Investigator
─────────────────
 problem
 players
 facts
 hypthotheses
─────────────────
 recognise ( )
 identify ( )
 explain ( )
 formulate ( )
 select ( )
```
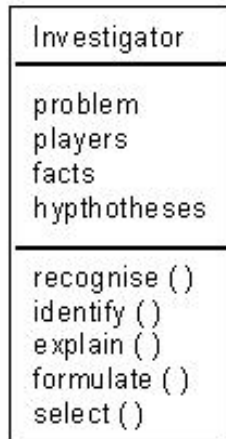
Figure 1: *Class Investigator*

Class Investigator recognises a problem to be investigated, identifies the involved players, explains the relevant facts, formulates at least two hypotheses and finally selects the best solution. Class Investigator is an abstract LOC that can be extended into other more concrete and useful LOCs as follows.

In Figure 2 below, we extend class Investigator into classes Crime Investigator and Ethic Investigator. Figure 2 uses the Unified Modelling Language (UML), a standard for diagrammatically depicting relationships between classes (Priestley, 1996).

Both 'child' classes inherit attributes and activities from their parent. These can be overridden (via polymorphism), specialised and aliased in the respective child classes. OOL facilitates the design of a hierarchy of LOCs. OOL thereby enhances the reusability of a LOC in future lessons.

Furthermore, OOL facilitates dynamic creation (instantiation) of an individualised LO for, or by, a student during an online lesson (see below).
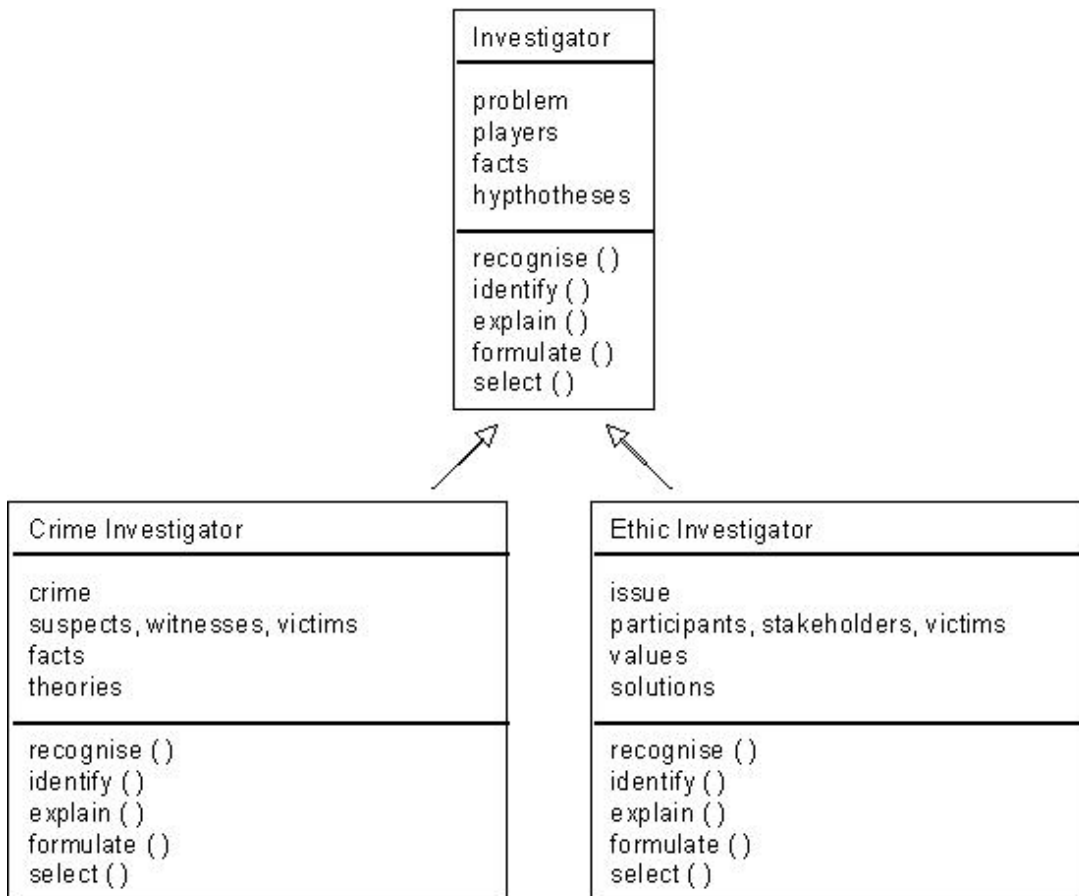
Figure 2: *Class Investigator and its 'child' classes*

5.2   Class Investigator online lessons

When class Crime Investigator is instantiated, the student can interact with video 1, 2 and 3, with guidance from the narrator's voice in between (section 4.2). The activities explain and illustrate the five steps in the crime investigation procedure (section 3.1).

When class Ethic Investigator is instantiated, the student can interact with video 1, etc. to solve an ethical issue nominated from the three listed in section 4.2. The student can instantiate a separate Ethic Investigator LO for each of the other issues. The student can interactively contribute to each step and check against prepared answers (partial or complete).

Teachers can reuse both these classes by 'plugging in' new crimes and ethical issues, as explained in section 5.3. Each LOC can be integrated into a new lesson by meeting the specifications of a Java-like interface type that defines the 'look and feel' of the new lesson (Morris, 2005).

5.3   Class Investigator reusability

In a software system, coupling measures how cleanly class objects are partitioned. Cohesion measures how closely activities in an object are related. Coupling and cohesion are interdependent measures – the less cohesive an object, the more likely it is coupled with other

objects. The more coupled an object is with other objects, the harder it is to alter or upgrade the class object in isolation, which lowers maintainability. A strongly coupled class object is less reusable without significant maintenance (Morris, 2005).

Class Investigator is sequentially cohesive (Yourdon & Constantine, 1978) because the output of each activity is input to the next activity: identifying the relevant players requires recognition of the problem; explaining the facts requires identification of all players; formulating plausible hypotheses requires all the facts; selecting a solution requires alternative hypotheses. Sequential cohesion is the second highest level and significantly strengthens reusability. The children of class Investigator inherit this strength.

6   CONCLUSION

This work provides a student centred platform for teaching and learning the investigation of ethical issues, both online and face-to-face. Our adaptation of a standard crime investigation procedure to the analysis of ethical 'crimes' appeals to students familiar with the current television crime investigation genre. And students less exposed to television, e.g., in remote regions, are often still familiar with 'whodunnit' novels, detective stories, crime thrillers and mystery books.

Evaluation of students using our ethical crime investigation procedure shows a 12% improvement in their grades (see section 3.3), which we attribute to a better appreciation of the need for rigour when analysing an ethical issue.

Our development of a video, which encourages students to investigate a petty crime and its underlying ethical issues, emphasises similarities in the respective investigations. The video can also be embedded in a LO for delivery online or via CD-ROM or television broadcast. These media will be utilised when the course is delivered 75% online in Africa and 50% online in Vietnam, Singapore and Malaysia.

To assist further online students learning to investigate ethical issues, we used the OOL methodology to design a class of LOs (see section 5). Class Investigator uses our ethical crime investigation procedure and example video. It facilitates extension by local staff and its offspring are reusable. Each 'child' facilitates dynamic instantiation of an individualised LO for, or by, a student during a lesson. This enables an online lesson to be not only more highly interactive but also far less predetermined in its sequence of activities for each student.
Thus we leverage information communication technologies to distribute our ethical crime investigation procedure, to students in both developing and developed countries. Local staff with limited experience should be able to facilitate student use of our relatively self-contained resources, as they encourage student self-directed learning. And staff with experience of the resources should be able to customise them.

We believe that further exploration into similarities between the investigation of crimes and ethical issues can lead to more precise techniques to investigate ethical issues. Also deserving further research are the theoretical, pedagogical and philosophical underpinnings of our overall approach. Finally, we intend to exploit the modularity and reusability of class Investigator by developing another example video, hopefully on a larger scale, to demonstrate that our overall approach is scalable to real world ethical issues.

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eNRICH: Archiving and accessing local information[1]

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ABSTRACT

This article is based on ethnographic action research undertaken in a site in urban north India using information and communication technologies (ICTs) towards development of the local community. It discusses the usage of eNRICH[2], a web based browser. It includes experiences about how the software can be used in the given field situation and the challenges towards the consistent functionality of such software in an ICT initiative meant to reach the poor and the marginalised. Since the software facilitates recording and archiving of content, the article also briefly touches upon issues of local content development, the cornerstone of ICTs for development.

Keywords: *India; marginalised groups; ethnography; local communication; poverty alleviation.*

INTRODUCTION

Background

ICTs do present incomparable opportunities for human development and empowerment in areas ranging from education to healthcare and livelihoods to business; they may also reinforce many of the existing social and economic disparities (Byron and Gagliardi 1998). As Slater and Tacchi (2003) find poverty is a significant factor in limiting access to ICTs and the information that can be gained through these technologies.

> *"The evidence suggests ICT has exacerbated existing inequalities, added Fullan. Among factors that adversely affect ICT's potential to address poverty are widespread adult illiteracy, affordability of the solutions, and the fact that most content is of questionable local relevance," states Ryan (2003, p.1).*

ICTs may also further strengthen gender inequalities across varied social and income groups. Throughout the world, women face serious challenges that are economic, social as well as cultural that limit or prevent their access to ICTs and thereby to a host of other opportunities (Burka 2001, Gruber 2001). Lack of access and control over ICTs further reinforces other gender inequalities whether economic (for instance, the ability to earn), political (for instance, participation in key political processes) or cultural (for instance, changing existing social hierarchies). Women's marginalisation from ICTs may also mean that they will benefit less from the educational and employment opportunities that will become available through ICTs. Also, as wealth, power and ultimately, the freedom of individuals derive from information where the latter is absent there is little possibility of the former. Achieving gender quality is also key to sustainable development (www.millenniumcampaign.org, 2004). Thus, the disparities in access to ICTs and their possible impact need to be understood and tackled.

Specially designed interventions responsive to the needs of these marginalised groups can help overcome some of these barriers (Prahalad and Hammond 2001). Thus, many community based ICT initiatives have emerged across the developing countries. Through consistent effort they have also been able to create access to ICTs for the marginalised groups (Subramanian 2003).

Yet, community based ICT initiatives have repeatedly encountered a couple of challenges. Firstly, while ICT skills are valued by the community; collecting and developing information that is locally needed and relevant has often been a major challenge for these initiatives. And while some local information is collected, it may not be compiled and shared in a systematic manner. Another major challenge is internet connectivity. In the absence of reliable connectivity, it is important that centres are able to make available a large body of reliable information offline. In response to such experiences, the eNRICH software was developed in partnership between UNESCO and National Informatics Centre.

The project in brief

In a socio-economic context of low incomes, poor education and almost absent civic amenities at Seelampur-Zaffrabad in Delhi, work was initiated in late 2002 to use information and communication technologies (ICTs) towards poverty reduction and better life opportunities. Since opportunities for women were even fewer than for men and there were evident gender disparities, the initiative focused on women in this area. Towards this end, an ICT centre was established by Datamation Foundation, a charitable, non-profit trust, in collaboration with UNESCO and Babul Uloom Madrasa[3]. The centre initially aimed to impart ICT skills to the women in the locality.

An integral part of this initiative is an innovative action research approach based on ethnography[4] and complementary to the implementation process. The research findings form the basis of this article.

Goal of the article

Given the particular socio-cultural context of Seelampur, locally developed relevant content came up as a significant issue from the early days of the initiative. The eNRICH software was introduced to lend support to this process. This article looks at how the software was used at the site and whether it could play an effective role in the local communicative ecology[5]. The advantages and limitations of such a software and indeed, ICT interventions of this nature are discussed based on research findings. The article concludes with some suggested directions for the future both in terms of the intervention and research in this area.

The sociological question that the article seeks to address is that, "Can a tool such as the eNRICH software be useful in creating better access to information for communities and if so, what are the factors that facilitate the use of the tool?"

ABOUT eNRICH

eNRICH is a software for managing content developed for use in local multimedia and ICT centres. eNRICH is simple, multimedia, multilingual and customisable. The software enables local groups to organise information resources from the internet and their own local computer systems. Users then navigate and browse content offline or, where connectivity allows, online.

Information is managed through a structure of categories and sub-categories of information. The structure is customisable on the basis of relevance to a given community. Content can be uploaded and made available as text, image or audio from a local computer or through links to the internet. The system's database and interfaces can be hosted online, on a local area network or in a standalone computer environment. eNRICH's communication facilities include bulletin boards, quick access to chat and email services as well as dedicated sections for opinion polls and daily messages. The Seelampur women prior to deployment and development of eNRICH

had no organised means to access need-based information in a condensed form and in the local language.

Figure 1: *eNRICH interface: Seelampur ICT centre*
(Translations are in a box placed adjacent to the Hindi text)

THE PROJECT

Context

Before we discuss the access to information using eNRICH tool by Seelampur women, it is useful to understand various existing means of information and communication in Seelampur, i.e., the communicative ecology[6] of the area.

Seelampur is a predominantly Muslim cluster located in North East Delhi of the National Capital Region of India. The civic facilities in this area are abysmal. The literacy in the area is much less

compared to the national average. The majority of people speak Hindi and an 'Indianised', colloquial form of Urdu language. The health care facilities in this area are also minimal and people have little information about health problems. Generally awareness about public services and government schemes and also, available opportunities are low. (Unpublished data from Survey done at the site, 2002)

The National Capital Region, including Delhi and its suburbs, has been one of the first areas in the country to enjoy television access. TV penetration in Seelampur has been high due to the interest of the people in cable TV-based entertainment as well as low cost cable access available to the people in the area. Like in many other parts of the country, in Seelampur, the cable revolution has been characterised by the multiplicity of entertainment channels showing 24-hour news, films in Hindi, English and other regional languages along with soap operas and especially the popular family story serials.

The penetration of radio is quite high; predominantly due to revival of the interest in the FM radio which plays round the clock popular music and entertainment programmes. The Urdu service of the All India Radio, especially dramas, has been immensely popular in the region. Despite orthodox restrictions on watching films and TV soap operas, the people of the area manage to go to the cinema halls in and near this area to watch movies especially old movies /Hindi classics. A lot of people also hire videocassette recorders to watch movies.

Newspaper/magazine readership habits of the local people are limited. Reading is restricted more to the men of the area, more so due to lower literacy rates among women than men. Survey findings reveal that only 35-40% of adults read newspapers out of which about 5% are women.

The people of the area mainly gain local knowledge through word of mouth, pamphlets, announcements and Masjids[7]. Religious events like the Quran Khani[8] are amongst the limited number of social gatherings that are considered safe for women.

Thus, sources of information are restricted for the women, and even the men, in the locality. Access to mass media remains restricted to fulfilling entertainment needs. Further, as the community people shared during the research done in the early days of the initiative, the lack of information on some vital issues clearly places them at a disadvantage in some situations such as those related to illness and employment.

Use of ICTs in the initiative

The ICT centre aims to impart computer skills and build the capacities of young women. Two courses in computer training are offered – one at the basic level and the other advanced, on desktop publishing and screen-printing. The ICT centre is also an open learning centre for young girls and women, providing them interactive multimedia content for enhancing their vocational and life-skills, and providing rights-based information on various issues.

The other significant goals of the initiative are development and dissemination of local content through a participatory process for enhancing vocational skills and also to overcome the language barrier which non-English speaking users of internet often face. As mentioned before, the research also brought up the need felt by the participants to develop local content and participate in this process themselves. Through their enhanced ICT and vocational skills along with opportunities to interact and articulate their views the overall goal was to build confidence in them to take decisions about their own lives in ways which would lead towards gender equality (Sheriff and Gnanalakshmi, 2006).

There are over 100 women visiting the ICT centre everyday and the total enrollment for the computer training is around 100 at any given time. More than a thousand young women have been trained in basic ICT skills at the centre since the inception of the centre. Developing local content and facilitating their access to relevant content and information have been the other significant areas in this initiative.

Processes and trends

The women initially came to the centre in order to learn computing and other ICT skills. But as time progressed there were several dynamic processes taking place in the initiative. One, the centre has come to be valued as a place for social interaction by the women, a place to discuss and reflect on various concerns and issues. Two, there is a lot of keenness among the women to gain information on a wide range of areas – education, livelihood, health, women's rights etc. Third, there is also a strongly expressed need to learn various vocational skills and be economically independent. Four, in their participation in the centre and its activities their interest to share and to draw from their rich cultural tradition is evident. These processes are elaborated upon below.

Research findings indicate to the effectiveness of the ICT centre in expanding a user's social network. It has provided different channels for the flow of information between people who have not previously been in social contact. Seelampur women are severely restricted in their mobility and therefore in their ability to participate in any social networks beyond their immediate family.

> *…We don't go to meet people like friends often. We keep ourselves occupied in the household work. Our husbands, brother and father do not like our going out much. Very rarely we go to the theatre with our family members only. Most common social gathering where we can go unrestricted is the 'QURAN KHANI'. It is purely a religious function. It is common in our culture for women and men to participate together in religious function.* (From Group Interview, 4th February 2003) [9]

The internet fascinated these women beyond imagination. A group of women who have discontinued their studies were interested in using search engines from an experimental point of view. This group was initially less interested in actual information retrieval but they felt overwhelmed when they were able to find the relevant site for which they used search engines. Generally the community was not aware of the availability of information through the internet. As the project progressed the participants became more aware about the power of information and how to obtain it. Invariably there is a demand for the information on various courses being offered by open schools, open universities and also to find out examination results and scores. With a fair amount of emphasis among the younger women on looking attractive and slim they also like to get information on the latest in fashion[10] and beauty care. Women are mostly accessing internet through eNRICH, but occasionally they open it through Internet Explorer.

The women also expressed desire to get training in vocational skills. Given their poverty and lack of education, the possibility to have an income of their own is very attractive to many of them. A lot of the content generated at the centre focussed on some vocational skill and these are quite popular among the women.

ICTs have given to the women of Seelampur new means to express and articulate themselves and also be heard by others. Women started first with designs—sharp, colourful designs have been created from their socio-cultural context—applying Paint Brush. These designs are quite useful for them in their own tailoring and dressmaking work. Once they got exposed to the multi-media capability of the computers especially the recording features of eNRICH, they started

recording enthusiastically. These include *Naat, Ghazals and Sher-Shairi*[11]. Women were quite enthusiastic in doing these recordings.

"I got inspired by the participation of the others, such as, the project coordinator and staff, self help group leader or the tailoring instructor. I also want to record and share my views about things" says a 17-year-old participant of the centre. Such interest led to a lot of group activities as they started discussing amongst themselves how they could improve the content. As a result, a large volume of content has been generated which hones their ICT skills as well as links them back with their oral traditions. The local women have till now contributed over 150 pieces of local content.

*Zeenath, a postgraduate girl had an innate desire to become a journalist. Due to her family circumstances she could not pursue with her career in journalism. She started coming to the centre where after knowing about the facility she started putting her paper presentations in which she wrote about women related issues in eNRICH. She came to the centre daily to see how the other girls constantly viewed her content and discussed about them. Content provided by Zeenath were very popular among the school going girls who often made notes using her content All this gave her a lot of happiness and satisfaction that her views and writings are reaching others in this manner and are not only being appreciated but being used by them. (*Notes from in-depth interview, May 2003)

RESEARCH METHODOLOGY

The research methodology used in this initiative is called ethnographic action research combining both ethnographic and action research approaches (Tacchi et al, 2003). Ethnography is the in-depth study of a culture in all its rich detail. Action research means integrating research into the development of the intervention. This kind of research is flexible and responsive to the needs of the intervention and the particular socio-cultural context. The research is an integral part of the initiative and is not restricted to specific points of the project cycle.

