

## **Alternative Online Pedagogical Models With Identical Contents: A Comparison of Two University-Level Course**

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### **Abstract**

*The research presented here has a double objective: comparing two undergraduate courses on research methods at Bar-Ilan University (BIU) in Israel, and examining students' attitudes toward the subject matter, as well as their attitudes toward incorporating online learning into the learning process. The subject matter in both courses—one in the School of Education and the other in the Department of Political Science—was almost identical. Each of the first two authors of this paper taught one of the courses. The pedagogical online model of the courses is different; while the education course is categorized as fully online with no required class meetings and the predetermined content occupies most of the course, the political science course uses the wrap-around model, combining class setting, online interaction and discussions with predetermined content. Students' attitudes were examined twice, at the beginning of the courses and at their end. Research findings reveal significant differences between the courses and between the two points in time. One possible explanation of these findings is based on processes of instructor-students interaction.*

In keeping with leading universities worldwide, Bar-Ilan University has begun incorporating Internet technologies into its academic, on-campus teaching in recent years. The well-developed Internet infrastructure allows for innovative learning and teaching possibilities that are neither time dependent nor location dependent. Students can attend lectures and participate in sessions from a PC connected to the Internet (at home, at workplace, or at any other location), without having to get to a classroom or gather in a common geographic location. This enables the utilization of time-delayed educational activities, in which the instructor and the students are not limited to a pre-scheduled lecture, but can participate at their convenience.

Bar-Ilan University (BIU) is one of the largest campus-based universities in Israel. Its student body numbers some 30,000. The university offers 6,300 different courses, taught by 1,500 members of the academic faculty.

The research has two objectives. The first is to compare two undergraduate courses on research methods at BIU taught by the first two authors, in 2000–2001. The courses were offered by the School of Education and by the Department of Political Science and are almost identical in content. However, they differ in the pedagogical online model: The School of Education course is categorized as fully online with no required class meetings, and the predetermined content occupies most of the course. In the Department of Political Science, the course uses the wrap-around model in which

class setting occupies half of the students' time, while the predetermined content, online interaction, and discussions occupy the other half (Mason, 1998). The second research objective was to examine the attitudes held by students toward the subject matter taught and their attitudes toward incorporating online learning into the learning process at two points in time: at the beginning of the courses (pre) and after they were over (post).

Studies show that courses in statistics and similar subjects, such as research methods, are perceived by students as a source of tension and anxiety. Consequently, a negative attitude develops toward these subjects, and there is less willingness to pursue advanced studies in them (Birenbaum & Eilath, 1994). At the same time, a study that traced changes in students' attitudes after they had attended a course in statistics and research methods revealed that the course was seen as less threatening, and the learning experience was seen as more significant and exciting (Gilat, 2001).

The current study examined students' attitudes toward the subject matter before the course began and the degree to which these attitudes changed following their participation in the course. These were seen compared to their attitudes toward incorporating online learning into the learning process.

### **Research Design**

The current study is based mainly on quantitative research methods aimed at examining students' attitudes toward the course and toward online learning, prior to commencing the learning process and at its conclusion. Data for examining students' attitudes was collected using evaluation questionnaires to be filled by the students. The questionnaires were identical for both courses. The questionnaires were based partially on a questionnaire developed for a study that examined changes of attitudes of college students toward a statistics and research methods course (Gilat, 2001).

These questionnaires were distributed personally to the participants, at two points in time: pre at the first class session and post at the last class session. We will support the findings with a selection of verbal or written comments made by the students. The wording of both questionnaires was identical, except for the use of the past tense for the post questionnaire.

The comparison between the two points in time was done by inter-subject design. This allows for anonymity of participants, thus enhancing the validity of the findings, in case of sensitive questions or those associated with a high degree of social desirability (Bradburn, 1983, p. 298), but its disadvantage is that it increases the unexplained differences (Gilat, 2001). A total of 124 students in research methods and statistics responded to the pre questionnaire (113 students in education and 11 in political science); 87 students responded to the post questionnaire (76 in the education and 11 in political science). The reason for the low rate of response at the School of Education is that as the students were not required to attend the classroom meetings and most of them chose this option. The questionnaire in both points in time for students of research methods and statistics included 25 questions that examined various aspects of the online course and is based on a conceptual assessment and on the research team's previous knowledge.

