A COMPARISON OF INSTRUCTIONAL TECHNOLOGY ADOPTION AT TWO CAMPUSES: A CASE STUDY OF A PRIVATE UNIVERSITY OF BANGLADESH

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ABSTRACT:
This study aims to observe the differences in faculties’ instructional technology adoption at two campuses of a university and to discuss reasons behind the differences. As ICT revolution has dramatically changed educational context, most higher education institutions are asking their faculties to adopt the new technologies in pedagogy. Many studies emphasize on faculties’ adoption of instructional technology in different institutions but say little about the faculties’ adoption at campuses within a single university. In this paper, triangulation methodology was adopted for collecting quantitative and qualitative data. Collected data were analyzed to discover obstacles and incentives to the adoption. The result shows that the main obstacle is infrastructure problem whereas the incentives are stipend for research and attending conferences on technologies, seminar of new technology and so on. The findings also suggest that faculty’s adoption of technology may depend on faculty’s objective of using technology as well as their respective subjects.

JEL Classifications: A29, I21, O32, O33
Keywords: Instructional Technology, adoption, faculty, triangulation methodology.
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1. INTRODUCTION
Over the past two decades at least, there has been rapid escalation in the use of computer and Internet technology for didactic purposes in higher education institutions across the globe. As a result, educational transformation and reform have become an urgent issue to meet the demands of new educational objectives in the knowledge-based economy (Barone & Hagner, 2001). Even many aspects of higher education have been modified by technology including administration, recruitment, and the way of teaching and learning (Zhou & Xu 2007). Therefore, academic institutions must prepare students to integrate technology in their learning to be feasible venues for students especially to train them for the job market (Beggs 2000). If institutions do not provide these instructional technology opportunities to students, it will be disfavor to them (Gilbert & Green 1997).

We usually think of computers and computer software as instructional technology, but instructional technologies are not limited to computers in the classroom. Instructional technology describes all tools that are used for teaching and learning such as: cameras, CD players, PDA’s, GPS devices, computer-based probes, calculators and electronic tools we have yet to discover. These tools are providing most innovative ways of learning. Students and teachers use computer software and Internet resources to locate, process, and present information, learn and assess their skills. Usually, teachers inspire students to use these technologies for pedagogy purpose. Hence the instructional technologies adopted particularly by the faculty are very important to observe the efficiency and effectiveness of the faculties. It is high time to see the adoption rate of the instructional technology in the universities.

A well recognized private university of Bangladesh named Daffodil International University (DIU) had been selected for the study purpose. This university started its journey on 24th January 2002. As “each institution’s mission gives differential weight to teaching, research, and service” (Boyer, 1990), this university’s mission is to pursue research, learning and teaching of international distinction for the benefit of the nation. It can be further defined by its IT-based traditions of service and access. As the number of students of the university increased, it led to an increase in the number of campuses as well. Besides the main campus at Dhanmondi, a new campus had been established at Uttara especially for the students of Uttara who needed to have more travels to come to the university’s main campus.

These two campuses had a large number of faculties to deliver instructions to the students. The main interest of this paper was to see how the faculties were using the instructional technologies in their courses. Because it is believed that the quality of the faculty as well as the knowledge and usage of technology can ensure the quality education. The Uttara campus had some deficiency in terms of technological support. There were also various barriers and necessary support structures required to facilitate adoption of instructional technology. Although the University authority was paying great attention to that problem, the faculties of Uttara campus felt an urgent necessity of some technological supports to deliver the best outputs of the instructions to the students. Whether this problem was affecting the adoption of instructional technology among the faculties or not was the main inquiry of this study. The rate of the instruction technology adoption and diffusion may have different impact in both campuses.
2. LITERATURE REVIEW

According to Soine (1998), the presence of technology in college classroom should be indispensable in the 21st century. As technological innovation continues, the classroom technology should become a vital ingredient of the core mission for the institution (Johnson 1997), with its central focus rooted in the paradigm shift from teaching to learning (Jafari 1999; Reynolds & Werner 1998). Levels of readiness and know-how for faculty, schools, students, parents, and educational technologists have become gradually more important that’s why it is obvious that “different technologies are deployed at different rates in different ways at different settings” (Molenda & Sullivan 2002). According to Reil et al (2000), programs that are designed to encourage technology use in the classroom enhance familiarization with technology as well as empowerment in teaching. In addition to that, technological enhancements to the traditional classroom must be in a manner of user-friendliness for both faculty and students (Zhang 1998).

