INSTITUTIONAL IMPLEMENTATION
OF WIKIS IN HIGHER EDUCATION:
The Case of the Open University of Israel (OUI)

> Hagit Meishar-Tal, Yoav Yair, & Edna Tal-Elhasid

Abstract
This chapter reviews the experience gained at the Open University of Israel (OUI) in implementing wikis in its academic courses. The first part discusses the strategy that has been employed to support the implementation of wikis in learning and teaching, concentrating on three perspectives: the technological, the pedagogical, and the administrative. The second part assesses the implementation process in terms of sustainability and diffusion. The experience gained at the OUI and the model of implementation developed by its leading team could serve as a model for the implementation of additional new and emerging learning technologies in distance learning institutions.

Introduction
Implementing a new e-learning technology in higher education institutions is a complicated process. Most of the literature discusses the implementation of various e-learning tools, often collectively known as Learning Management Systems (LMSs) or Virtual Learning Environments (VLEs). These environments usually contain course materials and forums for asynchronous online discussions. The focus of previous studies was on the transformation that was required from the university in moving from traditional face-to-face teaching to online teaching (Garrison & Anderson, 2003; Goodyear, Salmon, Spector, Steeple, & Tickner, 2001; Hegarty, Penman, Nichols, Brown, Hayden, Gower, Kelly, & Moore, 2005; Nichols & Anderson, 2005). The focus
of the present work is slightly different: the change we discuss here is the transformation required with the adoption of wikis into distance teaching and learning.

Wikis are collaborative writing tools (Augar, Raitman, & Zhou 2004; Bruns & Humphreys, 2005; Lamb, 2004). As such, they are not suitable for use in all courses, but only in courses in which collaborative learning may be effective. Nevertheless, they possess a revolutionary potential in terms of pedagogy. The change required of the university in this respect is quite dramatic, moving from individual distance Web-assisted self-learning to online collaborative group learning.

The OUI Background
The Open University of Israel (OUI) is a distance learning university, established in 1974, which presently enrolls more than 40,000 students. In Israel, it is considered the pioneer and leader in implementing innovative e-learning technologies to support and enhance learning. The university was the first in Israel (1996) to develop an online learning platform (named OPUS) of its own. Each course in the OUI has a website to which the course staff can upload learning materials such as briefs, presentations, and enrichment material. Each course has its own message boards and discussion groups, to which messages are relayed by the course team, and where the students can post questions and queries, which the course staff or their peers can answer and discuss.

The adoption of e-learning technologies is dictated by the pedagogical goals of the university and the students’ needs. As a distance learning university, OUI students can benefit from using an online learning environment, which allows them better contact with the academic staff, better access to learning materials, and an opportunity to collaborate from a distance (Harasim, 2000; Hiltz, 1990).

Before the Internet era, the OUI model of teaching was based exclusively on the self-study model. Students received a course kit containing printed and audio-visual material, which was sent to their homes by (regular) mail. They had to submit some written assignments to their tutors during the semester and pass the final exam at the end of the
course. Some students found it very difficult to adjust to this model of self-study. They felt lonely and isolated, and often dropped out during the first semester.

OPUS enables the emergence of innovative teaching methods relying on a more social and constructive approach to distance learning. By using the Internet, students can communicate and collaborate with each other and with their tutors from a distance through conferencing tools and discussion groups (Garrison & Anderson, 2003; Salmon, 2005). They can discuss issues online and learn through debate, and they can expose their work to peers and get their advice and feedback. They can assess other students’ work and comment on it. They can learn collaboratively in groups although they cannot meet face to face, and they can be part of a learning community (Hiltz, 1998). For this mode of collaboration, we regularly employed Internet tools that were not originally designed for this type of activity. Thus, the advent of wiki technology offered us an opportunity to use its unique aspects in a distance learning setting.

The implementation of wikis at the OUI started in September 2005. MediaWiki software was adapted to the university’s LMS. During the first stage, a pilot group was set up, in which six courses were given the opportunity of using the platform and developing course assignments for their students. This pilot study was essentially a feasibility study, which proved to be very successful in terms of student and staff satisfaction (Tal & Tal, 2006). During 2007 and early 2008, a set of actions was taken to fully implement and integrate wikis as one of the mainstream learning tools used in the university.

The Multi-Dimensional Implementation Strategy Framework

The “sustainable embedding” (Sharpe, Benefield, & Francis, 2006) of a new learning technology in the institution demands a complex set of changes and transformations. Its success depends on the willingness and capability of the academic staff to embrace the new technology, and on the ability of the institution to manage and coordinate the process of implementation using a holistic approach (Nichols, 2007).
It demands the development of a detailed, multi-dimensional institutional strategy to cover all aspects of implementation: technological, pedagogical, and organizational (Koper, 2004).

