INTERNET-BASED INNOVATIONS FOR TEACHING IS COURSES: THE STATE OF ADOPTION, 1998-2000

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ABSTRACT

The World Wide Web (WWW) has dramatically changed the role of communication media for research and commerce and it is expected to result in dramatic changes in how students learn in the world's tertiary educational institutions. There have been widespread reports of courses and programs taught over the WWW, particularly in IS, but to what extent have Internet-based teaching innovations actually been adopted by IS faculty? We surveyed more than 2600 IS faculty worldwide to determine what Internet-based teaching innovation they had adopted. More than 600 respondents from 23 countries provided us with data on their use of 13 Internet-based teaching activities. Eight of the activities were widely used (by more than 50% of the respondents), while five other activities were used by 26% or less of the respondents. The results suggest that at least 7% had the capacity to teach courses on line in 1998-9 and that at least 16% expected to have the capacity for 1999-2000.

INTRODUCTION

Since its inception in the early 1990's, the World Wide Web (WWW) has dramatically changed the role of communication media for research and commerce. There are strong indications that it is also in the process of changing the way that tertiary education is delivered, e. g., (Applebome, 1999). Many individual university courses and even whole programs have been reported in the media as delivered or

proposed for delivery, using the WWW. In addition, there are expectations that adoption of innovative teaching activities, supported by the Internet, might result in lower costs, increased flexibility, and better access for students to a wider range of program offerings.

How quickly have teachers adopted these innovations? Prior research has noted that widespread adoption of innovations often requires many years, even when the innovations have obvious value and when there is widespread industrial belief that the innovations will come into general use (Dos Santos and Peffers, 1995, Dos Santos and Peffers, 1998). Potential adopters may wait, hoping to avoid first mover risks and high costs. Later adopters may be able to imitate the first movers at low cost. If most potential adopters wait, the pace of adoption is slow.

IS faculty might be expected to be among the earliest adopters of innovative teaching methods and activities using the Internet because they have an obvious interest in learning about the technology itself. Have many IS teachers started using the Internet to support teaching or as a medium for instruction to substitute for the classroom? There has been much interest in the mechanisms for implementing these innovative activities, but nowhere is there an overall view of the extent to which IS faculty have adopted them. We wanted to determine the current adoption level for these innovative technologies in the IS teaching domain. To that end we conducted a geographically wide-ranging survey of teaching activities done using Internet-based activities.

THE SURVEY AND DATA

Table 1 summarizes our survey effort and the responses. On January 6, 1999, we sent a six-question survey to 2923 email addresses found in the ISWorld Faculty Directory in Spring 1998. This directory is open to self-registration for IS academics, including faculty members and researchers, globally. Some invalid and obsolete addresses had already been removed from our list as a result of its prior use for JITTA's Call For Papers" announcement. We received 236 notices of email delivery failure because the intended recipient was unknown or for other reasons.

Consequently, we believe that we had sent as many as 2687 valid email survey questionnaires. An unknown number of these may not have been received by the intended recipients because the email account had been abandoned or for other reasons. We received 623 responding messages, a satisfactory response rate of 23.2%, of which 617 responses contained survey data. We believe that the intentional brevity of the survey questionnaire, as well as the high level of interest in the subject matter, contributed to the high level of response.

The intended audience of the survey was teaching faculty of tertiary institutions globally. To the best of our knowledge most of the questionnaire addressees were teaching faculty, although some may have been non-teaching researchers, students, practicing IS professionals or people otherwise not engaged in teaching IS in higher education. All of the responses that we used appear to have been from teaching faculty members.

Most of the responses were complete. Some respondents from countries with academic calendars that vary dramatically from those in North America expressed concern about how to complete the responses, but most made suitable interpolations.

Table 1. Internet teaching survey response summary

Response summary	
Questionnaires sent	2,923
Returned for invalid addresses	(236)
Total valid surveys sent	2,687
Returned questionnaires	623 (23.2%)
Responses with data	617

Table 2 summarizes the geographic distribution, by country, of the responses with data. Slightly more than 2/3 came from the

Americas, most of those from the US. An almost equal number came from each of the Asia/Pacific (primarily Austrialia, New Zealand, Hong Kong and Singapore) and Europe/Africa (mostly the UK, Netherlands and the Nordic countries) regions. Twenty-three countries were represented. The information in Table2 suggests that the data collected, while widely representative, is not geographically unbiased.