2.1 Definition of Instructional Technology

In academic world, technology can be defined as the core curriculum, an apparatus for delivering course materials or supplementing instruction or an instructional device (Imel 1998) to enhance learning (Milliron & Miles 1999). Luppicini (2005) described technology as “the organization of knowledge for the achievement of practical purposes in intellectual and social contexts.” So, using the means, faculties are able to put up a link between the classroom and the globe (Ward & Clark 2000) to allow students to experience real-world opportunities in the classroom (Hull 1999), which are considered as highly significant (Lang 2000) to prepare them for competitive job market.

Previous literatures provided the opportunity to access to a plenty of definitions of instructional technology. According to Spotts & Bowman (1995), instructional technology can be referred as the use of technology to achieve an instructional objective. The board of School district U46 defined it as the use of a variety of teaching tools to improve student learning. This technology includes computer hardware and software, networks, email, multimedia, and computer peripherals such as CD players. Traditional media such as video and audio are also defined as instructional technology.

Sahin (2005) considered Instructional Technology or innovation as the new tool that is being adopted for teaching and learning purposes (both in and outside the classroom). The definition by Seels and Richey (1994) was as follows: “Instructional Technology (IT) is the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning” which had the approval of Association for Educational Communications and Technology (AECT) Definition and Terminology Committee and endorsement of AECT board of directors. Despite the AECT definition of IT, in which main weight had been given on IT rather than its’ products, there are several arguments concerning the use of technology in education still continue to focus on products such as computers, software, networks and instructional resources (Green 2000).

Different studies reveal that primarily seven types of instructional technologies are being used in college classrooms (Frayer 1997; Grasha & Yangarber-Hicks 2000; Green 2001) where most of the communications between students and faculty within traditional courses are via e-mail, Internet, course web sites, computer simulations, and presentation handouts. Internet technologies (e-mail, course websites, and newsgroups) have not only added value to traditional classroom knowledge delivery but also impacted the course delivery and design in many colleges and universities (Barnett et al 2004).

Within past few years a new wave of Internet technologies (Web 2.0) has emerged with the potential to further boost the teaching and learning environment. Although many studies have shown that the usage of instructional technology in the classroom has increased over the past years; however, this use has been primarily limited to content delivery, such as accessing course materials (Maloney 2007).

Ajan & Hartshorne (2008) conducted their study focusing on four types of Web 2.0 collaboration tools: blogs, wikis, social networking, and social bookmarking used in higher education. Alexander (2006) found some ways to use these tools for educational purpose. In case of blogs, he explained how blogs can be used for researching, tracking, interpreting, and evaluating political commentary (multiple perspectives), cultural events, business, or other news and for examining changes over time. He added wikis could be useful to support individualized learning and promote collaboration through group editing and peer review. Furthermore, Alexander supplemented that the social networking sites could be used to establish a series of academic connections or to foster cooperation and collaboration in the higher education classroom whereas social bookmarking could be used to facilitate collaborative information discovery.
Previous literatures identified some unique features of emerging Web 2.0 technologies such as ubiquitous access, ease of use, functionality, and flexibility that are responsible for the intensifying utilization of Web 2.0 as an instructional tool (Boulos et al 2006; Chen et al 2005). Additionally, Ferdig (2007) showed that it can support different pedagogical approaches such as active learning, social learning, and student publication to foster the higher education.

### 2.2 Adoption of Instructional Technology

Instructional technology can be beneficial for both teachers and students. They can perform their respective jobs easily, quickly and more effectively. A rationale for the development and propagation of instructional technology is that students can be engaged in the learning process to a much greater extent than they can be in traditional teaching methods, such as lecturing (Boettcher 1993; Knapper 1988; Kozma & Johnston 1991). Bates (2000) identified some motives for using technology to improve the classroom experience included upgrading of learning quality, providing students with opportunities to learn technology skills, expanding access to post secondary instruction, and spreading out the reach of technology into the world outside the classroom. Furthermore, the Internet technologies are adding more value to the learning process. Concannon, Flynn, & Campbell (2005) pointed out changes in students’ demographic factors, educational delivery market conditions, and innovation technology itself have brought a new trend in higher education such as e-learning systems that provide students with online access and learning content.

Carr (2001) defined adoption as “the stage in which a technology is selected for use” and diffusion as “the stage in which the technology spreads to general use and application.” For supporting the diffusion and adoption of technology, higher education institutions have invested huge amounts in infrastructure in past few years (Green, 1999; Jacobsen, 2000). However, even with the bulky investment in technology, instructional technology is not being integrated into instruction in higher education (Geoghegan, 1994; Spotts, 1999; Surry, 1997; Albright, 1996; Carlile & Sefron, 1998).

