INTEGRATING ICT INTO TEACHING AND LEARNING AT THE OPEN UNIVERSITY OF ISRAEL COURSE COORDINATORS’ PERSPECTIVE

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Summary

This study investigates the perspective of course coordinators regarding the implementation of ICT in instruction at the Open University of Israel, following ten years of experience. A survey of attitudes, beliefs and performance was sent electronically to all 285 course coordinators employed during the second semester of 2007. The results are based on a sample of 128 course coordinators who responded to the survey (45% response rate). The results show that the “belief index” in the potential of technology in teaching is higher than the “skepticism index”. The enhancing internal and external factors for integrating technology in teaching outweigh the inhibiting aspects. The main changes in the teaching and learning environment are in communication and learning materials. In general – the scope of reported usage shows that the course website is an integral part of the teaching and learning environment. Usage of highly advanced technologies (e.g., VC, WIKI) is significantly lower than the usage of more familiar tools. Minimal changes were reported in core areas of teaching and learning process.

The Open University of Israel (OUI) makes use of advanced technologies to improve its distance teaching, which provide a wealth of learning materials and continuous contact with teaching staff and other students in the course. In April 1995, the University established the SHOHAM Center (acronym in Hebrew for Distance Learning Methods), Shoham was established as a professional organization focusing on the integration of information technologies into the Open University teaching paradigm. The Center deals with the development, research, evaluation and integration of technology-based pedagogical solutions to meet the various needs of academic courses offered by OUI.

Most courses have course websites on the internet. These websites are an integral part of the course learning and teaching environment. A course website may include, among other things, study materials, links to databases and Internet sites related to the course subject matter, multimedia materials and learning aids, as well as tools for communication among all
the participants in the teaching and learning processes – students, tutors and course coordinators.

It is important to emphasize that the course coordinator (CC) is responsible for the academic and administrative planning and the implementation of all course activities, including the computer-mediated ones. As such the decisions concerning the use of technology in teaching the course, and the ways the technology is incorporated into the teaching, are in his or her hands.

The current study is a part of a wide-scale evaluation study, aimed at learning the fundamental nature and essence of ICT integration into academic learning and teaching processes at OUI from the perspective of the academic CCs. More specifically the study examines the beliefs, attitudes and motivation of the CCs at OUI, regarding the integration of ICT into teaching and learning processes. The study also examines changes in CCs activities and experience in light of the ICT implementation.

**Theoretical Framework**

The adoption and implementation of ICT by organizations in general, and by academic organizations in particular, is a complex process that involve essential changes in the ways of thinking and the professional practice of many users. Many researchers have studied and investigated these adoption processes, and various models have been suggested to characterize and explain these processes in different types of organizations (Bates, 2000; Bonk, Cummings, Hara, Fischler, & Lee, 1999; Harasim, 2000; Owston, 1997; Mioduser, Nachmias et. al. 2000)

Rogers (1995) suggested a five-stage model for characterizing the process of change in organizations in general, and the integration of new technologies into teaching – in particular. This model emphasizes the way in which the individual relates to the innovation, from the initial stage of awareness to the technological innovation; through the stages of expressing interest, evaluation and experiencing the new technology; to its complete adoption in the fifth stage.

Bonk et al (1999) focus on the integration of innovative technology (the Internet) into teaching, and suggest a model that describes the use of the Internet over a sequence of ten phases that defining the extent of use of the Internet based on the type and intensity of the pedagogic use of the World Wide Web. Sandholz et al (1997) and Mandinach & Cline (1994) propose a four-stage developmental model of professionalization in teaching and of assimilating ICT into teaching processes: survival; attainment of mastery; impact over the teaching process; and innovation. Other researchers in this field focus on factors that promote and inhibit the adoption process of ICT and its assimilation into teaching and learning practice. These studies identify two main clusters of factors that influence the usage patterns of integrating ICT into teaching and learning: external-environmental factors; and internal-personal factors (Preston, C., Cox, M., & Cox K. 2000). External-environmental factors included promoting elements such as: existing training programs, offered technological and pedagogical support system, proficient technological infrastructure. External-inhibiting factors include: significant time invest, the lack of organizational rewarding, and lack of technological and pedagogical support system.

Internal-personal factors include contributing factors such as the users’ positive attitudes toward ICT and their beliefs in the potential advantages of integrating ICT into teaching. The inhibiting internal factors are expressed in raising doubts in ICT and its contribution to teaching and learning.
The research conceptual framework was formulated on the basis of the theoretical background, and was used as the foundation for the evaluation process. The framework includes the following components:

1. The motivations that may promote or inhibit the implementation of ICT in teaching:
   - Internal motivations include: attitudes and beliefs toward teaching and the contribution of technology to teaching and learning processes.
   - The external motivations include: system-wide policy and support, provision of pedagogical and technological support systems.