Table 2. Internet teaching survey responses by country

Australia	54
New Zealand	20
Hong Kong	10
Singapore	10
India	3
Malaysia	2
Thailand	1
ASIA PACIFIC	**100**
USA	387
Canada	22
Brazil	5
Mexico	1
AMERICAS	**415**
Denmark	20
United Kingdom	18
Netherlands	17
Finland	10
Sweden	10
South Africa	10
Austria	4
France	4
Norway	4
Italy	2
Ireland	2
Spain	1
EUROPE/AFRICA	**102**

ADOPTION OF INTERNET-BASED TEACHING INNOVATIONS

The focus of the survey was on the use of the Internet to support teaching in IS courses. As Figure 1 indicates, the vast majority (86.4%) of the respondents indicated that they used the Internet to support teaching in academic year 1998-1999, at least at a minimal level. Of those who indicated that they did not use the Internet in teaching in 1998-1999, 12% indicated that they would do so in 1999-2000.

How do IS faculty use the Internet? Figure 2 shows the number of respondents who report performing each of thirteen Internet-based teaching activities in 1998-9 and the number that expect to perform these activities in 1999-2000. A casual observation of the chart suggests that the activities fall into two distinct groups, with strikingly different levels of adoption. Eight of the activities have high levels of adoption, while adoption of the other five is much lower. The most widely used application of the Internet was to communicate with students through email (85.6% of respondents). Likewise, seven other activities, involving online syllabi, lecture notes and course material, and the acceptance of homework online, were each used by more than 50% of the respondents. The other five activities, including online chatrooms, multimedia lectures, examinations, animations, or streaming video, were each used by 26% or less of respondents.

One possible interpretation is that the first eight activities may be used largely to support ordinary classroom-style teaching and may be implemented incrementally and at low cost. They support and enhance instruction, but don't necessarily change the model for instructional delivery fundamentally. The important information exchanges in courses taught by these respondents may still be centered around everyone meeting together in the classroom. The technology to support several of these applications, including the use of email and displaying information on the WWW, may have already been adopted by teachers to support research activities and IS course content.
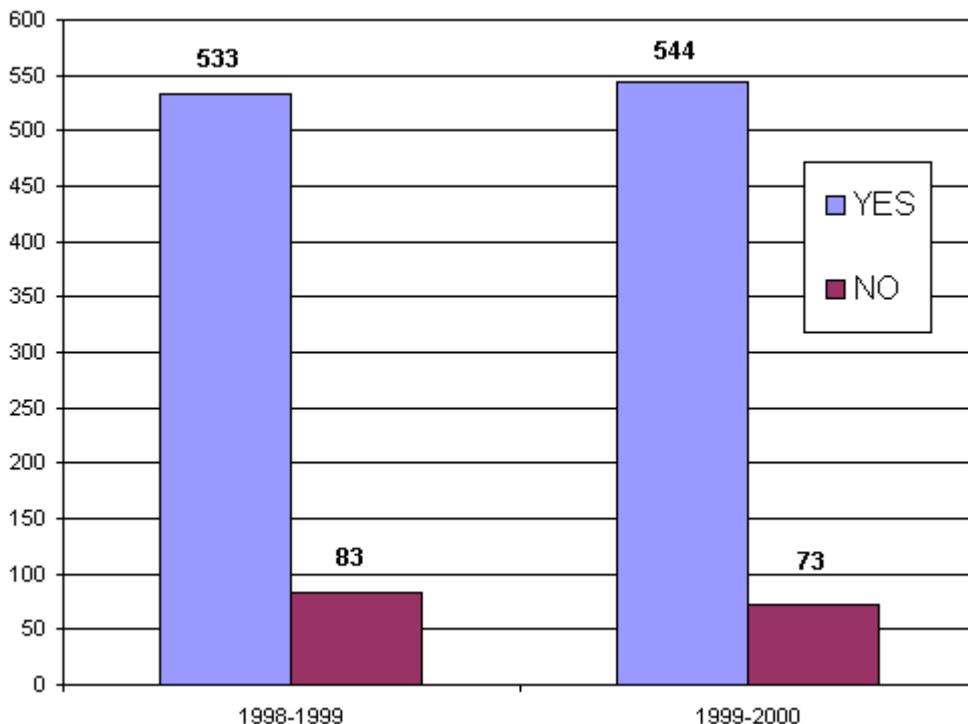
Figure 1. Respondent use of the Internet in IS instruction, 1998-9 and 1999-2000
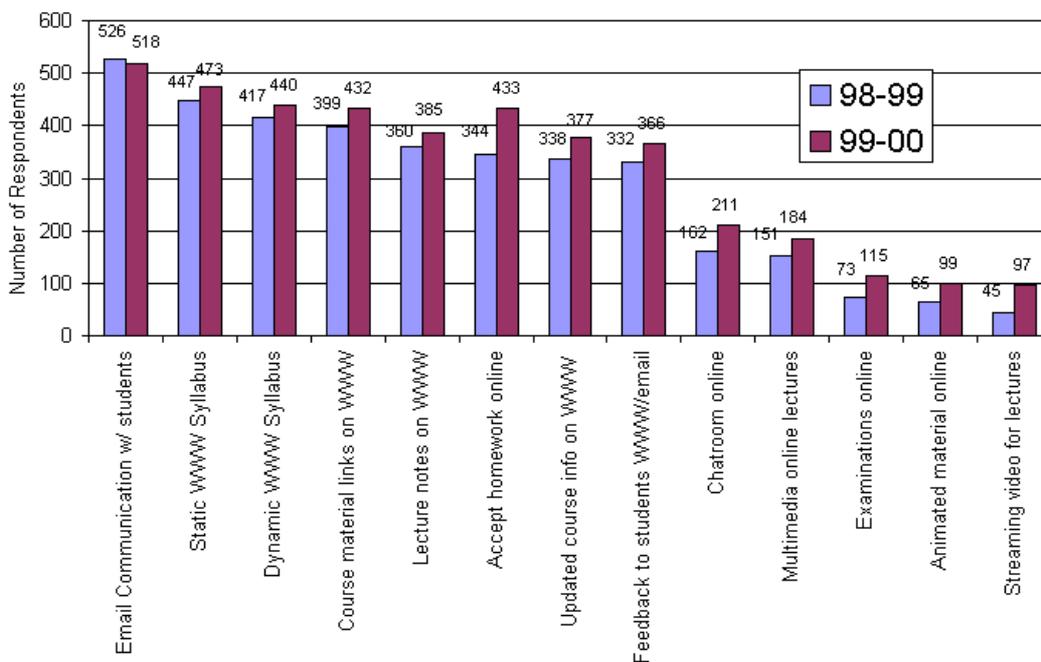