Carr (2001) demonstrated that “the adoption and diffusion of an innovation within an institution does not guarantee its successful integration into the curriculum or its continued use”. There are numerous impediments to the integration of instructional technology into higher education, such as technology infrastructure, faculty effort, technology satisfaction, and graduates competency (Surry, Ensninger, & Haab, 2005). Even many higher online educational institutions cannot succeed due to the high technology cost, poor decisions, competition, and the absence of a business strategy (Elloumi, 2004). Surry & Land (2000) noted the major reason that the most university-level technology strategies overlook the central role that the faculty plays in the process of change.

Besides these, to integrate instructional technology into higher education, the higher education institutions are facing a major challenge to persuade the faculty to adopt instructional technologies once they are made available. Googhegan (1994) expressed this challenge as follows: “One of the most basic reasons underlying the limited use of instructional technology is our failure to recognize and deal with the social and psychological dimension of technological innovation and diffusion: the constellation of academic and professional goals, interest, and needs, technology interest, patterns of work, sources of support, social networks, etc., that play a determining role in faculty willingness to adopt and utilize technology in the classroom.”

Resistance to the diffusion of information technology into the organization is not a new concept at all as this had been studied for at least twenty years (Hirschheim and Newman, 1988; Jiang and Muhanna, 2000). The resistance is now appearing within the academic environment. Chuntao (2011) stated that “some college teachers do not adopt instructional technologies in their teaching as we expected”. Selwyn (2007) claimed that, “the formal use of computer technology [by faculty and administrators] in many areas of higher education could best be described as sporadic, uneven, and often low-level”. Martin (2000) put that, if teachers do not accept the technology it will be almost impossible to develop educational technology projects. Aypay et al (2012) supported Martin defining teachers as follows “teachers are both gatekeepers of technology and the most important sources of delivering information in the classrooms.”

The situation is not similar in the context of students as they are increasing their use of emerging technologies. Prensky (2001) proposed two terms: digital natives (young and technologically savvy users) and digital immigrants (older but comfortable users of computer technology) which have been widely accepted and adapted in different literatures of instructional technology. Most of the literatures have used these terms to define students as digital natives and faculties as digital immigrants. Galloway’s (2011) contention is more relevant here: “One cannot integrate technology in education with a generation of non-computer-users.” One study documented some differences in the use of various types of digital technology by students (digital natives) and faculties (digital immigrants); although it concluded that the differences are minimal and insubstantial. (Kennedy et al 2008). Recently, Challenging the proposed terms of Prensky, Thirunarayanan et al (2011) proposed two new designations: “Digital Nerds” and Digital Normals” in place of “Digital Natives” and “Digital Immigrants.”
However, some recent studies have shown a steady increase in the computer usage among faculties as the new generation of faculties with higher computer literacy skills enters into teaching profession (Aypay & Özbaş, 2008; Dikbaş, Ilgaz, & Usluel, 2006). Aypay et al (2012) indicated that “age ought to be integrated into studies as one of the variables impacting the perceptions towards technological products”.

Even gender had been studied as a factor influencing the behavior of the faculties in the use of educational technology. Some studies report compared to women faculty, male faculty have greater expertise and feel more confident in the use of computers (Thompson and Lynch 2003; Zhou & Xu 2007). However, Anduwa-Ogiegbaen and Isah (2005) did not find any significant difference between male and female faculty in their rate of internet usage. Gerlich (2005) reported that gender plays little role in faculty perceptions of teaching online.

According to Butler & Sellbom (2002) “Understanding the rate of adoption in any given situation requires analyzing factors that may facilitate the adoption and those that may operate as barriers to adoption.” So in case of this study, the barriers and incentives are identified to recognize faculty’s rate of adoption.

2.3 Barriers to Adoption

Michael Albright (1996) provided that most probably education is the only business in which the existence of barriers to its employees’ adoption of technology is discussed. Gulbahar (2008) defined the difficulty of the adoption of technology in this way: “regardless of the quantity of technology placed in classrooms, the key to how those tools are used by the instructor.” Thus if instructors do not adopt instructional technologies in an effective or meaningful way, the technology may indeed be available but may not be properly leveraged by instructors to engage or retain students. Table 1 shows the barriers to faculties’ adoption of instructional technology within instructional technology literature.

