

# **An Investigation of the Innovation Decision Process of Faculty Members with Respect to Web-based Instruction**

*By: Catherine Mwaura, Ohio University*

## **Abstract**

Since Web-based Instruction (WBI) is growing faster than any other instructional technology, universities have provided faculty with accessible hardware, training, and discipline-specific media. Consequently, more and more university faculty members are using WBI as an integral part of instructional activities. In spite of this proliferation, WBI appeals to some, but not to all faculty members. A qualitative research study was conducted to investigate factors that affect innovation-decision process among faculty members based on their use of WBI. Diffusion of innovation: Innovation-decision process model was used as the theoretical framework. The research findings will bring an understanding of how to encourage more faculty members to adopt WBI.

## **Introduction**

Web-based Instruction (WBI) is growing faster than any other instructional technology and more and more university faculty are using WBI as an integral part of instructional activities (Fredrickson, 1999). On the contrary, a large number of faculty members in the universities are hesitant or reluctant to adopt WBI (Jacobsen, 1998). How then do faculty members decide to adopt or reject WBI? This question triggered the researcher to conduct this study based on the Rogers' (1995) theory: Diffusion of innovations. As a result, the researcher conducted the current study to find possible solutions to this dilemma under the light of the research question, "What factors influence the faculty members' innovation-decision process to adopt or reject web-based instruction?" In this case, the researcher conducted a qualitative research study to illuminate possible solutions to this research question. Thus, interviews were conducted with the faculty members at Ohio University and the participant observation was used to collect data by attending a conference, a workshop and a seminar offered to the faculty members in Ohio University.

## **Participants**

As mentioned earlier, this study focused on faculty members in Ohio University. Some of these faculty members have attended a three-hour or six-hour workshop conducted by the Center for Information and Technology Learning (CITL) in Ohio University. Accordingly, some of these faculty members are and others are not using web-based instruction to teach either traditional or distant classes. Other research participants included faculty members who have not attended Blackboard CourseInfo workshop and are either using or not using web-based instruction to teach traditional or distant classes. In addition, administrators and staff in Ohio University that have direct impact to the faculty members as they use or decide to use web-based instruction, participated in this research study. The research participants included male and female faculty members of any age who are either tenured or non-tenured. The duration the faculty members have taught in Ohio University was not an issue in the selection of the research participants.

## **Results from the Study**

Findings from this study reveal that providing faculty members with resources, a series of workshops on effective teaching or placing books about teaching practices on library shelves is not sufficient to entice the faculty members to use web-based instruction. In this case, the attributes of innovations and the innovativeness of the faculty members mainly influence their decision process to adopt or reject web-based instruction.

### **Attributes of Innovations**

According to Rogers (1995) attributes of innovations are, “the characteristics of innovations as perceived by individuals” (p. 15) and they consist of, relative advantages, compatibility, trialability, observability and complexity. Although Rogers portrays all the five attributes as major players in the diffusion of innovations, this research study shows that, complexity, compatibility, and relative advantages are the major players when faculty members make decisions to adopt or reject WBI.

### **Compatibility**

As defined by Rogers (1995), “compatibility is the degree to which an innovation is perceived as being consistent with existing values, past experiences, and needs of the potential adopters” (p. 15). Rogers adds that, an innovation can be compatible or incompatible with socio-cultural values and beliefs, with previously introduced ideas, or with client needs for the innovation.

#### **1. Socio-cultural Values and Beliefs**

An administrator from the division of Information Technology mentioned, “faculty are internally motivated because they care about teaching, they want their students to learn, they want to transmit their discipline to new people, but they do not want to commit suicide when they are doing it.” Thus, faculty members are dedicated to teaching effectively, but not at the expense of their teaching goals and the joy that they reap from teaching. As such, faculty members who rejected WBI believe face-to-face is freer and less structured and in the same way, it enables them to establish warm, personal and productive relationships with their students. Likewise, they believe that WBI is not a good way to discuss complex issues with their students. However, faculty members who adopted WBI believe that visual images are very important for some courses and so using the WBI provides enhanced clarity in the explanation of things to students. Therefore, when faculty members find the web as a superior tool, they invest time and energy in WBI, but those faculty members who find it valueless they do not give it any time.

#### **2. Previously Introduced Ideas**

Findings from this study show that age and work experience have an influence on how faculty members make decisions to adopt or reject WBI. That is, after working for many years (about 35 years), faculty members become more critical to new ideas and so they do not just accept the advertising. Such faculty members tend to be conservative because they have seen some of the traditional pieces pass the test of time. In this case, the faculty members who rejected WBI reported that they have used different types of instructional technology in the past, but eventually they went back to using the traditional methods of teaching. As a result, these faculty members argued that WBI is for faculty members who have not taught for long. That is, when faculty

members are new in teaching, they are curious to try different ways of teaching, which include the use of WBI before they establish the best way to teach.

