Models of Internet Based Learning Environment in Higher Education  
- Some Pedagogical Thoughts -  
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Introduction
The concept of distance learning has been applied for many years in higher education in various forms. Recently, this mode of learning became Internet based. The fact that the Internet is a dynamic information and communication environment gives reason to consider its educational realization to enhance student centered instruction. It is assumed that these environments support advanced pedagogical ideas. These ideas are claimed not only by instructors but also by students who seem to shift from viewing education as acquiring knowledge and memorization to a constructive activity (Lonke, 1997).

Could the net supply a learning environment, which supports a new pedagogy in higher education? One way to explore this question is to find out how the Internet is used in online higher education courses. In a survey we conducted in this matter 70 higher education sites out of 400 educational sites were analyzed. The analysis revealed that 91% of the sites used individual instruction, none of them used collaborative activities almost 75% of the sites were only information pages. From the communication point of view 67% used E-mail, almost no discussion groups were offered and only 8.6% offered synchronous means (Miodusar, Nachmias, Oren, Lahav, 1999). It seems quite clear that the communicative features were not used in the appropriate way. Another way to answer these questions is through developing; experiencing and exploring web based instruction. This way is discussed in the following article.

Our main interest lies with two main issues discussed in the literature concerning distance learning: (Harasim, 1995; Hitz, 1995; Anderson & Kanuka, 1997; Chan & Rapman, 1999; Bonk et.al, 2000).

- Do students control the learning process in a web based learning mode?
- Do students develop a social atmosphere and integration in a web based learning mode?

In order to look in depth into these questions we designed a course to be instructed in two different models: In the first model the web was used as an extension to the f2f course and in the second model the web was used as an online alternative. The article will article a course described research work conducted in the years 1999-2000. Findings will be presented and discussed in order to understand the significance of Internet based learning for higher education.

Some theoretical remarks
It is quite clear from the educational concepts covered by the literature that the Internet might serve as an educational environment while the pedagogical ideas it supports are still in question. The survey by Paulsen (1995) sums up the various instructional strategies that are known in the educational field. He proposes a classification of communication possibilities that reflects the pedagogical power of the net: person to information, person to person (help, apprenticeship etc.), person to many (lecture etc.) and many to many (debate, project etc). Fetterman (1998) uses a more global perspective view. He describes the educational possibilities offered through the net by classifying the educational environment into categories of information (pages) usage, communication means, and data handling emphasizing students activities involved such as processing, sharing and publishing. Apparently, it is clear that the Internet is becoming a place hosting pedagogical environments.
Researchers are curious about various questions related to online learning process, which take place within these learning environments. Some investigate the learning process from the learner’s control point of view. In this perspective Doherty (1998) points out the importance of asynchronous learning facilities quoting the findings of Drexel University. Apparently, students who used ALN indicated that they had more access to the instructor, more communication with peers and felt that they had gained knowledge in the online environment. Within this perspective the issue of using different communication facilities - synchronous and asynchronous is also discussed. For instance, Irani (1998) explored the information richness offered by various media for different types of assignments. It was found that synchronous communication facilities (video conferencing and chats) were ranked quite high for all types of tasks.

Not less important in research is the social perspective dealing with the issue of social atmosphere in virtual learning environments. The importance of the social atmosphere in learning is quite acknowledged in the educational domain. It is also an important issue in research of online learning. Wegerif (1998) suggests that a development of a social climate is important in order to make the student feel an insider in the learning environment: a feeling that contributes to students’ motivation, involvement and contentment. Chan & Rapman (1999) claim that social relations between students help in creating a state of flow, which is an expression of a deep involvement in the learning activity. Within this perspective the optimal ratio between face to face and online interactions is investigated. Apparently there are certain parts of a course that need the face to face communication, while others will be benefited more through distance learning.

**Course description**

Bearing this in mind a course dealing with the “Prospects of virtual environments for education” was designed. We assumed that students might be benefited through “learning by doing” being themselves part of an educational virtual environment.

