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Motivations, Consequences, and Barriers to Using the Internet in Adult Literacy and Basic Education Classroom

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Abstract: This study sought to create profiles of adult literacy and basic education (ALBE) instructors and use of the Internet in their classrooms. Two profiles were found and significant group differences were seen based on factors related to use of computers in the classroom, e-mail, and number of students served.

Introduction

The purpose of this research was to better understand ALBE instructors' use of the Internet in their classroom. The following four questions guided this research:

1. What ALBE instructors state are the motivations for using the Internet?
2. What do ALBE instructors state are the consequences of adopting the Internet?
3. What do ALBE instructor state are the barriers to using the Internet?
4. What profiles can be developed to describe these instructors?

Relevant Literature

To better understand the adoption of the Internet into ALBE classrooms, this study used Rogers' theory of diffusion of innovations. Everett Rogers published a theory of the diffusion of innovations in 1962. Since that time, he has updated and changed his theory and just recently (2003) published the 5th edition of his theory. Rogers posits that the decision to adopt or reject an innovation, a different approach or new technology, depends on characteristics of that innovation, the communication channels used to discuss the innovation, the time it takes for the social system to make the decision to adopt the innovation, and the social system which is making the decision to adopt the innovation. His theory is divided into four main elements: a) the innovation, b) communication channels, c) time, and d) social system.

An innovation refers to "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, p. 12). The innovation is not necessarily new in its concept or design; however, it is new to the individual or organization utilizing it. Whether an individual or organization decides to adopt the innovation depends on five characteristics of the innovation. The five characteristics of an innovation are relative advantage, compatibility, complexity, trialability, and observability. Relative advantage refers to the degree to which the innovation is more useful than the idea or technology it replaces. The greater the relative advantage, the more likely the potential adopter will adopt the innovation. Compatibility is the degree to which the innovation agrees with or is consistent with the potential adopter's values, past experiences, and needs. Complexity refers to how easily an individual understands the innovation. Trialability is a measure of how easy it is for potential adopters to experiment with the innovation. Being able to use the idea or technology on a trial basis improves the likelihood potential adopters will adopt an innovation. Finally, observability refers to the degree

results of using the innovation can be observed by others. The degree to which an innovation possesses of each of these characteristics will impact the potential adopter's decision to adopt.

The second element of the diffusion process, communication channels, is the process through which members of society or an organization create and dispense information with one another to develop a mutual understanding. The third element of the innovation diffusion process is time. The element of time can be divided into two components; the process of adoption, and rate of adoption. The process of adoption of innovations proceeds through five stages. The rate of adoption depends on each adopter's innovativeness or the degree to which an individual adopts an innovation earlier than others. Adopters can be classified into five categories: a) innovators, b) early adopters, c) early majority, d) late majority, and e) laggards. Innovators are typically the first to adopt a new idea or technology while laggards are the last to adopt an innovation. While there are differences among individual rates of adoption, there are also differences between the rate of adoption for the same innovation within social systems.

The fourth element, the social system is "defined as a set of interrelated units that are engaged in joint problem-solving to accomplish a common goal" (p. 23). After the decision is made, the group making the decision faces a series of consequences. The consequences of a decision fall into three classifications: desirable or undesirable, anticipated or unanticipated, and direct or indirect. Desirable or undesirable consequences depend upon whether the effects of the innovation are functional or dysfunctional in the social system where they were introduced. Anticipated or unanticipated consequences refer to whether changes as a result of the adoption of an innovation are intended. Direct or indirect consequences refer to the immediacy of the effects of adopting the innovation. It is usually at this point that the persons who decided to adopt the innovation will decide whether to keep it.

Studies Utilizing Rogers' Classification of Consequences

The purpose of this section is to examine those studies that have purposively sought to examine consequences of adopting computer technology. There are relatively few studies which examine the consequences of adopting an innovation. Even fewer studies examine the consequences of adopting computers. In the first study, Rogers, Daley, and Wu (1982) reported results from an exploratory investigation of the consequences of adoption and use of home computers. A 60-item questionnaire was developed and administered to 77 respondents in face-to-face interviews lasting between 30 and 45 minutes. The results showed respondents felt the computer changed their lives by facilitating their work (29%), increasing their awareness of the computer world (17%), changing their recreational activities (14%), saving time (12%), and allowing them to spend time at home (12%). When asked if the computer was a money-saving device, 35% of respondents responded positively. Respondents also claimed they decreased television viewing an average of 34 minutes a day. Rogers et al. reported that over two-thirds found the computer to be a time-saving device while a third of the participants found it to be a money-saving device. Forty percent of respondents reported a decrease in the number of hours of television watched on a daily basis since they adopted a computer.

In the second study, Baker (1985) examined the consequences of integrating a computer software cataloging system into the local elementary school's library. Desirable and undesirable consequences were determined through surveys. Analysis of the surveys indicated teachers felt more encouraged to use the software program and courseware. The only undesirable consequence, though not directly related to adoption of cataloging software, indicated teachers' frustration at other teachers for not returning courseware packaging or diskettes so others may

use the software. No other analysis of consequences was reported. The author concluded the cataloging system provided benefits to staff and students. No recommendations for future research were included in the report.