The technological aspect of implementing a new learning technology in the organization involves a whole range of technical issues: choosing the right software and hardware to meet the needs of the institution, the students and the academic staff; maintaining the technology; and supplying the end users with the proper support (Schonwald, 2003).

From a pedagogical perspective, the adoption of e-learning requires changes in teaching approaches. Teaching face-to-face or the traditional mode of distance teaching (correspondence courses) is different from teaching online. Special skills are required from the instructors to carry out online teaching (Goodyear et al., 2001). This is also true in the transformation of distance teaching from the self-learning model to collaborative learning, as in the case of the adoption of wikis into teaching and learning. Staff development is therefore a crucial component in the implementation process, as stated by Hegarty et al. (2006, p.1):

> Capability in e-learning was wider than just the acquisition of technical skills, and required staff development activities that would help staff overcome fear and anxiety, motivate them to become involved in new technologies for teaching, and develop a clear appreciation of pedagogy related to e-learning.

The third aspect to be considered in the implementation process is organizational. Nichols and Anderson (2005) claim that the strategic challenge to the institution is to “efficiently coordinate e-learning development without stifling innovation.” Implementing learning technologies successfully depends on a set of institutional moves and conditions. From the administrative perspective, moving towards online learning requires full coordination between managers, administrators, and faculty (Koper, 2004; Nichols, 2007; Salmon, 2005).
From an economic perspective, it is a matter of massive investments (Salmon, 2005). New technologies should be evaluated by the institution and proved to be not only effective but cost-effective as well (ibid.).

Table 11.1 sums up the overall parameters involved in the implementation process:

Table 11.1 The multi-dimensional framework of the implementation of wikis

<table>
<thead>
<tr>
<th>Technical aspects</th>
<th>Pedagogical aspects</th>
<th>Organizational aspects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software adjustments</td>
<td>Dissemination initiatives</td>
<td>Rules and regulations</td>
</tr>
<tr>
<td>Hardware adjustments</td>
<td>Staff development</td>
<td>Reporting procedures</td>
</tr>
<tr>
<td>Technical support</td>
<td>Pedagogical support</td>
<td>Financial aspects</td>
</tr>
<tr>
<td>services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment and evaluation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The following paragraphs review in detail the actions taken by the OUI Center for Technology in Distance Education (SHOHAM) in implementing wikis.

Technical Aspects

**Software adjustments.** MediaWiki, which was chosen to be the platform for the wiki activities, is open source software that can be downloaded from the Internet and installed on the university’s servers. The generic version of the software cannot meet the university’s special requirements. Some adjustments had to be made before starting to use the software, such as defining a bureaucrat and sysops (managers), and designing the edit toolbar to make it more user-friendly and function-rich. Also, language and design issues had to be solved, since Hebrew is written from right to left.

MediaWiki is external software and as such, is not an integral part of the OUI’s VLE. It was crucial to integrate it into the VLE by connecting it to the identification and authorization system that contains the database of the users and their passwords, which are needed to control access the wikis.
A PHP programmer was tasked with the management and maintenance of the wiki server and software. The job description also required improving the wiki and responding to new requirements. For example, MediaWiki did not have enough statistical reports, an essential tool for the course coordinators (academic staff) to control and assess the assignments and students’ performance. Based on the requirements, an in-house statistical tool was developed that gave a real-time report on the overall assignment and its various components.

**Hardware adjustments.** In the early stages of the project, the MediaWiki software was installed on a test server, which was unsuitable for use as a “Production Server.” In the transformation from a pilot to an integrated tool in the university’s arsenal, the system administrator had to provide a suitable server and backup system and move the wiki to it.

**Technical support services.** The OUI personnel of the Technical Support Center for students and staff were trained to be able to assist students by telephone in case of any difficulties in operating the wikis.

**Pedagogical Aspects**
Implementing wikis at the OUI was not only a technological endeavour; it was mainly a pedagogical revolution. The OUI existing model of teaching and learning depends mostly on self-study methods. We had to make some major changes and adjustments at the pedagogical level in order to generate the desired change.

**Dissemination initiatives.** The first challenge of the project managers was to identify the potential courses for carrying out wiki activities. At the end of the first pilot, a special seminar was held for a wide academic audience, presenting the pedagogical potential of wikis for different models of assignments. The successful activities from the pilot stage were discussed and ideas for continuation were presented. This seminar was planned and successfully served as a recruiting tool, and consequently additional course coordinators expressed their wish to
join the project in the following semester. The wiki project was also reported in internal university publications and in the Israeli media (Haner, 2006; Shalev, 2006).