### **3. Client needs for the innovation**

This research study shows that faculty members who learn about WBI when looking for ways to meet their instructional needs mostly adopt WBI unlike the faculty members who learn about the use of WBI with an intention to create a need for it. Faculty members who reported that WBI meets their needs expressed the idea of their students using the web sites at any place and time, whether at home, in their dooms, or even when traveling. In addition, students can register for online courses during their vacation because they do not have to be in the university to take the courses and they can plan for their graduation because they can register for more than one course since online courses do not have time conflict.

Faculty members reported the ability to supplement their teaching material as another way that WBI meets their instructional needs. Mainly, faculty members teaching distance courses were glad that they could use the web to enhance the information in the text books and also give some clarity to the information about projects that students take for their course work.

On the contrary, faculty members who rejected WBI felt that using instructional technology, which includes WBI, takes extra time to do what they can still do with the traditional methods, yet such instructional technologies distracts the flow of the class discussions. Others faculty members acknowledged the way their colleagues are using WBI, but they would rather continue using the traditional methods of teaching other than use it the same way. On the same note, other faculty members believe that the university is imposing the use of WBI as the only way to teach effectively, yet they do not want to use WBI the way they are learning to use it.

### **Relative Advantages**

Rogers (1995) defines relative advantage as “the degree to which an innovation is perceived as better than the idea it supersedes” (p. 15) and so whether an individual perceives an innovation as advantageous or not results in either an adoption or a rejection of that innovation. In the current study, all 31-faculty members that participated accepted that there are advantages to using WBI although five faculty members have not yet adopted the use of WBI. These advantages can be categorized in Rogers (1995) sub-dimensions of relative advantage that includes the degree of economic profitability, low initial cost, a decrease in discomfort, social prestige, a saving in time and effort, a decrease in discomfort, and immediacy of the reward. Use of WBI leads to economic profitability because of the reduction of the printing cost, low initial cost because faculty members do not spend their own money to learn, develop implement and maintain WBI, rather the university provides them with instructional, financial and technical support. Decrease in discomfort results from less copying which makes the distribute of information more convenient, being able to communicating with diverse students because it is possible to use audio features to talk to students, images to show examples of those concepts and at the same time, students can print information from the course web site. Use of WBI was also a relief to faculty members who reported that they wanted to change from rereading the book to the students and to start testing whether the students have understood the concepts or not. That is, these faculty members wanted to start encouraging more critical thinking, more synthesizing of the concepts, more applying of the concepts rather than retelling the students what they could

have read from the book. Using WBI has also enabled faculty members to solve the problem of overflow and to increase the class attendance in large enrollment classes. As a result, use of online quizzes in the WBI helps students to prepare themselves for the class and to know that there are many paths to come to a solution. Thus, their students are more engaged in their learning activities and they get very enthusiastic about it. At the same time, the class attendance for 244 students averages 89.9% and the high school GPA and SAT score correlates.

### **1. Social Prestige**

Faculty members who adopted WBI emphasized that use of WBI today will make it easy for them to adopt the advanced instructional technologies yet to come in future. That is, if faculty members do not embrace the use of WBI today, they will weaken their ability to use it later. Therefore, they emphasized the importance of keeping up with time as to prepare themselves for the next generation of students who have grown up with computer technology. On the contrary, there are faculty members who have rejected the use of WBI due to this same reason. That is, because they did not grow up with computer technology they do not feel comfortable using WBI as they fell comfortable with the use of the telephone and radio that they are familiar with since their childhood and so they do not want to adopt it.

### **2. Saving in Time and Effort**

This study reveals that faculty members are busy and that adding innovations into teaching make them work beyond their contract hours. That is, according to their contract, faculty members are supposed to spend 40% of their time with teaching, 40% on research and 20% on service. With 15 hours per week, they already spend 67% of their time on teaching without any innovations implying that they work overtime to accomplish all their responsibilities. As such, adding innovations takes four hours per one hour of lecturing.

Despite the time required for effective use of WBI, 26 out of 31 faculty members who participated in this study are using WBI. As the research findings show, the faculty members who adopted WBI believe that people make time for what they value and so to effectively use WBI, faculty members should be prepared to spend a lot of time to learn and develop WBI to save time when they implement it in their teaching. In this case, faculty members who are using WBI are ready to spend upfront time to save time in the end. As such, these faculty members identify being able to send announcements, assignments, or any other communication to the whole class through email attachments or listserv in their course web sites as saving their time and effort. In the same way, faculty members are able to keep in touch with their students on the days that the classes do not meet and to clarify things that students might not have understood because students can send in questions through the course web sites at any time whether the class is in session or not. Likewise, if a faculty member remembers a point that he or she missed during the class time, he or she can get to the course web site at any time and add it as a new message for the students to read. Faculty members also reported that using WBI has made students to complete their learning activities faster than when the faculty members did not use WBI.