As part of the approach, there is a range of methods – called a toolbox - that can be drawn upon for different purposes, and adapted as necessary. These include:

1. Field notes;
2. In-depth interviews;
3. Group interviews;
4. Diaries and other 'self-documentation';
5. ICT/Media content analysis;
6. Questionnaire-based sample surveys;
7. Public information and documentary material;
8. Feedback mechanisms.

At the Seelampur site, ethnographic action research was initiated right from the onset of the initiative. Initially, a small sample survey was done to understand the socio-economic context of the area and its communicative ecology. During this phase, some key informant interviews and group discussions and mapping were also done. After establishing the centre and initiating its activities, research tools that have been used are user feedback, in-depth interviews and focus group discussions. Observation-based field notes have been an integral part of the entire project

cycle. Field notes are written by more than one site based researcher, sometimes in the local language and later translated for analysis.

RESULTS

Processes involved in gathering local information for eNRICH

The issue of local language and content is quite significant because of which even if computers may be physically available they may continue to be "out of reach" in crucial ways. Content that is relevant and in local languages is a priority next to none in these ICT initiatives. Such content can be organised, archived and accessed in a systematic manner through eNRICH. Further, eNRICH provides the users with opportunity to access information collected from a range of sources and in a location where power and internet connectivity are both unreliable, it helps to access all this information even while being offline.

The process of collecting and assimilating content for eNRICH is done in such a way so that social interaction happens along with the exchange of views and individual talents are also explored. There are different methods used to collect local information:

1.   Verbally from users/ direct beneficiaries

2.   Through the information box

3.   Through the group of volunteers and staff

4.   Through the desk manager

1.   Users/Direct Beneficiaries

The users/direct beneficiaries are the ones who come to the ICT centre to learn, basic computers skills like familiarisation with Windows and programmes like MS Word, Paint, Wordpad, Media player and Excel. They seek information from the centre on a wide range of topics. They view vocational CDs that include vocational skills and life skills like health awareness and women's rights. They are also encouraged to produce their own multimedia programmes.

2.   Information Box

Information box is a cardboard box placed at the centre. The users put two types of slips in the box:
•   Slips consisting of local information
•   Slips consisting of information that the users are looking for, questions etc.

3.   Group of Volunteers and Staff

Group of volunteers are the ones who are the trainees and ex-trainees of the ICT centre. After benefiting from the information provided at the centre they have now extended support towards the updating of local information on eNRICH. They moderate and filter the information been put by the users into the information box.

Saira 25 is a volunteer of ICT centre. Who first came to learn computer later volunteered her for the centre. During my in-depth interview revealed. She used to feel very upset mentally until she started coming. She came here under frustration, as there was a big fight between her father and brother taking her marriage proposal. She was being pressurized from both the sides to accept the proposal they have brought for her as both of them had given their words to someone they knew. She was under high pressure and in dilemma. If

she goes in favor of father, the brother only her bread earner member of the family go against her or if she takes decision in favors of brother, father is committed not to see her face. Caught up in dilemma and unable to make any decision came to ICT centre to see the module on 'Nikah' [Islamic wedding]*, recommended by her friend.*

Saira says after going through the module number of times, I feel better as I have now learnt that a girl has right to say no to the proposal. I am feeling relieved that I have not committed any sin by refusing proposal recommended by my brother and father. I encourage every girl coming here to go through module and get equipped with knowledge. I have initiated discussion on this so many time that now I have learnt each and every line of this module by heart. Just like Saira. There are many Sairas who come to upgrade their knowledge for a say in the family. In a male dominated, not so open patriarchal society, where woman are not even taught about their rights and have no space to share or access right based information and are forced to give decision in favor of father or brother.

In one of the conversation another user Rabia, said that she has enriched herself with the rights of 'Nikah', but is it also necessary that she should also know about 'Talaq' [divorce]*? This way young woman also contributes to conceptualise content for their use.* (Excerpts from life story, March 2005)

Aisha 30 years old and mother of two children is regular attendee at the ICT centre. She first came to ICT centre to learn computer in 2003 through her friend. Her husband is a clerk in Jakir Hussain College. She comes along with her two children, hence is called Aisha Bhabhi by young users. Her name Aisha Bhabhi is on the lip of most of the participants. Her reaction about the ICT centre was that she had not thought initially that she would get to know so much from eNRICH that she would be so regular and volunteer her time.

She not only regularly accesses of eNRICH but contributes in mobilizing the community women also. Seelampur ICT centre, she says has given her a space where she can come express her views and concerns apart from accessing information on child immunization and other. 'When I became mother I did not know about pregnancy and the development of the fetus at all. But here seeing modules on pregnancy and child immunization I realized that every girl must be educated on these issues. I began to volunteer my time. These young girls feel shy about discussing the modules. I help them break hesitation and enable them to get educated on life skills. At the same time I get more and more skilled. Now it gives me immense satisfaction to help young girls to access information on life skill.'

Aisha Bhabhi has been instrumental in convincing other women of her area to contribute in local content on eNRICH such as on Home remedies and also conducts classes on life skills for the girls coming to the centre. Now she has convinced her husband also to join computer classes who comes in the evening batch to learn computer skill. (Excerpts from life story, October 2004)

4. *Desk Manager*

A Desk manager uses various tools to collect information to meet the information needs of the community. Desk manager collects information from local papers/magazines, internet, government departments and other institutions in the area and from the Information Box. Every weekend he/she sits with the volunteers and discusses information asked by community women and also provided by them. He/she condenses and translates it into the local language and finally uploads it into eNRICH.

Profile of a Desk Manager

Guddi graduated from Open University is a computer instructor. She also plays the role of Desk Manager. She uses media mixes to meet the information need of the community. She has adopted a variety of tools for collecting local information. Thus ensures to meet the information need of the community.

Apart from collecting local information from local newspaper, she uses regular participant of the ICT centre as an information agents. These participants put the slip in a cardboard box placed in ICT centre for the information they have been looking for as well for providing any piece of local information they have. Often she has to access information using internet. This way information gathered from various means needs to condensed and translated in to local language.

Every weekend she sits with the team of volunteers and discusses information sought from the community women and also the information provided by the community women. She along with her team of volunteer, ex-trainees of ICT centre, analyses the information material gathered. After completing the moderator part she, with the help of community women, compiles appropriate content in local context. When appropriate content is ready she takes the job to upload it on eNRICH. Her role does not end here since she has taken the responsibility of uploading local content she has to facilitate a lot of interaction and participation.

She constantly keeps updating the information on eNRICH. Based on her ethnographic observation she created a sub-category of designs and patterns of different types of neck of ladies suits. Which was extensively used by the young women and this particular category apart from poll questions and health category became the most popular among users.

A day's experience of the desk manager

One day I (the desk manager) was facilitating them to find a site using google search through eNRICH, having information on Dengue fever-an epidemic plaguing India during the monsoon season (the request had come from one of the women who had suffered from Dengue fever last year), when I was translating, many of the women present at that time took out their notebook and started taking notes. And that particular girl who had suffered was seen more curious to go into details about the causes, prevention and treatment. She was very interested to know the name of the mosquito responsible for Dengue fever. Opening of the site on Dengue seemed to have initiated the first ever debate on diseases caused by mosquitoes such as malaria, typhoid and other epidemics. SARS was also discussed at great length and then question of the origin of SARS disease led to opening the sites having information on SARS.

Since then I am noticing women are also speaking and recording through eNRICH, about disease caused by stagnant water due to rain as the monsoon season has started here. Hence voicing of significant issues relating to health generates lot of interest amongst the women. The collection of water due to open drains is also one of the problems encountered by the community. Thus discussion on issues is picking up. Even the mothers of young girls who come to the centre participated in recording messages to be communicated to community through eNRICH. These mothers had come to collect their daughters from the centre, got fascinated when they saw the girls recording messages and expressed a desire to record. (Desk manager's diary, March 2003)
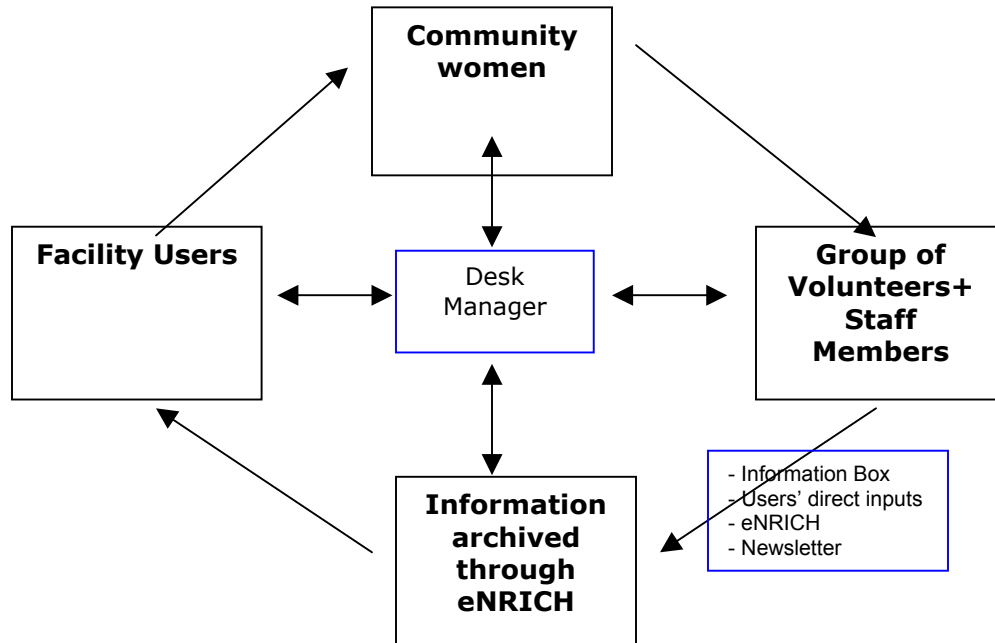
Figure 2: *Process of gathering local information for eNRICH*
Note – Black arrows and boxes denote the main process. Boxes with blue borders indicates tools/roles for facilitating eNRICH use.

eNRICH: Experiences and outcomes

Initially the process of gathering information was informal and incremental. Gradually, a management group that has evolved to run the day-to-day affairs of the centre from among the participants have been entrusted with the task of collecting and uploading information onto eNRICH. It makes the process participatory, friendly and innovative. The system supported by the use of eNRICH has established its credibility and standing in the community, and has led towards more informed women in the community and contributed towards their empowerment. The confidence level of the participating girls and women has increased. eNRICH has been used to provide correct information to the young women to realise and understand what is good for them and take the right decisions regarding their lives.

Guddi was happy that eNRICH has been functioning uninterruptedly for the past many days, she also stressed the use of it by other women as most of the participant restrict access up to only understanding various commands. Then came one woman and asked Rajat if she could open some information on fitness, from net. She was not fat rather slim. When I asked her why is she interested in fitness site, she said she feels she is fat and thus she wants to read how she can reduce some of excess weight. I asked has she been told by some one that she was fat, she said 'no' but said most of the girls (including her cousins who had come with her) are all slimmer than her. Since she has come from village she has this complex of excess weight, than she narrated how changed she becomes after coming

here. Also narrated how different she feels today than she had come from her village. Recalled incident when she had come first time to the centre with her cousin and had cried when could not use mouse and this made her feel so depressed that she thought that her education till 10th has no relevance and use when she can not apply that for using something that everyone is using so confidently. Said gained so much of confidence and feels so motivated that now is determined to acquire economic independence in 10 days time and has postponed her return to the village. (Action researcher's fieldnote, 11th November 2003)

It gives local information on health services; Delhi government's welfare schemes and grants, public utilities and services are compiled, listed and circulated among those seeking information.

I was keen to know whether all these modules and materials we collected and put on eNRICH has any significance in the life of young women. So while I was talking to Aisha Bhabhi, others also clustered around me and began to hear. Aisha Bhabhi stressed on the need to discuss on these topics, which are pertaining to women's health in practical life. She speaks very softly and sweetly. She said she keeps motivating others to know more about ourselves specially our body. She continued saying that in our family we give lots of focus on learning vocational skills but just do not pay any attention towards health care measures. We strive to learn new skills but always ignore to know about our body, health as we are not so open but this is the most essential.

I do not exactly remember how suddenly the topic on AIDS came in between. Most of these young women then said that in school they had got a kit on AIDS but neither had they discussed in school nor at home. Guddi began to ask the full form and how it is transmitted and can be prevented.

Though most of the young women present there had fairly good awareness about its spread. But none of them mentioned that it is transmitted sexually also. It is not they did not know but they were very shy. Jahaara (earlier used to be shy but now takes active part in discussion) referred to TV programme and updated the group about various modes of HIV infection spreading. Aisha Bhabhi then told the participant that only being aware about the disease is not sufficient they should use the knowledge in every day practice also. Like whenever you go to the doctors ensure that either a fresh needle or properly boiled needle is being used. Saba said that alertness is very important.

Suddenly (I do not remember the name of the woman), who was married, raised a question how a young newly wed woman ever suspect or ask her husband if he is HIV infected. The question was valid in context of male dominated society where a woman has no say and no rights. Aisha Bhabhi intervened saying "yes in the beginning you can't ask but gradually while living together we develop faith in each other, after all, there would be no world without faith and trust. (Action researcher's fieldnote, 3rd October 2004)

A lady whose name was Shama came to the centre and was accessing information on eNRICH about health in which she wanted to see the immunisation list. When I asked her she told me that she wanted to check whether her child has missed his vaccination. She told me that she is hesitant to take this information from the doctor whose attitude is quite rude. He scolded her when she had asked this from him. She was quite happy to know that her child's boaster is due and now she does not have to rely for this information on the rude doctor. (Action researcher's fieldnote, 11th August 2003)

It is mainly to the issue of health that most of the common participants would like to contribute either by using the message of the day, poll, or service category. It has been observed that the

general absence of information related to health and fast growing awareness towards health motivates young participants to contribute their knowledge using eNRICH. After realising this need, community people arranged for one doctor from DOTS[12] to sit at the Madrasa, who now handles as many as seventy cases from the community in a week.

Often young women access health information for their relatives or friends. There have also been a significant number of participants who accessed information on services available at hospitals in their area. For instance, one participant called Shabnam wanted to know about the availability of the paediatrician for her nephew. She wanted to take appointment from the doctor before visiting him.

Large number of participants have been using eNRICH for getting information on railways and roadways enquiries. It also gives information about passport and ration card, how it is made and what documents are required for them. Some participants also use eNRICH for accessing their computer proficiency scores since the Centre has been updating the scores on eNRICH. eNRICH is also used to share and discuss about their culture, practices and festivals. On occasions, for instance, during Eid celebration sumptuous recipes for making kebabs, biryani and desserts have been exchanged.

Thus, the eNRICH software has proved valuable in compiling and archiving information for easy access by users. Much of the content is also locally generated or compiled and in local language definitely increasing the possibility of the users gaining from the information. By facilitating the active role of participants in development of local content, eNRICH also presents rich possibilities in the area of local content development that has been a challenge as stated before. But as the narratives point out, their participation was made possible because of the environment that the women had at the centre that allowed for their free expression of both their talent and their views.

DISCUSSION

Evaluation and the issue of sustainability

Despite achievements, it would not be out of place to mention that the intervention of this nature cannot succeed without intensive and sustained work by a team of people and adequate technical resources. Seelampur ICT project certainly requires technical support and infrastructure in terms of trained local people, assured power supply, internet connectivity and a suitable environment. It is pertinent that this women-led initiative moves on. And for this, the continuous up-gradation of information is very important for which people of the community have to be motivated from time to time so as to be able to deliver local information.

There are technical problems in accessing eNRICH. There are limitations in changing and availability of login IDs, which has been impeding the usage of eNRICH. If this login ID issue is sorted out, as well as flexibility towards creation of new IDs is given; it shall make the eNRICH browser more robust and sturdy.

> *………Every time half of my time goes waste to log in my user id. Some time due to misspell of the password it does not open. But many times I do not know even when I enter correct id it refuses to open. This way I lose my interest and depend on off line access to information. Like I asked Guddi what new she has put on poll question rather than actually logging on to eNRICH. (*Action researcher's fieldnote, June 2003)

There are also issues regarding the human resources involved in using eNRICH. Even with regular contributions to information from various sources and an active desk manager, in some

cases area-experts are required to vet the contents being uploaded on eNRICH. This makes the use less cost-effective and self-sustainable.

> *Though Sanjeev the Desk Manager is there to assist him, but lack of coordination and understanding between the Desk Manager and in charge pushed us to think upon the role of Desk Manager (sounds very high profile). Moreover often we noticed his rude behavior with the community, (if someone would ask him to teach how to operate internet, his response would be so hurting that no one would dare ask him next time. Quite common reply he has if he will tell everything than what's the difference between him [a manager] and others, and will use facility for his private work thus the bill of internet also gone very high, though he is quite capable in his work and maintaining eNRICH but requires consistent observation and pushing).*

> *We all agreed that Sanjeev will visit to Seelampur every Friday to maintain and incorporate information in eNRICH. He will also follow the instruction and information to be appended from the register. But on a regular basis, the centre instructors will facilitate the use of eNRICH. (*Action researcher's fieldnote, 27th August 2003)

Even along with limitations eNRICH has been useful to provide a range of information from information about Eid and other festivals; to information on apparel designs and dresses; to that on educational and job opportunities. Apart from information of general interest and entertainment, information on health and education are highly sought after as discussed above. Information is enthusiastically accessed by people of the centre and thus leads to increasing their knowledge and levels of confidence at the same time.

Due to the sustained and high levels of enthusiasm to develop and gather content locally among the young women at Seelampur, plans are being made to use eNRICH in other aspects of the intervention such as group formation, in their campaigns to raise awareness about anaemia and reduce the incidence of anaemia, and so on.

Future Directions

Not only in the manner in which eNRICH can store information on a wide range of topics but also in the way it has potential to bring together information from various levels, global (through the internet), national/administrative unit (through government sources and local key persons) and the local level in innovative ways makes it unique. The selection of information is based on multiple factors – need, credibility, relevance and so on. So, what the individual user gets at the end is a useful package that combines more than one source. This is potential has been tapped well in initiatives such as Seelampur's and can be further developed.

Towards this end, in August 2004, UNESCO and NIC were joined by One World International in a new collaborative partnership to redesign the software and integrate new functionalities. This version will be based on UNESCO and NIC's experience with eNRICH and OneWorld's with Open Knowledge Network, a content sharing network initiated in Africa in 2003. The new development process will result in OpenEnrich 4.0, which will be built using open source tools and released as an open source product.

It is quite clear from the results of implementation that such software tools have the potential to be used for the benefit of the community. While the research seems to suggest that a critical factor in this success is creating the right environment for learning and interaction and also, a sense of ownership in the community towards the initiative, this needs to be studied further. It would be particularly useful if such software can be applied for the needs of different marginalised

groups, such as those from specific caste or ethnic backgrounds or the disabled, in order to study whether it can serve their specific information needs.

Endnotes

[1] The article is based on findings from research undertaken in a network of ICT initiatives with support from UNESCO. The author is responsible for the choice and the presentation of the facts contained in the article and for the opinions expressed therein, which are not necessarily those of UNESCO and do not commit the Organisation. The author acknowledges with thanks the editorial support and inputs from Savithri Subramanian, Research Coordinator based at UNESCO, New Delhi.

