The Open University of Israel

The Chais Research Center for the Integration of Technology in Education

ANNUAL REPORT

2007

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1. Introduction

As a university based on distance learning, the Open University is committed to the ongoing improvement of the quality of its teaching through the integration of innovative learning and teaching technologies. The Chais Research Center for the Integration of Technology in Education functions as the research division of the Open University for studying the integration of learning technologies in instructional processes. The main objective of the center is to promote research related to the enhancement of course instruction using learning technologies. The Center is comprised of a consortium of more than forty faculty members from various Open University departments. It supports studies conducted by its members and grants scholarships to outstanding students pursuing graduate degrees. The center conducts a large variety of ongoing academic activities such as symposia, workshops, conferences and research seminars. The Chais Research Center operates in close collaboration with Shoham - The Center for Integration of Technologies in Distance Education at the Open University whose Director is a member of the Center’s Steering Committee. The Chais Center is an active member in EDEN- the European Distance Education Network.

The following are some of the fields of research in which the Center is engaged:

- Studying the theoretical foundations of learning, instructional technology and distance education.
- Incorporating information and communication technologies into the design of instructional systems for distance education and determining how these technologies affect the learning process and leaning achievements.
- Defining and characterizing the variables needed for developing flexible and adaptive computer enhanced instructional strategies that respond to students' individual needs.
- Studying the pedagogical and cognitive contributions of emerging
technologies on teaching and learning.

**Structure and mode of operation**
The Chais Research Center operates as an independent unit under the auspices of the university's vice president, headed by a senior faculty member of the Open University. The Center is comprised of 49 members from various academic departments, one part-time research associate and one guest scientist who serves as a researcher at the center.
The Chais Research Center funds research and other professional activities which are conducted by its members, as well as by outstanding graduate students who specialize in instructional and information technologies.

The Chais Research Center conducts a wide variety of academic activities concerning educational technologies, such as research seminars, conferences and symposia, which are open to the academic public. In addition a monthly newsletter, "Dagim", is published.

**Organizational structure (as of 2007)**
- **Head of the Center**: Prof. Yoram Eshet-Alkalai
- **Research Fellows**: Dr. Avner Caspi (until February 2007) and Dr. Sigal Eden (Since August 2007)
- **Guest Scientist**: Dr. Paul Gorsky
- **Steering Committee**: Prof. Yoram Eshet- Alkalai (Chair), Dr. Avner Caspi, Dr. Sigal Eden, Dr. Nitza Geri, Dr. Yoav Yair.
- **Research Committee members**: Dr. Tali Heiman (Chair), Dr. Avner Caspi, Dr. Sigal Eden, Dr. Zippy Erlich, Dr. Paul Gorsky, Eva Klein-Friman (Secretary)
- **Newsletter editor**: Ingrid Mesika
- **Secretary**: Adi Berman-Shoval

**Website**: http://www.chais.openu.ac.il
2. Seminars, Symposia and Conferences

Research seminars

The Chais Research Center conducts regular research seminars in which researchers present their research findings in learning technologies. The following seminar lectures were delivered in 2007:

- 19.3.2007: Prof. Moti Ben Ari (Weizmann Institute): The Impact of the animation program Jelliot on learning programming among freshmen students in computer sciences.
- 30.4.2007. Prof. Leo Cori (Tel Aviv University): Encyclopedias and Internet: Seeing the knowledge in the information highway.
- 22.10.2007. Dr. Sigal Eden (Chais Center, Open University of Israel): Developing a sequence perception with advanced technologies.

Research in action (17.12.07)

In this framework, researchers of the Chais Center discuss their ongoing research projects and invite their peers for discussing the results. The following research in action lectures were delivered in 2007:

- Ms. Karen Precel, Ms. Ronit Webman, Prof. Yoram Eshet-Alkalai, Ms. Batsheva Engelberg-Behr: The influence of online text vowelization of homographic words on text comprehension among native and non-native Hebrew speakers
- Dr. Avner Caspi, Dr. Eran Chajut, Dr. Keli Saporta: Perceived learning: Differences between learning and its later recall

Beit Midrash ("Learning-House")

In this framework, the Center's members conduct a collaborative study on selected topics in the field of instructional technologies. Participants read articles
and attend background lectures on the topic. The meeting concludes with a plenary discussion on the instructional implications of the topic. One Beit Midrash meeting was held in 2007:

Print versus digital: Reading text in the technological era (8.1.07)
A symposium dedicated to the different aspects that relate to reading from print and from digital displays - one of the major present-days concerns of academic institutes. In addition to the plenary discussion of the topic, the following expert lectures were given:

- Dr. R. Ackerman (Haifa Univ.): Memorization and comprehension judgments in learning from print and from digital formats.
- Prof. Y. Eshet-Alkalai & Dr. N. Geri (Chais Center, Open University of Israel): Critical reading in printed versus digital text.

