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# Effect of Technology on Distance Learner Achievement: A Case Study of AIOU


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## Abstract

The rapid growth of technologies has influenced the way in which education is delivered and experienced. In distance education, the use of technology is essential. Distance education is a powerful and growing force in education at the university level. The globalization of distance education provides many opportunities for the developing countries for the realization of their education system-wide goals. Two main factors have led to an explosion of interest in distance learning: the growing need for continual skills upgrading and retraining; and the technological advances that have made it possible to teach more and more subjects at a distance. The world of technology is being reshaped by global trends such as convergence, increased bandwidth, enhanced multimedia capabilities, miniaturization, environmental variations, increase mobility, enhanced processing power, more powerful cognitive tools and reduced cost. These trends support transition across four generations in distance education models and associated delivery technologies.

This study aimed at the following:

1) To identify the access of technology for distance learner.
2) To explore the use of technology relating to the achievements of distance learner.
3) To identify the problems faced by distance learners in the use of technology.

A sample of 60 students of M.Phil. and Ph.D. was taken. A questionnaire was used as a research tool for the collection of data. Collected data were analyzed by percentage, mean score and correlation.

Main findings of the study revealed that use of technology enhances the quality of learning and improves the learning skill of the distance learner. Use of technology in education increases motivation and collaborative learning encourages competition. It was recommended that the distance course developer, instructor, or teacher should focus on designing online learning environments that support exploratory and dialogical learning. Exploratory and dialogical learning environments engage learners in learning activities that require collaboration, communication, social interaction, reflection, evaluation, and self-directed learning.

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**Key words:** Distance education, Technology, Achievement, Distance Learner

## Introduction

We all know that modern age is a technological age. Many learners improve their education through distance education. Today distance education is imparted through online education in many universities because it could be cost-effective, carried on using fast communication methods and automated performance measurement mechanisms that enhance the quality of learning**.**

In distance education the use of technology is essential. It is not a supplement to the traditional forms of distance education: correspondence and telecommunications-based education.

The history of distance education reaches back to the 18th century when it took the form of correspondence education first. It was supplemented later by telecommunications-based distance education, which relies on a synchronous form of delivery and interaction between tutors and students. Roughly 65 percent of educators surveyed also believe that students are more productive today than they were three years ago due to the increased reliance on technology in the classroom.

Many different types of technology can be used to support and enhance learning. Everything from video content and digital moviemaking to laptop computing and

handheld technologies (Marshall, 2002) has been used in classrooms, and new uses of technology such as podcasting are constantly emerging. Research indicates that computer technology can help support learning and is especially useful in developing the higher-order skills of critical thinking, analysis, and scientific inquiry "by engaging students in authentic, complex tasks within collaborative learning contexts" (Roschelle, Pea, Hoadley, Gordin & Means, 2000; Means, et. al., 1993). The application of new ICT concepts to support learning and teaching and provide Internet access to student administrative processes, has improved distance education.

In this age of science and technology distance educators should not demolish trees for making print-based materials for the readers, because it is expensive to purchase and there is also high risk of miscommunication in asynchronous media. On the other hand the use of internet and latest technology can be cost-effective and there are less chances of miscommunication in synchronous way**.**

## Distance Learner

The concept of the self-regulating place-bound, adult, self-motivated, disciplined self-starter, and goal-oriented learner has been very popular. It largely characterized the classic distance education learner. It is now being challenged with socially mediated online learning activities that de-emphasize independent learning and emphasize social interaction and collaboration. Online learners must understand and value the learning opportunities and the collaborative and communication technologies in order to engage actively and constructively in learning.

In summary, the following characteristics and skills are perceived as critical to the success of the online learner:

- Having a strong academic self-concept.
- Fluency in the use of online learning technologies.
- Taking interpersonal and communication skills.
- Understanding importance of interaction and collaborative learning.
- Possessing an internal locus of control.
- Exhibiting self-directed learning skills.
- Exhibiting a need for affiliation.

“Competency in the use of online learning technologies, particularly communication and collaborative technologies, does not guarantee meaningful interaction, collaboration, and knowledge building in online learning environments”. (Lindblom-Ylanne & Pihlajamaki, 2003).