In order to explore the special contribution of the network for student centered learning and instruction we offered two modes of a course dealing with the same subject: an online course and a hybrid course extending the face to face lessons with net based activities.

In designing the course modes we had in mind issues and research findings described above and considered the importance of the communication facilities as presented by Paulsen (1995). Likewise, we found the integrative model as discussed by Mason (1998), or as it is called the holistic model to be most suitable for our pedagogical framework. This model is based on the integration of all the elements involved in online learning: information and communication and pedagogy as described by Nachmias et al (1999).

The structure of the course was designed as follows:
Course materials were written especially for the on-line version, and structured according to the sequence of the lessons presented in the hybrid course. We wanted to enable each student to look in depth in the issues discussed according to her/his abilities, therefore we used the hypertext method through three types of links: links which enable navigation inside the specific subject, links between course subjects and links to information embedded in other sites. Each subject was accompanied with activities presented through a timetable. Some activities demanded collaborative learning and some of them were individual exercises. Students were asked to deliver the assignments by hand (hybrid course), or through mail (online course). In both courses assignments were related to fixed dates.

The courses used various communication means - synchronous and asynchronous - bearing in mind that each communication type might have a different contribution to the learning process. The online course used IRC and ICQ to maintain contact between online students. Likewise, forums (discussion groups) were a main part of the learning process, each one lasting one-week for both courses. Sending messages and comments to some forums was obligatory and defined as an assignment. In such forums students were asked to send at least one message and two comments at least. Three moderated chats were held through the online course in order to discuss its subjects. Students could use the chat in a free mode also for social interactions. Students of the online course had a preliminary face to face meeting in which they got an overview lecture and experienced the communication tools of the system. The hybrid course students had 4 lessons in the regular course time before using the Internet. All along the hybrid course used face to face regular lessons 50% of the course time.

Research description
Courses held in the years 1999-2000 were investigated. Each year another question was the focus of research.

- The 1999 research investigated the question of learner control in different models of web based instruction.
- The 2000 research investigated the question of developing a social atmosphere in different models of web based instruction.

1999 research
17 students participated in the on line course. Most of them were teachers in high school and college. 9 students participated in the hybrid course as part of their studies for master degree. Each course was given through one semester
Data was accumulated through logs, questionaries, and forum messages analysis.

Findings
Findings indicate the ways students dealt with course information, assignments and modes of communication as described below.

Information usage
Information was presented in a sequence of topics as defined in the course syllabus. Almost half of the students participating in the online course browsed through the information offered according to their interest and not according to the topics sequence presented. Some students printed out all the material in advance and read it as a textbook in the beginning of the course. Most of the students who participated in the hybrid course did not use the information on the net until they were asked to use this information in the forums. Likewise, the hybrid course students used the information according to the sequence of course lessons. From the forum messages it was apparent that most of the students used the links to other articles which were added to the written course material.
Assignments
As far as assignments were concerned, we observed two different patterns of accomplishment. Though in both courses a fixed date was announced for assignments’ delivery most of the hybrid course students hand over the assignment in the fixed date, while online students’ assignments were spread before and after the fixed date. Hybrid course students that handed over the assignments in the fixed date did it directly to the instructor. The others used Email to deliver the assignment after the fixed date. None of them delivered the assignment before the fixed date, while so behaved some of the online students.

Online students expected immediate feedback. They wanted the instructor to comment in details and immediately. The hybrid course students did not criticize the instructor on this matter. Apparently the net is viewed as an immediate mean of communication while in face to face courses students are accustomed to the university evaluation routine which allows more time for evaluation and feedback.

In assignments that were given as a collaborative work the usage of Email, ICQ and phone was in the same rate and by online students and no preference of one mean was revealed. Hybrid course students used basically face to face meetings but from time to time used the net for contact.

Communication
While analyzing the messages sent to the forums it was clear that most of the students in both courses participated as demanded. Only few of them wrote more than one message and more than two comments and these were students of the online course.