## Findings

### *Course Description and Methodological-Online Concept*

The subject matter in both courses is identical, and introduces the main approaches—and practice—of empirical research in the social sciences. One course, Research Methods and Statistics, is part the undergraduate studies in the School of Education, and is directed at implementation in education research. The other course, Introduction to Research Methods, is taught as part of the undergraduate program in the Department of Political Science, and is intended for implementation in political research. Both courses were developed with constructivist theory as their basis. This theory sees effective learning as not merely involving absorption of information, but rather as a gradual process of actively constructing knowledge (Salomon, 2000). To accomplish this, the learners are requested to be, among other things, active participants in designing the learning process and its outcomes (Chambers & Sprecher, 1980; Bruner, 1990). The following are detailed descriptions of each course discussed here.

The course Research Methods and Statistics is a required course for first-year undergraduates in the School of Education, and is a full-year course, taught 4 hours a week. With the exception of two class meetings, the entire course is taught online. This was a compulsory course attended by 228 students.

The course was designed so be self-paced so that students would study on their own and independently. The course' content and educational activities were carried out at the website. The students received frequent online support from the instructor. On the average, the students' queries were answered within 2 hours. In some cases student and instructor were online at the same time, which allowed for an immediate response. Among other reasons, the immediate support was aimed at creating a feeling of social presence, which is significant in minimizing the social distance between participants (Nipper, 1989). The students were asked to hand in two types of assignments. The first tested knowledge and was handed in individually, and the second was a summary assignment testing implementation and integration, handed in by pairs of students.

The course Introduction to Research Methods is a required course for second-year undergraduate students in the Department of Political Science. It is a one-semester course, taught 4 hours a week. Two hours were for classroom lessons, and the other two were online exercise sessions. Eighteen students registered to the course.

The teaching model for the course was the wrap-around model, in which about half of the instruction is held within the class setting and the other half is based on online activities which include exercises and discussion (Mason, 1998). The contents of all classroom lectures were uploaded onto the course site. Exercise and practice sessions were used to implement the classroom material. Some of the seven assignments were individual ones, others were prepared by pairs of students.

Peer assessment was one of the teaching strategies selected for evaluating the assignments carried out in pairs, and students evaluated their colleagues' work. About mid-semester the students were given an opportunity for self-evaluation using an online examination that included multiple-choice questions repeating the material presented during the lectures. Following this self-examination the students received detailed feedback and a grade which was entered into their virtual personal record.

The discussion group devoted its time to discussions, questions, and answers pertaining to the various subjects. All the students participated in the discussions. On average, 10 postings per week were sent to the forum. The synchronic-virtual dimension was applied the evening preceding the test, when the instructor conducted an online “chat” with the students and answered their questions.

### ***Students’ Background Variables, Attitudes Toward the Course and Toward Online Learning***

Most respondents to the pre questionnaire ( $n = 113$ , about 50% of those enrolled in the course) in the School of Education were women (97.3%) in their early twenties. The post questionnaire was returned by 76 students (about 33% of those enrolled). As stated earlier the reason for the latter low rate of response is that the education students were not required to attend the classroom meetings. In the Department of Political Science, the number of respondents ( $n = 11$ , which is 65% of the enrollment) was equal for both the pre and post questionnaire. The number of male and female respondents was almost equal, and most were in their mid-20s.

Studies indicate that computer skills and access to a computer are two important variables in attempting to forecast students’ attitudes toward online learning. McMahon and associates reported that students see their lack of computer skills to be a major obstacle to their participation in e-learning. It was further revealed that accessibility to a computer accounted for about half the variance in students’ attitudes toward online learning (McMahon, Gardner, Gray, & Mulhern, 1999).