## Academic Achievement

Academic achievement is a process of attaining predetermined objectives. The monitoring of learning achievements of students is one of the key component to assess

and to improve the quality of education. "Academic achievement is dependent on more than individual abilities and aspiration. Academic achievement is a function of study attitude of the students" (Hussain, 2006). Intelligence is not the only determinant of academic achievement. "High motivation and engagement in learning have consistently been linked to reduced dropout rates and increased levels of student success" (Kushman, Sieber, & Harold, 2000).

## Factors Affecting Academic Achievement of Distance Learner in OLIVE

The following factors have a positive or negative effect on the academic achievement of learners:

### 1-Access of Web

"World Wide Web facilitates the online education which is defined as the communication and collaboration within an education context using technologies" (Piezon, Donaldson, 2005). The web was developed to allow collaborators in remote sites to share their ideas and all aspects of a common project.

Schneiderman (2000) states that "it requires support for (1) a wide variety of hardware, software, and network access, (2) diverse user populations that differ on such dimensions as age, disabilities, disabling conditions".

### 2-Language Barrier

With literacy figures being low in Pakistan, familiarity with the English language is rare. Most of the population understands only Urdu which is the national language. The unfamiliarity with the English language presents a major constraint for Pakistan as Internet content in Urdu is scarce. Web sites that do offer Urdu content are slow to load because they contain scanned images of the Urdu script as there is no standard Urdu script for computers (Sayo, et al.).

### 3-Tutorial and Achievement

"The rising demand and growing consumer experience with flexible education programs to support career development and lifelong learning has increased people's expectations for quality instruction, effective educational outcome, and finally satisfaction for learning" (Debourgh, 1999). Allen et al. (2002) and Wang (2003) argued that "In any educational institution, the satisfaction of a student can be determined from his level of pleasure as well as the effectiveness of the education that the student experiences". "Students with higher levels of satisfaction towards various aspects of e-

learning courses are reported to show considerably higher levels of learning than students with low level of satisfaction" (Fredericksen, 2000). In this regard, specifically "instructors of e-learning courses can increase their students' satisfaction by considering the primary factors of student satisfaction" (Ho, et al., 2002).

## 4-Study Material and Achievement

The ease and accessibility of online courses attract educators and students. Online learners conveniently study anytime and anywhere while accessing rich online resources through course website links. However, "Online learning inherently requires more cognitive resources than does face-to-face learning and places a cognitive load on online learners that may affect their learning achievement" (Bruggen, Kirschner,& Jochems, 2002; Brunken, Plass, & Leutner, 2003; Gerjets & Scheiter, 2003).

"Online learning involves activities such as accessing course websites, navigating multiple-linked materials, determining the relevance among hyperlinks, getting lost in cyberspace, and solving technical and Internet connection problems, all of which split the learner's attention and increase extraneous cognitive load" (Harter, 1986; Marchionini, 1988; Nielsen, 1990). Information presented on multiple web pages and in two or more formats (e.g. text, graphic, audio, video, animation, etc.) is common in online learning.

## 5-Interaction and Achievement

Interaction is an important factor especially in Open University where students, teachers and teaching resources are away from each other in terms of time and place. "Interactivity in an online program is directly related with the amount of contact the student has with the instructor, with his peers, and with the course material" (Sherry, 1996). This interactivity and the roles of the students and instructors, changing from the traditional instructor-centered to learner-centered process, encourage the students to seek for answers and build their own knowledge from their own experiences .Interaction increased the student satisfaction and help them to achieve learning objectives and increase the achievement. Anderson (2002) refers to "interaction as a multifaceted concept and crucial component of educational process. Achievement is attaining and accomplishing something. It is something which someone has succeeded in doing especially after a lot of effort. Interaction and achievement are parallel to each other".

Interaction does not just occur in online courses, it has to be intentionally built into the instructional plan for the course. Incorporating interaction into your course has the following benefits:

- Interaction builds a sense of community among the students, which leads to student satisfaction, maintenance, and increased learning.
- Interaction provides students with the feedback they need to determine.