Figure 2. Internet-based activities used by respondents to support teaching IS, 1998-9 and 1999-2000

The last five activities involve moving information delivery out of the classroom. They involve more technologically sophisticated activities and activities that, in the case of most IS teachers, may not have already been used for research and may not have been the subject of IS course content. These activities clearly have the potential to substitute for classroom lecture, discussion, and examination. If a teacher used some or all five of these activities, along with some of the first 8 activities, he or she would likely have reduced or eliminated classroom teaching hours for the students or at least have tested the capacity to do so. Using this interpretation, the chart suggests that approximately 7% or more of the respondents were prepared to teach IS courses partly or entirely online in 1998-9 and that at least 16% expect to be prepared to do so in the following academic year. These estimates are probably conservative because, arguably, one or more of the specific activities are not essential for courses taught online.

Except for the use of email to communicate with students, more respondents expected to perform each of the activities in 1999-2000 than in 1998-9. The expected increases are larger for the last five activities than for the first eight. 30.3% more teachers expect to use chatrooms in 1999-2000, 57.5% more expect to conduct examinations online, and 115.5% more expect to use streaming video. These dramatic increases suggest that many IS teachers are gearing up to use the Internet as their primary teaching media or are planning to do so in the coming year.

The results of this survey provide too little data to credibly estimate future trends, since such adoption is probably not linear over time (Dos Santos and Peffers, 1998). It suggests, however, that education industry capacity for online teaching is rapidly increasing. What impact will this capacity have on the education industry? Will it lead to over-capacity and eventual industry consolidation? If so, which organizations will be forced to exit? Will it dramatically alter economies of scale and scope (Peffers and Tuunainen, 1998)? Will it reduce industry employment and salary levels? These are questions that are ripe for further study.

These are results from a very preliminary analysis of the survey data. This article gave us the opportunity to provide the IS community with important information in the most timely fashion about the state of Internet technology use for IS teaching. Additional analysis of the data reported here, as well as additional data collected in the survey, will be reported in forthcoming research publications.

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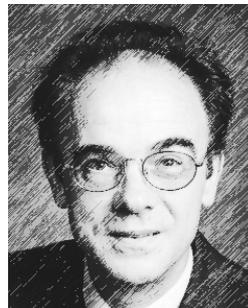
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