**TABLE 1. BARRIERS TO FACULTIES’ ADOPTION OF INSTRUCTIONAL TECHNOLOGY**

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Found in literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of institutional support</td>
<td>Park et al. (2008); Chizmar &amp; Williams (2001); Leggett &amp; Perschitte (1998); Butler &amp; Sellbom (2002); Buchanan et al. (2013).</td>
</tr>
<tr>
<td>Infrastructure problems</td>
<td>Aypay et al (2012); Surry, Ensminger, &amp; Haab (2005); Weston (2005).</td>
</tr>
<tr>
<td>Flawed training strategy</td>
<td>Weston (2005)</td>
</tr>
<tr>
<td>Lack of time</td>
<td>Chizmar &amp; Williams (2001); Wilson, W. (2003); Leggett &amp; Perschitte (1998); Weston (2005); Butler &amp; Sellbom (2002); Beggs, T.A. (2000); Sammons (1994)</td>
</tr>
<tr>
<td>Fear of failure</td>
<td>Hannafin &amp; Savenye (1993); Armstrong (1996); Byron (1995)</td>
</tr>
<tr>
<td>Lack of expertise</td>
<td>Leggett &amp; Perschitte (1998)</td>
</tr>
<tr>
<td>Lack of access</td>
<td>Leggett &amp; Perschitte (1998)</td>
</tr>
</tbody>
</table>

Source: The Author
Notes: Taken from Previous literatures

2.3.1 Lack of Institutional Support
Park et al. (2008) noted that “one unique and important aspect of Higher Education settings is that top university management in many institutions asks instructors to use an institution wide system regardless of the rank and file’s desire and motivation to adopt the system”. Most of the studies show that a large portion of the faculties requires motivation to adopt instructional technology. Without adequate institutional support, it is not possible to motivate them to adopt these emerging technologies in teaching.

2.3.2 Lack of Equipment/Resources

Generally, higher education institutions ask instructors to use an institution wide system without ensuring the available equipments/resources exit for the instructors’ use. Still now, education lacks an adequate inventory of relevant online learning resources. This means that already overburdened teachers must develop their own course materials for online learning. In such case, the availability of the equipments/resources inhibits the adoption process.

2.3.3 Infrastructure Problems

Infrastructure is important to use instructional technology as it consists of all the facilities needed to adopt the technology. If the infrastructure is not available, the faculties will not be able to use the existing facilities. So the effort may be ending at vain. Development of multimedia classrooms will bring all the technologies computers, the Internet, video, and audio to the easy reach of the faculty. These are factors that students and faculty now consider essential. A study by the U.S. Department of Education reported that institutions recognize that information infrastructure is expected by faculty and students alike (Jacobson, 1996).

2.3.4 Institutional Funding

Many studies show that the lack of institutional funding is a major reason for not using instructional technology. Teachers need fund for professional development to adopt the technology. Many institutions are not interested to give fund for the adoption and diffusion of instructional technology. Even if they provide some funds, most of the cases, the funds are insufficient to motivate the faculties for using the technology.

2.3.5 Equipment Failure/Malfunction

Inability to rely on the consistent operation of the technical infrastructure is another barrier to adopt technology smoothly. “Professionals who depend on technologies on a daily basis require reliable machines and software. If technical glitches occur weekly or a few times a month, then confidence in the technology’s worth erodes and contributes to sustaining current teaching practices” (Cuban, Kirkpatrick & Peck, 2001).

2.3.6 Lack of Training

Earlier studies identified the lack of training as one of main barriers to use of computer technology in case of teaching. As most of the faculties are not well trained in newly and highly innovative technologies, they are not being interested to use the technology on which they don’t feel conformable.

2.3.7 Flawed Training Strategy

While the higher education institutions are providing training for the teachers, sometimes the outcome of the training session is not positive at all. Despite the training, the teachers are reluctant to adopt instructional technologies. To find out the reason behind the scenario, one study was conducted and the study showed a crucial fact that is flawed training strategy responsible for the situation (Weston 2005).

2.3.8 Lack of Computer Courses & Poor Curriculum

Technology adoption is mainly related to the curriculum that requires the usage of the technology in learning. Most of the time, the lack of computer courses and poor curriculum act as the barrier in the adoption process. Even the faculties don’t feel motivated to use computer if this is not required by the core curriculum.

2.3.9 Faculty Reward Systems
Faculties need some rewards to use technology such as promotion, tenure or financial support etc. More often, institutions impose the technology to adopt without recognizing the efforts of faculties that may frustrate the faculties and discourage them to use the technologies anymore.

2.3.10 Lack of Time

Teachers need time to learn new technologies and even more time to develop instructional materials that utilize technology as inventory of online learning resources is not available. As a result, it is being difficult for the teachers to manage their time in adopting technology in all spheres of their pedagogy.