Symposia
As part of our reaching-out efforts to the academic community, both in the Open University and in other academic institute, as well as the general public, the Chais Research Center conducted in 2007 four symposia which were open to the public. The symposia dealt with various aspects of modern technologies and their effect on society. The events were broadcasted live, drew wide attention and were very well attended. Lectures can be viewed on the Chais Center website. The following symposia were conducted in 2007:

Knowledge and truth in a the technological era (15.1.2007)
This symposium was dedicated to the major issues that are raised by the exponentially increasing volumes of information in present days. It was organized in collaboration with the department of History, Philosophy and Jewish Studied. Lectures in the symposium were:

- Prof. J. Agassi: Truth in the technology.
• Prof. I. Ben Israel: Open society and intellectual property
• Dr. B. Hus: Online Kabalah: A new kind of communication.
• Dr. A. Bar-Levav and Dr. Y. Yair: Telling of me: From last wills to blogs.

Human interactions in a digital world: A guest-lecture-series by Prof. Terry Anderson, University of Athabasca (19-21.2.2007)
• The promise of educational social software
• Social and cognitive presence in virtual learning environments
• Design-based research: A new research paradigm.

Conversations: Dialogues on the net (16.5.2007)
This symposium focused on the new kinds of communication that flourish in the cyberspace, using the advanced present-days communication platforms.
It was organized in collaboration with the Dep. of Sociology and Communication. Lectures were:
• Dr. O. Soffer: Dialogues in the digital era
• Dr. D. Levin: Couples in the emotional web
• Dr. M. Buniel-Nissim: The diary emerges from the drawer: The blog as an interpersonal and intrapersonal tool.
• Ms. C. Weisman: Blogs as a new kind of political narrative

The Impossible Mission of Multitasking (19.11.2007)
• Mr. Y. Kimor: The impossible is possible: On the limitations of human’s processing
• Dr. A. Gotler: Is it possible to do two things simultaneously? : Multitasking from a cognitive perspective.
• Prof. Y. Eshet- Alkalai: Living under bombardment: Real-time thinking in a technological world.
• Prof. R. Aviram: Multitasking and the disintegration of the "self" in the technological postmodern society.
Conferences

Learning in the Digital Era: The 2nd annual research conference of the Chais Center (20.2.2007)

The second annual research conference entitled "Learning in the Digital Era" was held at the Chais Center on the 20.2.2007. The conference received a very positive response from the professional community, with a very high attendance (~500 participants) and submission rate (~80 submitted papers). It was conducted in the Open University Campus, with four parallel lecture, poster and workshop sessions, which were preceded by a keynote lecture by Prof. Terry Anderson, Athabasca University. The conference was organized in collaboration with EDEN - The European Distance Education Network. Papers were published in a special Proceedings volume. Lectures and papers are available at:

http://telem.openu.ac.il/hp_files/chais/07/english_site.html

1 http://telem.openu.ac.il/hp_files/chais/07/english_site.html


4: Lectures Presented in Conferences


5. Research projects

Friendship in the cyberspace
Researchers: Ms. M. Aharon, Dr. E. Chajut & Prof. Y. Eshet-Alkalai

This study investigates the dimensions of present-days friendship among Israeli youth, comparing the dimensions of face-to-face and online friendship.

Technology Uses in the Open University of Israel: Patterns and Evaluation
Researchers: Ms. Y. Alberton, Dr. E. Guterman & Dr. R. Brickner

The present research was designed to examine the patterns of the technology uses in instruction at the Open University of Israel after an implementation process of ten years.

The broad research focuses on the attitudes and behavior of all the parties involved in the learning/teaching process: course coordinators, tutors, the senior academic faculty and students. This specific stage of the research will present outcomes related only to the attitudes and behavior of course coordinators. The research questions examine the beliefs and attitudes of the involved participants as to the implementation process of the technology, the mapping of its actual uses and the evaluation of changes in learning and teaching patterns following the use of the new technologies.

The conceptual framework of the research is based on relevant literature in the field of change implementation in organizations. The research purports to pinpoint effective ways of incorporating technology at university level instruction in the future, based on lessons of the past.

The main research tool of this stage was an electronic survey sent to 250 participants.
The Quality of the Discussions in a-synchronous learning forums
Researchers: Ms. N. Bauman & Ms. E. Iger

This study is expected to offer a model for planning, and for achieving a meaningful teaching and instruction in a-synchronous learning forums. More specifically, the main purpose was to develop a tool for assessing the quality of discussions. The tool was designed on the base of an integration of three main domains that were cited in the literature: The structure and contents, the Participant's presences, and the Instructional process. During the research the quality of discussions were analyzed using a Content Analysis methods. The discussions in a-synchronous learning forums were chosen from six web-based courses of the Open University. The analyses had been conducted by four assessors that received a preliminary training, and evaluated three different forums each. The main results indicated that using the tool enables to differentiate three kinds of forums: Open forums for clarifications and information, forums for discussion of main issues or dilemmas, and forums that are instructionally designed for assignment. Additionally, the results indicate high agreement among assessors.