2. The actual implementation of ICT in teaching and course management.

3. Reported impact on pedagogical and administrative aspects of CCs' work- changes that had taken place following the use of ICT.

Four evaluation questions emerged from this conceptual framework:

1. What are the attitudes and beliefs of the CC concerning the integration of technology into academic learning at OUI?
2. What are the factors that promote or inhibit the integration of technology into teaching?
3. Which changes had occurred following the use of technology in learning, teaching, management and communication?

The conceptual framework served as the infrastructure for developing research tools, planning and collecting data and their analysis.

**Method**

**Participants**

Research sample included 285 CCs employed at the Open University during the second semester of 2007. Findings are based on a sample of 128 CCs that completed the electronic questioner (45% response rate).

**Measures**

An electronic survey of attitudes, beliefs and performance was sent to all 285 CCs. The survey included 100 items (multiple choice and open ended), and was developed by the authors with the cooperation of SHOAM staff members.

The survey comprised of four main parts:

1. **Attitudes and beliefs.** This part includes:
   (a) 15 items regarding attitudes toward the use of technology in teaching in general, and the issue of traditional vs. nontraditional teaching, in particular.
   (b) 12 items regarding the level of importance attributed to integrating ICT into academic teaching in relation to various teaching goals. The integration of technology into teaching can facilitate the achievement of various teaching goals. CCs were asked to indicate the level of importance they attribute to the use of as a mean for achieving these goals, even if at this stage they have not yet been attained in their courses.
   (c) 17 items regarding factors that can promote or inhibit the decision to integrate ICT into teaching.
   All 44 items were measured on a 5-point Likert Scale.
2. ** Reported impact.** 14 items regarding the impact of using technology on pedagogical and administrative aspects of CC work. The respondents were asked to report to what extent their ongoing work as CCs have changed as a result of using technology. All items were measured on a 5-point Likert Scale.

3. **Implementation in practice.** This part comprised of 36 items. Findings from this part will not be presented here.

4. **Support of SHOAM.** 9 items regarding training, pedagogical guidance and technological support. Findings from this part will not be presented here.

**Data Processing**

A Factor Analysis was performed separately on the items of each part of the questionnaire, to identify factors. These factors were used as a basis for the construction of indices. The internal reliability (Cronbach's $\alpha$) of the items composing each index was also taken into consideration in the final decision as to the composition of items in each index. The indices' value range from 1 to 5 (mean value of all the items composing the index). Later on we will relate only to the fourteen indices that are relevant to the research questions presented above:

**Attitudes and beliefs – six indices, measuring various dimensions of the decision to integrate ICT into teaching:**

Belief in the potential of ICT (5 items, $\alpha = 0.79$); skepticism concerning the contribution of the technology (5 items, $\alpha = 0.69$); promoting internal motivations (3 items, $\alpha = 0.7$); inhibiting internal motivation (5 items, $\alpha = 0.69$); promoting external motivations (5 items, $\alpha = 0.78$); inhibiting external motivation (5 items, $\alpha = 0.81$).

**Importance attributed to integrating ICT into academic teaching in relation to various teaching goals -4 indices:** Communication and Interactions of ICT (3 items, $\alpha = 0.79$); Teaching and learning support (3 items, $\alpha = 0.75$); provide a wealth of learning materials (3 items, $\alpha = 0.69$); ICT as an alternative of face-to-face teaching (2 items, $\alpha = 0.83$);

**Reported impact- 4 indices, measuring various aspects of the impact of ICT integration on:** communication, interaction and transparency (5 items, $\alpha = 0.81$); learning materials (2 items, $\alpha = 0.77$); pedagogy (3 items, $\alpha = 0.8$); course management (3 items, $\alpha = 0.75$).

**Results**

The results will be presented by the evaluation questions defined and presented above.

1. **Attitudes and beliefs of CCs regarding the use of technology in academic teaching learning at OUI**

   Figure 1 below present six indices: belief in the potential of ICT in teaching, skepticism concerning ICT in teaching and the four dimension of the level of importance of ICT – communication and interaction; learning support; learning materials; and replacement of face-to-face teaching.
The results shown in figure 1 demonstrate that:

- The level of belief in the potential of ICT in teaching is higher than the level of skepticism concerning ICT in teaching (averages of 3.6 and 2.9, respectively, a statistically significant difference: \( p < 0.0001 \)).

- A comparison between the four dimensions of importance attributed to ICT – communication and interaction; learning support; learning materials; and replacement of face-to-face teaching – reveal that the respondents attribute the same high level of importance (average = 4.2) to the contribution of ICT to communication and interaction, to learning materials and to learning support. A lower level of importance is attributed to the contribution of ICT to the replacement of face-to-face teaching (average = 2.4; significantly lower than the above three indices - \( p < 0.0001 \)).