Analysis of the online course forums

<table>
<thead>
<tr>
<th>Main Subject</th>
<th>Obligatory Participation</th>
<th>No. of participants</th>
<th>No. of messages</th>
<th>No. of comments</th>
<th>No. of Sub-subjects</th>
<th>No. of levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussion groups applications yes</td>
<td>16</td>
<td>14</td>
<td>32</td>
<td>6</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Role of moderator chats no</td>
<td>15</td>
<td>10</td>
<td>33</td>
<td>8</td>
<td>2-3</td>
<td></td>
</tr>
<tr>
<td>Role of moderator chats no</td>
<td>10</td>
<td>7</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Analysis of the hybrid course forums

<table>
<thead>
<tr>
<th>Main Subject</th>
<th>Obligatory participation</th>
<th>No. of participants</th>
<th>No. of messages</th>
<th>No. of comments</th>
<th>No. of Sub-subjects</th>
<th>No. of levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussion groups applications yes</td>
<td>9</td>
<td>10</td>
<td>36</td>
<td>6</td>
<td>2-5</td>
<td></td>
</tr>
<tr>
<td>Role of moderator chats no</td>
<td>9</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>1-2</td>
<td></td>
</tr>
<tr>
<td>Role of moderator chats no</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Findings indicate that the most discussed forums were those which were considered obligatory as assignments. They had not only more massages and comments, but almost 3 times more comment than messages, when the demand was only for two comments. Likewise, in these forums the main subjects was split to more sub-subjects and comments went deeper in the discussion than in the other forums. These findings are more apparent in the online group than in the hybrid one. It seems that in the hybrid course students could discuss things in class, while for the online group the net was the only place for discussion. Only in the subject dealing with chat’s educational
potential the hybrid course participation was higher. It might be explained by the fact that online students used chats and things were obvious with no need to discuss. It is quite clear that students went over a learning process, each one in another mode of intensity. The typology of students participating in forums and chats is an important question that should be researched also in quantitative methods. Findings in this issue are most important for developing models of forums and chats moderation.

**2000 research**

17 students participated in the online course. Most of them were teachers in high school and college. 9 students participated in the hybrid course as part of their studies for master degree. Each course was given through one semester. Research was part of a master thesis (Sherry-Steinberg, 2000)

Data was derived out of social expression analysis of messages sent by students of both courses. Messages were also classified as related either to course assignments or to social forum so called “The Cafeteria”. Social expressions were classified as personally addressed, as directed to the whole group or not refereed at all. The strength of social climate for each student was calculated by dividing the number of social expressions that she/he used with the total number of messages she/he generated.

**Findings**

As mentioned above social atmosphere of virtual learning environment was the focus of this work. Like in the former research both modes of web based instructions were investigated. In both modes a virtual cafeteria was part of the course as a social forum. Likewise each course included forums in which issues of the course subject -matter were discussed. The following questions were explored in this part of research:

1. Is there a difference in "strength of social climate" emerging in social discussion-forums (e.g., the forum 'cafeateria') in courses of different kinds?
2. Does a social climate evolve at all in content discussion groups?
3. Is there a difference in "strength of social climate" emerging in subject matter discussions?

The table below describes the “strength” of social climate in both modes of web based instruction

<table>
<thead>
<tr>
<th>Course type</th>
<th>Hybrid</th>
<th>Online</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social (cafeteria)</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>0.39</td>
<td>0.43</td>
<td>0.82</td>
</tr>
<tr>
<td>content</td>
<td>1.41</td>
<td>0.87</td>
</tr>
</tbody>
</table>

(F=6.37, p<0.05)

Results indicate significant differences. The strength of the social climate in the online 'cafeateria' used by distance learning students is higher (M=0.82) than the strength of social climate in the online cafeteria used by face-to-face students (M=0.39). In content discussion forums the degree of social strength was higher in the face-to-face group (M=1.41) than in the distance-learning group (M=0.8). Analysis of social atmosphere at different periods of time showed that only in the distance-learning course, and only in the cafeteria forum, the strength of social atmosphere progressed in time (t=1.33, p<0.05). Another interesting finding dealt with the correlation between the social atmosphere evolving in both social forum and content forums. It was found that only in the online model a significant correlation was found (r(s)=0.67 ; p<.05).