**Staff development.** Although MediaWiki is user-friendly software, training is required at both the technical and the pedagogical levels. A five-hour workshop was given to new course coordinators (CCs) who joined the project. During the technical part of the workshop, the CCs learned to operate a wiki both as a user and as the manager of the environment (sysop). They were exposed to the special tags of MediaWiki, they learned how to compare versions, and they learned how to look at a user contributions report. In the pedagogical part of the workshop, they were shown how to design a successful wiki assignment and how to run it during the semester. They received advice on how to encourage students to participate and to collaborate, how to assess these assignments, and how and what level of involvement they should invest in the assignment while it is being developed by the students.

The workshop was compulsory for CCs who wished to join the project, and at the end of the workshop the participating CCs were required to prepare outlines for their future wiki assignment.

**Ongoing pedagogical support.** SHOHAM staff continued to support the CCs during their first semester and onwards, assisting with technical and pedagogical issues on demand.

A special Web portal for the wiki project was published, containing important information on the educational wikis, such as links to published academic papers, printed tutorials on the usage of wikis, a set of audio-visual short clips that explain how to use wikis, the seminar recording, and the list of courses and CCs in the project, with links to their wikis. The portal also contains a training zone in which course coordinators who are interested in trying or practicing how to use wikis are able to do so (http://wiki-openu.openu.ac.il/courses/wikiop).
Organizational Aspects

**Rules and regulations.** Within the traditional model of teaching of the Open University, students are not allowed to submit assignment in pairs or in groups, only individually. If two assignments are identified as containing a high level of resemblance, they are not accepted and the students may be subjected to disciplinary measures.

Wiki assignments are, by definition, collaborative assignments. In order to move to a stage in which wiki assignments are not considered “experiments” but are part of the pedagogical options that can be utilized by the CCs, some modifications to the regular rules of the university had to be made. The university’s academic committee had to decide whether a collaborative wiki assignment is acceptable and under which conditions.

The instructional designers and pedagogical experts in SHOHAM prepared a White Paper containing all the regulations that had to be implemented when working with wikis. This paper covered issues such as the maximum percentage of the final grade that could be given to the wiki assignment, the assignments’ assessment procedures, the training of CCs, and the question of how to use wikis — as compulsory or as optional assignments. The OUI academic committee accepted most of the recommendations in July 2007, emphasizing that a wiki assignment should replace an existing “regular” one, and not be added to the total number of assignments in the course. Since the fall semester of 2008, the wiki collaborative assignments have been considered a legitimate option and are an established teaching tool. This development demonstrates the possibility of emerging technologies impacting, changing, and moulding the organization in which they are being deployed (chapter 1).

**Financial aspects.** Designing, implementing, and assessing a wiki assignment is a time-consuming activity. To achieve CCs’ participation in and persistence with wikis, there must be a fair fee related to the work. The shift from a pilot project to a mainstream teaching tool required establishing criteria for payments to the CCs that are not wholly different from the reward system for normal assignments. Otherwise,
large-scale usage of wikis with a higher level of payment would create a huge burden on the university’s budget. Thus, two levels of wiki duration and accompanying fees were established: one for a short-term assignment (up to two weeks) and the other for a long-term assignment (more than two weeks and up to two months).

Furthermore, since access to computers and the Internet is still not considered compulsory for studying at the OUI, students who state that they are unable to take part in a wiki assignment should be offered an alternative task, equal in content and pedagogical value.

**Reporting procedures.** The assignment reporting procedure in the university is rigorous, both in its traditional format (assignments sent by mail) and in its online format (assignments submitted online). The tutors receive the assignment (hard copy or electronic), assess it, complete the feedback and grade, and send it back to the Center of Learning Achievements. In the case of a wiki assignment, this procedure is inadequate, since the wiki assignment is not submitted to the assessor, but takes place within the wiki website. The procedures and the online assignment reporting system had to be changed in order to enable reporting grades for wiki assignments.

**Assessment and Evaluation**

The wiki project was assessed and evaluated from the initial pilot stage in various ways:

(1) Each semester, a survey was distributed to the students asking about their satisfaction with learning on the wiki platform. The findings are used to improve the design and management of collaborative assignments.

One of the outcomes of the students’ survey was the insight that students want more feedback and tutor involvement during the time allocated for completing the assignment.

(2) Each semester, the CCs had to submit a report that described their wiki assignments: the level of commitment (compulsory/optional), the type of activity (glossary, web query, etc.), and the level of
collaboration. The forms are gathered into a database and saved for further research.

(3) The log files on the wiki server are accessible to the academic staff, who are able to conduct their own research on wikis. Students in the MA program in educational technologies are also encouraged to conduct research on wikis using qualitative and quantitative methods.