[2] For more details visit www.enrich.nic.in. eNRICH was developed by UNESCO and National Informatics Centre, Government of India

[3] Madrasa is an orthodox place of learning in Islam. Babul Uloom is located in Seelampur and has provided free-of-cost space for the ICT centre.

[4] Research on ICT Innovations for Poverty Reduction, Slater. D. et al, 2004, UNESCO. http://unesdoc.unesco.org/images/0013/001361/136121e.pdf

[5] 'Communicative ecology' refers to the complete range of communication media and information flows in a community. It places ICTs (radio, computers, mobile phones, print media and so on) in the context of all the ways of communicating that are important locally, including face-to-face interaction. It is recognised that any 'new' connections and networks (social and technical) that develop as a result of project work and the introduction of individual media technologies will be far more effective if they are somehow interconnected with existing, locally appropriate systems and structures (Slater and Tacchi, 2004).

[6] For an explanation of the concept, communicative ecology, please refer to Ethnographic Action Research: A User's Handbook Developed to Innovate and Research ICT Applications for Poverty Eradication, Tacchi J., et al, 2003, UNESCO. http://unescodelhi.nic.in/publications/ear.pdf

[7] Masjid is the place where prayer is offered and is also the centre of other religious activities

[8] 'Quran Khani' is the collective recitation of the Holy Quran,

[9] All pieces of raw data, quotes from the field etc are italicised in the paper. These have not been edited and appear as they were recorded in the field. All names have been changed to protect the individual's identity.

[10] However, this does not imply that they wear westernised clothes such as jeans and shirts that one would find in other Delhi neighbourhoods. Here, women wear only traditional clothes but in new designs and keeping with fashion.

[11] Naat: Religious songs sung for the Prophet, Ghazals: Melodies of love, solitude, companionship and friendship, Sher-Shairi: Rhyming verses on a variety of topics.

[12] DOTS, Directly Observed Treatment also known as the Revised National Tuberculosis Control Programme (RNTCP) of the Government of India, is a comprehensive strategy for TB control.

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Cultural perceptions:
The missing element in the implementation of ICT in developing countries

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ABSTRACT

Given the widely recognized importance of culture for the successful implementation of information and communication technology (ICT), this study explored the cultural perceptions of high school EFL (English as a Foreign Language) teachers in Syria toward ICT. Using both quantitative and qualitative research methods, the study sought to determine the teachers' overall perceptions of ICT as influenced by their national culture and school culture(s). The findings point to a notable conservatism in participants' perception of ICT in education and society at large. Teachers were mainly concerned about the morally damaging effect of ICT (particularly the Internet), its inattentiveness to their cultural and language needs, and its growing primacy at the expense of other societal needs. Hence, participants urged for the creation of local computers and software that would better serve Syrian identity and culture. The implications of the findings are discussed.

Keywords: Syria; culture; EFL; school; education; adoption of ICT.

INTRODUCTION

The global adoption of information and communication technology (ICT, henceforth) has been the landmark of the educational scene for the last two decades. The adoption of ICT into education has often been premised on the potential of the new technological tools to revolutionize an outmoded educational system, better prepare students for the information age, and/or accelerate national development efforts. Harvey (1983) predicts that the effectiveness of the use of the computer in education may be an important factor in determining which countries will succeed in the future. Central to this vision is the powerful metaphor of the "information age," where media, business and industry become increasingly computer-reliant.

In developing countries in particular, the metaphor of the information age has generated a whole set of wild speculations about the necessity of educational reforms that will accommodate the new tools (Pelgrum, 2001). Educational planners in most developing countries have responded to the challenge by initiating national programs to integrate new technologies (computers, educational software, the Internet, and other computer-related technologies) in education. Doing so, these governments have added to their burden of debt "even though the costs are large and the payoffs modest" (Benzie, 1995, p.38). An important reason for the frequently disappointing results in transferring electronic technology to developing countries is the inattention on the part of decision-makers to the end-users' cultural conditions or their prevailing school culture, or both (Zhuang & Thomas, 1987; Benzie, 1995). It is widely accepted that culture, within a nation or an organization, shapes individuals' perceptions of innovations that bear directly on their lives (Williams-Green, Holmes & Sherman, 1997; Chen, Mashhadi, Ang & Harkrider, 1999; Loch, Straub & Kamel, 2003).

In the field of education, it has been noticed that teachers' reactions to technological innovations are mediated by their cultural perceptions (Watson, 1998; Harper, 1987). Cultural perceptions "embody group understanding based on common beliefs and values" (Jones and Maloy, 1996: p.

25). They are influenced by not only national norms and values but school regularities and practices as well (Hofstede, 1997). A number of studies have shown that cultural perceptions toward different computer-related technologies are key factors related to both the initial acceptance of these technologies as well as future behavior regarding their usage (Al-Oteawi 2002; Chen, et. al., 1999; Loch, et. al., 2003; Straub, Keil & Brenner, 1997; Hill, Loch, Straub, & El-Sheshai, 1998). Studying teachers' cultural perceptions is particularly important in developing countries where ICT is not usually part of the culture. Due to its novel presence in society at large and in schools in particular, ICT may not be well received by developing-country teachers under various cultural influences.

One developing country that is currently pursuing the technological track in education is the Syrian Arab Republic. Recognizing the challenge of the "information age," the Syrian Ministry of Education has recently adopted a national plan to introduce computers and informatics into pre-college education. To this end, the Ministry has established computer-equipped labs within secondary schools for general, vocational and technical education. It has also connected many schools to the Internet. In addition, the Ministry created a new specialization in computer technologies in an effort to increase the number of computer experts in society. According to The National Report (2000), the introduction of ICT into the Syrian educational system aims "to keep pace with the progress and to reach efficient levels of education."

Unfortunately, the implementation of ICT into the Syrian schools has not been guided by research. The "initiation stage" (Rogers, 1995), which demands information gathering and planning, has been overlooked in the urgency to implement ICT in schools. A key element that has been left out is understanding the cultural perceptions of the end-users toward these new tools. Such inattention to the teachers' cultural perceptions may generate unforeseen repercussions for ICT diffusion in Syrian schools. Many technology experts have pointed out that the integration of ICT in education should occur in the light of the cultural conditions of the country and the prevailing school culture (Watson, 1998; Harper, 1987; Thomas, 1987). Obviously, unless teachers recognize the importance of ICT for their school and national cultures, they will not use it in their classes. This suggests that studies at the early stages of technology implementation should focus on teachers' cultural perceptions toward technology. Starting to understand these information gaps about teachers' cultural perceptions of ICT was the primary purpose for this study.

REVIEW OF LITERATURE

In the headlong drive to incorporate educational technology in schools, the accommodation of the new tools has often taken precedence over the end-users' cultural perceptions toward the media. Many researchers have cautioned about the current lack of attention to cultural beliefs and their impact on ICT adoption in developing countries (Loch, et. al., 2003; Hill et. al., 1998). Researchers suggest that force-fitting the culture to the technology can create an unfavorable climate for the acceptance of ICT in different organizations in the importing country. In fact, Hill et. al. (1998) asserts that, unless taken into consideration, socio-cultural factors may put ICT transfer at risk in certain developing countries.

Apparently, the changes developing countries are opting for cannot be attained by simply placing more computers in their schools. Martinez (1999) suggests that one of the major challenges facing developing countries is to make technology an essential part of the culture of the people. In fact, the reverence with which technology is held in technologically developed countries may be in contradiction to the perceptions of cultures that are relationship-oriented (Roblyer, Dozier-Henry & Burnette, 1996: p. 9). Harper (1987, p. 47) contends that cultural factors play an important role in creating negative perceptions toward computers: "One direct cultural cause is people's

apprehension that life is becoming too mechanized, so they resist contributing to a "computer culture." Another cause is the concern that there are other social problems that need to be solved before computer-education is addressed..." Intellectuals from different developing nations have been aware of the difficulty involved in accommodating "the computer culture" within their home cultures. For example, Modum (1998, p. 99), noting Nigerians' cultural conservatism toward computers, urges his people to "imbibe the values of the computer as a tool that can be used by all for problem solving, no matter their profession." Similarly, Dewachi (2002) notes that "cultural impediments" are responsible for the Arab States' slow launch into the new information and communication age and their inadequate exploitation of the Internet. Obviously, the change initiated through the diffusion of technological innovations is a complex process characterized by many obstacles, regressions and cultural challenges (Benzie, 1995). Rather than being transposed through ready-made models, change often evolves as a response to societal needs originating from the inside culture.

In his theory of Diffusion of Innovations, Rogers (1995, 1971) identifies the *Social System* as an important parameter in the innovation diffusion process. The social system denotes the social context in which the innovation diffuses. The structure of the social system affects diffusion in many ways. Rogers points specifically to the effects of the social norms on the rate of innovation adoption. Norms are the established patterns of behavior that tell members of the system what behavior is expected (Rogers, 1995, p.26). According to Rogers, social norms can be a main barrier to change. Following Rogers, Thomas (1987, p. 15) proposes that "How acceptable a new technology will be in a society depends on how well the proposed innovation fits the existing culture." Thomas refers to his hypothesis as the *cultural suitability* factor, which he places within his model of technology transfer from developed to developing countries. Both Rogers and Thomas note that, despite their indisputable importance, cultural conditions and/or social norms have not been sufficiently studied in the innovation-diffusion research. The dearth of studies examining "cultural conditions" might be attributed to the difficulty involved in capturing this construct. To be researchable, cultural perceptions was delineated in this study to mean "Syrian teachers' perceptions of the value, relevance, and impact of ICT as it relates to the cultural norms in Syrian society and schools."

The study of cultural perceptions has been found essential for accounting for teachers' overall attitude toward ICT and for anticipating their future adoption of the new tools (Thomas, 1987; Harper, 1987). In fact, Chen, et. al. (1999) considers cultural perceptions among five main factors that may determine ICT adoption by educators. Unfortunately, however, only a few studies have tried to study the impact of cultural perceptions on the reception/rejection of ICT in education. Loch, et. al. (2003) tried to find the extent to which social norms influence the acceptance of the Internet in the Arab world. They found that, although many of the participants were enthusiastic about the promoting role of the Internet for education and training, cultural barriers affected their acceptance of the Internet is so many ways. Among these are the limited number of websites with Arabic content, the "moral and religious cultural issues" (p. 53), social life and communication, and fear of the influence of other cultures. Similarly, Hill et al. (1998) found that the cultural tendency to face-to-face dealings and to family-like environments militate against technology acceptance in the Arab World. They also found that participants with "traditional religious values and conservatism" showed greater resistance to ICT transfer in its current "Westernized" form.

Al-Oteawi (2002, p. 258) found that teachers refrain from using the Internet in the classroom for fear of the ethically inappropriate material on the Internet. He also found that his participants looked at much of the material on the Internet as inappropriate for the Saudi culture. He particularly pointed to the teachers' reluctance to endorse the Internet for teaching and learning "because of concerns about the evil aspects of the Internet." Chen, et. al. (1999) created three computer-enhanced learning environments: local-institutional, trans-institutional, and global. The

first two were designed for giving student teachers the opportunity to explore the conditions of learning and teaching in Singapore primary schools. Unlike the learning environments commonly built on Western assumptions, the learning environments created by the researchers took into account different aspects of the Singaporean culture. The researchers found that the participants benefited both educationally and socially from this experience because of its incorporation of cultural issues that are important for the participants. Therefore they urged for a consideration of cultural factors in computer-based learning environments.

Apart from the effect of the national culture on technological diffusion in schools, the micro-culture of the school itself may affect such diffusion (Hodas, 1993). Williams-Green, et. al. (1997) contends that the culture developed within an institution or within an organization can act as a barrier to change. For a new technology to be placed into an organization's culture there must be a match of organizational and technological values (Hodas, 1993). Within the school organization, if the technology is not received well by teachers, there must be a mismatch of values between the culture of schools and that of the technology. Watson (1998) found that teachers' inability to negotiate the role of the computer in their practice resulted in their resistance to its use in their classrooms. Therefore, he warned that the mismatch between the culture of technocentric mindedness and the teachers' pedagogic culture results in the alienation of the teachers from the use of technology. On the other hand, Coppola (2000) found that because the norms of school and community encouraged innovation and autonomy, teachers learned not only how to use computers in their teaching but also how to operate them within the constructivist framework. It seems that the integration of ICT in schools cannot be effective unless escorted by supplementary programs that would foster a culture of acceptance amongst teachers, students, and administrators.

One area about which the literature remains virtually silent is the cultural non-neutrality of computers, the fact that the "…characteristics of technologies are determined by the socially and culturally-based assumptions of their designers" (Damarin, 1998, p. 12). As Bowers (1998, p. 50) notes, "Right now, learning about the cultural non-neutrality of technology is a peripheral area of study, if it is studied at all." Computer technologies, like most other tools, select, amplify, and reduce aspects of experience in various ways. This aspect of the new technology may pose a threat to conservative cultures that value their own experiences. In *The Media Is the Message*, McLuhan (1964, p. 207) wrote, "The spiritual and cultural reservations that the oriental peoples may have toward *our* technology will avail them not at all. The effects of technology do not occur at the level of opinions or concepts, but alter sense ratios or patterns of perceptions steadily and without any resistance [italics added]." Undeniably, teachers' awareness of the cultural non-neutrality of ICT may have substantial influence on their attitudes toward it as well as their conception of its place in their instructional practices.

From both theoretical and empirical perspectives, cultural perceptions seem to have a significant impact on teachers' adoption of ICT. Unfortunately, much of the early research on computer uses in education has ignored teachers' cultural perceptions toward the new machines (Harper, 1987). Studies focused on the computer and its effect on students' achievement, thus overlooking the psychological and contextual factors involved in the process of educational computerization (Clark, 1983; Thompson, Simonson & Hargrave, 1992). The delicacy of this situation calls for an investigation of teachers' cultural perceptions regarding the introduction of ICT into their schools and society at large.

THE STUDY

Given the importance of teachers' cultural perceptions for the success of the integration of ICT into education, the purpose of this study was therefore to determine the high school EFL teachers' cultural perceptions toward ICT in Syrian education. More specifically, the study investigated the following two questions:

1. What are teachers' perceptions about the introduction of ICT into their society, given its own mandates and their own cultural conditions?

2. What are their perceptions about the relevance of ICT to their schools?

First of its kind in the Syrian context, this study is part of a larger study aiming to assess the recent introduction of ICT into Syrian schools from a teacher viewpoint. The study focused mainly on EFL (English as a Foreign Language) teachers because they were first to experiment with computers in the Syrian context. This is partly because of their familiarity with English as "the main computer language" and also because much of the available software and educational web content is for English language practice. Moreover, teachers with English language skills have access to a wider range of material on the Internet and are expected to be more familiar with technology discourses. More importantly, "The field of foreign language education has always been in the forefront of the use of technology to facilitate the language-acquisition process" (Lafford and Lafford, 1997, p.215).

METHODOLOGY

This was a descriptive study of an exploratory nature. Creswell (2003, p. 30) suggests that exploratory studies are most advantageous when "not much has been written about the topic or the population being studied." The target population in this study was high school EFL teachers in Hims (the largest Syrian province) during the 2003-2004 school year. Hims contains diverse Syrian communities, and might therefore be considered a "representative" Syrian province. The list of teachers was based on EFL teachers' Directory, which is maintained and updated on a quarterly basis by Hims Department of Education. The total number of high school EFL teachers in the Directory of the Department of Education was 887 (214 males, 24%; 673 females, 76%) as of the thirtieth of March, 2004.

Both quantitative and qualitative methods were used in order to collect the data on the population of EFL teachers in Hims. A questionnaire consisting of sixteen items was developed by the researcher to obtain the information needed for the study (Appendix 1). The instrument was evaluated by a panel of experts for content and face validity. The panel included three content experts (professors of educational technology and EFL), two bilingual experts, one measurement expert, and four population experts (Syrian EFL teachers). The Cronbach's alpha reliability coefficient for the scale was .76. The questionnaire was translated into Arabic and then back into English to ensure its suitability for the participants. The qualitative data was collected through in-depth phone interviews. This qualitative element was employed not only to gather more in-depth information but also to ensure the trustworthiness of the results (Gelsne, 1998). A semi-structured interview form (Gay & Airasian, 2000) was developed by the researcher and then piloted on one participant to ensure that the questions were comprehensible to the respondents (Appendix 2).

The data were collected in two stages. In stage one, the questionnaire described above was administered to a random sample of 326 EFL teachers in the Department of Education in Hims. The specific procedure used for sample selection was a "table of random numbers" (Gay & Airasian, 2000, p. 124). This procedure involved assigning each subject in the population to a

number, and then selecting 326 arbitrary numbers from the population. Since each number corresponded to a subject in the population, the selected numbers formed the sample of subjects for the study. Following Dillman's (1978) recommendations, a letter of recruitment, a letter of informed consent (which also included consent to participate in a follow-up interview), and a return envelope accompanied the questionnaire. Letters of support by the Syrian Ministry of Education and the Director of English in the Department of Education in Hims were used for accessing the schools and teachers. A total of 326 questionnaires were distributed over a period of three days from the 27th to the 29th of April. By May 17th, a total of 320 questionnaires were collected from the participants. The response rate was 98.16%. The rate was high enough to avoid further survey distribution. Six out of 320 were not usable for data analysis because they were not completed. Only 314 were analyzed, representing a valid response rate of 96.32%.

In stage two, a purposeful sample of 15 teachers out of 97 who provided their consent to participate in follow-up interviews were interviewed via phone. The selected subjects were contacted by phone twice. During the first contact, the researcher presented a cover story to re-introduce himself and his research topic, explain the purpose of the interview, request participation in the interview, and set up appointments for the interviews. The second contact was dedicated to the interviews themselves. All interviews lasted between 20-30 minutes, and all were audio-taped and then immediately coded.

The quantitative data were analyzed via SPSS. 12 statistical package. Descriptive statistics were used to describe and summarize the properties of the data collected from the respondents. Prior to conducting the analysis, the scoring of all negatively stated items was reversed. The qualitative data were analyzed using an interpretive qualitative approach (Glesne, 1998). Within this paradigm, "it is possible to understand the subjective meaning of action (grasping the actor's beliefs, desires and so on) yet do so in an objective manner" (Schwandt, 2000, p.193). Interviews were transcribed verbatim and then coded. The coding followed the procedure recommended by Glesne (1998) for data cataloging using analytic codes, categorization, and theme-searching. In developing codes, the first step was to systematically read and group the participants' transcribed responses. After this basic grouping of data, recurring words, phrases, and ways of thinking within each group were identified and then labeled into coding categories. Related codes were synthesized into broader codes. For verification purposes, a combination of manual and computer-assisted methods was employed to code the data. The particular computer program used for coding the data was NUDIST (N6). Relevant quotations were grouped with their related codes and then translated into English. To ensure the anonymity of the respondents, pseudonyms were used to identify individual respondents. Lastly, the relationships amongst codes were sought and then assembled into themes and sub-themes before final reporting.

MAIN FINDINGS

Quantitative Data

Participants were asked to respond to 16, Likert-type statements dealing with their perceptions about computers' cultural relevance to and impact on Syrian society and schools (Appendix 1). Cultural perceptions were represented by a mean score on a 5-point scale, where 5 (Strongly Agree) represents the maximum score of the scale and 1 (Strongly Disagree) represents the minimum score. Table 1 illustrates the frequency of participants' responses to the Cultural Perceptions scale.