The current study supports the idea of immediacy of reward in the use of WBI in various ways. All the 26 faculty members that are using WBI identified the ability to engage students in learning as an advantage from the use of WBI. First, faculty members are able to prepare students for a lesson before class time by making them answer questions on topics to be covered

during the class time, which leads to more interaction during class discussions. Second, WBI makes all the students pay attention to the information posted on the course web site because there is no physical contact between the teacher and the students. That is, in the face-to-face class interaction may be limited by the fact that, some students could be facing somewhere else, others could be a little bit shy about asking a faculty member to repeat what he or she said or a faculty member may be addressing one student and so the other students do not get involved. Other immediate rewards to using WBI reported in this study are the reduction of students' writing and keeping faculty members focused on what they are teaching.

### **Complexity**

Rogers (1995) defines complexity as, "the degree to which an innovation is perceived as difficult to understand and use" (p. 16) which is true about the use of WBI by faculty members because it is a new phenomenon in the education realm. Accordingly, as indicated by findings from this study, not many faculty members have formal training on how to use web-based instruction. In this respect, this research report shows, if faculty members are not familiar with the WBI, it will take them a lot of time and effort to get to a point where they can teach with it and this makes some faculty members to reject WBI. Therefore, how fast faculty members understand the use of WBI matters in deciding to adopt or reject it. If it is hard to use WBI, there are faculty members who get intimidated by learning how to develop and use it and they do not want to try it, but if they are able to quickly learn and use WBI, they are quick to make the decision to adopt it.

Faculty members associated difficulty to learn with the language used by instructors in training faculty members how to use WBI and the pace at which those instructors teach the faculty members. That is, the instructors use technical language that confuses the faculty members, and they teach at a fast pace that the novice faculty members get lost in the process. In addition, the way the instructors conduct training do not meet the faculty members aim of attending the training, which is to learn how to use the WBI in their courses, but instead, the training sessions focuses on the features of the software.

### **Adopter Category**

Rogers (1995) affirms that individuals in a social system do not adopt an innovation at the same time; implying that there are different categories of adopters. Therefore, the categorization of the adopters depends on an individual's innovativeness which means, "the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a social system" (p. 261). As a result, if faculty members are innovative, they do not take long to decide to adopt or reject WBI or any other instructional technology indicating that the adopter category influences the decision to adopt WBI. That is, depending on the adopter category that faculty members fall in, they may decide to adopt the WBI without considering the consequences of its use or the available support. Otherwise, faculty members may wait to see the outcome of its use by their colleagues before deciding to adopt or reject it. In view of that, the research findings from this study reveal different categories of faculty members: those that adopt easily, those that take a long time to adopt, and those that never adopt web-based instruction. The faculty members that easily adopt the use of web-based instruction relate to the innovators and early adopter categories identified by Rogers (1995).

### **Innovators**

As Rogers (1995) portrays, innovators are almost obsessed with new ideas, which make them go out of their peer network into a cosmopolite social relationships. Findings from this research study reveals that faculty members in the innovator adopters category, do not care what problems they encounter, they use WBI irrespective of whether there are problems or not and they are ready to use WBI whether others are using it or not. Such faculty members are not pushed to use WBI rather, they do all they can to be effective in using WBI. When faced with problems while using WBI, they look for support within the university and if the support is not available, they seek for such support from without the university.

### **Early adopters**

According to Rogers (1995) ascertains, “potential adopters look to early adopters for advice and information about the innovation” (p. 264). Faculty members in the early adopters category are the major advocates for the use of WBI to their colleagues. The research findings reveal that the faculty members in the early adopters category are active information seekers and once they identify that the use of WBI is beneficial to them, they spread the word to the rest of the faculty. In this case, they give evidence of why they advocate for WBI and demonstrate how they effectively use it in their courses. They are also willing to assist other faculty members in the adoption process, which makes other faculty members respect them for their knowledge.

The faculty members that do not easily adapt to the use of web-based instruction wait to see the outcome from those faculties already using it and they fit in Rogers’ (1995) early majority and late majority adopter categories.