(4) Every year a report is written and submitted to the university chancellor describing advancements in the wiki project.

**Diffusion and Sustainability of Wikis in the OUI**

The basic measurement of the successful implementation of e-learning technologies in institutions is adoption (Hegarty et al., 2006; Nichols & Anderson, 2005). Adoption can be measured by two parameters: diffusion and sustainability.

**Diffusion** is measured in terms of scope: how many users, courses, or faculties have adopted the new tool (Nichols, 2007; Rogers, 2003).

**Sustainability** is measured in terms of time and continuous use. The sustainable embedding of e-learning is indicated by the number of courses that make use of the technology an integral part of their course’s learning environment for a long period of time (Sharpe et al., 2006).

While measuring the diffusion and sustainability of wikis in academic courses, one must bear in mind that wikis are not “core technologies,” like VLE platforms, but only a “peripheral technology” (Salmon, 2005). They are not suitable for use in all courses, but only in courses in which collaborative learning may be effective. Therefore, the rate of implementation should not be measured against the total number of courses the university has to offer, but with reference to the courses that joined the project.

The figures below present the current state of wikis in the OUI in terms of diffusion and sustainability.
Figure 11.1 presents the growth of the usage of wikis in the OUI for the period 2006–2008 (every course could open only one wiki per semester). The overall picture shows a growth trend in 2006 and at the beginning of 2007, with stabilization during 2007–2008. This level of usage should be maintained over time, in order to achieve sustainability of the project.

Figure 11.2 shows the number of wikis and the number of courses per faculty (2006–2007).
Figure 11.2 shows the distribution of wikis in the different academic departments. The black bars represent the number of wikis opened for the faculty, and the grey bars represent the number of courses that carried out a wiki assignment. The differences between the columns reflect the fact that some courses carried out a wiki activity more than once. This is a positive indication for the sustainability of the wiki project (see also Table 11.2).

The wiki was used mostly in the natural sciences and in the education and psychology departments, and was not used at all by the department of computer sciences and mathematics. The reason for this may stem from the lack of adequate mathematical capabilities within the wiki editing tools (equations cannot be easily written). The wiki editing tools should be improved before other potential users in additional disciplines are able to use it.

Table 11.2 Number of semesters of wiki usage per course

<table>
<thead>
<tr>
<th>Number of semesters</th>
<th>Number of courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 11.2 shows the number of semesters in which the courses operated a wiki. The longest term possible is six semesters. The shortest is only one semester. Not all the courses started in the same semester and could operate a wiki for all the six semesters. Out of nine courses that operated a wiki only once, six were taken for the first time during the 2008 spring semester (2008b), the last one in the present research. This means that only three courses (11 percent) dropped out of the project after one semester; the other courses that took part in the project found it useful and wished to continue using it for at least another semester. Only one course operated a wiki in all six semesters.
The wiki project is still in its early stages, and summaries and conclusions are naturally limited. However, the research on the diffusion and sustainability of the wikis in the OUI should continue as the project develops.

Problems and Obstacles
The wiki project in the OUI is successful in terms of diffusion and sustainability. Nevertheless, there are still some problems that must be considered.

(1) The wiki is not yet fully integrated into the VLE system. It is connected to the main VLE, yet works on another platform and with a different programming language. Therefore, maintaining the system is not easy and requires special effort from the system administrator.

(2) MediaWiki is not equipped with a graphic user interface, meaning the students have to be engaged in writing tags as well as content while working on the wiki. Some CCs find it not friendly enough and therefore refuse to take part in the project (see chapter 10).

(3) Collaborative writing is new to the OUI students, since they are used to studying alone. Although most of the students who participated in wikis did report a high level of satisfaction, they had numerous objections and fears at the beginning of the assignment. Some students (a minority) even refused to participate in the collaborative assignment, although it was compulsory.

Summary and Conclusions
The OUI’s wiki project is a good example of the successful implementation of a new technology and innovative pedagogies in a higher education institution. It was flexible, quick, and required little prior set-up, often encountered during the development of new software. The project began with a small group of “wiki pioneers” (the typical innovators and early adopters, according to Rogers, 2003), and then extended into a large-scale project that eventually became an integrated part of the OUI arsenal of learning technologies. This process can serve as a model for the implementation of emerging technologies in other educational/
learning institutes. The model is based on six components: promotion, technical and pedagogical training, technical adjustments, institutional adjustment, assessment, and administrative arrangements.

A successful implementation must act in all the dimensions simultaneously in order to achieve good results, a quick and sustainable diffusion, and high levels of student achievement and satisfaction.

REFERENCES


Conference of the WWW, Internet and Intranet Proceedings, Orlando, Florida.