Table 1: *Frequency Percentages on the Cultural Perceptions Scale*

N.	Cultural Perceptions Scale	Percent (%)				
		SD	D	N	A	SA
1	*Computers will not make any difference in our classrooms, schools, or lives	23.3	54.8	15.3	6.1	0.6
2	Students need to know how to use computers for their future jobs	0.0	3.2	9.6	60.8	26.4
3	*Students prefer learning from teachers to learning from computers	4.1	27.4	38.9	23.6	6.1
4	Knowing about computers earns one the respect of others	1.9	13.4	20.4	49.7	14.6
5	*We need computers that suit better the Arabic culture and identity	2.6	5.4	8.6	52.2	31.2
6	Computers will improve our standard of living	1.0	4.8	24.8	43.0	26.4
7	Using computers would not hinder Arab generations from learning their traditions	4.1	9.9	23.9	48.7	13.4
8	*Computers are proliferating too fast	0.3	4.5	6.7	60.8	27.7
9	People who are skilled in computers have privileges not available to others	0.0	3.8	11.5	51.6	33.1
10	*Computers will increase our dependence on foreign countries	7.0	31.2	29.3	26.1	6.4
11	*There are other social issues that need to be addressed before implementing computers in education	6.4	23.9	16.6	41.1	12.1
12	The increased proliferation of computers will make our lives easier	1.6	5.4	12.1	65.0	15.9
13	*Computers dehumanize society.	21.3	48.7	15.9	10.5	3.5
14	Working with computers does not diminish people' relationships with one other	5.7	26.4	15.9	43.3	8.6
15	*Computers encourage unethical practices	14.7	32.2	26.1	19.4	7.6
16	Computers should be a priority in education	1.9	5.4	12.4	51.0	29.3

Scale: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree
*Note: * polarity reversed on these items*

From a school culture perceptive, the majority of the respondents agreed or strongly agreed that students need to know how to use computers for their future jobs (87.2%), and that computers should be a priority in education (80.3%). Also, a high percentage of the respondents disagreed or strongly disagreed with the negatively stated item 1, indicating that computers will make difference in their classrooms, schools, and lives (78.1%). However, a high percentage of them

(38.9%) were neutral about whether or not students prefer learning from teachers to learning from computers.

From a national culture viewpoint, the majority of the respondents agreed or strongly agreed that knowing about computers earns one the respect of others (70.1%), entitle people who are skilled in computers to privileges not available to others (84.7%), contribute to improving their standard of living (69.4%), and eventually make their lives easier (80.9%). Most of them indicated that computers do not diminish people' relationships with one other (51.9%), or hinder Arab generations from learning their traditions (62.1%). Also, a high percentage of the respondents disagreed or strongly disagreed with the three negatively stated items 10, 13, and 15, indicating that computers do not increase their dependence on foreign countries (38.2%), dehumanize society (70%), or encourage unethical practices (46.9%).

Participants' negative responses surfaced on three items. The majority of them indicated that there are other social issues that need to be addressed before implementing computers in education (53.2%), that computers are proliferating too fast (88.5%), and that alternative computers which better suit the Arabic culture and identity are needed (83.4%).

Table 2: Distribution of Mean Scores on the Cultural Perceptions Scale

Scale	Percent (%)					Mean	SD
	Highly negative	**Negative**	**Neutral**	**Positive**	**Highly positive**		
Cultural Perceptions	7.0	19.5	18.0	40.0	15.5	3.38	0.44

In general, teachers' perceptions of the cultural relevance of computers were somehow midway between neutral and positive (Table 2). The overall mean score on the Cultural Perceptions Scale was 3.38 with a standard deviation of 0.44.

Qualitative Data

The majority of the interviewees were aware that computers are bringing about perceptible changes in the character of the Syrian society. These changes were eyed with a mixture of hope and discomfort on the part of the participants. On one hand, participants considered ICT as a new window opened to the world. What interviewees particularly valued about this feature is getting acquainted not only with the events of the world but also with different cultures and different people. To some interviewees, this helps enhance "cultural education" with the added advantage of having a way for communicating directly with people around the world. In one of the participants' terms, cultural education indicates that "…you know what people from the rest of the world think, how they behave…these are things you cannot find in the school books."

On the other hand, some of these changes were not seen as favorably by a number of interviewees. For example, three respondents were concerned about the reduction of social exchanges that the new means of communication (chatting and email) were bringing into the lives of Syrian people. Samer hoped that computers "will not isolate us by locking us within their domain away from family kinships." Two other participants were disappointed that Arabic has limited presence on the Internet compared to the other main languages. Kareem complained, "I cannot believe that Arabic …with all the large number of people speaking it… has such shy

presence on the Internet…to me this means less advantage of this tool for Arab people in general and Arab students in particular."

More disconcerting to most of the participants was the immoralities that the Internet is bringing into the Syrian culture, even though their effect may encroach on only a limited audience. As Omar stated, "I do not think though that immoral websites affect rational people. Only corrupt people will be affected by such things." A reiterated assertion was that "if one is confident of himself, nothing like that will affect him…I myself won't care about these websites even if they were to multiply hundred times…" Most of the participants were particularly worried that the increased proliferation of immoral websites may negatively influence younger generations through the promotion of inappropriate adult material and the incitement of "loose manners" and "degenerate behavior." Hence, they urged that children should never use the Internet on their own. For example, Zahra remarked, "My deepest fear is about my children. I cannot overcome the fear that one of my children would reach one of these awful websites. This is my only complaint about the use of the Internet. One has always to be on the alert when children are using it." To some participants, allowing these culturally inappropriate websites to appear for the common Syrian people is just another way of facilitating cultural invasion. As Ali indicated, "it seems there are people who are dedicated to spreading immorality…I really do not understand what the point of this is (…)…what we can do is to forbid these websites…else we would be aiding this form of cultural invasion."

When asked whether an Arab-made computer would make any difference, most of the participants indicated that an Arab-made computer would be safer insofar as morality issues and children are concerned. In addition, "an Arab-made computer would serve better Arabic customs and values," one of the interviewees commented. Nonetheless, participants were not sure as to how an Arab-made computer would look like. For example, Ali mentioned, "We have to create something that reflects our ethics and rules of conduct… I myself do not know how this would be achieved, but there should be some people who can deal with this issue." More essential to many participants was the creation of Arab-made software that reflects the needs and character of the Arab people. Added to this are "awareness programs about what is useful to our people and what is not…" These measures might alleviate, but not necessarily eliminate, the effects of the new technologies, for any new invention might be re-oriented to serve morally damaging purposes. As Kareem commented, "Intruders and saboteurs always try to ruin and destroy good things. If an Arab invented a different computer, another Arab may find a way to corrupt it."

To investigate teachers' views about the cultural non-neutrality of computers, the researcher asked participants about their reactions to the statement, "Computers are said to reflect the values and ways of thinking of those who make them." The statement provoked a variety of reactions amongst participants. Three of the participants simply disagreed with this statement and tried to avoid (or failed to provide) any further explanation for their response. Two of them contested this statement on historical grounds. For example, Kareem argued:

> *We cannot simply say that computers are developed by a certain people or for a certain people since the computer industry has evolved through the contribution of people from different ethnic backgrounds…just like we cannot say that the writing system reflects the mentality of Arabs who invented it, or that mathematics reflects the values of Indians who were the first people to use it. What counts is the user and how he uses these things according to his own purposes.*

The remaining ten participants agreed hesitantly to the statement, but indicated that it is not the computer itself that is value-laden but the applications that the user chooses. In other words, it is the user who decides how to use the computer and to infuse it with his/her own values. For

example, Hala stated "the computer as a tool is like any other machine. It can be employed in whichever manner the user wants and in accordance with his own ethics and values." Typical of Hala's assertion, most of the teachers' responses seemed to subscribe to the discourse that it is humans who manipulate computers and dictate their values depending on how they put them to use. However, this explanation is arguable given that teachers were explicit about the need for Arab-made computers, culturally appropriate software, and awareness programs. It seemed that participants had vague perceptions of this concept itself, yet they had no full awareness of its meaning or implications.

Insofar as the school culture is concerned, most of the interviewees suggested that if computers were to be used in teaching, the Department of Education should prepare programs that educate students "morally and culturally" about the improper material on the Internet. Ali remarked, "We cannot expect students to take responsibility for their own behavior. Most of them may be introduced to computers at a stage where they cannot make informed judgments about the value or dangers of what they see." Ali further explained, "I would like to have computers used on a wider scale in education provided that this step would be well calculated and planned, especially when matters of supervision and guidance for students is concerned." Other participants indicated that teachers using the computer in the classroom or even teaching about it should know how to use it effectively and wisely in accordance with Arab students. As Hala stated, "…the teacher is still important to guide students as to where to go, warning them of harmful or misleading websites… Unless the teacher herself is able to evaluate the Internet material, she cannot guide her students during their access to the Internet…she cannot make effective use of it, either." Clear as it is, Hala's account externalizes and echoes the apprehension that most of the teachers felt about the culturally improper aspects of ICT. It seems that the cross-cultural benefits of ICT were moderated in the participants' eyes by the more serious apprehension about the morally damaging effects of Internet-related material.

DISCUSSION

While the computerization of schools in developing countries is gaining more and more momentum, little attention is paid to the cultural challenges to this process or, more basically, to the cultural perceptions of the end-users toward it. The technological discourse abounds with calls for training teachers, endowing them with technological competencies, and giving them more access to different technologies. Yet, only a few studies, if any, have tried to examine the educators' cultural perceptions toward the new tools. Rockman (2000) contends:

> *If schools have access to the Internet and there are computers in reasonable numbers, we also need to know that the teachers are prepared... Further, we must also have a culture that encourages and supports the use of technology for teaching and learning (p.3).*

Zhuang & Thomas (1987) warn that importing a technology into developing countries without enough understanding of the home culture can result in an incompatibility between the technology and the culture and eventually raise resistance among the indigenous end-users to the technology. Similarly, Thomas (1987) and Rogers (1995) emphasize that potential adopters may resist a technological tool because it may not fit within their macro- or micro-cultures. Both note that, despite their indisputable importance, cultural conditions and/or social norms have not been sufficiently studied in the innovation-diffusion research. This may be related to the difficulty involved in capturing this construct. To be researchable, cultural perceptions was delineated in this study to mean Syrian teachers' perceptions of the value, relevance, and impact of ICT as it relates to the cultural norms in Syrian society and schools. Even with this focused definition, the use of both quantitative and qualitative measures was still necessary for pinpointing this construct.

Findings from the current study suggest that teachers have positive perceptions about the relative importance of ICT within their school culture(s). Thus, the majority of survey participants perceived that computers should be a priority in education given that students need to know how to use computers for their future jobs. This rationale seems to resonate with the common rhetoric behind the entry of ICT into the field of education: "Schools must prepare students with the new skills and ideas that are needed for living and working in a digital society." (Resnick, 2002: p.5). A report from the North Central Regional Educational Laboratory states that "Technology is transforming society, and schools do not have a choice as to whether they will incorporate technology but rather how well they use it to enhance learning." Obviously, the participants' support of ICT presence in their schools does not go along with the common conception of teachers as antagonists to change in their practice (Watson, 1998). Nonetheless, participants were emphatic about the importance of equipping potential technology users among teachers and students with the basic skills to ensure the success of their ICT experience.

 The survey data showed that, although most of the participants saw ICT as appropriate for the Syrian society, many of them indicated that computers are proliferating too fast and that there are more important social issues to be addressed before implementing ICT in education. It seems that balancing resource allocation among the competing areas of need in developing countries is a critical issue. The discrepancy in developing countries lies in that, while lacking in financial and human resources to invest in computer technologies, they still need to face the greater demand of keeping pace with the technologically developed countries. According to Harvey (1983, p. 266), "there is a rapid extension of information and data dissemination processes in the industrialized nations that threatens to push Third World countries even further behind their more developed sister states…" This dilemma threatens of a digital-divide on a national scale that would further polarize the world on a technology have/have not basis.

The interviews showed that while participants were slightly positive about the cross-cultural and cultural effects of ICT, they were apprehensive about the morally and culturally inappropriate aspects of ICT, and particularly the Internet. In fact, participants were concerned mainly about websites that spread immorality among children and "some corrupt people." Hence, some of them saw that children and students in particular should never use the Internet unattended. This last concern has been voiced in different parts of the world as well (e.g., Armstrong & Casement, 2000; Al-Oteawi, 2002; Alliance for Childhood, 2000). According to a statement made by the Alliance for Childhood (2000), "Too often, what computers actually connect children to are trivial games, inappropriate adult material, and aggressive advertising." It was for the above reason that most of the respondents were hoping for the creation of "cultural and ethical" awareness programs. This type of programs might make less the effect of the immoral and culturally inappropriate material on the Internet. The alarmist outlook through which a few respondents saw the effects of such websites was expressed in a fear of cultural invasion. Undoubtedly, cultural invasion is made easier and more effective through the new telecommunication channels opened up by various modern technologies, and teachers' apprehension may reflect this fact. Freire (1972, pp. 121-22) warns of the consequences of cultural invasion: "Cultural conquest leads to the cultural inauthenticity of those who are invaded; they begin to respond to the values, the standards, and the goals of the invaders." This concern has been reported by researchers from other parts of the Arab World (e.g., Al-Oteawi, 2002).

A less frequently voiced concern was about the under-representation of the Arabic language on the Web, which lowered the value that the Arab people can obtain from this tool. Many researchers have pointed to the shortage of Arabic Internet applications and web content, and warned of their limiting effects on the expansion of Internet usage in the Arab region (Gary, 2001; Loch, et. al, 2003). Though categorized among the five most widely spoken languages in the

world, Arabic ranks 20th in terms of web content with less than 1% of the world's overall Internet users coming from the Arab World (Dewachi, 2001). In view of the above inadequacies, "the major questions for educators with respect to technology would be whether the technologies are so thoroughly saturated with cultural biases that they must be changed or resisted more energetically and fully than other aspects of education" (Damarin,1998, p.12).

In both the surveys and the interviews, most of the teachers responded that they would prefer Arab-made computers that reflect the Arab customs and values. It has often been noted that people who have not been quite influential in the design and development of ICT would prefer a localized version of these technologies (Damarin, 1998). This is quite explicable since the current computer technologies fall short of serving the cultural and learning needs of "other nondominant cultures" (Roblyer et. al., 1996: p. 9). In fact, participants in this study were less concerned about the computer itself and more about its related programs and software. They were particularly emphatic about the need for Arab-made software that integrates the values, ethics and way of thinking of Arab people. This demand seems to resonate with Fodje's (1999) argument in the International Conference for Technology in Education:

> *What the world needs today is not talent in producing new technologies but talent in understanding the impact of technology on the society and individuals…Educational programs in the third world heretofore have been designed around the Western ideals. These need to be reworked to reflect the indigenous cultures and promote human values while at the same time producing the talent for 'controlled' technological advancement.*

Obviously, the creation of local computer applications and software may help in the initial cultural acceptance of ICT as well as future behavior regarding its usage.

What should not go unnoticed is that the majority of the interviewees expressed little concern about the cultural non-neutrality of computers; they thought it is the user who ultimately determines how these tools are used. Although it seems attractive to suggest that teachers endorse the instrumentalist argument (that it is humans who decide how to put technology to use, for good or ill), the interviews showed that teachers were not aware of the non-neutral aspect of technology. This affirms Bowers' (1998) apprehension over the global unawareness about the cultural non-neutrality of ICT. As Bowers puts it, "…neither the computer industry nor educational policy makers understand the cultural mediating characteristics of computers" (p. 49). Unfortunately, people from different countries have often accepted technological innovations as neutral tools (De Castell et al., 2002). De Castell et al. cite Penley and Ross (1991) arguing:

> *We fully recognize that cultural technologies are far from neutral and that they are the result of social processes and power relations. Like all technologies, they are ultimately developed in the interests of industrial and corporate profits, and seldom in the name of greater community participation or creative autonomy (p. 10)*

The sensitivity of this issue suggests that teachers need to be informed about the value-laden aspect of ICT and how to adjust its functionality in accordance with their cultural character. Harvey (1983) warns that "computerization cannot be allowed to become a new form of cultural imposition — neocolonialism is not acceptable even in an automated package" (p. 269). Apparently, the non-neutrality aspect of ICT requires special awareness on the part of educational planners in developing countries, who might need to find local solutions to this problem.

Overall, the participants' reservations about the above aspects of ICT might be interpreted within Hofstede's general cultural communication model (1997), which suggests that the values and practices of a certain culture or organization provide the lenses though which a person perceives, discerns, and constructs meaning. As members of an educational system embedded in a larger

cultural context, teachers approach ICT through this cultural framework. The findings of this study go along with Rogers' premise about the decisive role of social norms in the diffusion of innovations, and also with Thomas's "Cultural Suitability" hypothesis, which posits that the acceptance of a new technology depends to a large extent on its compatibility with the existing culture. The fact that the participants acknowledged the importance of ICT for their educational system and society, yet simultaneously aspired to modify its functionality in accordance with their cultural values, reflects the influence of their cultural norms on their perception of ICT.

CONCLUSION

While the study of teachers' cultural perceptions is a global need, it is more so in developing countries, being at the receiving end of the computerization process. Researchers have pointed to teachers' cultural perceptions as one of the main factors influencing ICT adoption (Chen, et. al, 1999; Loch, et. al; 2003; Straub, et. al., 1997). Findings from the current study support this conclusion. The participants' enthusiasm about the advent of ICT into their schools seems to be conditional; different cultural issues have to be resolved before the new tools are fully accepted. Although teachers supported the entry of ICT into the school system, viewing it in the light of the global demands for technologically capable generations, they simultaneously expected a careful plan that would take into account preparing teachers and students for this innovation. Likewise, the advent of ICT into Syrian society was welcomed by participants, who were nonetheless cognizant of other social needs that might be overlooked in favor of computerization, and were additionally apprehensive about the immoralities that the Internet might bring into the Syrian culture (through the promotion of improper adult material as well as the incitement of "loose manners" and "degenerate behavior"). Besides, teachers urged for the creation of Arab-made computers and software that would reflect Syrian values and better serve Syrian culture.

Teachers' apprehension about the culturally inappropriate materials on the web and their unwelcome effects on Syrian children and students should receive its due attention on the part of the Ministry of Education. The Ministry might need to employ Internet content blocking systems, apply strict rules about Internet use, and/or implement awareness programs in schools. Such steps might alleviate the teachers' concerns and simultaneously motivate them to use ICT in their classrooms with the least amount of anxiety. It is also incumbent upon teachers themselves to increase their awareness of this issue in order to be able to guide students during their access to the Internet. Another important step toward assuaging teachers' cultural concerns is the creation of software and programs that are congruent with the Syrian character, values, and customs. Such software may depart from the common ideals promoted explicitly or implicitly in common Western software (such as individualism, materialism, competition, ownership, etc.) and focus more on indigenous values, such as kinship relationships, spirituality, cooperation, empathy, and sharing. Such undertaking should attract future researchers, who might explore teachers' cultural perceptions in the light of these changes.