In the third study, Latting (1994) examined consequences of trying to work with e-mail. The undesirable consequences included being discouraged by using e-mail, estrangement from others who supported using CMC, "addiction" to CMC, and difficulty adjusting to communicating using e-mail. Desirable consequences of using e-mail included increased pride at overcoming their fear of the computer, development of rewarding friendships, enjoyment of discussions among other students and experts, the convenience of using e-mail, and an increased knowledge of the benefits and difficulties of using e-mail as a form of communication.

A fourth study (Berger, 2005), examined perceived consequences of ALBE instructors when they adopted the Internet into their classrooms and provided much of the groundwork for this research project. Twenty instructors from six states were asked how they used the Internet, what consequences they found, and how they felt about those consequences. Of the 60 reported changes, 56 were considered desirable. They included students were empowered, the classroom become more collaborative, and instructors saw a shift in their role to more of a facilitator. Surprisingly, while many of the consequences were desirable, less than half were anticipated.

Methodology

The survey was a 56-item survey developed using Scantron software called E-listen®. Items were grouped into five scales that represented domains of inquiry regarding why the instructors used the Internet in their classroom (Why), how they used the Internet (How), what positive consequences they experienced (PosCons), what negative consequences they experienced (NegCons), and reasons they would not or could not use the Internet in their classroom (Barriers). The survey was piloted and minor corrections were made (Sallant & Dillman, 1994). Estimated Cronbach alpha reliability (Pedhazur, 1997) for the five scales ranged from .63 to .81 (See Table 1).

Surveys were distributed through a stepwise process. A packet of fifty surveys was sent to each of the state directors who were asked to distribute pre-stamped envelopes to their ten largest programs in their state, regardless of their Internet use. At the program level, each program director was asked to distribute the five enclosed surveys to five of their instructors. Each survey was paired with a business-reply envelope so the respondents would have little hassle in returning the survey for analysis. Of the fifty states which were sent packets, 24 states distributed surveys or 1,200 surveys out 2,500 surveys were distributed. Of the 1,200 surveys distributed, 219 were returned for an 18.25% adjusted response rate.

Sample

Of the 219 respondents, 88.7% were White, 6.6% Black, 2.4% Asian or Island Pacific, 1.4% American Indian or Alaska Native, and .9% were two or more races. The sample was predominantly non-Hispanic (97.6%), female (80.4%), with highest earned degrees of Bachelor's and Master's degrees, 44.7% and 52.6% respectively. Average annual household income was between \$35,000 and \$49,000 and participants ranged in age from 25 to 73 and averaged 49.

The programs the respondents came from also varied. The number of employees ranged from 1 to 275 and averaged 14.6 employees. The number of students ranged from 7 to 2,000 and averaged 135.9 students. Eighty-one percent indicated they had computers available in their classrooms with numbers of computers ranging from 0 to 62 computers and averaging 10.56 computers. The most often used operating system was Windows XP (34.67%) followed by

Windows 98 (30.33%) and Windows 2000 (16.00%). Windows users made up 92.34% of the sample while Macintosh users made up 6.33%. Linux users made up less than one percent. Respondents reported working an average of 21 to 30 hours a week.

When asked about their use of the Internet, 67.3% reported they used the Internet in their classrooms an average of 10.00 days a month. Respondents reported they had used the Internet an average of three to four years. E-mail was used by 32.0% of the participants for an average of 6.7 days a month. To determine their level of innovativeness, participants were asked to report how early they adopted the Internet compared with their colleagues. Among the respondents, 14.1% indicated they were innovators, 24.4% indicated they were early adopters, 41.5% indicated they were in the early majority, 17.0% indicated they were in the late majority, and 3.0% indicated they were laggards.

Table 1. Reliability scores for each composite scale

Scale	Cronbach Alpha Reliability Score
Why	.63
Practice	.64
PosCons	.81
NegCons	.74
Barriers	.77

Results

Motivations to use the Internet

The first research question asked what motivations ALBE instructors had for using the Internet in their classroom. They were asked to respond to a Likert like scale rating the importance of a various attributes from Not to Very. When instructors were about the importance of using the Internet with their students, 93.3% reported they use the Internet because it helped students learn basic skills, 96.4% indicated students encountering the Internet in their professional lives. When asked about attributes of themselves, 84.1% indicated using the Internet made them a better teacher and 93.7% enjoyed it. When asked to identify attributes regarding their workplace, 61.9% reported the fact that other instructors were using the Internet was at least of some importance, 5.6% indicated the importance of using it made them eligible for merit pay, and 62.6% stated the administration expected them to use it.

