

Bridging Great Divides: Innovation Diffusion in Hawaiian Distance Learning

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Abstract: This article characterizes Internet-based distance learning innovation by faculty and schools in Hawaii from the perspective of Rogers' diffusion of innovation model. It also describes representative cases of innovation at varied educational levels and academic fields based on subject interviews and Web site content analysis. Besides the practical necessity for using distance learning as an educational outreach to people on the islands of Hawaii, several themes emerged - all of them highlighting the need to create distance learning bridges to span the physical and cultural space of Hawaii and its links to the world.

Introduction

This article describes qualitative findings from an initial, exploratory study of distance learning innovations by faculty and schools in Hawaii. Its purpose was to discover the nature of distance learning initiatives there and to examine the nature of educational change in the context of a "diffusion of innovation" model that has been refined over forty years by Everett Rogers, a leading researcher in the field of innovation studies (Rogers, 2003).

It was initially reasoned that Hawaii would be an empirically rich environment in which to explore the nature and challenges of distance learning innovation as it is composed of geographically remote islands populated by people representing a diversity of cultures and languages.

Method

As this study was exploratory in purpose and the likely number of appropriate subjects would be small in size, we chose a qualitative (case study) method. A purposive selection of subjects and cases was made based on researcher knowledge, data from subjects during initial interviews, and content analysis of relevant Web sites. The original sample (eight cases) from which initial data was collected was chosen to represent a range of

educational levels, types of schools, and types of departments and courses by academic field.

Our initial purpose was to identify any “themes” (concerning the adoption and use of Internet-based distance learning) that might emerge from semi-structured, initial and follow-up interviews with subjects and Web content analysis. We thought that these themes would help characterize the underlying nature of how this innovation took hold and became diffused over time in Hawaii. We also assumed that these themes might be useful conceptual components in subsequent studies of this population and problem area. The result of this initial part of our study is primarily represented in the Findings section of this report.

However, to gain a more structured and comprehensive understanding of the findings, we also wanted to use a well-known conceptual framework or model (Rogers, 2003) to characterize the nature of diffusion of this innovation – especially its adoption phase. Through the publication of the five editions of his book (1962, 1971, 1983 1995, 2003) spanning a forty year period, Everett Rogers proposed and supported the use of a general diffusion model to describe how innovations become adopted, implemented, and incorporated over time under certain conditions and by certain types of people (Rogers, 2003). Although initially and extensively applied in research characterizing innovations in the health field, its research applications have been extended into many other academic disciplines, including information technology and education (Rogers, 2004).

To achieve this perspective, we purposively chose four subjects (from our original sample of cases) whose history with respect to the adoption and implementation of this innovation was the longest and most continuous (among subjects in the cases). These four subjects and their cases of adoption and use were all faculty from University of Hawaii at Manoa and they each represented different academic fields. This characterization is found primarily in the Discussion section of this report.

Findings

Besides the practical necessity for innovation in distance learning unique to the islands and people of Hawaii, several themes emerged from interviews with innovators - all of them invoking the need to create distance learning bridges to span the physical and cultural space of Hawaii and its links to the world. In this section we describe cases that exemplify these major themes.

Bridging Islands

One of the first themes identified was the practical necessity of providing distance learning opportunities that could span the physical separation of the islands. Thus, one of the initial and continuing program initiatives in distance learning was to provide an “outreach” to students on the Hawaiian islands and elsewhere throughout the world.

The University of Hawaii has ten campuses situated throughout the islands of Oahu, Hawaii, Maui, and Kauai. One of the University's stated goals is development of distance

learning. Due to its relatively higher population and access to resources, the UH at Manoa campus on the island of Oahu has traditionally been a center for educational outreach as well as initiation of educational innovations that diffuse to schools on the other islands. Outreach College provides the Web-based courses and e-blended special programs using distance learning (Outreach College, 2005). Outreach Online is the Web-based portal for online courses provided by the various UH campuses (Outreach Online, 2005).

Departments representing academic fields that are most closely associated with the use of technology also tend to have access and knowledge of its use. John Southworth is a faculty member of the University of Hawaii Educational Laboratory School which is part of the Curriculum Research & Development Group in the College of Education. His group pioneered (in the 1970s-80s) the use of the Electronic Field Trip concept to provide distance learning support for their students. He taught his first Internet-based course at Kapiolani Community College in the spring of 1986 (a testament to how community colleges have played a part in the early adoption of educational innovations). His group is currently using Internet-based distance learning for a collaborative project called the Student Ambassador program (StAmPNet) of the UH College of Tropical Agriculture and Human Resources (Southworth, Knezek, and Flanigan, 2003).