2.3.11 Fear of Failure

The fear of failure in using the technology is a factor that has been studied in different literature. Although faculty members are skilled in their content area, they are not always skilled in the use of technology. The fear is strong when they feel that they will not be able to use the technology well in front of their students and colleagues. Sometimes, faculties are afraid because of their interpretation that technology will be difficult to use. And if they find that it is difficult to use, they become more reluctant to use the technology again.

2.3.12 Lack of Expertise

Faculties are experts and knowledgeable in their subject matter. But this fact will not always guarantee their proficiency in case of using emerging technology. Lack of expertise is a detriment in case of adopting technology among the faculties. As the new generation of faculties with higher computer literacy skills enters into teaching profession, this scenario is about to change.

2.3.13 Lack of Access

Lack of access is one of the major reasons of not adopting technology in teaching. Sometimes, faculties cannot have the access of the latest technology as well as the online learning resources which discourage them to use the technology effectively.

2.4 Facilitators to Adoption

Earlier researches also revealed some factors that facilitate the adoption of instructional technology. According to Carr (2001) “Successful adoption is highly dependent on the degree, stability and wisdom of administrative sponsorship”. Generally, higher education institutions mandate the adoption of technology without any motivation to adopt the system. So institutional support/top management support is an essential factor to motivate faculties in adoption process. Zayim, Yildirim & Saka (2006) added that “to encourage the adoption and diffusion of technology, the institutions’ investment in technology should be based on a long range technology plan driven by the institutions’ overall vision and strategy for its teaching”.

From past studies three types of factors are identified influencing the adoption of technology at universities: technical factors, individual factors, and organisational factors. Technical factors consist of variables like access to technology, technical support etc (Nantz & Lundgren, 1998; Leggett & Perschichte, 1998; Schifter, 2000). Individual factors comprise the available time that university instructors can spend in learning how to use technology, their tolerance of possible failures in using technology and their beliefs in the effectiveness of technology in enhancing teaching and learning (Adams, 2003; Anderson et al., 1998; Ebersole & Vorndam, 2003; Hannafin & Savenye, 1993). Organisational factors, such as a technology strategic plan, administrative support, professional development, and an incentive policy, could influence the adoption of technology (Anderson et al., 1998; Barone & Hagner, 2001; Green, 1998).

Within individual factor, time is always a critical resource for faculty, Thirunarayanan et al (2011) suggested that “massive funding is needed for professional development and validation of creative, state-of-the-art materials to advance the quality of teaching and learning.” Somekh (2008) found that successful adoption of instructional technology was focusing professional development on technical skills and pedagogical practices as well as the teachers themselves. Becking (2011) also emphasized on professional development and instructional technology training for instructors. She stated, “Instructors need to not only know where to click but also how, why, and when to use chosen technologies”. So training is a crucial need for the instructors (Armstrong, 1996). Zayim, Yildirim & Saka (2006) recommended that “in designing training programs, institutions might consider gearing early adopters towards advanced topics and focusing on the specific needs of these faculty members.”

As faculties are adapting technology to their pedagogy, they deserve appreciation for their efforts (Beggs 2000). There must be a faculty reward system such as promotion and tenure that will recognize the
adoption and integration of technology into instruction (Nantz & Lundgren, 1998). By providing incentives to faculties such as release time for training, providing funds for developing instructional materials, supporting symposia and conference participation, faculties can be encouraged to adopt technology (Zayim, Yildirim & Saka, 2006). In one study Beggs (2000) revealed a hidden scenario of incentive from the comment of one Assistant Professor in the College of Arts and Sciences. The comment is "I don’t want incentives, there’s too much pressure to use technology when it is not appropriate to my field." So the technology use is also related to the field of study.

Institutional and administrative commitment to instructional technology through financial support, infrastructure, and support personnel is essential for the successful development of instructional technology (Albright, 1996). Nicolle (2005) focused on institutional support and peer support that appear important in motivating faculties’ technology integration process. Lookatch (1995) argued that “It is not, however, the machine that motivates: It is curiosity, content, and instructional strategies”. Other studies show that attitudes, enthusiasm, motives, adequacy of resources and faculty’s commitment to pedagogical quality play a large role in adoption.

Smith (1997) reported that due to the expectations of peers or supervisors or because of the availability of technology, faculties tend to jump on the technology bandwagon, rather than for the value it would add to the curriculum. Naquin (2000), in a study of nearly 200 faculty members in Virginia community colleges, suggested to use of faculty serving as technology mentors to other faculty to motivate the reluctant faculty toward the use of technology in the classroom. The most influential to college teacher’s adoption of instructional technology are the student, the teacher, the technology, or the surroundings (Chuntao 2011). Besides these, institutions should consider the other factors like availability of the equipment/resources, consistent functions of equipment, Good curriculum, effective training strategy, ease of access to technology etc for the effective adoption of instructional technology.