While the findings shed some light on teachers' cultural perceptions of ICT in one developing country, their implications are significant to other educators in similar educational contexts. The findings bring to light the main concerns voiced by many technology experts about the current cultural challenges to the implementation of educational technology in developing countries (Bowers, 1998; Loch, et. al., 2003; Chen et al., 1997; Straub, et. al., 1997). At the same time, they raise questions about the potential direction of educational technology in developing countries, given that most of these countries are not technically capable of producing local technologies that would better serve their own needs, purposes and circumstances: How can technology be implemented with maximum educational value and minimal negative effects on the indigenous cultures? What measures are needed for developing countries to "indigenize" these

tools? And how can teachers be culturally and educationally prepared to put these tools to ends commensurate with their national and school cultures? These and similar questions should be taken into account by those involved in ICT implementation in developing countries.

Note:

The word "computer/computers" in Arabic often refers not only to computers but their related technologies (software, Internet, etc.). Therefore the word "computers" in the questionnaire refers to ICT in general.

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Information Literacy Skills Course delivery through WebCT: The University of Botswana Library experience

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ABSTRACT

The use of Course Management Systems such as WebCT and Blackboard for teaching information skills is not new. Many libraries in higher education institutions have designed user-education programmes using electronic media, including WebCT. The University of Botswana bought into this initiative because of the need to address the problems of large classes, assessment of students in relation to large number of scripts to mark, shortage of staff, timetable clashes, and the need for consistency in delivery of content. The implementation of the pilot by the library started in 2003 with the first year social science students. This paper shares the library's experiences during implementation.

Keywords: Southern Africa; WebCT; information literacy; e-learning; library.

BACKGROUND

Hadengue (2004) describes online learning, as an educational concept, which implies using local, extended networks, or the Internet to spread information, to communicate, and to support any other kind of educational interaction between students and teachers. It is the effective learning process created by combining electronically delivered content with (learning) support and services (Waller and Wilson cited in Wang and Hwang, 2004). Other terms in use for this concept, according to Hadengue, include e-learning, virtual learning, distance learning, and tele-learning.

E-learning strategies according to Hadengue, offer a larger amount of information than traditional courses as well as easier access to that information. Both controlled information sources (i.e. provided narrowly by the teacher's text book) and open information sources are available in parallel. It thus opens the way to greater diversity in the learning process through which the student masters the information provided.

E-learning is becoming the way to go if student-centred learning is to be encouraged and if education is to be made available to all irrespective of location and status in the society. E-learning has captured the attention of many in the last couple of years. It arose as a result of the development of Internet technologies, especially the Web. E-learning is said to be an innovative way of learning suited to meet today's learners' learning requirements, particularly as the industrial economy evolves into a knowledge-based economy. It is sometimes referred to as a revolution in learning (EU-Asia e-Learning, 2003). As noted in the second issue of Manchester Metropolitan University (2002) Library News, e-learning initiatives are mushrooming as the use of Content Management Systems like WebCT expands across all the University Faculties. Other term in use is Course Management Systems. This, according to the Library News signals the beginning of changes in approach to teaching and learning, as online modules are used either in supporting and supplementing traditional courses and teaching models, or as completely self-contained courses, accessed both on and off campus.

Benefits of e-learning to libraries

Course management systems such as WebCT and Blackboard (courseware) according to Machovec (2001), have the potential to leverage the rich array of electronic resources and newer library services that are now becoming popular. According to Shank and Dewald (2003), the benefits include the ability to distribute resources (such as research guides and websites), extra communication tools, and a potential medium for assessment. Other benefits, according to the authors, include the possibility of adding resources into the university's general courseware interface, including links to the OPAC and databases, global pathfinders, a virtual reference desk, and document delivery services. Virtual reference services are especially ideal for course management systems (Machovec, 2001). This possibility of being able to promote library resources through the courseware is particularly beneficial to not only the on-campus student but also students who cannot come to the campus or the physical library. Hadengue (2004) identified e-learning strategies in use, in libraries, to include providing online content for improved information searching and management. One model is using new information and communications technologies for information (e.g. providing timely online help to users). Course management systems can also be used as a library training tool. For example, according to Hedengue (2004), a web-based user's guide designed as a training course with progressive levels may be seen as using new information and communications technologies (e.g. Course Management Systems) for learning. This strategy offers a unique opportunity for librarians to collaborate with university teachers, to offer courses tailored to end-users, and to provide professional tutoring in information literacy (Hadengue, 2004).

Stubbings and Brine (2001) particularly reported a growing perception among librarians of the need for students in Higher Education (HE) to enhance their information literacy skills. Literature attributed this to several factors such as increase in student numbers; students with different levels of skills; changes in learning and teaching practices that place a greater emphasis on student centred learning; a decrease in library expenditure, resulting in more students chasing less resources; and an increase in the availability of electronic information that has led to the need for students to have greater critical and evaluative skills (Ray and Day, 1998; Brown and Gibbs, 1996; and Brophy, 1993 cited in Stubbings and Brine, 2001).

Benefits of e-learning to users

On user benefits, the use of e-learning systems allows learners to access modules independent of place and time. Learners who prefer support can also access modules in self-paced laboratory sessions with the assistance of an instructor; while learners who have attended face-to-face sessions can use these modules for review and reinforcement (Harris and Fletcher, 2002). It, also, according to Wang and Hwang (2004) enables users to submit and retrieve information and incorporate collaborative tools like chat, threaded discussions, email, white boards, Internet links, etc. Further, it can help users keep track of learning progress, download and upload learning materials, and link to relevant resources.

Use of e-learning systems in some libraries

Literature points to a situation where many libraries in higher education institutions have designed user education programmes using electronic media (Wade, n.d.). The Texas Information Literacy Tutorial (TILT) developed by the University of Texas is one example of an on-line tutorial (Wade, n.d.). The University of Wisconsin-Parkside Library developed a web-based information literacy tutorial consisting of a set of modules and quizzes managed through WebCT (University of Wisconsin-Parkside, 2002). In developing the library's web pages, the library was assisted by "…Instructional Technology Support staff, including a graphic designer and a curriculum specialist." (University of Wisconsin-Parkside, 2002). The Steve Biko campus library of the

Durban Institute of Technology (Kromberg, 2002) also employed the online learning concept using WebCT. At the Selly Oak campus of the University of Birmingham, information services (IS) staff provided face-to-face ICT component of the core skills module, teaching 5 sessions for each group plus a test under examination condition. This was however found to be extremely resource intensive. In 2001-02, the IS and academic staff jointly decided to replace the tutor-led credit-earning core skills module with a WebCT course to address the learning and resource issues, allowing the students to work through materials as self-paced learning. This also allowed opportunity for IS staff to develop their skills and knowledge in the use of WebCT (Fratus and Woodcock, 2003). Reynoids, Curl, Mai, and Smith (2003) also reported that their institution took full advantage of WebCT course management software in its information strategies course. The course initially adapted the conventional linear format used in the classroom but later had "to deconstruct and reconstruct the course for" online delivery. And with the WebCT course management software, the instructors were able to integrate assignments, tests and self-tests, discussion via bulletin boards and chat rooms.

THE UNIVERSITY OF BOTSWANA (UB)

The University of Botswana (UB) recently made a major investment in a course management tool, the WebCT, as part of the integration of information technologies to support flexible teaching and learning. The University recognizes the need for a paradigm shift in the way teaching and learning is conducted towards producing a student who is…"independent, confident, self-directed, critical thinkers…" (University of Botswana Vision, nd). The University believes that online learning can help achieve the university vision, and it has therefore, become an integral part of teaching and learning.

Educational Technology Unit (EduTech) in the Centre for Academic Development (CAD) of the University of Botswana is charged with the responsibility for the promotion of this concept. Therefore among many of its activities such as organizing workshops and training of academics in the use of various ICTs, is the introduction of e-learning into the traditional methods of teaching and learning. E-learning is defined as "the appropriate organization of information and communication technologies, for advancing student-oriented, active, open, and life-long teaching-learning process" (Thurab-Nkhosi, 2003). Towards the end of 2002, EduTech sent out invitations for submission of proposals for e-learning pilot projects. The invitation was extended to all faculties as well as the Centre for Continuing Education (CCE), Communication and Study Skills Unit (CSSU) and the Department of Library Services. E-learning pilot projects were intended to achieve the following (University of Botswana, 2002):

- Test and develop best-practice models and approaches in the University and wider Botswana context

- Build up successful representative role models across the campus

- Create an experiential awareness of the issues and advantages of e-learning, and

- Create a written analysis of our collaborative learning

EduTech considered a number of criteria in assessing each proposal submitted. These include:

- The possibility of linking areas covered by the proposal to academic areas, which might become strategic roll-out areas

- The proposals' representation of various models of development

- Its representation of development levels of students' maturity and computer literacy; and the demand for the course

- Its representation of the different rationales for using e-learning such as benefits to students, lecturers and/or to the institution

- The project's feasibility and possibility of whole level of course being offered using e-learning

- Possibility of identifying a content expert who would be trained and be part of a multi-disciplinary approach that could include an editor, instructional designer, online media developer, graphic designer

There were more than seven proposals submitted, out of which five were approved.

RATIONALE FOR THE LIBRARY'S PARTICIPATION

The problems with negotiating time for the Information literacy Skills (ILS) delivery, the increases in students' enrolment resulting in large classes for both the GEC 121 and 122 (the two compulsory GEC-2 courses, see explanation below), and the desire to foster partnership between librarians and academics underscores the library's participation in the e-learning pilot project.

The University of Botswana Library (UBL) has had a long history in offering user education (Lamusse, 1992; Lumande, Mbambo, and Roselle 1996; Mbambo and Roselle, 1999; Roselle and Mbambo, 1996). It has been offering orientation to its first year students, and bibliographic instructions, to senior students. This required that the library staff negotiate with course teachers for time to teach information skills beyond how to use particular information resources. Initially, this was done at an informal level, and therefore not all departments were participating. This changed into a formal, examinable two-credit module, integrating information literacy skills with computing skills, under the General Education Course (GEC) area 2 (Computing and Information Skills) courses in 2002, and was made mandatory for all first year students. Students are required to take two modules: GEC 121 and GEC 122 - Computing and Information Skills Fundamentals I and II. However, the advent of GEC coincided with the increases in students' enrolment which resulted in large classes for the two compulsory courses, and the desire to foster partnership between Librarians and academics, which now more than ever before had become necessary as the library strove to become a learning resource centre. In order to actualize the UB's vision it was necessary that Librarians and academics work together to equip the students with knowledge in their chosen fields, and also to teach them how to learn independently. Participating in the e-learning pilot project as well as being active members of University of Botswana e-learning (UBel) Committee was seen as promoting this learning resource centre concept of partnership with teaching staff. University of Botswana Library (UBL) was keen in taking advantage of the virtues or positive attributes of e-learning as a direct response to one of the UB's vision aspirations of "developing a student-centred, intellectually stimulating and technologically advanced teaching, learning and research environment."

The pilot project focused on the social science students who were already part of the e-learning project for computing component of the GEC-2, and would thus have undergone instruction on how to use WebCT before the Information Skills component commenced. The library assumed that most students stayed on campus and would, therefore use computers in the computer laboratories, and the library. It was also assumed that part-time students would have Internet access at their work places, with a few students having Internet access at their homes.
The UBL in its project proposal admitted that information literacy skills are fundamental to the students' academic life on campus as well as adult life, being part of the "life long learning"

process. UBL also acknowledged the paradigm shift taking root at UB within a "…technologically advanced teaching…environment" (UB Vision). This further suggests the need for information skills tenets and ideals.

Secondly, as the world becomes increasingly globalised and the technological information expands, a non-information literate person is likely to find the variety of information sources and quantity of information overwhelming and threatening. The ability and skills, therefore, to access a variety of information sources by employing all available ICTs and evaluating them for accuracy and relevance, is important during ones academic life, in the workplace and above all as the foundation upon which the concept of democracy (Botswana Vision 2016) is based and thrives.

Information Communication Technologies have been identified as the way of the future and to that extent UBL has pioneered many new IT based resources for the benefit of customers. Currently, UBL programmes and services employ ICT for: technical processing using Innovative Interface Library Software called INNOPAC, communicating with customers, and provision of services via Internet, e-mail and cd-roms. E-learning mode would add another feature to life-long and open learning by addressing the problems of delivering to dispersed and large numbers of students.

The objective of this paper however, is to share the library's experience with other libraries that might want to deliver information skills course through the use of WebCT.

The Project workflow

Seven subject librarians formed the e-learning pilot project team (subject matter experts, SMEs) for the library. The team was responsible for completing the EduTech "Proposal form for an e-learning Pilot in 2003" following the approved guidelines.

The workflow paired the e-learning team with an instructional and a graphic designer in the design stages. The team attended a number of training workshops in which it learnt how to use the WebCT software. One of these is 'Introduction to e-learning', which was in two parts: Part 1: Principles of e-learning and Part II: Planning for e-learning. Two members of the team were also trained on web design using Microsoft FrontPage and how to use it to deliver materials to WebCT. The project team as content experts had several planning meetings with the CAD Instructional and Graphic Designers.

Development Process

The project development started in January 2003 and ran until June 2003. The actual implementation started in August 2003 of the first semester of 2003/2004 academic year. The development was aimed at advancing instructional technology's three main benefits which are enhancing course content, making education accessible and creating new interactions. This was done in three parts*:*

- Course preparation

- Course production and

- Implementation

Course preparation

During course preparation, the curriculum components (for GEC 121) in the traditional mode were assigned to e-learning team members to adapt to the online style. The components included:

- Concept of information

- Organization of information

- Information access tools (which later changed to 'Finding information')

- Reference sources, and

- Periodical literature

In response to the instructional designer's advice, previous materials on each of the components were "deconstructed and reconstructed". The instructional designer also suggested restructuring the presentation of each component as follows:

- Objective

- Introduction

- Content

- Summary

- Links / References

- Self test / Lab assignments [where applicable]

Accordingly, each component started with clearly stated learning objectives. This was followed by a brief and concise contents (to avoid continuous scrolling on the scrollbar) presented in the form of conversation as against the free flowing prose of lecture notes being given out to students. It also included relevant hyperlinks (many of which were in-text but not too many so as not to take the students completely away from the subject at hand) and references (for further reading). The team also received assistance on how to set quizzes and self-tests.

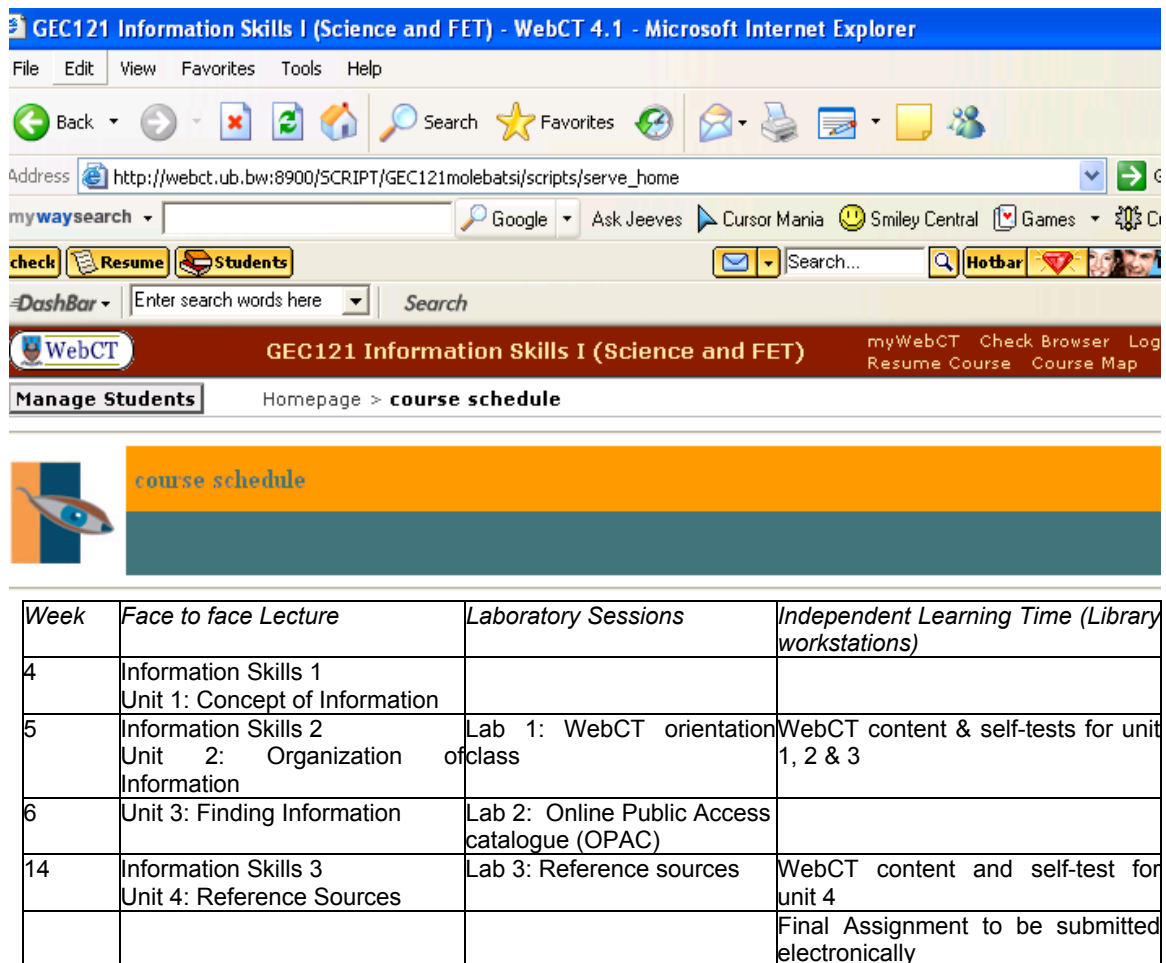On the suggestion of the Instructional Designer, the team came up with an "anchor", a story line character, serving as instructional guidance throughout the online course to introduce the information skills component of the programme. This character enhanced students' identification with the ILS course. This is a "muscled" book, symbolising that "Information is Power".

*Diagram 1: **Muscled Book***

Course production

The team discovered that the online course design was still like the design of face-to-face instruction. This is because instruction was still based on course goals and learning outcomes. The course schedule still reflected a balance between the amount of instruction needed to meet the goals of the course and the time available. The essence, it seems, was to create a virtual classroom where students did not need to rely on face-to-face interaction with the instructor to learn the content. The course schedule was therefore designed to accommodate the two modes (figure 1).

Week	Face to face Lecture	Laboratory Sessions	Independent Learning Time (Library workstations)
4	Information Skills 1 Unit 1: Concept of Information		
5	Information Skills 2 Unit 2: Organization of Information	Lab 1: WebCT orientation class	WebCT content & self-tests for unit 1, 2 & 3
6	Unit 3: Finding Information	Lab 2: Online Public Access catalogue (OPAC)	
14	Information Skills 3 Unit 4: Reference Sources	Lab 3: Reference sources	WebCT content and self-test for unit 4
			Final Assignment to be submitted electronically

Figure 1: *Course Schedule*

The production of hypertext mark-up language (html) content pages involved the conversion of content from Microsoft Word format to html using Microsoft FrontPage. The online course thus consisted of the following parts: welcome page, information pages, and content pages, which included interactive self-tests per module and a communication area. The placement of the course on WebCT involved designing the logo; welcome page, standard html template for the

course content pages; inserting graphics, production of html content pages, uploading of html pages to the WebCT platform and restructuring of the html pages in WebCT.

The Instructional and the Graphic designer from CAD were very instrumental to the final design of the online course. They helped in designing the logo, the html template, the welcome page as well as all the graphics that illuminated the online course. Two members of the team (who had been trained) participated in the production of the html content pages, and uploading of the pages to WebCT. See figures 2, 3, and 4 depicting the homepage as it appears in WebCT.
