Integrating Technology
in Learning Systems

The rapid technological changes in the world of computers and communications create continuous opportunities for innovation in the various components of distance learning, including learning materials, learning processes, information distribution and transmission systems and the organizational-logistical aspects of learning.

The Computerized University

With the integration of all digital services currently offered by the Open University, particularly *Sheilta*, the digital library and the Opus learning environment, the vision of a computerized university is becoming a reality. Our aim is to provide students, if they are interested, with all teaching, support and administrative services directly to their homes through their personal computers. We already provide such solutions to our students abroad, to students bound to their homes, and to groups of students for whom we cannot open a study group.
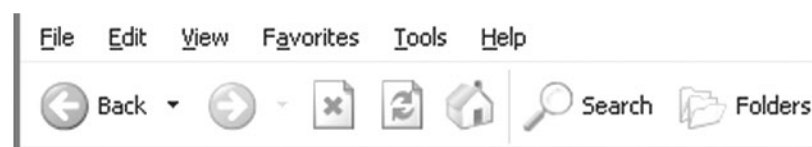
The InterWise system for synchronous transmission of lessons on the Internet

This year we expanded the use of the Internet-based synchronous teaching system, InterWise. Through this system, course coordinators and tutors in different disciplines transmitted lessons, expert lectures, review and exercise sessions, office hours and more. Some lessons targeted specific groups (e.g., gifted students or students abroad), while others served all students in the course. Recordings of InterWise lessons from earlier semesters are available on the course websites for students' use according to their needs.

Online assignment system

Through the online assignment system, assignments are sent from students to course tutors and returned to the students after they are checked, under the supervision of the course coordinators. New tools and functions were added to the system this year and efforts were made to increase its use among students. The system enables interested students to transmit their assignments as electronic files through the internet. Tutors receive an e-mail message informing them that assignments

are waiting to be checked. The tutor types comments into the student's file and the grade on an electronic form. Students receive the checked assignments along with the tutor's comments and the grade. Grades are calculated automatically.

Graded assignments checked through the online assignment system are automatically entered into the student's record. The system enables course coordinators to sample checked assignments and to receive a report on assignments (in a variety of cross-sections) with an up-to-date picture of electronic submission of assignments. Coordinators can obtain an overview of all assignments submitted, including statistical data. The system also enables administrative units to enact tutor payment transactions.

Integration of Websites into Open University Courses

The infrastructure for setting up websites for all Open University courses was completed last year. The course website serves as a virtual study center containing all reference material, recorded lectures, summaries, briefings and discussion forums relating to the course. Through the course site students can interact with the teaching team and with their peers and benefit from the various materials on the site.

The Opus learning environment, developed by the Open University, serves as a platform for the development and operation of course sites, and is the result of a joint effort of the technical and pedagogic teams in *Shoham* and the course teaching teams. New versions are launched twice a year (in February and August) and include new tools as well as improvements in existing tools with the aim of creating convenient, friendly and efficient tools for representation of content, to afford interaction, to organize learning and to manage activities on the site. This year the discussion group module was enhanced, a version for printing site pages was developed and two new tools were launched: a "personal notepad" that enables students to organize material according to their needs, and which accompanies them throughout their studies; and a "homepage editor" that makes organizing information on the site more flexible for course coordinators. In addition, the *Mapa* (Open University Activity Plan) system was integrated into course sites this year. The system was jointly developed by the Computer Unit and *Shoham*, enabling all users (students, tutors and course coordinators) to view a personal monthly schedule that lists most relevant activities, both academic and administrative. Users can view the activities relevant to their courses according to different cross-sections.

Improving and Expanding Services of the Interactive Voice Response (IVR) System "Kol HaOp"
Services provided to students through IVR were improved and expanded: requests and payment for learning aids, seminar paper registration, confirmations of studies.

Development of Multimedia Titles

Due to the unique nature of many courses in the natural sciences, which involve the study of natural phenomena on the macro level above and under ground, in the atmosphere and in space; as well as on the level of cells, molecules and atoms, the development of imaging tools and special teaching technologies for studying these phenomena is of particular importance. Accordingly, members of the department of Natural Sciences have been intensively involved in developing such tools for their courses. Among the tools developed: interactive courseware for studying symmetry in crystals; courseware for studying the three-dimensional structure of complex molecules such as lipids, sugars, proteins and nucleic acids in the courses Biochemistry I and Biochemistry II; courseware on the behavior of various animals in nature and the structure of crystals and minerals; and courseware for reviewing fieldtrips and laboratory experiments.

In addition to the above, multimedia titles are being developed in the following areas: financial theory; a Hebrew version of "WINECON" courseware for the course **Introduction to Macroeconomics**; a computer-based workshop on writing seminar papers; prototypes of digital study units; and the entire course **Introduction to Computer Science Using Java** on digital video.

Assessment of the Implementation of Learning Technologies in OU Course Websites

As part of a project funded by the Planning and Budgeting Committee for the implementation of learning technologies, the Evaluation and Academic Staff development department completed its assessment of the project in the websites of Open University courses this year.

The integration of technologies into teaching has pedagogic, social and economic goals: to raise the level of students' learning, to increase student access to the learning environment, to create a learning environment that provides social support, and to reduce costs. The study evaluated the websites of academic courses at the Open University over a three-year period. The course websites include various learning components that aim to assist students, enable them to maintain contact with the teaching staff and other students, and provide them with social support in their studies. These include: discussion groups, access to information databases on the Internet, summaries of tutorial sessions, and a glossary of course terms.

The study was a comprehensive and detailed evaluation of the integration of the websites into academic courses. The evaluation focused on an attempt to understand whether and how pedagogic and social processes take place on these sites. A comprehensive evaluation of about 50 course websites, as well as detailed evaluations of individual courses, were conducted in each semester.

The study suggests that most students visit course websites at least once during a semester. The percentage of students entering the course site with greater frequency (several times a week) was found to be increasing. Students' overall satisfaction with online communication is above medium and rising. It appears that students enter the sites primarily to contact the teaching staff and receive answers, and to obtain specific information when preparing assignments.

Course coordinators view online communication primarily as an additional channel of communication with students and as a learning aid, complementing the other tools available to students.