3. RESEARCH QUESTION

Given findings of literatures on various barriers and necessary support structures required to facilitate adoption of instructional technology, the following research question was asked.

Broad Research Question was “Whether there are significant differences in the adoption of instructional technologies between two campuses of Daffodil International University.”

To identify the main difference, the following hypotheses were made:

H1: There are differences in attitudes towards technology among faculties in two campuses.
H2: There are differences in frequency of using instructional technology in classrooms in two campuses.
H3: There are differences in the levels of the utilization purposes of instructional technology in both campuses.
H4: There are differences in the levels of the computer literacy among the faculties of two campuses.
H5: There are differences in frequency of using DIU website facilities among the faculties of two campuses.

4. METHODOLOGY

Generally, triangulation methodology is used for collecting quantitative and qualitative data to get inside into the phenomenon. In this research, this methodology had been used to have an in-depth insight of the faculties’ adoption of instructional technology at campuses. Triangulation is broadly defined by Denzin (1978) as "the combination of methodologies in the study of the same phenomenon." For this study, quantitative and qualitative data were collected on the same phenomenon from the faculties of a single university so that the researcher can be more confident about the accuracy of the result.

4.1 Data Collection

The sampling method for the study was purposive, the population of interest being the faculty employed at two campuses of the Daffodil International University. As the part time faculties were not available at the time of survey, the full time faculties are selected as the sample.

<table>
<thead>
<tr>
<th>TABLE 2. RESPONSE RATE OF FACULTIES</th>
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<tbody>
<tr>
<td>Branch Campuses</td>
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<tr>
<td>Dhanmondi</td>
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Table 2 shows the response rate of the full-time faculties. There were 230 full-time faculties employed by Daffodil International University for the Fall 2011 semester. The Dhanmondi campus employed a total of 218 full-time faculties for the Fall 2011 semester providing a total population of 94.78% possible responses to the survey. But the response rate was only 12.84% in the Dhanmondi campus. Although this response rate was relatively low, since the primary purpose of this study was to gain insight rather than to make generalizations about instructional technology adoption, 12.84% may be considered adequate. The majority of the Dhanmondi campus respondents taught in the Science and Information Technology, the next largest respondent curriculum area was Business and Economics, with the remaining curriculum areas responding in approximately equal numbers. The Uttara campus employed a total of 12 full-time faculties for Fall 2011 semester providing a total population of 5.21% possible responses to the survey. The response rate at Uttara campus was 83.33% which was considered adequate. The majority of the Uttara campus respondents were from the area of Business and Economics, Law, English and Textile Engineering.

4.2 Measurement and Scaling

Both quantitative and qualitative approaches were used in this research. Quantitative data were collected using a survey instrument. The survey instrument has been provided in Appendix A. The conceptualization and development of the questionnaire was based on the existing literature of Manea & Williams (2010), resulted in total of 40 items. Additional four items were included for capturing demographic information (teaching area, campus location, faculty status, location of computer and Internet access) and other four items were included by the researcher especially for this study. So the final questionnaire had a total of 48 items. A typical 5-point Likert scale was used to measure the differences in both campuses. For qualitative data, interviews were conducted with some open ended questions for this study.

4.3 Data Analysis

An independent samples t-test was chosen to compare adoption of various instructional technologies between Dhanmondi and Uttara campuses. Because the researcher was unable to explicitly manipulate the independent variable of location (Dhanmondi or Uttara), the IV is thus referred to as the status variable [SV]. The dependent variables [DV] for the study are the rate and types of adoption of instructional technologies. Assumptions for the t-test require that the dependent variable be normally distributed. Normal distribution was tested with Q-Q plots and shown (Figure 1) to be reasonably normal.

Equal variance of both groups on the dependent variable as shown by the results of the Levene’s Test was examined in order to filter those cases showing a p-value of less than 0.05. Thus, for these cases, the null hypothesis of equal variances was rejected and it may be concluded that there was a difference between the
variances in the population. It was also assumed that the two groups were independent of one another de facto since the SV of location created an explicit separation of sample populations.