Apparently, face-to-face students had the real cafeteria to develop communication. As time passed and they began to know each other personally, the virtual social place became less important. In contrast, virtual students had to use the cafeteria all along the course in order to
communicate also socially. It was interesting to find that online student, in need of social interaction, embedded social interactions within the content discussion forums.

Social behavior is a natural human need, and it is acknowledged as an important factor for the development of significant learning processes. It is also particularly important in virtual learning environments as they provide the emotional glue that motivates students to learn together and to learn from each other (rather than only from the teacher) in technology mediated learning situations (Harasim, 1995). The results support these claims. Students in the mixed mode group (face-to-face and online) used the online content discussion forum also as a social space. Students that spent most of the time in online interactions needed also a special social place to meet each other. The main conclusion here is that educators and developers should pay attention to the students’ social needs and ensure appropriate support for social processes when developing either online only or mixed-mode courses.

Concluding Remarks
Learning control in web based environments
The findings described below the way students used information indicate that an online environment creates a wide and dynamic knowledge space in which online students might be active without instructor’s involvement. It was a less an open space for hybrid course students who were not only navigated by the lectures given by the instructor but also used to depend on these lectures as the main learning strategy.

As far as the course communication layer is concerned the usage of forums and chats indicate the success of the obligatory mode. Students’ motivation to participate in forums was more extrinsic relating to course duties than intrinsic as a consequence of curiosity, personal involvement or responsibility. But, it is clear that when a subject is interesting enough students are more initiative in the forums. Moreover, in both courses students preferred moderated forums. Some students remarked that they needed more structured instruction than was given. One student complained that the instructor comments in the forum were presented as an equal message to peer messages and therefore had not an instructional value. It was clear that most students experienced and felt the significance of communication embedded in the course. But online course students took a little bit more initiative by creating social contact and are more active in discussions. On the whole though students were involved deeply in the course activities findings indicate that Israeli students should develop new habits of learning, initiating contact with experts on the base of learning needs, appreciating feedback of peers, be responsible for knowledge acquire and feel comfortable in a less structured environment. It seems that the on line learning mode creates a learning environment that is more powerful to reach these goals.

Social atmosphere in web based environments
As far as social activities in online learning course our analysis showed that there are different modes of social behavior: strictly social and content-related. The first mode is reflected in messages that are delivered in forums dedicated to social interaction per se, and are detached from the learning task or the content under discussion. These flourishes especially in an online course were students become acquainted and create a friendly atmosphere in the learning group. The second mode is evident in content-related messages that include explicit social components. The context for the interaction is a learning task, but besides the formal statements, the message contains expressions aimed to offer guidance, support or personal feedback to its recipient. These two modes are in some way interwoven, and variations in emphasis on either of them seem to be a function of time.

However, at the same time, the gradual conformation of the social layer can be recognized in the style and language used in content-related messages. Messages became more friendly and personal. When at the end of the course students were asked about the social climate in the course they mentioned it was exciting and that the personal ties evolved with time. Our
observations reinforce previous claims on the importance of special virtual places for students to maintain social activity (Harasim, 1995). In these previous studies, instructors and students participating in virtual courses stressed both the importances of informal or incidental-meeting places. However, the nature of the course, namely it's being only virtual or a combined face-to-face/virtual course, seems to affect the quality and intensity of use of these functional virtual meeting places. For face-to-face groups, meetings in “real” cafeterias and the continuous personal interaction in the classes diminish the social role of the virtual meeting places.

On the whole web based instruction in the online model supports independent learning control of higher education students and though being virtual learning environments may develop a social cohesion of participants.

Bibliography