Social presence and participation in asynchronous discussion groups
Researchers: Ms. I. Blau & Dr. A. Caspi

This study investigated the effect of three 'social presence' categories on students' willingness to participate in online discussion groups. A quantitative content analysis was used in order measure the levels of the three categories of social presence according to of the Community of Inquiry model (Garrison et al., 2000; Rourke et al, 1999) in two online discussion groups. A questionnaire measured the perceived social presence and the willingness to participate in these discussion groups. It was found that despite differences in amount of social presence between the two discussion groups students' perception of 'social presence' was similar. The willingness to participate in a discussion group was
related to the level of perceived interactivity, but was unaffected by neither level of affective responses nor level of cohesiveness. This study suggests that social presence is not unitary construct. The data indicates that online instructors should promote high degree of interactivity between participants in discussion group more than affective communication or cohesive group references.

**Does visual anonymity assist learning? Field and laboratory studies of Face-to-Face and Skype™ teaching**

Researchers: Ms. I. Blau & Dr. A. Caspi

This study examines the differences between audio conferencing and traditional face-to-face learning. We investigated whether the medium richness (Media Richness Theory, Daft & Lengel, 1984), medium naturalness (Media Naturalness Hypothesis, Kock, 2005) and visual anonymity determine students' learning efficacy, perception, satisfaction, participation, risk-taking, immediacy and "flaming" (or more exactly, "freed") behavior.

**Using podcast for acquiring advanced English skills**

Researchers: Dr. A. Caspi & Ms. D. Avramovich

This series of studies compares acquiring English skills under four conditions: (1) preparing podcast alone (2) preparing podcast in groups, (3) writing individual assignment, and (4) writing group assignment. English is a foreign language for all participants (10th grade students). The preliminary results suggest advantage for group over the individual work and for the podcast over the written assignment, both in grade and in students' motivation.

**Teachers' media choice**

Researchers: Dr. A. Caspi & Ms. I. Blau

Fifty-nine high school teachers were asked about their attitude toward and actual utilization of four communication media: face-to-face, telephone, e-mail and
SMS. We hypothesized that the richness of a medium, the social attitude toward it, and the actual experience a teacher has with it will influence its utilization for different types of messages.

**Students’ media choice: media richness, social influence, or experience?**  
Researchers: Dr. A. Caspi & Ms. T. Levin

Four media choice theories aiming to explain selection of a medium to transact different messages were tested: Media richness theory (Daft & Lengel, 1984; 1986), Social influence theory (Fulk, 1993), the Experience account (King & Xia, 1997), and the Paradox of richness (Robert & Dennis, 2005). 162 Open University students ranked eight communication media on different scales that measured perceived media richness, social influence, skill, actual utilization, mental resources allocation, and their fit to transmit messages that were differed in level of equivocality. The results partially supported Social influence theory and the Experience account, and refuted Media richness theory and Media paradox.

**The contribution of the course "Computer Applications" to online learning and to the use of the courseware in the course "Financing"**  
Researchers: Dr. Z. Erlich, Ms. R. Gadot & Ms. D. Shahak

The study relates to the course "Financial Theory: Financial Management of Business Firms" which integrates online learning with face-to-face tutoring and courseware. The purpose of the study is to check whether learning the Computer Literacy and Applications course prior to the Financial Theory course, increase the students' usage of the courseware.
Critical reading in print and digital formats
Researchers: Prof. Y. Eshet- Alkalai & Dr. N. Geri

This research explores the ability of information consumers to explore the effect of text format (print or digital) on the ability of information consumers (high-school and college students) to exercise critical thinking skills in reading news. The most important finding is the better performance of the younger participants (high school students) in reading digital news formats, and the better performance of the college students when reading news in a print format.

Life-long changes in digital literacy
Researchers: Prof. Y. Eshet- Alkalai & Dr. E. Chajut

This research focuses on an effort to describe the nature of changes in digital literacy through time and the factors that affect these changes. The research follows-up on Eshet-Alkalai & Amichai-Hamburger's (2004) empirical study of digital literacy among different age groups, focusing on the question whether changes in digital literacy are age-dependent or a result of experience with technologies. In the study, the different digital literacy skills of the same participants of Eshet-Alkalai & Amichai-Hamburger, were tested five years later and compared to a new control group. Results indicate an improvement in performance in the photo-visual and lateral literacy skills among all age groups, especially with the adults. On the other hand, information literacy of all participants dropped dramatically. Our results suggest that life-long changes in digital literacy probably result from experience with technology and not from cognitive development. Moreover the data suggest that mere exposure to information, without mastering appropriate cognitive tools for critical thinking hinder the beneficial components of experience with respect to information literacy.
Probing the Slow Adoption and continued use of an Online Assignment Submission System
Researchers: Dr. N. Geri & Ms. O. Naor-Elaiza

This Research draws on the technology acceptance model (TAM) and diffusion of innovation theory, and analyses an online assignment submission system in a blended distance learning university, that apparently is very similar to an e-mail system, and is supposed to be valuable to students, but after seven years of implementation handled only a small proportion of the assignments.