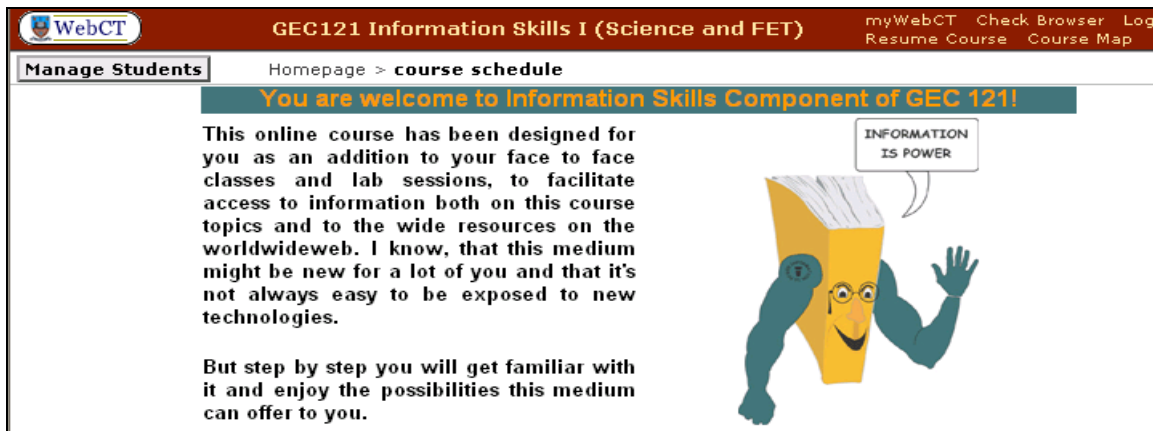

Figure 2: *Top section of home page*

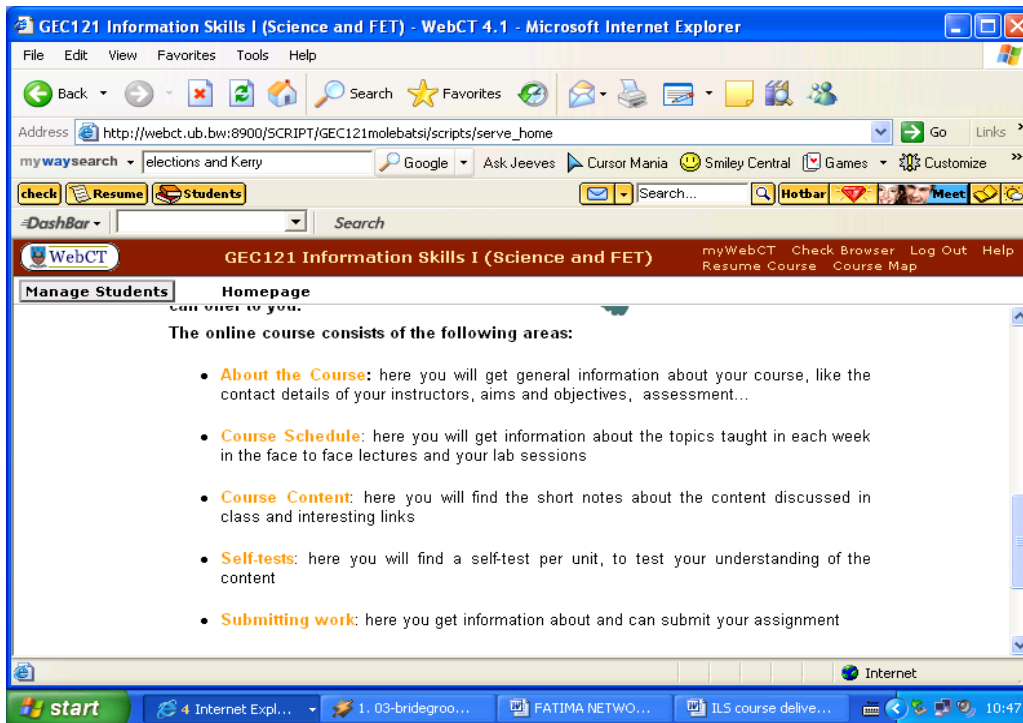**Figure 3:** *Middle section of homepage*

Figure 4: *Bottom section of homepage*

All members of the library e-learning team subjected the product at every stage to some rigorous scrutiny before it could be finalized. Having finalised the materials, they were uploaded on WebCT and made available to all library senior staff for their comments using passwords and a common user name provided by the Instructional Designer. The e-learning team looked into the comments, and agreements were reached on what needed to be changed in line with comments received.

Preparation for Implementation

Prior to implementation, the project team had two meetings with the Social Science subject team members, who were to deliver the course, to explain the project to them so that they could own the course. They were briefed on what was expected of them and asked to further study the course schedule and content. They were given opportunity to ask questions on areas they did not understand. At the meeting, it was emphasized that social sciences students had to be introduced to the WebCT course and all the units and self test quizzes. In addition, it was explained that the social science students had to do their OPAC exercises in the laboratory using WebCT course materials.

Implementation

In implementing the online course, the team seconded one of its members to join the four members of the social science teaching team (instructors) to ensure that the implementation schedule was adhered to, and that problems were reported promptly. The total number of students who took the course was 750. WebCT was again introduced to the Social Sciences

students in the first week of teaching. The course was allocated one hour for face-to-face delivery of the theory and two hours for laboratory session per week. The first hour of each laboratory session was spent on demonstrating access to WebCT and hands-on practice, and the second hour for laboratory assignments, through WebCT.

THE CHALLENGES

Online course delivery is new to UBL; the library was therefore faced with three major challenges. These include: the selection of the project team, conforming to the rules of writing for online course delivery, and style of instructions delivery.

Project team selection

The library practices a version of subject librarianship, in which each librarian (except for the librarians in the Resource Management and Customer and Extension Services divisions) is responsible for a cluster of subjects (say two to three subjects) one of which must be his/her subject background. Based on this, a group of librarians services the information needs of a particular faculty in the university thereby constituting a subject team. Each of these groups is also responsible for the Information Literacy Skills instructions under the GEC area 2 programme of the university. The library management however, discovered that none had experience in online course delivery. Although, some were quite literate in IT applications and also have knowledge of web design, these skills did not cut across all librarians in all the faculties represented in the library. Some were also not comfortable with teaching credit-earning ILS under the new semesterised system. The management also noted that only the students from the Social Sciences faculty would be taking part in the pilot project and would require involvement of a member of the subject team. With all the above taken together, the library management was faced with what to consider in constituting the project team.

One of the policies of the library however is that all librarians must be equipped to function effectively in a learning resource centre for which the library management has committed itself. It was therefore decided that: all identified staff with IT skill and knowledge of web design must be part of the team; and that at least each subject team must be represented, one of whom must come from the faculty where the project is being piloted (i.e. Social Science). And having been advised of the wisdom in having a small number of individuals constituting any project team, the library management succeeded in selecting seven librarians into the team. The members of this team were expected to cascade whatever they learnt through the project to the team, which the library management intended to constitute to handle the GEC 122 pilot project. As at the time of writing this paper, a team had been constituted for this purpose, which included two members of the first project team.

Writing for online course delivery

One of the skills required is how to write for online course delivery especially one that would cater for distance learners, a group to which the library is also committed to serving. Although about three of the team members have taught in secondary schools prior to joining the librarianship profession, with one or two having background in education, none was equipped with this vital skill, except for a two-day writing workshop organised by a staff of CCE, which some members of the team were fortunate to attend. All the team members were only familiar with the free flowing narrative way of writing lecture notes rather than the interactive style. Unfortunately, the library also had nothing to fall back on; as such online courses (i.e. for Information Literacy Skills) are not freely available on the Internet. For the team to produce appropriate online teaching materials therefore, the instructional and graphic designers had to be invited. The library had no problem

getting the services of these experts since the CAD had promised support for the project. These two UB employees belonged to CAD.

Notwithstanding the availability of the experts, the assistance they could render was found to be limited. The assistance was limited to the advice on the appropriate structure and style of presentation of materials, the need for the materials to be interactive, and also the need for brevity. The team had to grapple with putting into effect this style of presentation of contents as explained to the team by the instructors i.e. the need for a preamble, the kind of leading questions to ask, and the need for the contents to be presented in an interactive manner, a skill, which requires experience probably from years of creating online course for distance learners. The team tried but was limited by the lack of such experience. The ILS tutorial on WebCT of the Edge Hill library (Lancashire, UK) availed to UBL by the Edge Hill library however provided a useful reference point.

Course delivery

All the members of the team were familiar with face-to-face course delivery, where communication with students is instant, assessments are either carried out through tests in class or through take home assignment, and students' participation can instantly be monitored. Course delivery online was therefore a challenge, particularly online assessment, online communication with students, and the need to constantly monitor student's participation online. The team carried out online assessment for the theory with guidance from the instructors but not for the practical exercises. The team agreed to suspend online communication with students until such a time the library is sure that staff would be able to cope with the frequency with which they would have to respond to emails from students. The team also considered in this case the rising population of the first year students, and the likelihood of the second and third year ILS courses starting soon.

The instructors however, noted that the students were not accessing WebCT in sufficient number. numbers. The students were said to have complained that library computers were never available as Personal Computers were always occupied and that computer labs were always in use for formal classes which made it difficult for them to do independent learning using the computers. Their concern was that UB computing infrastructure was not yet suitable for online learning.

Similarly, the instructors themselves observed that due to the shortage of computing facilities, students ended up seeking help from the instructors and that this took a great deal of the instructor's time. This was particularly so when students had been given tasks to complete. They noted that a good number of library computers were not working. Sharing of computers was also said to be common among students. The instructors also reported limited support from the library systems unit, as well as constant server breakdown.

CONCLUSION AND RECOMMENDATIONS

The WebCT could no doubt be used to address many challenges of instruction delivery. However, it requires adequate planning, which must address the logistics of implementation. Prior to implementation, it is important to assess the adequacy of facilities. The university would need to put in place a system that ensured that students in general have adequate access to computers, even if it meant keeping the departmental computer laboratories open for 24 hours.

It is also essential that both the instructor and a select number of students be involved in the course development from an early stage to the testing phase so that they can feel at ease with the course delivery through the WebCT. It is equally important to involve them in the evaluation

process because student's rejection or acceptance of the on-line course may hinge on the way the instructor presents the material.

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eSagu [1]: An IT based personalized agricultural extension system prototype – analysis of 51 Farmers' case studies

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ABSTRACT

To bridge the information gap between the agricultural expert and the farmer, International Institute of Information Technology (IIIT), Hyderabad has built the eSagu ("Sagu" means cultivation in Telugu language) system, which is an IT-based personalized agricultural extension system to improve agricultural productivity by disseminating a fresh expert agricultural advice to the farmers, both in a timely and personalized manner. In e-Sagu, the agricultural experts generate the expert advice based on the information about the crop situation received in the form of both text and digital photographs. In Kharif[2] 2004, a prototype was developed and implemented with 1051 farms. In the prototype, a team of agricultural experts stayed at IIIT, Hyderabad (India) and delivered 20,000 pieces of agricultural expert advice to 1051 cotton farms of three villages (Oorugonda, Gudeppad and Oglapur) in Atmakur Mandal of Warangal district in Andhra Pradesh state, India, by looking at digital photographs and other farm information supplied by some educated and experienced farmers (coordinators) in these villages. The pilot project was implemented successfully. In this article, an analysis of 51 registered farmers' regarding compliance of advices and corresponding effect is reported. The following of expert advice on pest and disease management and IPM practices were analyzed by giving appropriate scores based on their effect on yield and input cost. The analysis showed that about fifty percent of farmers have followed the practices which increase yield and reduce input cost. A high positive correlation (r=0.46**) was observed between the compliance rate and the yields. Though some farmers obtained same yield as the farmers who have followed the advices, their input costs were significantly higher.

Keywords: eSagu; ICT; human capital; T&V System; knowledge system; information system; factor analysis.

INTRODUCTION

Indian farming community is facing a multitude of problems to maximize crop productivity. In spite of successful research on new agricultural practices, the majority of farmers is not getting upper-bound yield due to several reasons. One of the reasons is that expert/scientific advice regarding crop cultivation is not reaching farming community in a timely manner. It is true that India possesses a valuable agricultural knowledge and expert advice. However, a wide information gap exists between the research level and practice. Indian farmers need timely expert advice to make them more productive and competitive.

> To bridge the information gap between the agricultural expert and the farmer, International Institute of Information Technology (IIIT), Hyderabad (http://www.iiit.ac.in) has built the eSagu ("Sagu" means cultivation in Telugu language) system (http://www.esagu.in), which is an IT-based personalized agricultural extension system to improve agricultural productivity by disseminating a fresh expert agricultural advice to the farmers, both in a timely and personalized manner (Reddy and Ankaiah, 2005, Reddy et al.2004). In e-Sagu, the agricultural experts generate the expert advice based on the information about the crop

situation received in the form of both text and digital photographs. These photographs are sent by some educated and experienced farmers in the village. In 2004, a prototype of 1051 cotton farms was developed and implemented. In the prototype, a team of agricultural experts has stayed at IIIT, Hyderabad (India) and delivered 20,000 pieces of agricultural expert advice to 1051 cotton farms of three villages (Oorugonda, Gudeppad and Oglapur) in Atmakur Mandal of Warangal, in Andhra Pradesh State, India, by looking at digital photographs and other farm information supplied by some educated and experienced farmers (coordinators) in these villages. The project was successfully implemented (Reddy et al. October 2005, Reddy et al, December 2005).

THE eSAGU SYSTEM AND ITS OPERATION

In eSagu, instead of agricultural expert visiting the crop, the crop situation is brought to the agricultural expert using both text and digital photographs. In eSagu the agricultural expert delivers the expert advice by getting the crop status in the form of digital photographs and other information rather than visiting the crop in person. In Figure 1, eSagu components are shown. eSagu contains five parts: (i) Farms, (ii) Coordinators, (iii) Agricultural Experts, (iv) Agricultural Information System and (v) Communication System. The system operates in the following manner (Figure 2). Several farms are assigned to each coordinator (an educated farmer in the village). The farmer of the corresponding farm registers into the system by supplying the relevant information including soil data, water resources, and capital availability through coordinator. The coordinator visits the farm on a weekly basis and sends the crop details in the form of text and digital photographs and feedback of previous week's advice through communication system (Internet or courier). By accessing the soil data, farmer's details, crop database, and the information sent by the coordinators, the agricultural experts prepare the advice. The advice contains the steps that are to be taken up by the farmer to improve crop productivity. English is the main language. The agricultural experts prepare the advice and store it in the system. The coordinators get the advice by accessing the system through Internet. The coordinator then explains the advice to the farmer gets the feedback and sends it to agricultural expert. All the information is maintained in agricultural information system which can be accessed through Internet.

Some of the advantages of the system over existing traditional system of extension are availability of a team of diversified experts at a single place, conservation of time, money and energy, enabling correct diagnosis of the problem, strong database to support decision-making, zooming facility adds an extra dimension, accountability to the farmer, capacitating of rural livelihoods and employment generation, documentation of success stories and content development, feedback helps to evaluate and improve the performance etc.

We now explain the components of the software system. Each farmer receives unique identifier (Figure 3). The farmers' background and the soil details are collected and stored in the system. For each farm, the history is also maintained (Figure 4). The history of the farm is a sequence of advices received by that farm and corresponding observation photographs. Figure 5 shows the case of crop observation photographs sent by the coordinator for one farm. Figure 6 shows the photographs of a filled-in feedback farm. Figure 7 shows an advice prepared by the agricultural expert.

The results show that it is possible for the agriculture experts to deliver the advice by seeing the crop information in the form of digital photographs and text information. The agricultural expert can more effectively deliver the expert advice as compared to the advice provided by visiting the crop in person. Because, in the proposed system several agricultural experts discuss the problem and prepare the appropriate advice. Also, the expert advice has helped the farmers to improve

input efficiency by encouraging Integrated Pest Management (IPM) methods, judicious use of pesticides and fertilizers.

The system has worked during the Kharif 2004. Each farm has received expert advice once in a week. In this paper, evaluation has been made to see the compliance rate by analyzing 51 registered farmers. Other aspects like e-sagu analysis, results evaluation, farmers' responses were included in the file attached as a supporting document entitled "The Application of ICT in Indian Agriculture – The case of eSagu Model of Web-based Agricultural Expert Advice Dissemination System".