The current study revealed that in the School of Education only 23% of the students are proficient or very proficient at using the Internet. About one third have little or no knowledge of the Internet. The vast majority does not regularly surf the Internet either at home (72%) or at work (69%). In contrast, students in the Department of Political Science reported a much higher rate of Internet skills. Over half the students (55%) reported high or very high proficiency in Internet use. The vast majority surfs the net (73%), with about 20% doing so from their place of work or from the university campus.

There seems to be one major difference relevant to our research, between the students in both courses. The difference is that the students in political science have high technical skills in Internet use and to the Internet, as compared to the students in education who are enrolled in the identical research methods course.

### ***Comparing Students’ Pre and Post Attitudes***

Gathering the relevant items regarding the subject matter and online learning was carried out by a factor analysis of the answers to the pre questionnaire. The first factor was *attitudes toward online learning* (accounted variance = 21.6%,  $\alpha = .9067$ ) and included 8 statements regarding technological innovations and incorporating Internet into the course, such as interest, preference and satisfaction with the innovative learning method, and attitudes toward e-learning and toward expanding the innovative methods to additional courses. The second factor was *attitudes toward the course* (accounted variance = 18.9%,  $\alpha = .8485$ ). It included 8 statements regarding various aspects of

learning in the course such as the importance of the course, expectations of interest and enjoyment, and fears regarding the course. Since the factor loading of .50 was determined to be the lowest acceptable for both factors, 9 items did not load on either factor. The students were asked to evaluate the degree in which the statements matched their attitudes, on a scale from 1 (*not at all = very negative attitude*) to 5 (*to a very large degree = very positive attitude*). From these two factors, *attitudes toward the course* and *attitudes toward online learning*, two additional measurements were constructed. Each was calculated using the mean score for the answers to items included in each factor in both courses in the two points in time. The mean score ranges from 1, which indicated a very negative attitude, to 5, which indicated a very positive attitude toward the factors. Furthermore, an independent *t* test was conducted for each factor in both points in time (pre and post) for each course separately. The results appear in Table 1.

**Table 1. Pre and Post *t* test in Research Methods Courses**

	Department of Political Science					School of Education				
	Pre (n = 11)		Post (n = 11)			Pre (n = 113)		Post (n = 76)		
Course	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>T</i>
Online learning	3.45	0.03	3.64	0.42	*-1.22	2.54	0.63	3.25	0.96	** -6.13
Course	3.46	0.44	3.81	0.34	N.S.	2.44	0.86	3.63	1.48	** -6.86

\**p* < .05 \*\**p* < .001

The results in Table 1 indicate that, when the course commenced, students in political science reported more positive attitudes than did their peers in education in both factors. The gap narrowed after the course ended, with the students from education significantly changing their attitude at the end of the course in both measurements selected, and especially toward online learning. Conversely, the significant change in the students in political science was toward the course, but not toward online learning.

E-mails sent to the instructors at the end of the course further substantiate the claims as to the essential change of attitude:

I must say that the great fear of the course was the issue of interaction. Lack of face-to-face interaction with the instructor was the greatest conceptual obstacle to the question of how learning in the new method will work. I was surprised to find personal and special attention in the discussion group, including ongoing professional help and interest in my professional and personal progress.

Not only was the quantitative course one of the most enjoyable courses I took this year, but it also helped me realize what a successful time-delayed, online course should be, and what components make up this success.

The greatest advantage for me in this course was the feeling I had at the end of it, that I learned to use statistics. I also feel that I was given a basis for conducting quantitative research.

### **Summary and Conclusions**

The current research has two aims. First, to provide a description of the two online courses in research methods taught at Bar-Ilan University. Second, to examine the attitudes of students in both courses toward the contents and toward incorporating online learning into the course, at two points in time—the commencement and end of the course.

Both courses were developed along the lines of the constructivist concept, and the online dimension was integrated in both, although to a different degree. In the political science course, half the course was given over the Internet, whereas in education, the course was for the most part given over the Internet. In both cases the research methods course is compulsory. However, in the School of Education, the students were not given an alternative, non-online course, whereas the Department of Political Science also maintained the conventional classroom version. There is also a difference in numbers—18 students in the Department of Political Science, versus 228 in the School of Education.