- Interaction exposes students to a variety of learning resources, including content materials and experiences and knowledge shared by other students.
- Interaction makes students become more actively engaged in the learning process, leading to higher levels of learning.

## 5.1- Learner-Instructor Interaction

"In an online learning environment, the instructor is required of a new set of skills for success since latest technologies bring as much change to instructors as they do to students" (Jones, 2003). Now, "the roles of the instructors change from being the primary source of students' knowledge to being the manager of the students' knowledge resources" (Romiszowski, 2004). Moreover, "In an effective online learning environment, instructor plays a central role. It is not only because of technology but practical accomplishment of the technology that has certain effects on learning" (Collis, 1995). "An instructor has a definite role to make the online environment successful. For this purpose, instructors must ensure required level of interactions and discussions with their students" (Hong et al., 2003).

However, " interaction is different in this environment" (Walker & Hackman, 1991) with "more emphasis on the instructor's role as a mediator between the student and the materials" (Beaudoin, 1990) or "between the student and the technology" (Hillman et al., 1994). Therefore, "instructor must understand the increased diversity of learners, and then accordingly determine test formats, measurement practices, and assessment strategies" (Banerjee & Brinckerhoff, 2002), "which might persuade and motivate students to accept e-learning environment" (Selim, 2005).

"In e-learning, there are certain factors and conditions, which are closely related to the professional development of an instructor, and to enhance the teaching quality of instructors, it is necessary for the instructors to consider these factors" (Louden, 2000). Jensen (1993) conducted a study in which he collected data from students and instructors, and concluded that distance education requires a different set of skills and involves different responsibilities. According to Freeman (2010) "distance learning is an educational situation where the instructor and the students are separated by time, location, or both, and it can be either synchronous or asynchronous using a variety of distribution methods including technology.

According to many researchers, "the overall effectiveness and success of online education depends upon the interaction which is an essential element to a student learning" (Fresen, 2007; Moore, 1993; Northrup, 2001) "An online learning model is proposed in which an instructor and learners are separated by physical distance, and online delivery media are used to bridge the instructional gap. Moving into the information technology era, a wide range of instructional technologies facilitates online educators" (Huang, 2000). Finally, "the increase of communication and interaction between the students and their instructors in an online learning has a great importance" (Swan, 2002). The instructional activities give students the opportunity to receive

information, motivation, timely feedback, mentoring and coaching. As the rubric annotations state, "Interactions between the instructor and the students are designed to facilitate students' understanding and mastery of the learning objectives. These interactions may be supportive (welcome and introduction messages, "about the instructor," weekly announcements) and instructional (direct instruction, assignment feedback, FAQs, etc. The communications between student and instructor may be one-to-one (personal emails) or one-to-many (forum postings, class announcements)."

## 5.2- Learner-Content Interaction

Learner-content interaction is where there is an active intellectual participation between the learner and the subject matter. Learner-content interaction is the most basic form of interactivity in distance education. In learner, presentations, podcasts, audio/video, hyperlinks, social networking, etc.). How will you design your materials to engage the learner? Knowledge changes in understanding and perspective of learner's mind and known as learner content interaction. Careful selection of materials and activities for online instruction can increase the content interaction the student interacts with the course materials. The learner gains and constructs knowledge by working with the subject matter. The instructional activities give students the opportunity to engage with the course materials in multiple ways and encourage active learning. There are many ways to present content to students and for them to engage with it. There are many alternative delivery methods (blogslikelihood that learner-content interaction will help learners achieve course objectives.

## 5.3- Learner-Learner Interaction

Volery et al. (2000) suggested that "in order to boost student's interactions, the instructor may give a participation mark. Furthermore, instructors should be able to understand the diverse nature of students, involve them in online discussions and encourage student to student interactions" (Durling, Cross, & Johnson, 1996) **"**the instructional activities give students the opportunity to collaborate with their classmates by exchanging and building information together. There are many types of instructional activities that encourage may include self-introductions, group discussion postings, small-group projects, peer critiques, etc." Academic achievement improved by interaction among students.