According to Dr. Wes Peterson, professor of Computer Science at the University of Hawaii at Manoa, the Information and Computer Science department, “the main purpose of developing these online courses was to reach students on other islands.” After initially offering online graduate courses in the ICS department, in 2000, the ICS department began to offer undergraduate courses as well (ICS Department ALN, 2005).

The Hawaii Department of Education has also been involved with distance learning programs. It began with programs using ITV (Tele-School) and later launched an Internet-based program called E-School that provides distance learning courses via the Internet (E-School, 2005).

Bridging Cultures

Another theme that emerged was the need to bridge cultures. People of many cultures call Hawaii their home and many keep strong ties to their parent cultures. Schools in Hawaii recognize this vital cultural legacy by using distance learning via the Internet and study-abroad programs to immerse students in learning through their native cultures.

The Punahou School, a private K-12 college preparatory school on Oahu (Punahou School, 2005) supports cross-cultural programs through its Wo International Center. Their teacher development and student study abroad program outcomes are posted with text and photos as a Web-journal on their Web site. Several teachers at the Punahou School have adopted the use of email and videoconferencing through the Internet in their classroom-based courses to provide a multi-cultural perspective in learning.

Conversely, there are people from other cultures who wish to study and work in Hawaii. To help them acclimate, the Outreach College at UH of Manoa provides distance learning

programs and workshops through its International Bridge program (Outreach College, 2005).

Bridging Languages

Stephen Tschudi, Instructor in Technology for Foreign Language Education at University of Hawaii describes a program undertaken by the College of Language, Linguistics and Literature. Although the earliest course used ITV, Internet-based online courses in foreign languages began in 2000. Since then, his program has undertaken research and development initiatives and become a leader in distance-delivered language education (Fleming, Hiple, and Du, 2002).

They are currently teaching beginning and intermediate Chinese using a hybrid model. However, Web-based delivery is leveraged for advanced online courses that focus on reading and writing. For example, a program of advanced instruction in Mandarin Chinese is offered as a Web-based asynchronous course. Tschudi sums up the impetus for adopting distance learning as an educational innovation for the islands of Hawaii with a simple, yet telling observation, “practical necessity has required it.” The University of Hawaii has received two grants from NSEP (the National Security Education Program) to embark on a plan to deliver less commonly taught languages via distance education.

Bridging Homes and Schools

With a preponderance of distance learning programs emerging from centers of higher learning, you might think that all such innovations are originating top-down. In Hawaii, there is a steadily growing “core” of later adopters at the grass-roots level seeking educational change: from within K-12 public and private schools and by concerned parents, many of whom are promoting and exploring home-schooling options.

For example, the Myron B. Thompson Academy has embarked on a successful program in support of home-schooling families. Their K-6 home-school learning support program opened for enrollment for the 2004-2005 academic year. Though they experienced the trials associated with tackling the novelty and complexity found in almost all innovations, through the efforts of their dedicated staff and teachers, they have crafted a program that they feel meets Hawaii's unique home-schooling needs (Myron B. Thompson Academy, 2005).

In addition to their largely presentational school Web site, the Punahou School provides ePunahou, a Web portal for online learning and communications to connect Punahou students, parents, alumni, faculty, and staff (Punahou School, 2005). This online community provides email and discussion boards, event calendars, and announcements.

Bridging Technology Innovators and Users

The educational technology departments in schools of education are typically early adopters and also successfully manage implementation because they are usually charged

with introducing new technology to teachers and administrators who in turn introduce (and help diffuse) educational innovations within their school systems.

Dr. Curtis Ho is the chair of the Department of Educational Technology in the College of Education at the University of Hawaii at Manoa. In his unique administrative and “teaching the teachers” role, he has acted as an agent of change throughout the evolution of educational technology in Hawaii. This was made evident by the comments of several subjects as well as his record of innovative distance education programs and research projects, such as those available through the ETEC-Connections Web site (ETEC-Connections, 2005).

His history is characteristic of an early adopter of distance education in this population and parallels the overall diffusion of the Internet. During the summer of 1990, Dr. Ho taught an Education Technology course for 60 teachers at four sites via two-way video. At that time, everything was synchronous, but soon after the initial course, it became possible to do asynchronous teaching by email and discussion board. Eventually, it integrated into a more hybrid course (i.e., synchronous and asynchronous). In 1998, he coordinated a diploma program for teachers who needed professional certification. Initially offered via the Hawaii Interactive Television System, it migrated online. In 2001, he taught using a blended approach: the first two weeks in American Samoa, students learned the WebCT course management system (CMS) and other online course delivery software, and last two weeks he taught online from Hawaii.