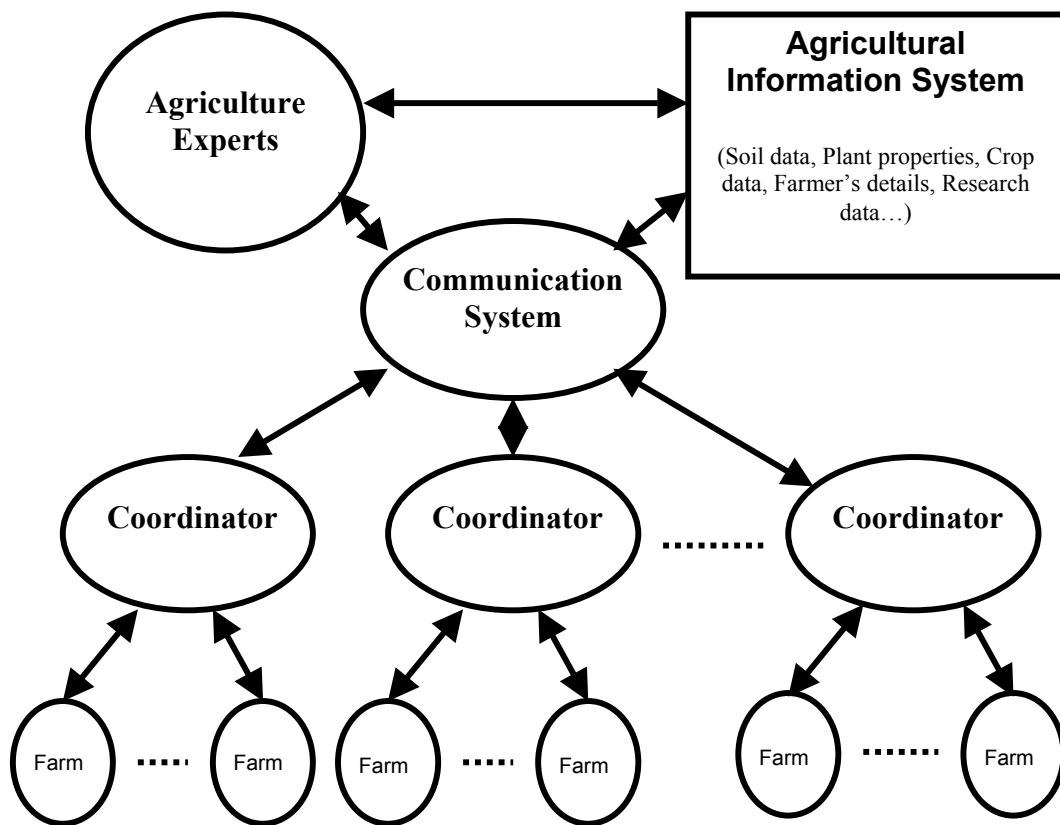

Figure 1. *Components of eSagu system. In this, a double arrow indicates information flow.*
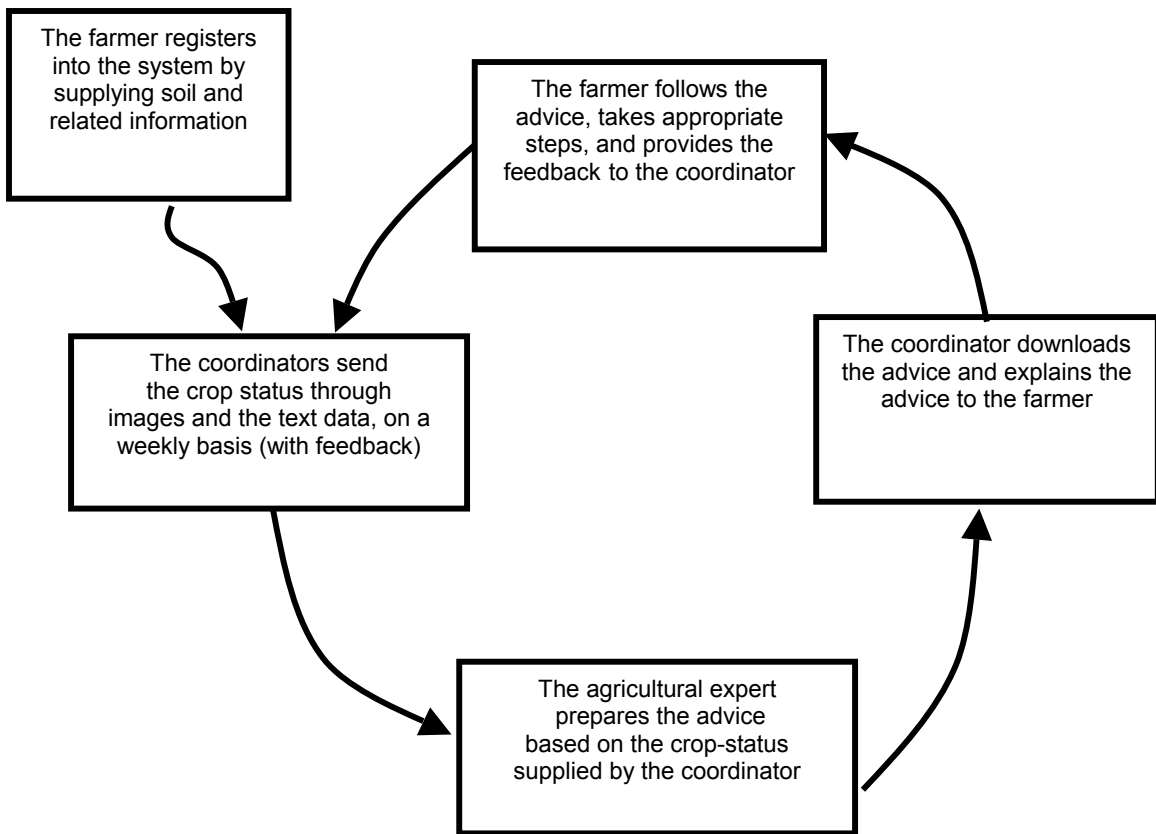
The farmer registers into the system by supplying soil and related information

The farmer follows the advice, takes appropriate steps, and provides the feedback to the coordinator

The coordinators send the crop status through images and the text data, on a weekly basis (with feedback)

The coordinator downloads the advice and explains the advice to the farmer

The agricultural expert prepares the advice based on the crop-status supplied by the coordinator

Figure 2. Depiction of eSagu operation

Figure 3. *List of farms (farmers)*

For each farm, the details such as the farmer's name, father's name, farm identifier, size of the farm (in acres), type of soil and water source are maintained. By clicking farm-id corresponding history is displayed.
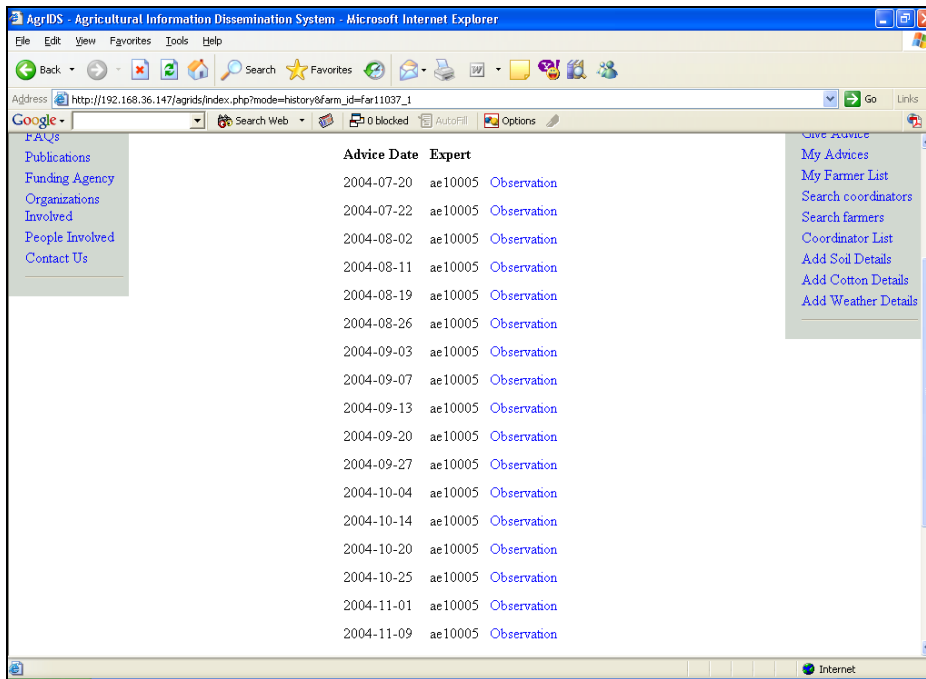
Figure 4. Farm history for one farm. By clicking "observation" corresponding photographs and advice is displayed.
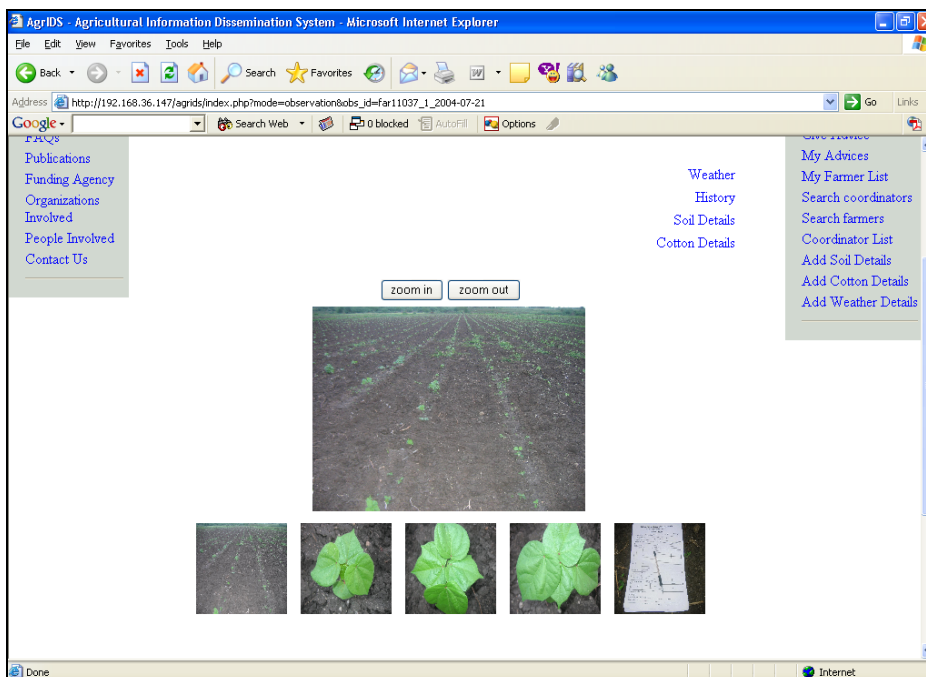
Figure 5. One instance of crop observation photographs. It contains four crop photographs and the photograph of crop observation (feedback) form. Each photograph can be zoomed.
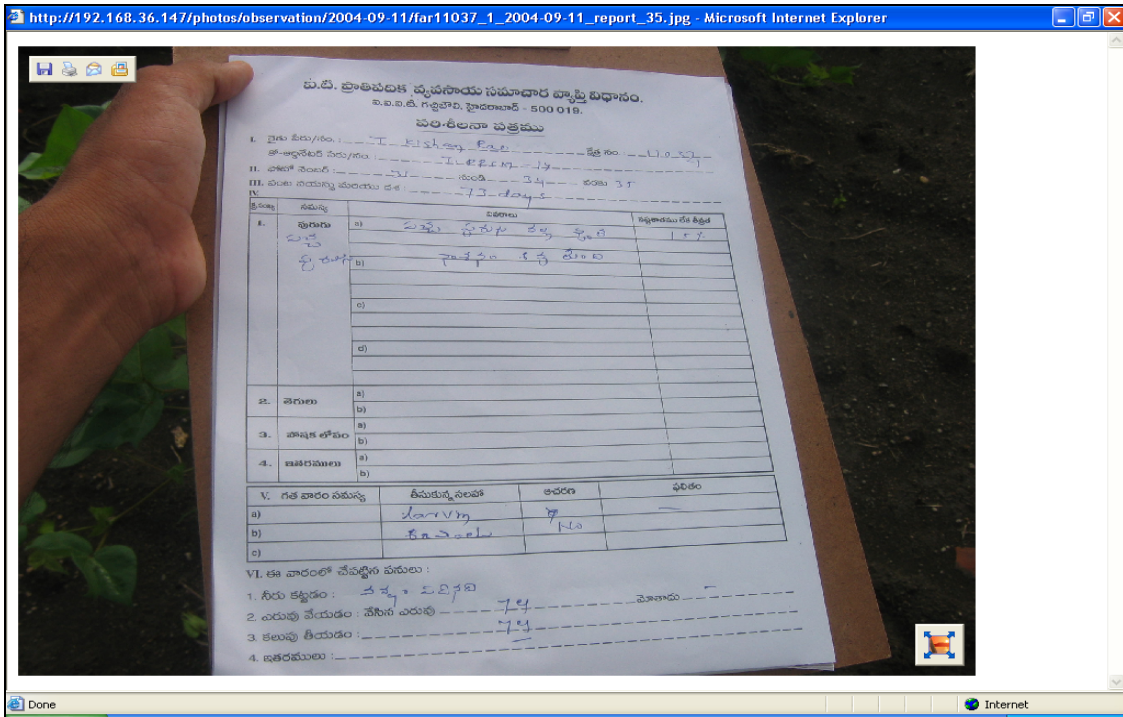
Figure 6. *Zoomed photograph of crop observation sheet. The details of pest, disease, deficiency levels, and the result of last week's advice is written by coordinator in Telugu language.*
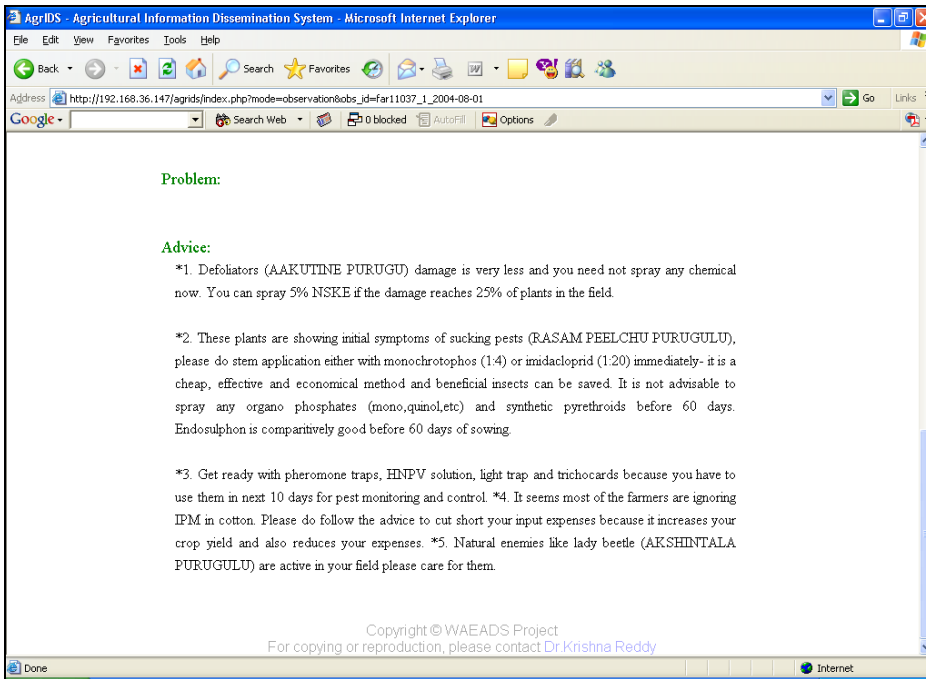
Figure 7. *A sample advice prepared by agricultural expert based on the crop observation photographs, feedback form and soil details.*

METHODOLOGY

Fifty one registered farmers of the project were taken to study their compliance rate on the advice delivered by the system. Compliance rate was seen for the farmers from their field observation sheet which was stored in the individual farm history. The project has the advantage of having farm history which includes the advice delivered and and corresponding feedback regarding steps taken. While evaluating the rate of follow-up some scores have been developed to see the rate of compliance and to make comparison between the farmers. As the cotton crop is pest prone, importance was given to insects and diseases management by making other factors like climatic and management aspects as constant. As the advice delivered has given to the area under the same geographical location there was less influence of rainfall and temperature on the follow-up studies. The management aspects like irrigation, weeding, fertilizer application and other inter-cultivation operations are not much varied among the studied farmers. So by making these factors uniform, the following of expert advice regarding management of major pests like American bollworm, spotted bollworm, sucking pests and grey mildew disease were taken as factors for analysis. It was observed that these factors had an influence on the yield and input to the farms. Farmers' data were taken as per their identifiers from the farm history for the whole cropping season.

Scores were allocated for each practice advised for specific pests, diseases and also their influence on the yield. Scores were also allocated to capture the degree of the advice follow-up. Any insect or disease which has a direct influence on the yield was given prime importance in giving scores.

Two kinds of scores were assigned: positive scores and negative scores. The factors which increase yield and decrease input cost were given positive scores and the factors which decrease yield and increase input cost were given negative scores.

Postive factors:

The factors included here are advice followed in control of helicoverpa, sucking pests, grey mildew, pink bollworm, and the number of sprays saved.

a) Helicoverpa control: One point was given for the each practice (either through organic or inorganic) to control helicoverpa. For example, if the farmer follows three pieces of advice for the helicoverpa control, he/she will get 3 points out of 5 (maximum value=5).

b)Sucking pests control: This year the effect of sucking pets on cotton crop was less in the project area. So, one point has been given for two pieces of advice followed to control the sucking pests.

c) Grey mildew control: During Kharif 2004, grey-mildew disease had an influence on the yield levels for most of the farmers. Maximum value for this factor is 4.

d) Sprays saved: This is the important factor in saving the money of the farmer. During the analysis it was observed the farmers have carried out several unnecessary sprays. So positive score is given for the factor "sprays saved".

The factor "*Sprays saved"* means the number of sprays that were not taken by the farmer, when expert advise mentions that the crop was fine. Otherwise the farmer would have gone for unnecessary spray. As this factor will have direct influence on the amount spent and maintaining eco-friendly ambience, maximum of 5 points have been allotted to this factor.
Negative factors:

The factors which decrease yield/increase input cost are considered as negative factors: These factors include, no sprays when required, unnecessary sprays, using high cost chemical in place of low cost one and repetition of same chemical.

a) Not spraying when required: This factor has due importance as it carries direct bearing on yield loss. This is the factor where farmer has not taken up spraying (either chemical or non chemical spray) when the expert has advised to do so. Maximum of five points have been allotted for this factor.

b) Unnecessary sprays: Unnecessary sprays means sprayings taken out by the farmer without need. Case studies of individual selected farmers show that, all the farmers without exception made many unnecessary sprays. These include three types of wastage
1. Low cost chemical sprays (LC): Include chemicals which cost up to Rs. 750/ha like monocrotophos, quinolphos, chloripyriphos, imadachloprid etc.
2. Medium cost chemical sprays (MC): Includes chemicals which cost up to Rs 1500/ha.
3. High cost chemical sprays (HC): Includes chemicals which cost up to Rs 2500/ha.

Negative marks, minimum one point and maximum 5 points, were assigned to this factor.

c) Using high cost chemical in place of low cost one: This includes advice which emphasizes to spray organic or low active ingredient chemicals for the pest control in cotton. For example when the expert advised to go for NSKE (Neem Seed Kernal Extract) for the control of helicoverpa eggs and first instars, many farmers have gone for tracer spray. In our case studies, often it was observed that farmers always prefer high cost chemicals to spray for their fields, which was not at all necessary. One score point has been given for each high cost chemical sprayed where the insect control can be taken care of by low cost chemicals.

d) Repetition of the same chemical: Repeated use of the same chemical is continuously for 2 to 3 weeks has been observed. Insecticides like indoxicarb + acetamiprid and spinosad were mostly used for this type of activity by several farmers. For each repeated spray one point was allotted.

Above factors like unnecessary sprays, using high cost chemicals and repetition of the same chemical bears negative impacts for both the soil and the environment. They do increase pest resistance and pest resurgence.

RESULTS AND DISCUSSION

A total of 51 case studies have been carried out to see the impact of advice indicated by scores and yield. Table 1 shows the positive and negative scores of different factors of all the studied farmers. The analysis for each factor is as follows.