Learning mathematics: The dialogic behavior of secondary school pupils
Researchers: Dr. P. Gorsky & Dr. A. Caspi

This study investigates the kinds of dialogic behavior engaged in by about 550 secondary school pupils (7th – 12th grades) while studying mathematics. Research objectives are twofold: (1) to document what dialogue types, mediated through which resources, were utilized by students to overcome conceptual difficulties that emerged while solving difficult homework assignments and (2) to correlate dialogic behaviors with several student attributes (age, gender, motivation to achieve a high grade and ability as measured by previous grades).

Confronting conceptual difficulty: The dialogic behavior of elementary school pupils
Researchers: Dr. P. Gorsky & Dr. A. Caspi

We are investigating how elementary school children deal with the inability to understand concepts and with the inability to solve homework problems. Initially, it is assumed that young children will turn to parents and siblings for help. As they progress, children turn to peers. We hope to map this movement from family help to peers and to investigate the kinds of communication media used by pupils for their interpersonal dialogues. About 400 1st – 6th graders will participate in the study.
The relationship between academic disciplines and Open University students’ dialogic behavior in course forums
Researchers: Dr. P. Gorsky & Dr. A. Caspi

Different academic disciplines are characterized by certain epistemological assumptions which, in turn, lead to different means of teaching, learning and doing research. We are investigating the dialogic behavior of course forums in the exact sciences, social sciences and humanities. Content analysis will be carried out in 18 forums (six from each discipline).

The Relationship between Students' Strategic and Tactical Approaches to Study
Researchers: Dr. P. Gorsky & Dr. A. Caspi

In this study we tried to find the relations between "dialogic behavior" and "approaches to learning". We considered "approaches to learning" as a strategy (or strategies) students adopt while studying, and "dialogic behavior" as a tactic, or a set of tactics, employed to execute the strategy. Results were mixed, mainly due to the unstable measurement of "approaches to learning", using the current questionnaires. We suggested revising these tools and to reexamine the proposed relations.

Usage patterns of electronic technology and its contributions among students with special needs at the Open University
Researchers: Dr. T. Heiman, Dr. D. Olenik-Shemesh & Ms. D. Kaspi-Tsahor

The present study examined the usage patterns of Assistive Technologies (AT), with particular focus on courses websites, amongst students with and without Learning Disabilities (LD/NLD) studying at the Open University (OU). We investigated the question of whether the use of AT contributes to the students’ academic and socio-emotional satisfaction. The sample included 363 students
with LD and 601 NLD students studying in the OU, aged 16-74. Significant differences were found in the use of AT between the two groups: The students with LD are more familiar with AT and use it more and reported on higher 'Hope' scores on the Satisfaction Scale. Students with LD log more into the forum and leave more messages. They perceive the use of the sites as an important opportunity to exchange views with the course team. On the other hand, students with LD made less use of materials provided by the websites. It was generally found that websites course contribute to a greater extent to students with LD regarding their sense of academic satisfaction than their socio-emotional satisfaction.

The digital games culture in Israel and Australia

Researchers: Dr. J. Klemes, Prof. Y. Eshet-Alkalai & Prof. L. Henderson

This research is an exploratory survey in Australia and Israel of the leisure habits, attitudes and preferences of 716 teenagers aged 13-14 years who are part of the international digital games culture. The rationale was threefold: (a) this age group is not singled out in other surveys; (b) examination of gaming across five platforms would contribute new insights; and (c) the premise that a comparison between eGamers in a war zone and a peaceful country would produce striking contrasts. Virtually all participants played digital games for an average of 10-12 hours per week, the majority using all gaming platforms daily. Notable country differences were identified, particularly game genre preferences but there was also commonality as digital gamers. Digital games remain "boys' games" with the male teenagers devoting more time to playing across five game platforms than did the females who, however, demonstrated a lessening of the gender gap. Although playing digital games was one of the two top-rated leisure activities across country and gender, isolation and fitness were of less concern than popularly believed.
Students’ attitudes toward learning in a fully-online course
Researchers: Ms. K. Precel, Prof. Y. Eshet-Alkalai & Ms. Y. Alberton

The present research focuses on students’ perceptions of an online course at the Open University of Israel, which offers a new model for blended online learning. The research focused on the following major aspects of the course’s design: (1) Course’s pedagogy, (2) issues concerning the course-book format (print vs. digital) and (3) usability issues in designing the course’s learning environment. Results illustrate the course’s model’s potential in creating meaningful learning, which takes into account the state-of-the-art knowledge on the major pedagogical considerations in online learning. The model suggest ways to bridge the gap, that is typical of online learning in general and open universities in particular, between students and instructors and students and their peers.