According to Dr. Ho, initially the students were concerned about the quality and use of technology, and teachers were concerned about the workload. “There are always concerns, but successful programs were in high demand. Now, it’s not a question of whether we should be doing it, but how we should do it. Administrators under pressure due to teacher shortages are supportive of the use of Internet technology to reach more potential students.” Beginning July of 2006, he will devote a year to educational technology research and development in Japan. As of Fall 2006, the Educational Technology Department will offer a two-year cohort-based Online Master’s in Educational Technology program using a hybrid approach that includes limited face-to-face sessions in addition to the online sessions for some courses.

Discussion

As necessity is accepted as the mother of invention, then it must also be the driving force behind the early and successful adoption of new technologies that address that need. This is the over-riding descriptive finding in this study characterizing the nature of adoption and use of Internet-based distance learning in Hawaii: necessity and means to reach students on other islands, to bridge cultures and languages, to bridge homes and schools, and to teach others how to use this enabling technology.

Most of the adoption and implementation of this innovation has occurred from the top-down (i.e., educational and administrative level), whereas later adopters were promoting

change from the bottom-up (i.e., classroom use by teachers, home-schooling use by parents) and at lower educational levels (K-12).

The earliest online courses were offered at the college level (through the UH Manoa campus, but also notably through the Community Colleges that are part of the UH system). These early initiatives were also associated with academic disciplines and teachers with a background in computer and network use and with access to that technology. Other initiatives arose from individual college teachers who received administrative support and/or funding to support their early adoption and use.

As innovation diffusion spread, eventually less-served populations became supported through distance learning innovations such as in lower educational levels (e.g., K-12) and by individual teachers (e.g., Punahou School). Eventually, parents became involved with supporting administrative distance learning initiatives for remedial work and home-schooling (e.g., Myron B. Thompson Academy).

When considering the various “components” in Rogers’ diffusion of innovation model (Rogers, 2003) as factors in characterizing the nature of adoption, we found a consistent relationship between a given state for most of these components and the empirical evidence we found for successful adoption and implementation. The adoption stage is the first and most critical stage in the diffusion of an innovation because it is at this point when initial efforts can fail and the innovation is rejected (sometimes prematurely and without sufficient justification) by its users and their organizations.

One of Rogers’ components involves the degree of choice (voluntary or mandatory) to adopt. All of the subjects acknowledged that their adoption was voluntary. In addition to their intrinsic curiosity with educational uses of technology, they also responded individually to the perceived need to reach out to Hawaiian students across physical space to meet their educational needs. We believe that this type of adoption may have important implications for how this educational innovation has become diffused throughout the Hawaiian islands as well as for learners throughout the world’s great divides.

The components of compatibility (with values, past experiences, or needs), complexity (how difficult it was to understand), and ease of experimentation (playing with the technology before adoption) were present as they had already embraced and used computers and other technologies to support learning.

However, the components of observability (results seen by others) and organizational size (of their department and/or school) were not attributed as important factors in their adoption of this innovation. This can also be observed in the early adoption of the Internet in courses at community colleges as well as the larger main campus.

The role of communication channels as a factor in adoption does not seem to have a distinct role, perhaps because existing channels were “disrupted” in a positive way by the communicative potential of this new medium, but also as early adopters, these subjects

were able and willing to work on their own or in small groups composed of other early-adopting innovators and users.

When examining diffusion of innovation, the component of time plays an important role. It describes a continuum from adoption to use (initiation to implementation to incorporation) of an innovation within an organization. It also characterizes the relative rate (pace) of adoption by individuals and organizations. What is unique about these subjects is their role as early adopters (Rogers, 2003) of an innovation – initiating their programs as early as Internet and telecommunications infrastructure in Hawaii could provide appropriate support. Their rate of adoption was also relatively fast in that they had the technology, knowledge, confidence, and support they needed to progress at their own fleet pace of change.

As an example of the desirable state of the component of relative advantage, two of the four early adopters were initially using ITV applications, but eagerly sought transition from this more expensive and restrictive technology to Internet-based distance learning because they understood the relative advantage of using an inexpensive, ubiquitous, and flexible technology for distance learning.

Conclusion

Besides the practical necessity for using Internet-based distance learning as an educational outreach to people on the islands of Hawaii, several themes emerged from interviews with innovators - all of them invoking the need to create distance learning bridges to span the physical and cultural space of Hawaii and its links to the world.

The history and extent of their work can be traced over the broader diffusion of the Internet as an innovation. The record of their innovations suggests that they have moved from adoption to the implementation stage and may be progressing toward incorporation within their respective educational organizations. However, in educational reform as well as in computer-mediated communications, implementation of an innovation is typically a lengthy and time-consuming process (Sproull and Kiesler, 1991), especially those that involve organizational change (Giacquinta, 1973; Berman, 1981).

Given this relatively long history of innovation in Hawaiian distance learning and how studying it using many of the components in Rogers' diffusion of innovation model help characterize its successful adoption and implementation, we feel that subsequent studies of this population would benefit from using this model to better understand educational change of this nature.

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