5. DISCUSSIONS OF FINDINGS

SPSS 17.0 had been deployed to identify which variables had significant association with demographic factors, the independent t-test used to assess the significance of the difference between the means of the two data samples. To test the statistical association, at first the highest modes were taken from the descriptive statistics of variables. The major interests were found in the following cases with highest modes:

- “The campus administration encourages me to use technology” and “Using technology makes me more effective” in terms of attitude toward the technology.
- “Frequency of using LCD projector” and “Frequency of using Computer” in terms of frequency of using instructional technology in classrooms.
- “Using Instruction technology for professional growth and communication” and “Using Instruction technology for research and evaluation of technology use” in terms of the levels of utilization purposes of instructional technology.
- “Level of basic computer operations”, “Word processing”, “Spreadsheet use”, “Presentation skills”, “File management”, “Information searching”, “Web browser and Internet Research”, “Telecommunication use” and “Ethical awareness” in terms of the levels of the computer literacy among the faculties of two campuses.
- “Frequency of visiting DIU website”, “Frequency of using learning feedback system”, “Frequency of checking official mail”, and “Frequency of using virtual university” in terms of frequency of using DIU website facilities by the faculties of two campuses.

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>Technology helps me organize my work</td>
<td>Equal variances assumed</td>
<td>.015</td>
</tr>
<tr>
<td>The campus administration encourages me to use technology</td>
<td>Equal variances assumed</td>
<td>2.087</td>
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<tr>
<td>Frequency of using LCD projector</td>
<td>Equal variances assumed</td>
<td>.039</td>
</tr>
<tr>
<td>Frequency of using Computer use technology</td>
<td>Equal variances assumed</td>
<td>.017</td>
</tr>
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<td>Using Instruction technology for professional growth and communication</td>
<td>Equal variances assumed</td>
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<td>Using Instruction technology for research and evaluation of technology use</td>
<td>Equal variances assumed</td>
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<td>Level of basic computer operations</td>
<td>Equal variances assumed</td>
<td>4.488</td>
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<tr>
<td>Skill</td>
<td>Equal variances assumed</td>
<td>Mean</td>
</tr>
<tr>
<td>-----------------------------</td>
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<td>------</td>
</tr>
<tr>
<td>Word processing</td>
<td></td>
<td>4.321</td>
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<td>Spreadsheet use</td>
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<td>Presentation skills</td>
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</tr>
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<td>File management</td>
<td></td>
<td>0.200</td>
</tr>
<tr>
<td>Information searching</td>
<td></td>
<td>1.133</td>
</tr>
<tr>
<td>Web browser and Internet Research</td>
<td></td>
<td>3.185</td>
</tr>
<tr>
<td>Telecommunication use</td>
<td></td>
<td>0.462</td>
</tr>
<tr>
<td>Ethical awareness</td>
<td></td>
<td>0.044</td>
</tr>
<tr>
<td>Frequency of visiting DIU website</td>
<td></td>
<td>0.425</td>
</tr>
<tr>
<td>Frequency of using virtual university</td>
<td></td>
<td>6.067</td>
</tr>
<tr>
<td>Frequency of checking official mail</td>
<td></td>
<td>0.015</td>
</tr>
<tr>
<td>Frequency of using learning feedback system</td>
<td></td>
<td>0.371</td>
</tr>
</tbody>
</table>

Source: The Author

From Table-3, with the complete results of independent samples t-test of highest mode variables, it had been observed that there was no significant difference in attitude toward the technology in two Campus; t (36) = -1.225, p= .228 in terms of the dependent variable “Technology helps me organize my work” and t (36) = -1.005, p= .322 in terms of the dependent variable “The campus administration encourages me to use technology”, indicating hypothesis 1 was not supported. This result brings a broad view to the researcher that the both campuses’ faculties think technology as a positive sign of quality and it helps them to organize their work in effective and efficient manner. And the Daffodil International University’s both campus administrations encourage the faculties to use the technology.

Secondly, hypothesis 2 is rejected as there was no significant difference in frequency of using instructional technology in classrooms in two Campus; t (36) = -1.224, p= .229 in terms of the dependent variable “Frequency of using LCD projector” and t (36) = -1.143, p= .887 in terms of the dependent variable “Frequency of using Computer use technology”. This result brings a general picture to the researcher that the both campuses’ faculties use the LCD projector and the computer in their classrooms. And other technologies used are relatively low. Both campuses share a common use of these technologies.

Thirdly, there was no significant difference in the levels of utilization purposes of instructional technology in two Campus; t (36) = -.432, p= .668 in terms of the dependent variable “Using Instruction technology for professional growth and communication” and t (36) = -.518, p= .608 in terms of the dependent variable “Using Instruction technology for research and evaluation of technology use”, meaning hypothesis 3 is not supported as well. This result helps the researcher to understand that the both campuses’ faculties use Instruction technology for professional growth and communication and for research and evaluation of technology use. And other
purposes are at beginning level. Both campuses share a common level of utilization purposes of instructional technology.