## 6- Support Services and Achievement

Successful online support services aid both students and faculty. As higher education expands its distance education offerings, "the diversity of its student population increases, particularly in the area of students' proficiency with technology" (Bruso, 2001, p. 9). "the learner support phase, students learn self-development strategies so that they can accept responsibility for developing their own skills. Key support services during this phase are academic advising, instructional support and tutoring, library and bookstore

services, disability services, and networking". As Dalziel and Payne(2001) note, "Providing effective, efficient online student services is an enormous challenge for higher education administrators".

## 7- Modern Technology and Achievement

"Communication technologies give geologically and temporally distributed students the opportunity for team collaboration in a virtual workplace by providing an upbringing for knowledge construction through collaborative learning" (Stacey, 1999). Yet current web-based learning environments may not fully support opportunities for social interaction. In this environment, online group work may be perceived as more tough than group work in face-to-face settings. "Communication tools can be difficult to use and may delay communication between group members, which, in turn, can make collaboration between group members difficult. When communication is problematic, the collaborative process is not able to function at an optimal level" (Ragoonaden & Bordeleau, 2000). "Student experience of technology shapes and influences their perceptions of online collaborative learning, as well" (Ragoonaden & Bordeleau, 2000). For a successful online collaborative learning environment, the instructor has to make students comfortable with the system and with the software that they are using. Students interface with the course technology computer hardware/software, the course management system, audio/video materials, etc. can impact their potential to learn from and engage with the course materials. Technology crisis points need to be projected and addressed. Educators do enhance their programs by utilizing technology.

### OBJECTIVES OF THE STUDY

Objectives of the study were:

- To identify the access of technology for distance learner.
- To explore the use of technology on achievement of distance Learner.
- To enlist the problems faced by distance learners in the use of technology
- To suggest the measures for the development of human resources.

## Delimitation of the Study:

The study was delimited to only Open Learning Institute of Virtual Education (OLIVE) to assess the Effect of Technology on Distance Learner Achievement.

### RESEARCH METHODOLOGY

#### Sampling

It was a descriptive study therefore, survey was considered appropriate for this study. A sample of 60 students of PGD (cs) students of AIOU, Islamabad were taken as a sample.

**Instruments and their Development**

In this survey, a questionnaire on five points (Likert Scale) was used for the collection of data. In the questionnaire items towards Quantity education, female education, learning with earning, higher education, unemployment, technological innovations and professional development of tutors and teachers were asked to elicit the valuable opinions of the respective respondents .A questionnaire was developed on five point (likert) to know the opinion of faculty members and students. The finalized research tool was administered on the respective sample for the collection of data. Same questionnaire was administered on the respective sample of students for the collection of data Collected data was analyzed through percentage and mean score. Responses of 56 out Of 60 respondents of Ph.D/M.Phil were interpreted and presented in percentage.

**Data Analysis**

The data collected through Questionnaires were analyzed by applying percentage and mean score

**Table .1 Olive access and teaching learning process**.

| S.No | Statements | SA | A | UNC | DA | SDA | % | Mean |
|---|---|---|---|---|---|---|---|---|
| 01 | Student can easily access the educational material. | 8 | 44 | 4 | 0 | 0 | 92.7 | 4.07 |
| 02 | Content of study material is easy to understand. | 4 | 34 | 6 | 10 | 2 | 67.9 | 3.5 |
| 03 | OLIVE enhance the quality of learning in IT discipline. | 4 | 34 | 2 | 14 | 2 | 67.9 | 3.42 |
| 04 | Student can easily access the online tutorial support. | 2 | 28 | 12 | 10 | 4 | 53.5 | 3.25 |
| 05 | Student can easily access other online activities. | 4 | 44 | 4 | 4 | 0 | 85.7 | 3.85 |
| 06 | During the lecture friendly learning environment. | 8 | 24 | 10 | 12 | 2 | 57.1 | 3.42 |

**Scale value for this table is SA(Strongly Agree)=5, A(Agree)=4, UNC(Uncertain)=3, DA(Disagree)=2, SDA(Strongly Disagree)=1**

Table 1 shows that in online education students have easy access to the education material, online tutorial support and other online activities. During the lecture friendly learning environment and content of study material is easy to understand. A large number of respondents was uncertain about online tutorial support and friendly learning environment. Similarly the mean score is above than 3.24.