Making reading easier: The influence of vowelization in a deep language orthography on online text comprehension
Researchers: Ms. K. Precel, Ms. R. Webman, Prof. Y. Eshet-Alkalai & Ms. B. Engelberg-behr

The present study examines the effect of online text vowelization of Hebrew words in context on reading among native Hebrew speakers and speakers of Hebrew as a second language. The study focuses on homographs – words that have more than one meaning in their unvoweled version. The hypothesis was that for non-native Hebrew speakers, vowels will shorten reading latencies, especially in the case of low frequency words at the beginning of sentences (no context information). Participants were 44 students at the Open University of Israel divided into two groups: 32 native Hebrew speakers and 12 speakers of Hebrew as a second language. The participants filled out a demographic questionnaire and performed a self-paced computerized reading task – a noncumulative presentation task (Marinis, 2003) using E-Prime professional software to present the stimuli. The design included 2 (voweled/nonvoweled) X 2
(homographs/unambiguous words) X 2 (location of words: beginning of sentence/not beginning of sentence) X 2 (control/experimental sentences). The hypothesis that for non-native Hebrew speakers vowels would shorten reading latencies, especially in the case of low-frequency words at the beginning of sentences (no context information), was not supported; non-vowelized target words were read faster than vowelized target words for both groups. Results are analyzed in relation to group composition and experimental problems.

The relationship between instructor's scaffolding and students’ metacognition in academic online course: A case study
Researchers: Dr. R. Rimor, Dr. R. Reingold & Ms. A. Kalay

This study describes the relationship between the instructor’s feedback and students' metacognitive processes in an online course on democracy and multiculturalism, which was taught as part of a teacher education program. 700 postings, written by 68 students, were content analyzed along with 66 postings by the instructor, using tools designed for that purpose. A strong positive correlation was found between the instructor’s responses and students' metacognitive thinking demonstrating the importance of instructor’s feedback in helping to produce an environment in which students would experience learning through reflective and metacognitive processes. Our study highlights the unique potential of online courses coupled with instructor’s scaffolding to promote and study students’ metacognitive reflections.

The Relationship between Metacognitive Thinking, Activity and Attitudes of Students in an E-Learning Course
Researchers: Dr. R. Rimor, Dr. R. Wadmany & Ms. E. Rozner

The research examines the relationship between metacognitive thinking, forum activities and attitudes of students in an e-learning course. 270 students' messages were sent to the online forum. The content of these messages was
analyzed according to Flavell’s metacognitive dimensions. Students with positive attitudes toward learning in the forum scored significantly higher on the examined metacognitive measures compared to those with negative attitudes. Moreover, students with high level of activity in the forum demonstrated a significant higher metacognitive level than did students whose activity level in the forum was low. Finally, a positive correlation was found between students' rate of activity and their positive attitudes toward the online forum. The relationship found between attitude and activity on one hand and metacognitive thinking on the other, signifies the importance of studying the cognitive contribution made by e-learning courses to learning and thinking.

**Development of instructional materials- CoSyM Website**

Researcher: Dr. I. Tuvi-Arad

A joint project of the Open University and the research group of Prof. David Avnir from the Institute of Chemistry at the Hebrew university. The traditional view of molecular structure treats molecules as symmetrical entities and ignores any distortion that may exist in nature. Continuous symmetry measures, developed by Prof. David Avnir, provide a quantitative estimate for the amount of distortion of molecules as compared with their expected symmetry. In this project we developed a Website for online calculation of continuous symmetry measures of molecules ([http://telem.openu.ac.il/symmetry/csm](http://telem.openu.ac.il/symmetry/csm)). The Website is used by both students and researchers from around the world. In addition, a learning unit in this topic has been written as part of the course "analysis of experiments" for undergraduate chemistry students at the Open University.
Appendix: Abstracts of Research Papers Published by members of the Chais Research Center


**Abstract**

The Open University of Israel offers M.Sc. studies in Computer Science for students with an undergraduate degree in Computer Science and a grade point average of at least 80. For those students who do not meet the requested average requirement, we offer a distance learning program which gives them an opportunity to improve their achievements. If the students prove capable, we accept them as regular students to the M.Sc. studies. In this paper we describe the achievements improvement program which we have been running for the last several years. We give some information as to the success of the students in the program. Furthermore, we followed these students to see if they can cope with graduate studies as well as the students who did meet the acceptance requirements.


**Abstract**

The Open University of Israel (OUI) is an institution of higher learning with an open admission policy which is based solely on distance learning and self-study. The teaching methods practiced at the OUI combine traditional and web-based distance education. This paper will elaborate on the web-based distance education which is practiced in the Computer Science (CS) department at the OUI. We describe a typical CS course website. We present some facts and figures regarding the use of a typical CS course website, including: the average number of pages requested per day, the most popular pages in the website, some data regarding the use of the discussion group, the use of the web-based assignment submission system, website use per student and results of a survey checking student satisfaction from the course website.

**Abstract**

This study investigated the effect of three 'social presence' categories on students' willingness to participate in online discussion groups. A quantitative content analysis was used in order measure the levels of the three categories of social presence according to the Community of Inquiry model (Garrison et al., 2000; Rourke et al, 1999) in two online discussion groups. A questionnaire measured the perceived social presence and the willingness to participate in these discussion groups. It was found that despite differences in amount of social presence between the two discussion groups students' perception of 'social presence' was similar. The willingness to participate in a discussion group was related to the level of perceived interactivity, but was unaffected by neither level of affective responses nor level of cohesiveness. This study suggests that social presence is not unitary construct. The data indicates that online instructors should promote high degree of interactivity between participants in discussion group more than affective communication or cohesive group references.


