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# **Have the Transformational Information Technologies Really Transformed the Academia?**

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## **Introduction**

The Internet and the World Wide Web are often referred to as transformational information technologies (Jarvenpaa and Ives, 1996). With the advent and rapid growth of these technologies, the business landscape is being redrawn through the shrinking of space and time, and exploding global competition. While a number of studies have been initiated in recent years to research into different facets of electronic commerce (EC), very few studies have been undertaken to examine the impact of these transformational information technologies on the academia who are among the early users.

In a knowledge-based economy, the emerging information technologies (IT) can be expected to play a dynamic role in higher education. Education, potentially the world's largest information industry, is undergoing a globalization process involving new methods of packaging and delivering educational products (Adam, 1997). Integration of technologies such as multimedia, groupware and the Internet can spawn significant innovations in management education (Angehrn, 1997). Several U.S. universities offer totally Internet/Web-based classes for college credit (Herther, 1997). An estimated one million students attend virtual classrooms compared to thirteen million in regular universities (Gubernick, 1997). In the corporate world, Web-based training can effectively replace costly and time-consuming traditional seminars (Gill, 1997). In 1996, Web-based programs grew by 83% while instructor-led training fell by 13% (King, 1997).

Massy and Zemsky (1995) predict a rapid increase in the demand for IT-based programs during the next decade and a profound impact on the education process. The Internet, in particular, has the potential to create virtual communities of students (Jorn, 1996). To exploit the emerging trend of Web-based education (Fister, 1998) and to remain competitive in student enrollment and retention, higher educational institutions need to design on-line courses with pedagogical framework (Jorn, 1996). Only such institutions with innovative programs and flexible faculty supported by IT and meaningful reward systems are likely to survive (Ives and Jarvenpaa, 1996).

The purpose of this study is to understand the extent of use of IT in the three domains of academic activities (teaching, research and service) and the impact of such use on the academia. Data for this study were collected via a Web-based survey.

## **Survey Methodology**

The study was conducted in two phases. First, an electronic mail with an open-ended questionnaire was sent to the IS World Mailing List. Seventeen responses were received from the members of the mailing list. Based on the analysis of those responses, a structured and closed questionnaire (<http://www.cba.bgsu.edu/amis/smagal/research/academia/impactq.html>) was designed as a Web based document. An electronic mail was sent to the IS World Mailing List requesting members to visit the Web site and respond to the questionnaire. The IS World site included a hyperlink to the Web questionnaire site. The main intent of the Web based survey is to collect responses from IS faculty. For our analysis, we retained IS faculty responses only.

There is no accepted or well-defined method to calculate the response rate in the case of a Web based survey. We adopted a new approach. First, we computed the number of pertinent accesses using access logs. We excluded '.com' and '.net' domain responses as these were believed to be from non-faculty visitors to the site. Next, all duplicate accesses from the same node or with the same host name or IP address were excluded from the total count of accesses. The number of valid accesses was 174. The number of valid and usable responses from IS faculty who are members of the IS World Mailing List is 62. The ratio of valid responses to valid accesses is taken as the response rate for this survey. It works out to 35.6%.

## **Analysis of Survey Data**

### *Teaching*

The majority of respondents (71%) do not offer courses primarily related to the Internet and Electronic Commerce (EC). Just about 20% of the respondents plan to introduce such courses in the immediate future. Where offered, such courses are mostly available to students as electives at both the undergraduate and graduate levels. About 58% of the respondents have included topics related to the Internet and EC in existing IS faculty at both undergraduate and graduate levels. About 35% of the respondents prefer the College MIS core course for including the above topics. Data Communications and Introduction to MIS (for MIS majors) are the next two preferred courses.

Almost every IS faculty uses electronic communication to support teaching IS courses. 90% of the IS faculty use electronic channels and tools for communication with their students. About 73% of the faculty use tools to support electronic communication among students. Most of the few non-users of electronic communication tools to support teaching intend to use them in the immediate future. Despite the heavy usage of electronic communication to support teaching by IS faculty, only 66% believe that the use of electronic communication has contributed to improvement in teaching effectiveness. A possible reason is that a substantial number of IS faculty may be using electronic mail for purposes unrelated to teaching. About 87% of the users consider electronic mail as the most effective tool. Mailing lists and Newsgroups are ranked distant second in improving teaching effectiveness.