**Table .2 Individual development and achievement**

| S.No | Statements | SA | A | UNC | DA | SDA | % | Mean |
|---|---|---|---|---|---|---|---|---|
| 01 | OLIVE develops motivation in the learner . | 6 | 38 | 4 | 6 | 2 | 78.5 | 3.71 |
| 02 | OLIVE increases professional development in the learners. | 8 | 36 | 6 | 4 | 2 | 78.6 | 3.75 |
| 03 | OLIVE provides collaborative learning opportunities. | 6 | 36 | 4 | 6 | 4 | 75 | 3.60 |
| 04 | OLIVE improves learning skill of the distance learner. | 16 | 32 | 4 | 4 | 0 | 85.7 | 4.07 |
| 05 | Learning management system helpful for better academic achievement. | 4 | 36 | 6 | 8 | 2 | 71.5 | 3.60 |
| 06 | It enables the learner to give online feedback on the spot. | 10 | 40 | 6 | 0 | 0 | 89.3 | 4.07 |

**Scale value for this table is SA(Strongly Agree)=5, A(Agree)=4, UNC(Uncertain)=3, DA(Disagree)=2, SDA(Strongly Disagree)=1**

Table -2 shows that online education has a positive effect on individual development and achievement. Majority of respondent 71% that Online education improves the learning skill of the distance learner and develop motivation and professional development. It provide collaborative learning opportunities to the learner and encourage for better academic achievement. Similarly, mean score is more than 3.59. It is very interesting that online education enables the learner to give online feedback on the spot.

**Table.3 Problems of students in OLIVE**

| S.No | Statements | SA | A | UNC | DA | SDA | % | Mean |
|---|---|---|---|---|---|---|---|---|
| 01 | At the lecture time, electricity is present. | 8 | 20 | 12 | 2 | 4 | 49.9 | 3.28 |
| 02 | Internet is easily available. | 8 | 36 | 2 | 4 | 6 | 78.6 | 3.64 |
| 03 | Computer service in | 6 | 38 | 6 | 6 | 0 | 71.4 | 3.78 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | case of disorder is difficult. | | | | | | | |
| 04 | Student face problem of software. | 6 | 34 | 4 | 8 | 4 | 71.4 | 3.55 |
| 05 | Student face problem of virus. | 7 | 33 | 4 | 8 | 4 | 71.4 | 3.55 |
| 06 | Student may forgot his/her password. | 12 | 12 | 10 | 14 | 8 | 43 | 3.10 |

**Scale value for this table is SA(Strongly Agree)=5, A(Agree)=4, UNC(Uncertain)=3, DA(Disagree)=2, SDA(Strongly Disagree)=1**

Table -3 shows that student face problem of hardware and software virus. Electricity and internet are major problems. It was a great surprise that some of the respondents remain uncertain about power failure. The student has also the problem of forgetting the password. Majority of the respondents agreed that above mentioned barriers were major problems for them in online education.

## Conclusions

Distance learner has easily access to educational material and other online activities. It enhances the quality of learning because content of study material and language of lecture is easy to understand. Student has easy access to online tutorial support with friendly learning environment. It improves learning skill of the distance learner with online feedback. Online education motivates students to make decision about the task assigned to them and use to improve distance learning of distance learner. The analysis showed that male students perceiving online education as these is higher than the female students. It was also concluded that collaborative learning encouraged competition among students as well as encouraged the student to ask question about their queries and the problems they encounter. Internet is easily available but the students face problem of hardware, software and viruses.

## Recommendations

On the basis of conclusions, following recommendations were drawn:

The online course developer, instructor, or teacher should focus on designing online learning environments that support exploratory and dialogical learning. Exploratory and dialogical learning environments engage learners in online learning activities that require collaboration, communication, social interaction, reflection, evaluation, and self-directed learning. Online courses may be need weekly quizzes or assignments. Social interaction is much important for online collaborative group work. So there is a much need to improve online education. Learning centers should be available to students. For many students taking classes at home is not a viable option for

a number of reasons. There is need to establish learning centers to meet the needs of such students.

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