Table 1: Details of factors and scores for 51 farmers

S.No	ID No.	Acres	Factors that increase yield/decrease input cost					Positive score	Factors that decrease yield/increase input cost						Negative score	Total Score	Yield/ acre	Variety - Bt/Non Bt
			Helico	GM	SP	IPM	Sprays saved		Not spraying when reqd	Unnecessary sprays			Using high cost chemical for low cost one	Repeated use of same chemical				
										LC	MC	HC						
1	10704_0	1	5	-	-	-	-	5	-4	-2				-1	-7	-2	5	Chitra
2	11113_0	3	5	-	-	-	-	5	-5	-				-1	-6	-1	5.3	Bunny,ganess
3	10761_0	5	5	-	2	-	2	9	-2	-1	-1	-1	-1	-1	-7	2	10	danno,Bt
4	11167_0	1	2	-		-	-	2	-3						-3	-1	4	Ganesh
5	10223_0	5	5	-	2	-	2	9	-2	-1					-3	6	10	Chitra,Bt
6	10884_0	2	5	-	2	-	2	9	-2	-2				-1	-5	4	9	Chitra
7	10866_0	2	3	-	4	-	3	10	-3	-1	-2				-6	4	8	Bunny,Bt
8	10234_0	2	-	2	3	-	3	8		-3	-2				-5	3	9	Chitra
9	10013_0	1.5	-	-	-	-	4	4	-2	-1					-3	1	8.6	Bt
10	10037_0	1	4	-	2	-	3	9	-1		-1			-1	-3	6	11	
11	`10482_0	1	4	2	1	-	2	9	-1	-1				-1	-3	6	10	Bt
12	10517_0	7	3	-	-	1	1	5	-3		-2			-1	-7	-1	8	Danno
13	10244_0	2	1	-	-	-	1	2	-1	-1	-1			-1	-4	-2	8	Brahma
14	10389_0	1	2	-	4	-	1	7	-1	-1				-2	-4	3	10	Satya
15	10042_0	1	2	-	-	-	3	5	-2	-1	-1	-1		-2	-9	-4	10	Danno
16	10178_0	7	1	-	-	-	5	6	-3						-3	3	8.2	Bt
17	10170_0	3	1	-	-	-	1	2	-1	-1	-1	-2			-5	-3	6	Mech-12
18	10196_0	1.5	-	-	-	-	4	4	-2	-1				-2	-5	-1	6	Viswanath
19	11016_0	1	3	-	1	1		5	-3					-1	-4	1	8.6	Amogh
20	11064_0	6	5	-	1		4	9	-3			-3			-6	3	8	Bt
21	11055_0	7	3	-	1		2	6	-5		-2		-1	-1	-9	-3	6.5	Dhanno,Bunny
22	11061_0	6.5	4	2	1		2	9	-2	-1			-1	-1	-5	4	10	Dhanno

23	11086_0	5	1		1	1		1	-3		-2	-2			-7	-6	10.4	Bt
24	11063_0	4	3		1		2	6	-2			-2	-2	-1	-7	-1	10	Rudra
25	11049_0	4	4		1		1	5	-2	-1		-2	-3	-1	-9	-4	8	Nanada,Bharat
26	11041_0	3	5		1		4	10	-1	-1		-3		-1	-6	4	10	Tulsi
27	11093_0	3	3		1		1	5	-1		-1				-2	3	10	Dhanno
28	11079_0	3	5	3	1	4	2	13	-1						-1	12	11	Dhanno
29	11094_0	2	3		1			4	-4		-2	-3			-9	-5	9	Ananth
30	11074_0	2	4		1	1		5	-2						-2	3	9	Atal,Dhanno
31	11037_0	2	4		1		1	7	-2		-3	-2	-1	-1	-9	-2	10	Bunny
32	11078_0	1.5	4	2	1			7	-1		-3	-1	-1		-5	2	10	Ananth
33	11077_0	1	4		1		3	8	-1		-2	-1	-1		-5	3		Dhanno
34	11095_0	1	3		1			4	-2		-1	-3	-2	-1	-9	-5	9	Dasera
35	11072_0	1	2		1			3	-5		-1			-1	-7	-4	8	Dhanno
36	10628_0	5	5	2	-		4	11	-3	-1	-				-4	7		Chitra
37	11113_0	3	2	1	-		4	7	-2		-2				-4	3	6	Bunny
38	10956_0	9	3	-	-		1	4	-4	-1				-3	-8	-4	8.2	Chitra
39	10624_0	2	3	-	-		1	4	-5		-2				-7	-1	8.8	Chandramukhi
40	11150_0	4	3	-	-			3	-2	-1					-3	0	8.5	Ganesh
41	10644_0	1	6	-	-	2	3	9	-4	-3					-7	2	8.2	Dhanno
42	10678_0	6	1	1	2	2	1	7	-4	-2					-6	1	7.1	Chitr
43	10627_0	7	1	-	2	1	1	7	-1	-1			-2		-4	3	10	Atal,Dhanno
44	10636_0	3	2	-	1		1	4	-3	-1					-4	0	8	Brahma
45	10228_0	1	1	1	-		1	3	-3	-2					-5	-1	7.2	Brahma
46	10231_0	3	-	-	-			-	-2	-2					-4	-4	8.3	Dhanno
47	10121_0	1	2	-	1			3	-1	-1			-2		-4	-1	8.5	Bunny
48	10133_0	2	2	2	-			4	-1	-	-1		-1		-3	1	9	Bunny
49	10142_0	1	3		-			3	-1				-1		-2	1	9	Bt,Bunny
50	10214_0	2	5		1			6	-1		-1		-1		-3	3	9.4	Bt
51	10366_0	3	2					2	-1	-1	-1	-1	-3		-7	-5	7.6	Dhanno

Analysis of factors

a) Helicoverpa control: As Helicoverpa is the major pest of cotton in this area, all the farmers have followed the expert advice for the timely and effective control of this pest. The scores assigned ranges from 1 to 5 indicate there were farmers who have taken up the control as per the expert advice.

b) Grey mildew control: Only twenty percent of the farmers have followed the expert advice for the control of grey mildew disease. This is mainly because there was notion among the farmers that spraying wet-able sulphur as per the advice for the control of mildew there would be flower drop in the cotton. So it has become very difficult to convince them to spray to control the same.

c) Sucking pests control: Sixty percent of the farmers followed the expert advice delivered on sucking pests. The score 1 for many farmers in this factor indicates that least importance was given to control this type of pests as per the advise delivered.

d) Integrated Pest management: The advice delivered in the project mainly emphasized the importance of IPM, even though only 10 percent of the farmers were involved in this activity for pest control. We observed that farmers are not aware of the importance of this factor in protecting the soil and environment.

e) Sprays saved: The project has successfully helped the farmers in saving the sprays when the crop was fine. The analysis shows that 70 percent of them were not taken up spraying when the expert advised crop was fine. It was found that 30 percent of the farmers have followed spraying activities irrespective of the advice and pest threshold levels indicating that there were many unnecessary sprays carried out by the farmers. Though 70 percent of the farmers saved sprays, scores (1 to 4) indicate only one or two sprays have been saved as per the advice. However, it can be observed that eSagu was successful in saving the unnecessary pesticide sprays. On an average 1.5 sprays have been saved under this project.

f) Not spraying when advised: The data set shows that all the farmers under case studies have not taken up some of the spraying activities when advised to do so. Our experiences with the farming community indicates that there were many reasons for this factor like poor economic condition of the farmer, due to lack of confidence on the delivered IT based advise, illiteracy, casual approach and attitude of the farmer etc.

g) Unnecessary sprays: It was observed that the farmers have taken up the unnecessary spays for the cotton crop irrespective of farm size. Ninety percent of the farmers have sprayed low cost chemicals unnecessarily more than once. Forty percent of farmers unnecessarily sprayed medium and high cost chemicals. The reasons include the lack of awareness on pest threshold levels, superficial knowledge of the farmers, dependence on neighborhood farmers etc.

h) High cost chemicals: The analysis shows that along with unnecessary sprays, farmers have got inclined towards the use of high cost chemicals like spinosad, thiometaxam etc, instead of low cost pesticides advised. Thirty percent of the studied farmers have showed this type of activity.

i) Repeated use of same chemical: Fifty percent of the studied farmers came under this category. We recorded indoxacarb as the main chemical comes under this category. Most of the farmers were unaware of the ill-effects like pest resurgence, secondary infestation etc. due to repeated use of the same chemicals.

Analysis of Scores

Positive scores: The scores of yield enhancing/input reducing factors according to the compliance status are the representative positive score factors of the given farmer.

Total negative scores: The total scores gained by adding all the scores of yield reducing /input cost enhancing factors according to the compliance status is the representative negative score of the given farmer.

Total score: Total score is the score obtained by combining both positive and negative scores.

Farmers with total positive scores:

Table 1 shows that out of 51 farmers studied, 53% of the farmers have got positive scores. This indicates that 53% of the farmers have taken up measures to control pests and diseases/lessen the input cost. Farmers with positive scores are the measure of compliance of the factors that increase yield /decrease input cost. This does not mean that they have high compliance rate. This indicates that these farmers have followed necessary sprays to control helicoverpa, grey mildew, sucking pest as per the advice. These farmers have less negative scores than positive, i.e., they seldom took up the practices which lessen the yield /increase the cost of input.

Farmers with total negative scores:

Lower scores less than zero indicates that these farmers have not followed the expert advice fully and taken-up the activities which decrease the yield and increase the input cost .These farmers have carried out unnecessary sprays, used repeated sprays and also not followed necessary expert's advice. Nearly 47% of the farmers are coming under this category (Table1). Some of the reasons for not following the delivered expert advice were farmers' egoistic nature, superficial knowledge of the farmers, lack of education to understand the scientific farming, dependence on the neighborhood farmers and pesticide dealers etc.

Scores and Yield:

It was observed that many farmers who got the total positive scores have also recorded higher yields. Scores may not represent the exact yield levels but have influence on them. There was a significant positive correlation was observed between the compliance rate and yields (r= 0.46**) and also between scores and yields (r= 0.40*) (Table 2).

Less scores and High yields:

Many farmers (approx 20%) in spite of having negative scores have also recorded higher yields. Farmers under this category though got higher yields but the input costs were much higher than the positive score farmers with same yields. So it can be concluded that a farmer with 10q/ac yield with a score 6 (far 10223_0) has spent much less input cost than the farmer with same 10q/ac yield with -4 score (far 10042_0) (Table 1)

Compliance rate and scores

It was observed that there was a positive correlation exists between compliance rate and scores(r= 0.57**). Majority of the farmers who have got >10q/ac yield, recorded a compliance rate ranging from 40 to 75 %.

The study indicates that advise delivery has some influence on the higher scores development. It has observed that inspite of giving weekly advice for crop management we have recorded almost 50% of the farmers have negative scores. This factor needs further studies.

Table 2: Scores and Compliance Rate

No	Percentage of Advice Followed	Scores	Yield (quintals/acre)
1	50.0	6	10.0
2	50.0	4	9.0
3	55.0	4	8.0
4	40.0	6	11.0
5	40.0	6	10.0
6	75.0	3	10.0
7	30.0	3	10.0
8	40.0	3	9.0
9	33.0	3	8.6
10	38.0	3	8.2
11	21.0	-2	5.0
12	30.0	-2	5.3
13	20.0	-1	4.0
14	35.0	-1	8.0
15	55.0	-2	8.0
16	40.0	-2	10.0
17	13.0	-3	6.0
18	20.0	-1	6.0
19	47.0	1	8.6
20	27.0	3	8.0
21	38.8	4	10.0
22	27.7	4	10.0
23	37.5	3	10.0
24	70.5	12	11.0
25	15.3	3	9.0
26	44.4	2	10.0
27	35.2	3	9.0
28	25.0	-3	6.5
29	23.0	-9	10.4
30	27.0	-1	10.0
31	38.0	-4	8.0
32	26.1	-5	9.0
33	38.8	-2	10.0
34	22.2	-5	9.0
35	11.7	-4	8.0

IMPLICATIONS OF THESE CASE STUDIES

The study shows that:

a. The project eSagu had some influence on building the farming knowledge of cotton farmers;

b. Positive correlation existed between compliance rate and yield of the cotton;

c. On an average 50 % of the farmers studied showed a good follow-up with positive scores;

d. Unnecessary sprays, using high cost chemicals for low cost, repeated use of the same chemical were some of the unwanted practices followed by the farmers observed under the study.

Endnotes

[1] eSagu is a registered trademark of International Institute of Information Technology, Hyderabad (India).

[2] *Kharif* is the crop growing season in India from June to November.

r denotes the correlation coefficient

* * indicates significance at 1% level of significance or 99% confidence interval

* indicates significance at 5% level of significance or 95% confidence interval

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Commitment or Public Relations? A Review of *Empowering Children: Children's Rights Education as a Pathway to Citizenship*, R. Brian Howe and Katherine Covell, University of Toronto Press (0802038573, $45.00, £28.00), 28 May 2005.

Review by Ed Brandon
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Here we have an issue in development, potentially one of the most far-reaching that can be seriously considered, and one that will require extensive and unavoidable educational action. For readers of this journal, the book does not, however, invoke ICT – apart from a couple of remarks to the effect that a government's putting some material on a web-page is hardly an adequate fulfilment of its responsibilities in this area. But ICT-enhanced educational activity can certainly form a significant part of any adequate response, so perhaps we should look more closely.

For one outside the children's rights arena, perhaps the most striking fact Howe and Covell report is the near-universal ratification by members of the United Nations of the 1989 Convention on the Rights of the Child <http://www.unhchr.ch/html/menu3/b/k2crc.htm> (apart from two rogue states, Somalia and the United States of America, that have only signed it – full details are available at <http://www.unhchr.ch/pdf/report.pdf>)[1]. Ratification, as Howe and Covell explain, means that "states parties officially committed themselves to a policy of recognizing and implementing the rights of the child, not merely to aspiring to practise children's rights. Ratification constitutes a legally binding commitment, obligating states parties to bring their laws, policies, and practices into line with the standards set out in the Convention" (p. 25). The British, it is said, acquired their empire in a fit of absence of mind; one wonders whether the 192 ratifiers of the 1989 Convention were similarly afflicted: serious endeavour to undertake, or even to publicize the nature of their legal commitments is surprisingly hard to discern.[2]

Publicity is certainly required, for the Convention adopts a way of thinking about children (i.e. persons below the age of 18 years) that is by no means widely accepted or understood. I would guess that the normal reasonably enlightened view is a version of the "assumptions about parental rights and state paternalism in regard to children" (p. 26) that Howe and Covell see rejected by the Convention in favour of a view that "it now is children who have fundamental rights, and it is parents, adults, and state authorities who have obligations to respect and provide for those rights" (p. 26), rights that will be implemented in age-appropriate ways ("in a manner consistent with the evolving capacities of the child," Article 14). Related to this, Howe and Covell contrast a view of children as "becoming-citizens" or "not-yets", on the way to acquiring full status in the community, with children as "being-citizens", already citizens with definite rights. The Convention recognises both aspects (p. 62), but again I suspect most people would not venture far beyond what is appropriate for "becoming-citizens".[3]

Education is then needed, not only for the children, but for the adult populations whose views have largely been superseded by the framers of the Convention. It is mandated by Article 42: "States Parties undertake to make the principles and provisions of the Convention widely known, by appropriate and active means, to adults and children alike." But, given that a primary concern for at least part of childhood is with education in some sense or other, the very rights allotted to children by the Convention speak centrally to a right to education (Articles 28 and 29), and, as Howe and Covell argue (p. 29ff), several other articles implicitly require or impinge on educational action. The main concern of the book is with the nature of the children's rights education that has been offered so far and that might go some way to fulfilling the obligations entailed by the Convention.

After an introductory chapter, the book's second chapter briefly describes views about the status of children – very roughly a historical sequence starting with their being the property of their parents, through their being immature beings with rights to be cared for, to the Convention's "individual and independent persons with rights of their own" (p. 20) to limited participation and self-determination. It then looks at the educational consequences of the Convention and surveys what has actually happened in the field.

The third chapter focuses on the notion of children as citizens, not just as people on the path to citizenship. It begins with T.H. Marshall's understanding of citizenship, as legal standing within a nation plus a sense of belonging generated by recognition of a variety of rights. Howe and Covell then review more recent and controversial contributions to the "citizenship literature", emphasising a need to stress the responsibilities of citizenship, to recognise pluralistic or differentiated citizenship with its concomitant "group rights", and "to think of the global community as the most important setting for the practise of citizenship" (p. 54). They then look at what child citizenship might entail and conclude with some remarks on educational programmes in this area.

Chapter Four reviews ways in which citizenship has been taught and their shortcomings. The following chapter looks at a few examples of educational programmes devoted to children's rights, including one devised by the authors, and discusses their consequences. Chapter Six confronts some of the many obstacles to changing what goes on in schools (it begins with a nice quotation from Woodrow Wilson, "it is easier to change the location of a cemetery than to change the school curriculum"). It first rehearses again some general objections to the view of children and their rights espoused by the Convention and then moves on to examine the resistance teachers and the organisation of schools put up to curricular change. Howe and Covell go on to observe the yawning gap between the commitments entered into by governments and their lack of interest in implementation, suggesting (after 173 pages!) that perhaps governments are being hypocritical, or in their own words "have adopted a symbolic approach to implementing the Convention" (p. 179). Somehow the authors try to put an optimistic spin on all this by discerning some vestigial "prospects for change" (p. 180ff).

The authors point to a genuine problem: 192 governments have publicly committed themselves to a wholesale reorientation of their laws and practices, much of which flies in the face of vocal groups in their societies. The fact that they have made these, to my mind admirable, commitments[4] gives us some ground for shaming them into taking action – not that shame is a very potent weapon in international affairs. But one wonders why they ever bothered: despite the authors' remark that the Convention "is not a partisan document" (p. 157) their acknowledgement of the large groups of adults who categorically reject its ideas demonstrates that that is precisely what it is. Our authors seem oblivious to the fact that democracy involves difference of opinion; they want to see "an emerging worldwide consciousness and consensus" (p. 181) where the reality is conflict.[5] A fit of absence of mind is not much of an explanation, but I see no other for the signatories.

Our authors are cautiously optimistic, appealing to the fact that even hypocritical commitments on the part of the powerful can encourage people to demand their rights, that other groups – women, gays, the disabled – have made undeniable progress in many countries (though they do not make much of the fact that these groups have typically spoken for themselves, something younger children at any rate are going to find very difficult), and that successful advocacy can trigger imitation elsewhere. Apart from stressing the reasonableness of the view of children's rights at stake, Howe and Covell do not give us much advice on what exactly children's advocates should do to change attitudes, organisations, and curricula. In technologically advanced contexts, one would think that advocacy groups should find that children's eager adoption of ICTs should provide openings for collective consciousness-raising and collective action. But within the official school setting, it confirms one point the authors make that the United Nations itself provides an

on-line course in human rights <http://www.un.org/cyberschoolbus/humanrights/index.asp>, but not specifically on the rights of the child.

The book suffers from a certain amount of repetition, and from a chronic mistake of educational writing: saying that something will happen when all that can be seriously meant is that it is intended that it will. I have already alluded to their long-delayed recognition that perhaps governments never meant to do anything about the Convention – acknowledgement earlier might have suggested a recasting of the type of argument in the rest of the book. But Howe and Covell have brought to our attention a fascinating range of issues where reflection and programmes of rational critique may well serve to catalyse significant socio-political change, and where the little that has so far been achieved seems to point in desirable directions.[6]

Endnotes:

[1] Howe and Covell tell us that "As a signatory to the Convention, the United States is at least obligated not to adopt policies contrary to it" (p. 26).

[2] A UN Committee on the Rights of the Child monitors compliance with the convention. Its web-site < http://www.ohchr.org/english/bodies/crc/index.htm> provides access to a large number of documents, though not offered in an easily accessible manner. The regular reports the CRC is meant to receive and analyse from individual countries can be found at http://www.unhchr.ch/tbs/doc.nsf - perhaps most easily by checking Documents By Treaty and then CRC.

[3] It is tempting to see our authors as caught in the same trap, since their subtitle, with its talk of a "pathway" to citizenship, sits much better with the idea of children as developing towards a future status than as possessors of one now.

[4] Admirable, although marred perhaps by "lack of precision and general vagueness" in some crucial articles, as a Caribbean commentator has remarked (Zanifa McDowell, *Elements of Child Law in the Commonwealth Caribbean*, University of the West Indies Press, 2000, p. 241). She goes on to deplore the absence of a parent's supposed "right to administer necessary corporal punishment to a child who is disrespectful, rude, violent, or deserving of such punishment" (p. 242), and suggests that the Convention contains several other "cultural biases". Given the prevalence of oppression and authoritarianism in the world generally, a defence of any one's rights is inevitably going to be culturally loaded. Howe and Covell err, however, by supposing that an appeal to a country's ratification of the Convention can supplant genuine and principled argument in support of the freedoms it tries to establish.

[5] They display a curiously totalitarian dogmatism at times: it is just wrong to think that wives are appendages and possessions of their husbands, and that children are similarly the property of their parents (p. 152); the phrase "whether citizens approve of it or not" appears twice (p. 153, 155) where such citizens are told that their views have been summarily rejected by their governments. What has become of legitimate opposition?

[6] They start off with the important point that attention to children's rights tends to make children more concerned for the plight of others than for their own ability to do as they please. Perhaps only nasty traditionalists would have such a low opinion of themselves as to make this surprising, but given the prevalence of such traditionalists it is a point worth making.

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