76% of users of electronic communication consider speed as the most significant advantage. Paperless communication, just-in-time communication, and the only-means-of communication are considered as other significant advantages by more than 50% of the IS faculty. Oddly enough, only 37% of the users believe reliability of electronic communication to be a significant advantage. The most frequently identified disadvantage (by 45%) is generation of excessive mail. Even less number of users (about 25%) consider electronic communication as time-consuming.

The IS faculty use Internet technologies (FTP, gopher, and the World Wide Web) to deliver a variety of classroom material such as assignments, syllabi, cases, handouts, and information about examinations. About 50% of respondents use each of the above types of classroom material. It is probable that most users deliver multiple types of material. Surprisingly enough, about 15% of the users of electronic communication do not use the Internet to deliver any classroom material. One plausible reason could be that some of these users do not have the requisite facilities in their workplace. Also, some of them do not have the needed skills and do not want to put in additional efforts to deliver classroom material using the Internet technologies.

### *Research*

All the IS faculty who responded to the survey questionnaire use the Internet technologies for research activities. About 95% of the respondents use the Internet tools to search for and collect literature and data. About 85% of them use these tools to communicate and to exchange with fellow researchers and co-authors. 86% of the respondents rate the potential of Internet technologies to support academic research as moderate to high. It is interesting to note that 5% of the respondents do not consider Internet technologies to have any potential to support research. More than half of the non-users plan to use Internet technologies to support their research activities.

### *Service and Other Activities*

We include under this head faculty service, placement of students, faculty recruitment, and faculty performance evaluation. Just a little above 55% of the respondents report the use of Internet technologies in student placement activities. These placement activities are provision of online resumes, coops and internship information, and job-related information. Only about 18% of respondents report of future plans for using Internet technologies to support placement.

About 89% of the respondents report use of these technologies to support activities under faculty service. Such use is mostly for inter-departmental and intra-departmental communication, committee activities, and online documents. Six percent of non-users report of plans to use Internet technologies to support service activities.

About 87% of the respondents report use of these technologies to support IS faculty recruitment. The major applications involve position announcements, communication with candidates, and promotional information. Only about 18% use the Internet for electronic transmission of application material. About 6% report of plans to use the Internet to support faculty recruitment process.

Just about 37% of the respondents report that their use of the Internet and related activities have a small to moderate extent of bearing on their performance evaluation, tenure and promotion. A very insignificant number of the respondents (just 3%) report of any plans for including Internet related activities as a factor of performance evaluation. More significantly, a substantial percentage (29%) is unsure of the future.

## **Conclusions**

Conducting a survey using a questionnaire posted on the Web is a novel technique adopted in this study. This approach differs significantly from the traditional mail survey. The respondents in the Web survey form a self-selected sample, and at the same time a voluntary sample. The respondents are members of the IS World Mailing List. The concern that all respondents belong to a specific group is a valid one. But, many traditional mail surveys involve mailing of questionnaires to individuals belonging to a specific group such as Chief Information Officers and IS personnel.

Though the responses to the questionnaire were received over a period of 28 months, this study is not longitudinal. Multiple responses from the same node or IP address to the Web questionnaire were discarded after retaining only one of them. The survey does not measure longitudinal changes.

This study attempts to gain an understanding of the impact of IT on the academia. However, the results cannot be generalized. As pointed out earlier, the sample is self-selected from a community of IS faculty with membership in a specific mailing list. Moreover, this group can be expected to have a favorable bias towards use of IT in academic setting.

Despite these limitations, this study helps us to observe certain basic trends and could become the leads for more refined research. Though information technologies are being used extensively by IS faculty, such use is confined to alternate ways of performing traditional tasks. There is no evidence of widespread innovative use of IT in teaching IS courses. In the area of research, IS academicians use the Internet to search for literature and to gather data. But very little use is made for publishing research outcome. In the area of service, technology has not impacted significantly on the process. The use of IT or its non-use in academic setting has virtually no bearing on the current reward system.

If IT is not effectively used for changing academic processes, traditional institutions of higher education may lose to privately sponsored institutions that focus on spreading knowledge on demand through skillful exploitation of information technologies (Ives and Jarvenpaa, 1996). Such skillful exploitation may involve reach beyond classrooms, assemblage of expertise, just-in-time delivery, and downloadable learn-yourself modules.

#### *References*

References are available upon request from Simha Magal (smagal@cba.bgsu.edu).