**Abstract**

Findings of a large survey indicate that the structure of leadership in an asynchronous learning environment is consisted with the one repeatedly found in the context of face-to-face leadership. Correlations with students' satisfaction were highly positive for transformational leadership (including contingent reward), low positive for management by exception-active and negative for passive leadership (laissez faire and management by exception-passive). Leadership styles predict students' satisfaction above and beyond their need for leader assistance.

**Abstract**
The process of developing concepts of time continues from age 5 to 11 years (Zakay, 1998). This study sought the representation mode in which children could best express time concepts, especially the proper arrangement of events in a logical and temporal order. Usually, temporal order is examined and taught by 2D (2-dimensional) pictorial scripts. Using Bruner’s (1973, 1986, 1990) representation stages, we tested the comparative effectiveness of VR (Virtual Reality) as a mode of representation on children’s conception of sequential time with the pictorial representation mode, the oral, and textual modes. The study involved 65 participants, aged 4 to 10, in 2 groups: kindergarten and school children. The study examined their ability to arrange episodes of a scenario in which a temporal order exists, using the different modes of representation. The findings demonstrate substantial differences in the temporal order arrangement between the modes of representation. In the 3D VR representation, the subjects had a smaller number of errors than in the other representations. These findings suggest that even though the pictorial mode is the most common way of examining and expressing temporal sequence, we should establish new ways of presenting sequencing so that children will be better able to achieve their full cognitive and academic potential.


**Abstract**
Researchers have found that one area of thinking where children with hearing impairment have difficulty, is time conception, and in particular, the proper arrangement of events in a logical, temporal order (Kaiser-Grodecka & Cieszynska 1991, Maschark, Lang & Albertini 2002, Senior 1989).
The study examined whether children with hearing impairment would grasp a temporal order in a different way using various modes of representation. For the first time, this work used Virtual Reality as a new mode of representation, in order to examine the influence of a 3D representation in comparison to a pictorial, a textual, a spoken and a signed representation, on the perception of temporal order amongst 69 children with hearing impairment aged 4 to 10.

The findings demonstrate substantial differences in the temporal order arrangement between the modes of representation. In the 3D VR and signed representation, the subjects had a smaller number of errors than in the other representations. The mode of representations with the most number of errors was the written and the pictorial representations.


**Abstract**

In present-day technologies, such as computer games, multimedia simulators, educational animations, chat-rooms and, and synchronous teaching platforms, the performance of users depends on their ability to process simultaneously large volumes and various types of stimuli that "bombard" their cognition in real-time and at a high speed. Real-time thinking is described here as a cognitive skill that helps users to work effectively in real-time environments. The paper describes the major dimensions of real-time thinking (i.e. simultaneous processing, responding to high-speed stimuli, attention management and multi-tasking, handling multiple perspectives and multiple representations effectively and managing real-time feedback), and discusses the challenges it poses for online teachers and designers of multimedia learning environments.


**Abstract**

The rapid infiltration of instructional technologies into educational systems and corporations, confront teachers, trainers and instructors with situations that require the utilization of an ever-growing assortment of technical, cognitive, and sociological skills
that are necessary in order to perform effectively in digital environments. These skills are termed collectively 'digital literacy'. But unlike the common attitude towards digital literacy in most studies of instructional technologies, it is more than just the technical ability to use digital devices properly. Digital literacy comprises a variety of cognitive skills that are utilized when teaching or learning at a distance, such as the ability to divide attention between students in an online lecture, the ability to teach effectively in a non-linear environment, and the ability decipher information from visual representations, as in user interfaces. In fact, digital literacy has become today a "survival skill" for present-days teachers that use technology for instruction; a key that helps them to employ successfully complex instructional strategies in their teaching.

In this paper, I present a holistic conceptual model for digital literacy in online teaching, arguing that it covers most of the cognitive skills that teachers employ in their work with instructional technologies. This model provides online teachers and designers of online learning environments, with a powerful conceptual framework for improving online teaching and learning. I will describe each of the major cognitive skills that are used in online teaching, discuss their value in refining our understanding of the online teaching-learning process and examine their application in improving communication among online instructors and students.


**Abstract**

The story-telling multimedia, Living Book, is one of the most common edutainment genres, in which children hear and play with interactive and animated stories, in a highly-engaging multimedia environment. Living Books are designed so that every word of the story is projected as text on the computer monitor simultaneously with its narration. This enables listeners to synchronize between the audio and textual representation of words and thus to learn their pronunciation and understand their meaning. This article presents results of a study which showed that young children who did not know how to speak or read the English language became proficient in pronunciation and gained a high level of understanding by playing with Living Books. Results show that the participants were able to correctly pronounce almost 70% of the words in the Living Book and could identify the meaning of about 70% of them. On the other hand, it was found that they were able to
read words as orthographic units but not to identify individual letters (average of 6.25%). Our findings point to the potential for incidental learning in highly-interactive, engaging and playful multimedia environments, such as Living Books.