Again, there was no significant difference in the levels of the computer literacy among the faculties of two campuses as none of the dependent variables are showing p value less than .05. This finding divulges to the researcher that the both campuses’ faculties have the same level of computer literacy. And other variable such as the “Database Use” is relatively low among the faculties. Both campuses share a common level of computer literacy.

Therefore, hypothesis 5 is supported as there were significant differences in the frequency of using DIU website facilities by the faculties of two campuses; t(36) = 6.520, p = .000 in terms of the dependent variable “Frequency of using virtual university” and t(36) = 3.451, p = .001 in terms of the dependent variable “Frequency of using learning feedback system”. This result gives the researcher a broader insight that the both campuses’ faculties have significant differences in using virtual university facility and using learning feedback system. And other facilities usages are comparatively same in both campuses.

6. CONCLUSION

Although most of the situations of two branch campuses were almost same, there were some significant differences between the two campuses.

In terms of attitudes towards the technology, the both campuses shared a similar view. Both campus administrations had encouraged the use of technology. The faculties at both campuses felt more comfortable helping others in the campus with technology and organizing their work with technology.

In terms of frequent technology equipments’ use, the use of LCD projector and Computer proved to be under greater use at both campuses.

In terms of the purpose of using instructional technology, both campuses had a common insight. They normally used the technologies for the professional growth and research purpose. Regarding skills, the use of Word Processing rate, web browser and Internet Research and telecommunication usage rate were proved to be higher at both campuses.

In terms of the level of computer literacy, both campuses’ faculties had the same level of computer literacy.

The main differences came from the usage of Daffodil International University website facilities. Dhanmondi campus had a higher rate of usage of the virtual university facilities and learning feedback system than the Uttara campus due to the infrastructural support.

There were a number of suggestions recommended by the faculties at both campuses in terms of using technologies in teaching. Most of the faculties felt an urgent need of IT support, Seminar of new technology, Instructional technology conferences, computer for the classroom. The most important was the stipend for research and attending conferences on technologies.

In addition to that a strong stable advocacy needed to ensure the conditions necessary for technology adoption and diffusion, training in its technical aspects and application to real needs are crucial to its integration beyond the faculties of both campuses. So faculties also wanted incentives to take part in technology related trainings.

Achieving meaningful technology use is a slow process that is influenced by many factors. Understanding teachers’ visions for technology use and their beliefs about teaching and learning might be important to initiate an adoption of modern technology interventions in teaching (Mehra & Mital 2007). In this study, most faculties agreed on the fact that top management need to understand the purpose of using instructional technology and the vision of the faculties.

IT support is also important because of the infrastructure problem, Uttara campus was not allowed to use of the virtual university and the learning feedback system at the time of the study conducted. So the university authority must concentrate on that point. If the technological support was available to the faculties of Uttara campus, they would be more efficient dealing with the students.

A careful review of studies on the effects of technology shows that more than the specific technology or software used, the context in which the technology is applied is most critical to the instructor (Cradler et al. 2002). In the study, one faculty shared her view as “I will not use the technology when it is not appropriate to my subject”. The last but not the least one is the subject for which the faculties are giving instructions. So the context must be examined and the university must provide the facilities needed for the faculties to deal with the students.

7. LIMITATION AND DIRECTION FOR FUTURE RESEARCH

No research is without limitations; this study has no exception. During the conduction of the survey, there were many problems faced by the researcher. The most apparent limitation is the low response rate. The survey
questionnaires were distributed to the entire faculty of the two campuses but some faculties had not returned their questionnaires. As a result, the number of possible respondents was relatively small. It may be due to the time limitation of the faculties or due to the reluctance of filling up the questionnaires. The respondent’s answers could not be verified due to the subjectivity of the questionnaires. Due to variation in perceptions of respondents, scaling method adopted in survey may be assumed differently.

In this study, the part time faculties are not included due to their unavailability. Their inclusion may affect the result of the survey. Further studies can be conducted including part time faculties. Even the context of public university can have different atmosphere regarding the instructional technology adoption. These factors can be studied in the future and a more robust model can be built.

8. REFERENCES


Byron, S., “Computing and other instructional technologies: faculty perceptions of current practices and views of future challenges”, 1995, a focus group study conducted for the information resources council and the office of the provost. (ERIC Document Reproduction Service No. ED 390 381)


Chuntao, Du., “An Experimental Study on College Teacher’s Adoption of Instructional Technology”, J.I. Modern Education and Computer Science; 2011, Vol. 3, pp. 47-54