### **Early majority**

Rogers (1995) explains that, “the early majority’s innovation-decision period is relatively longer than that of the innovator and early adopter.... They follow with deliberate willingness in adopting innovations, but seldom lead” (p. 265). In this case, faculty members that fall in this category interact with the faculty members who have already adopted the use of WBI as well as those who have not yet adopted it for sometime before deciding to adopt WBI. This might be partly because, although they are willing to use WBI, they do not want to invest their already inadequate time and effort on an instructional technology that might not be of benefit to their instructional needs. Thus, these faculty members relay the information about successful use of an innovation from the early adopters to either the faculty members deciding to adopt or who have rejected the use of WBI.

### **Late majority**

In Rogers (1995) view, late majority adopt innovations with a skeptical and cautious air and they do not adopt until others in the system have adopted. This research study shows that the faculty members in the late majority category need a lot of support to use WBI. For one, they want all the services very close to them, second they are lured by incentives and third they need be certain that WBI is effective before they adopt it. In this case, they might attend workshops and other types of training offered in the university, but they will not implement the skills unless they have a one-on-one training, not by going an extra mile of seeking for such assistant, but by having it from the vicinity of their offices or classrooms.

There are also faculty members who do not show signs of ever adopting WBI although they know that there are some benefits associated from its use. Rogers (1995) categorizes these faculty members as laggards.

### **Laggards**

Rogers' argument shows that laggards take a long time to decide to adopt an innovation mainly because they have to completely be certain that they will benefit from the adoption. Therefore, at this stage, considering that WBI is at its infant stage as mentioned by Pedroni (1996), the findings shows that faculty members in the laggard adopters category do not show signs of ever adopting WBI although they know that there are some benefits associated from its use. Three of the faculty members who have reported to have rejected WBI reported that if they start using WBI, they will suffer personal deprivation because they would be doing what does not please them and so they would rather do another job rather than teach using WBI which would take away the fun of teaching.

Still, Rogers (1995) mentions, "laggards tend to be suspicious of innovations and change agents" (p. 265). This study supports this view in that faculty members in this category agree that universities need to be competitive, but they argue that, universities see WBI as having great potential financially and that is mainly the reasons they support and promote WBI. Therefore, to faculty members in the laggard category, universities are promoting the use of WBI mainly to be more competitive, rather than to boost the faculty members' effectiveness in instruction.

### **Implications**

Despite the fact that WBI appeals to some faculty members but not to others, the research findings support that, the universities are witnessing an increase in the number of faculty members using WBI. As such, since the current research shows discomfort among most faculty members in the way instructors conduct training for WBI there should be more emphasis on the need analysis before launching any training program. That is, need analysis could focus on the faculty members' learning styles; the faculty members' goals and views of effective teaching; the most appropriate time in terms of the quarters, days and times of the day for the scheduling of the training sessions as well as the faculty members' prior knowledge about WBI. Also, the faculty members need more time to learn, develop and implement WBI which could be made available to them through release time, course buy ups, and providing monetary incentives in case faculty members decide to develop their course web sites during their vacation.

Likewise, the information gathered from this study shows that all faculty members using WBI have experienced relative advantages in their teaching process, but it requires time and effort on the side of faculty members. As a result, faculty members need to be ready to spend time in the beginning when learning and developing the course web sites if they want to save time at the long run. Besides, collaboration with their colleagues as they develop and use WBI will be of great help.

### **Contributor' information**

Catherine Mwaura is a graduate student in Ohio University, The College of Education in the department of Educational Studies: Instructional Studies. Catherine is

currently working on her dissertation in partial fulfillment of the requirement for the Doctor of Philosophy in Education.

**References**

Center for Innovations in Technology for Learning, (2001) [Online]. Available: <http://www.citl.ohiou.edu> (November 20, 2001).

Fredrickson, S. (1999). Untangling a tangled Web: An overview of Web-based instruction programs. *T.H.E Journal*, 26 (11), 67-77.

Jacobsen, D. M. (1998). Adoption patterns of faculty who integrate computer technology for teaching and learning in higher education. Proceedings of the ED-MEDIA AND ED-TELECOM 98: World Conference on Educational Multimedia and Hypermedia & World Conference on Educational Telecommunications, Freiburg, Germany, June 20-25.

Khan B. H. (Ed.). (1997). *Web-based instruction*. New Jersey: Educational Technology Publications.

Pedroni, G. E. (1996). The importance of World Wide Web in K-12 [Online]. Available: [http://www.geocities.com/Athens/5461/paper\\_1.html](http://www.geocities.com/Athens/5461/paper_1.html) (November 20, 2002).

Rogers, D. L. (2000). A paradigm shift: Technology integration for higher education in the new millennium. *Educational Technology Review* 13, 19-27.

Rogers, E. M. (1995). *Diffusion of innovations* (4<sup>th</sup> ed.). New York: The Free Press.