**Abstract**
The proliferation of digital information resources in recent years challenges consumers with the need to employ critical thinking skills in reading news. This paper suggests an updated perspective to the expression that "the medium is the message" by comparing the ability of high-school and college students to exercise critical thinking skills in reading news in print and digital formats. The most important finding is the better performance of the younger participants (high school students) in reading digital news formats, and the better performance of the college students when reading news in a print format. The findings of this exploratory study are discussed through the lenses of three perspectives: a usability perspective, a cognitive perspective and an information economics perspective in order to stimulate further research that may provide designers, researchers and educators with useful guidelines for designing effective messages in the information age.


**Abstract**
At the core of sociolinguistic theory is the recognition that men and women when engaging in an open conversation communicate differently because of their different respective social objectives in communication. Oral conversations are, according to sociolinguists, akin to cross cultural conversations and hence the tendency toward same-gender conversations. Extrapolating to the realm of threaded discussions in online courses, these gender differences, it is hypothesized, should translate into mild gender segregation in the threaded discussions as well as men showing a greater proclivity to
dominate the discussion. Data from 233 students in 27 courses support these hypotheses and allow a significant identification of the gender of the student based on whom they reference in the threaded discussion and the way they reference others. Implications on managing threaded discussions are discussed.


**Abstract**

Academic institutions invest considerable resources in improving the website quality of their MBA courses, in the hope of increasing student retention and willingness to recommend the programs to others. Despite this investment, it seems that the old "keep it simple" rule is also true for e-learning. Data collected from students enrolled in a blended distance learning MBA program at the Open University of Israel, shows that the students were most satisfied with the simple and relatively inexpensive e-learning tools, which did not require their active participation. The paper discusses bounded rationality and attention economy as suggested theoretical explanations for this phenomenon, as well as practical implications for academic institutions and educators.


**Abstract**

Increasing retention in MBA programs and having the students recommend it to others is crucial for the ongoing financial success of these programs. E-learning has been proposed as one way of doing so and many universities are investing heavily in improving the website quality of their courses. This study probes the effectiveness of these investments, examining how various aspects of the online learning experience contribute to and compare with overall satisfaction with the learning assistance quality at the websites. The data, collected from MBA students who participated in a blended distance learning MBA program which included online courses as an integral part of the program support the model, shows that the most important thing to influence both retention and recommendations was overall satisfaction with the quality of the learning
tools. The quality of the auxiliary technical, teaching, and communication services of the websites contributed to the quality of learning but did not contribute to retention or recommendation. This was so, even after controlling for the students' grades and their inclination to stay or leave the MBA program. The indirect contribution of satisfaction with e-learning tools highlights the importance of the teaching aspects also in blended online MBA courses, and shows the mostly background influence of the technology itself.


**Abstract**

Maintaining student satisfaction and through it retaining students and having them recommend the program to others, is central to the success of any MBA program. This is especially important in distance learning programs because of their high dropout rates. The study shows the centrality of social norms outside the realm of the MBA program in determining three aspects of such satisfaction, namely satisfaction with knowledge gained in the program, MBA personnel, and quality of the MBA program e-learning services. Data collected from students who participated in a blended distance learning MBA program show the importance of social norms over and above the communicational and technical characteristics of the e-learning services. Social norms also contributed to student self-reported ability to cope with the learning load which significantly influenced both elements of retention: willingness to recommend the program and reduced inclination to withdraw. The importance of social norm management is discussed.


**Abstract**
This chapter presents a unified theory of instructional design in the cognitive domain. The theory differs from specific instructional design theories in that it describes how all instructional systems operate (regardless of their goals) in terms of resources and dialogues common to all instructional systems; it predicts certain instructional outcomes based on given initial conditions. The theory affords practical and theoretical advantages. Practically, it (1) simply and accurately describes the mechanisms at play in instructional systems, (2) presents readily quantifiable operational definitions, (3) suggests hypotheses that may be evaluated empirically, and (4) points the way toward optimizing instructional systems. Theoretically, it (1) subsumes all current theories of instructional design and (2) views campus-based, distance and online instructional systems as a single discipline.


Abstract
This study investigated how students specifically overcame conceptual difficulty and solved problems through the use of intrapersonal and interpersonal instructional dialogues in a difficult physics course at Open University, UK. It was found that students initially tried to overcome difficulties alone; if unsuccessful, they turned to interpersonal dialogue, especially with tutors. Interpersonal dialogue was generally mediated by telephone, not by technology-based communication resources.


Abstract
This study investigated the kinds of dialogic behavior engaged in by students while studying a difficult physics course at the Open University, UK. Research objectives were twofold: (1) to document what dialogue types, mediated through which resources, were utilized by students to overcome conceptual difficulties that emerged while reading the
course materials and while solving difficult Tutor Marked Assignments and (2) to correlate dialogic behaviors with several student attributes (age, gender, motivation to achieve a high grade, learning preference and a prior acquaintance with at least one other student in the course). Two main findings emerged: (1) initially, a large majority of students dealt with both kinds of difficulty individually; only when such efforts failed did they turn to interpersonal dialogue and (2) a very large majority of students turned to instructors for help, not to their peers. The first finding replicated those from previous studies while the second finding differed from previous ones wherein students turned overwhelmingly to peers, not to instructors.