Given the a priori differences in the courses, it comes as no surprise that the major difference between the two groups of students was in the negative attitude of the students in education toward the course and toward online learning. It is our assessment that previous acquaintance with the Internet and its characteristics—and the consequent lowering of the uncertainty involved in learning—had a positive influence on the students' attitude, especially toward incorporating online learning into the course.

In the post questionnaire, the gap between the two groups narrowed considerably, especially concerning attitudes toward online learning. A partial explanation for this major finding can be the strong student-instructor interaction in the education course. In this course the instructor made a point of providing very frequent answers to queries and personal and collective feedback (on the average she posted a response within two hours of the query appearing on the Net). The personal attitude to the instructor to all 228 students, which was accompanied by ongoing, daily interaction, was manifested in the significant changes in students' attitudes from the commencement of the course to its end. Although research warns against large study groups (Rovai, 2002), the findings in this research indicate that certain subject matter can be taught in large groups. At the same time, the frequent feedback and the support provided by the instructor to the students as a group and individually contributed, in our opinion, to the increase in satisfaction seen in the education students at the end of the course. This finding is consistent with studies that emphasize the importance of constant support by the virtual teacher for an effective learning experience (Coomey & Stephenson, 2001).

This research is, by definition, a case study, and as such is found lacking due to generalizations similar to those in other studies of this nature (e.g., Carey, 2001). However, it is our hope that this comparative study will serve as a starting point for further research.

## References

- Birenbaum, M., & Eilath, S. (1994). Who is afraid of statistics? Correlates of statistics anxiety among students of educational sciences. *Educational Research*, 36, 93-98.
- Bradburn, N. M. (1983). Response effects. In P.H. Rossi, J. D. Wright, & A. B. Anderson (Eds.), *Handbook of Survey Research* (pp. 289-328). New York: Academic Press.
- Bruner, J. S. (1990). *Acts of meaning*. Cambridge, MA: Harvard University Press.
- Carey, J. M. (2001). Effective student outcomes: A comparison of online and face-to-face delivery modes. *DEOSNEWS*, 11(9). Retrieved June 30, 2002, from [http://www.ed.psu.edu/acsde/deos/deosnews/deosnews11\\_9.asp](http://www.ed.psu.edu/acsde/deos/deosnews/deosnews11_9.asp)
- Chambers, J. A., & Sprecher, R. Y. (1980). Computer-assisted instruction: Current trends and critical issues. *Communications of the ACM*, 23, 332-342.
- Coomey, M., & Stephenson, J. (2001). Online learning: It is all about dialogue, involvement, support and control—according to the research. In J. Stephenson (Ed.), *Teaching and learning online* (pp. 37-52). London: Kogan Page.
- Gilat, Y. (2001). Shinuy bemdot shel talmiday miclala klapay hakurs bstatistica veshitot mechkar [Change in students' attitudes toward statistics and research method course: A research report]. Tel-Aviv, Israel: Levinsky College, Development and Research Unit.
- Mason, R. (1998). Models of online courses. *ALN Magazine*, 2(2). Retrieved May 30, 2002, from <http://www.aln.org/publications/magazine/v2n2/mason.asp>
- McMahon, J., Gardner, J., Gray, C., & Mulhern, G. (1999). Barriers to computer usage: Staff and students perceptions. *Journal of Computer Assisted Learning*, 15, 302-311.
- Nipper, S. (1989). Third generation distance learning and computer conferencing. In R. Mason & A. Kaye (Eds.), *Mindweave: Communication, computers and distance education*. Oxford, England: Pergamon [Electronic version]. Retrieved May 30, 2002: <http://www-icdl.open.ac.uk/literaturestore/mindweave/chap5.html>
- Rovai, A. (2002). Building sense of community at a distance. *International Review of Research in Open and Distance Learning*, 3(1). Retrieved May 30, 2002, from <http://www.irrodl.org/content/v3.1/rovai.html>
- Salomon G. (2000). *Technologia vehinuch beidan h-meda* [Technology and education in the age of information]. Tel-Aviv, Israel: Zmora Bitan.