2. **Factors that may enhance or inhibit the decision to integrate ICT into the teaching of courses**
The Factors that may enhance or inhibit the decision to integrate ICT into the teaching of courses are measured by four indices: internal-enhancing, internal-inhibiting, external-enhancing and external-inhibiting.

Figure 2 below presents the average, median, standard deviation and the inter-quarterly range for each of the four indices.

*Fig. 2: Average, median and standard deviation of each of the indices relating to the motivations for integrating technologies into teaching*

The results demonstrate that:

- The level of influence of the enhancing factors is higher than the level of influence of the inhibiting factors (a statistically significant difference: p< 0.0001).
- No significant differences were found between the level of influence of the external and the internal enhancing factors.
- No significant differences were found between the level of influence of the external and the internal inhibiting factors.

3. **The changes that had occurred following the use of technology**

The impact of integrating ICT into teaching and other aspects of CCs work is measured by 4 indices that measure changes in four dimensions: communication, learning materials, teaching and learning processes and management.
A comparative analysis of the 4 indices shown in fig. 3 reveals that the two aspects in which the most significant changes had occurred, according to the coordinators' reports, were communication (average = 3.8); and learning materials (average = 3.7). The smallest extent of the change had occurred in pedagogy (average = 2.2), and it is significantly lower than the extent of change in other areas (p<0.0001).

**Discussion and Conclusions**

This study expose the CCs' perceptions of ICT utilization in teaching and learning, identifying factors that enhance or inhibit ICT adoption, thus give a better understanding of what need to be done in order to broaden and deepen the use of ICT in teaching. Four key findings emerged from the findings.

1. The level of CCs' beliefs and attitudes regarding the potential of the use of ICT in teaching is higher than their level of scepticism. Furthermore, the level of motivations promoting the decision to integrate technology into teaching – both internal and external – is higher than the level of motivations inhibiting This decision
2. The main reported changes in the teaching and learning environment relate to aspects of communication with students – more intensive and more extensive, and learning materials – students are exposed to more updated and richer variety of materials.
3. Minimal changes had occurred in core areas of teaching and learning process. Thus in most courses no changes have been made to features of instruction or students' assignments features. Likewise, the respondents cannot point to a change in the academic achievements, following the implementation of the technology.
4. The level of importance attributed to ICT as an alternative of face-to-face teaching is low.

Following ten years of implementation of ICT in instruction at the Open University of Israel results indicate that the CCs are beyond the initial stages of adopting a technological change, as these are described by Rogers (1995), Bonk et al (2000) and Mandinach et al (1994). It seems that the CCs have mastered the use of the common technologies, and are not apprehensive about the technological innovation; do not have objections; are not very skeptical; and do not look for the disadvantages of the use of technology – which characterize the initial stages of the integration of technology into teaching. The findings also show that the integration of technologies into teaching is here to stay, as a vital part of academic teaching and learning at OUI, and not only at a declaration level. The majority of the respondents are, at least, at the stage that Mandinach et al (1994) refer to as the "Mastery Stage". Technology is now an integral part of their teaching practice whether it is used in context of teaching materials, teaching aids, course management and communication with students and colleagues or as an alternative to face-to-face teaching. Within the context of Mandinach et al model it appear that the CC are at the "Impact Stage", where different applications of the technology are integrated into teaching and management processes, and these applications embrace a greater part of the curriculum. Notwithstanding, we have found that most of the CCs reported minimal changes in core areas of teaching and learning process. That is to say that integrating ICT has not changed the courses teaching and students’ assignments features. Likewise, the CC cannot point to a change in the academic achievements, following the implementation of the technology. These findings, combined with the finding that the majority of CC do not consider the online alternative as sufficiently worthy of replacing traditional face-to-face teaching, are compatible with what is known about attitudes and practice of faculties at other institutes of higher education (Kurtz,G., Sagee, R. & Getz-Lengerman., 2003. Nachmias, R., Ram, J & Mioduser, D., 2006). It appears that the most common teaching model at OUI today may be described as a "blended learning" model, which is between the enrichment model and the blended model as defined by Harasim et al (1995). Some claim that the blended model is probably the preferable and the most achievable model in academic learning and teaching (Ginns, P. & Ellis, R. 2007). According to Bonk et al (2000) and Mandinach et al (1994) the most advanced stages relate to the development of integrated ICT, is the "innovation", stage which focuses on the restructuring of the curriculum, making the Internet essential and obligatory in learning and teaching the course content – ultimately producing a fully on line course. Even though there is an understanding among researchers that this stage is far from reach the OUI, via the SHOHAM Center, distinct this stage as an "aspiration" stage. Hence Shoham is actively involved in developing of alternative distance learning methodologies and models and the assessment of the use of technological and pedagogical alternatives for tutorial sessions.

References


• Ginns, P & Ellis, R. (2007). Quality in blended learning: Exploring the relationships between on-line and face-to-face teaching and learning. Internet and Higher Education.10 (1), 53-64.