**Abstract**

This paper reports an exploratory survey in Australia and Israel of the leisure habits, attitudes and preferences of 716 teenagers aged 13-14 years who are part of the international digital games culture. The rationale was threefold: (a) this age group is not singled out in other surveys; (b) examination of gaming across five platforms would contribute new insights; and (c) the premise that a comparison between eGamers in a war zone and a peaceful country would produce striking contrasts. Virtually all participants played digital games for an average of 10-12 hours per week, the majority using all gaming platforms daily. Notable country differences were identified, particularly game genre preferences but there was also commonality as digital gamers. Digital games remain "boys’ games" with the male teenagers devoting more time to playing across five game platforms than did the females who, however, demonstrated a lessening of the gender gap. Although playing digital games was one of the two top-rated leisure activities across country and gender, isolation and fitness were of less concern than popularly believed.


**Abstract**
Although videoconference-based distance learning opens new possibilities, it also raises a number of pedagogical problems, such as a lack of personal contact with the lecturer, reduced interactivity during the lesson and technical problems with hardware and/or software. These difficulties have differential effects on achievement levels among learners with different cognitive styles.

A systematic attempt to increase the effectiveness of distance learning requires a clear understanding of the complex interrelationship between learner characteristics, educational environment and student outcomes. In this study we examined the relationship between cognitive style based on Jung's theory (1971) and achievement levels among seventy-seven university students in a videoconference-based learning environment. Cognitive style was assessed using the F version of the Myer-Briggs (MBTI) Test, and a significant relationship was found between students’ cognitive style in the extrovert-introvert dimension and achievement levels. In-depth interviews were conducted to examine why introverts attained significantly higher achievements than did extroverts.

These results help us begin to identify learner characteristics that predict academic success in a distance learning environment. Identification of learner profiles that correlate positively with achievement in a distance learning environment represents an important direction for future research that will facilitate the design of distance learning environments that accommodate a range of students’ needs, instead of a “one size fits all” approach.


**Abstract**

The current study examined the use of VR (Virtual Reality) and its affect on the degree of awareness of 178 seventh and eighth graders to the emotional and social experiences of a new immigrant during his or her first months in the adoptive country. Students native to the adoptive country were divided into two groups: an experimental group, which tried out VR worlds designed to simulate the emotional and social feelings and experiences of a new immigrant teen, and a control group which viewed a movie on the same subject. In addition, we have examined another group of teen immigrants who provided us with a benchmark of the degree of awareness to be measured. Their responses were
compared to those of native teenagers of the adoptive country. All the subjects responded to an awareness questionnaire before and after the experiment (Sever 1977), and had a personal interview before and after the experiment as well. The results indicate that the experience of a VR simulated emotional and social experiences of a recent immigrant teen has intensified the emotional and social awareness of the experiment group while the movie intensified the social feelings only in the control group.


Abstract
The purpose of this study is to examine whether online text vowelization of words in context facilitates reading in Hebrew, which is a deep orthography language. The study compares the effect of vowelization on reading among native and non-native Hebrew speakers. Participants will perform a self-paced reading - cumulative presentation (Marinis, 2003) task, that includes a 2 (voweled/nonvoweled) X 2 (homographs/unambiguous words) X 2 (location of words: beginning or middle/end of sentence) design. Results will facilitate the determination of criteria for vowelization to improve online reading.


Abstract
The research examines the relationship between metacognitive thinking, forum activities and attitudes of students in an e-learning course. 270 students' messages were sent to the online forum. The content of these messages was analyzed according to Flavell’s metacognitive dimensions. Students with positive attitudes toward learning in the forum scored significantly higher on the examined metacognitive measures compared to those with negative attitudes. Moreover, students with high level of activity in the forum
demonstrated a significant higher metacognitive level than did students whose activity level in the forum was low. Finally, a positive correlation was found between students’ rate of activity and their positive attitudes toward the online forum. The relationship found between attitude and activity on one hand and metacognitive thinking on the other, signifies the importance of studying the cognitive contribution made by e-learning courses to learning and thinking.


**Abstract**

A Website that helps students visualize and locate symmetry elements on three-dimensional molecular structures was developed. It includes textual explanations, an interactive example window and a Microsoft-Excel based symmetry toolkit that enables students to draw symmetry elements in three dimensions. Preliminary qualitative research aimed at exploring how students learned with this tool was performed. It was found that the three-dimensional graphical capabilities of the toolkit (1) helped students overcome difficulties in three-dimensional visualization, (2) enabled students to find symmetry elements of complex molecules generally not accessible from drawings and (3) contributed to a deeper understanding of molecular structure and chemical symmetry.