Next, instructors were asked what encouraged them to begin using the Internet in their classroom. Of those using the Internet, 87.5% indicated having the equipment available for use in their classroom had encouraged them while 34.2% reported having technology-focused professional development. Having administrators or supervisors support the use of technology was selected by 50.7% and having more technical support to overcome problems was chosen by 23.6%. Less than 7% selected having the decision made for them as being the encouraging factor for using the Internet in their classrooms.

Consequences of Using the Internet

The consequences chosen by instructors can be separated into two categories: Positive and Negative. Positive consequences included students becoming more engaged with the material (82.4%), more empowered (83.5%), and collaborating with others (50.4%). Instructors

also reported that they could be more student centered (70.2%) and incorporate more higher level thinking activities (76.2%). Negative consequences included students visiting other sites not related to their assignments (54.4%), students visiting inappropriate sites such as gambling or pornographic sites (23.9%), the class splitting into those who know how to use the Internet and those that do not (36.7%), and students copying material from other sites and presenting it as their own (22.5%).

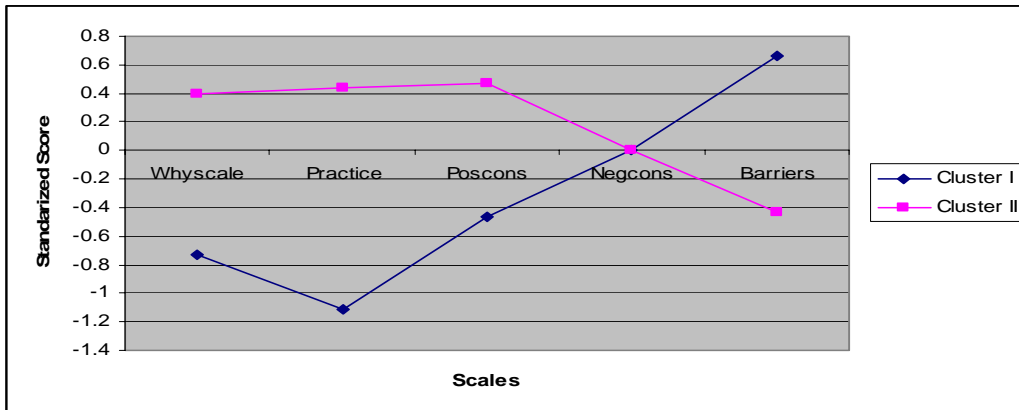
Barriers to Use

Instructors were asked why they would not be able to use the Internet. They reported that they would not use the Internet because it was unnecessary for their curriculum (25.5%), there was no money for purchasing equipment (35.5%), and they were provided no financial reward for the additional work of using the Internet (49.0%).

Profiles

A hierarchical cluster analysis (Kaufman & Rousseeuw, 1990) revealed two distinct groups of instructors. The first group (61.25% of instructors) scored high on why scale, practice scale, positive consequences scale. They scored zero on the negative consequences scale and low on the barriers scale. The other group (38.75%) was almost a mirror image of the first group scoring low on the why scale, practice scale and positive consequences scale, zero on negative consequences scale and high on barriers scale. (See Figure 1) When comparing the two groups together using a MANOVA with the Bonferroni correction, it was found that four of the five scale scores were significantly different $\Lambda(5, 74) = .334, p < .001$. When compared across specific dimensions, the two groups differed significantly on the following items: average number of computers ($p < .001$), use of e-mail in the classroom ($p < .001$), average number of days using the Internet ($p < .001$), average number of students served ($p < .05$). To determine if the two groups differed in how they perceived their adopter status, a Chi-Squared test was conducted and was found to be statistically insignificant $\chi^2(4, N=74) = 4.845, p = .304$.

Figure 1. Standardized Scale Scores for Clusters of ALBE Instructors.



Conclusions

The results of this survey point to four important findings. First, instructors used the Internet in their classrooms because of the benefits it would have for their students more than for themselves. Second, instructors reported that using the Internet helped students become better, stronger learners and enabled teachers to become stronger facilitators of learning. However, there were marked concerns that students would use the Internet for unrelated or inappropriate purposes. Finally, the strongest deterrents against using the Internet were not having the equipment available and no incentive to incorporate it with their curriculum. The cluster analysis indicates that not everybody is comfortable using the Internet nor anticipates its benefits. Exploratory correlational analysis points out the role of how one perceives the Internet's usefulness will determine how quickly he or she will adopt it.

Implications for Adult Education

This study has implications in four areas. First, the perceived benefits of Internet use suggest that policymakers need to consider increased funding to provide Internet-connected computers in each ALBE classroom. Second, instructors who consider the Internet only as a resource for finding materials for class may find benefits for them and their students in incorporating Internet activities into their curriculum. Third, students who are bored with workbook or deskwork activities may become engaged if the instructor would incorporate more hands-on Internet activities. Finally, for the field of adult education, these results provide a basis for exploring using the Internet as a means to empower students and facilitate their learning but the difference among instructors and reluctance to adopt new technologies means that not everybody will be willing to try it out in their classrooms.

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