

Full Length Research Paper

Practices and Problems in the Technological Interventions in Distance Learning in Colleges/Universities of Addis Ababa, Ethiopia

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The principal aim in undertaking this research was to assess the current practices and problems in technological interventions in distance learning in Distance Education colleges and universities of Addis Ababa and forward possible suggestions for the improvement and better use of technologies to the universities/colleges. A descriptive survey method was employed for the study. The sample colleges/universities comprised of Unity University, Alpha University College, Saint Mary's University College and Ethiopian Civil Service College from Addis Ababa. A total of 77 academic staff and 123 students participated in the study. Major statistical tools applied in the study were the mean values, t-test, percentages, the chi-square, correlation and one way ANOVA. Findings depicted that the colleges/universities were only in the first generation of technology backed by only a little support from the second generation. Only a few factors were found to be considered when selecting technologies. It was also revealed that the technologies were integrated only with the objectives and content of the instructional design. It was found that learner support system (which was not supported by technologies) was in existence. The Institutions felt that the Government did not take significant initiative in supporting the Distance Learning (DL) institutions in their efforts. While the attitude of learners towards technology in general and in relation to DL in particular was negative that of the academic staff was positive.

Keywords Technological interventions, distance learning, generations of technology, factors in selection of technology, learner support system, instructional design and elements.

INTRODUCTION AND OVERVIEW

Ethiopia's success in today's information-based world economy requires an accelerated demographic transition to an educated and healthy work force. It is this work force that is expected to contribute a lion's share in the development of the country. One way to acquire the force is achieved by applying a well organized education and training. Many believe that education and training are strategic tools that a society needs to continuously apply in order to sustain a global competitive advantage, create a better standard of living and development.

Two major alternatives are widely being used in the world to provide formal education, namely conventional face-to-face mode of delivery and distance education. Both are believed to be vital for an education system of a country. Though the widely used form is the conventional face-to-face mode of delivery, a study by UNESCO indicates that supply of the conventional face-to-face mode of delivery has for various reasons failed to keep up with the growing demand for education (UNESCO, 2008:61). Distance education has long been

used as an alternative to the conventional education and training system. Distance education could be seen as an educational process in which a significant proportion of teaching is conducted by someone removed physically from the learner. It is aimed to open the doors for those who cannot attend traditional institutions of higher education. Like the conventional face-to-face learning, it should be a planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instructional techniques, special methods of communication by electronic and other technology, as well as special organizational and administrative arrangements.

In distance education the use of modern technologies is inevitable. A distance learning institution has a lot to benefit from a sound application of different technologies in its program. Technology enhances the teaching learning in distance education. UNESCO defines technology as *"the know-how and creative processes that may assist people to utilize tools, resources and*

systems to solve problems and to enhance control over the natural and made environment in an endeavor to improve the human condition” (UNESCO, 2003).

In Distance Education the use of new and emerging technologies is the need of the day, especially when the world is digitalizing at a rapid speed and embracing new technologies in the education sector too. A distance learning institution has a lot to benefit from a sound application of different technologies to enhance learning. Technology enhances and enriches the teaching-learning in distance education and has immense potential to do so if utilized wisely and correctly. A wide range of technological options are available to a distance educator to apply or use in providing distance learning which range from print to the advanced web-learning. Although the prime focus in distance education is on the instructional outcomes, the technologies for pedagogy and delivery are also aspects that need thorough consideration.

The different technologies that have been used can be categorized into different generations. Distance Education operations have evolved through the following four generations: first, the Correspondence Model based on print technology which is typically found in the form of study guides, self-study materials, resource materials such as books, journals, and articles and auxiliary materials such as course brochures and assignments. Second, the Multi-Media Model based on print, audio and video technologies. In this generation the listening and visual effects provide students with much more control over the medium- as being able to stop, start and reply at will, unlike the TV and radio. Third, the Tele-learning Model based on applications of telecommunications' technologies to provide opportunities for synchronous communication. A possibility of providing students with a means of contacting their tutors and vice-versa was developed in the third generation. Fourth is the Flexible Learning Model based on online delivery via the Internet. The e-mail, computer conferencing, CD-ROMs and the World Wide Web are the prominent technologies being used in this generation. These allow the widest possible use of media (text, graphics, audio and video). Although many universities are just beginning to implement the fourth generation distance education initiatives, the fifth generation is already emerging, based on the further exploitation of new technologies. The fifth generation of distance education is essentially a derivation of the fourth generation, which aims to capitalize on the features of the Internet and the Web (Taylor, 2001 and Melton, 2002).

The evidence of the development of distance education in developing countries suggests different concerns. For the most part, while it may have been driven by the idea of using a range of technologies, it has not been technologically driven, rather, there has been a cautious and restricted use of any technology other than print, backed by limited opportunities for face-

to-face study (Perraton, 2005:158). A review of 150 distance education programs in sub-Saharan Africa has concluded that traditional paper-based means of Distance Learning continues to be more reliable, sustainable and widely used rather than technology-mediated distance learning programs, particularly online and web-based methods of learning (Leary and Berge, 2006 in Gulati, 2008: 56). The technological advantages in distance learning leveraged by most developed countries are not effectively being utilized in Ethiopia unlike the other developing countries in Africa too. Even though the history of distance education in Ethiopia takes goes back 40 years, the system has long been predominantly bound to only print materials, and only very recently some second generation technologies are initiated. In support to this Sahlemariam (2004:51) states that the prominent medium used in distance education in Ethiopia is the printed course module.

Purpose of the Study and Research Questions

In this article, the practices and problems of technological interventions in distance learning were addressed. Seven research questions were at stake: (1) To which technological generation of distance learning do the colleges/universities belong? (2) What factors have been considered while selecting technologies being used in the colleges/universities? (3) To what extent are the existing technologies integrated with the elements of distance learning instructional design? (4) To what extent does the existing technology enhance the learner support system? (5) What are the attitudes of learners and the academic staff of the universities/colleges towards the use of technologies in the distance education program? (6) To what extent does the government take the initiatives to support technology enhanced distance learning programs? (7) What are the problems faced by the colleges/universities in the use of technologies in distance education?

The first research question relates to the technology in the distance learning being utilized by the colleges/universities of Addis Ababa. In his review, Williams (2005:80) states that there are the five generations of technology being used in the world through the life span of distance learning. Hence, the question related to the technological generations to which the universities/colleges of Ethiopia belong to.

The second question relates to the importance of considering factors in choosing technologies for application in distance learning. Educators believe that technology should not be used in the distance learning system only because it is available but to support learning. The article, therefore, uses the ACTION model suggested by Harry and Khan (2000:124) as a frame to assess the consideration of different factors in selecting technologies.

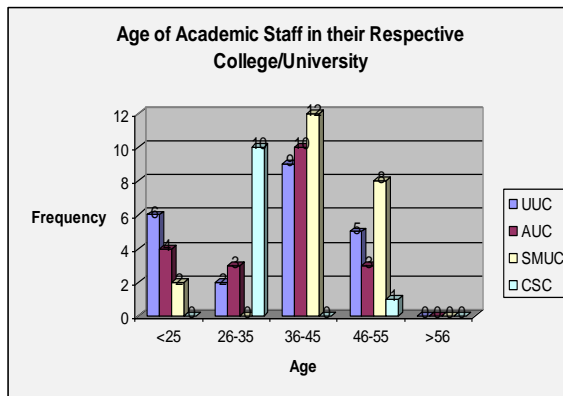


Figure 1. Graphic Representation of Age Profile of Academic staff Students

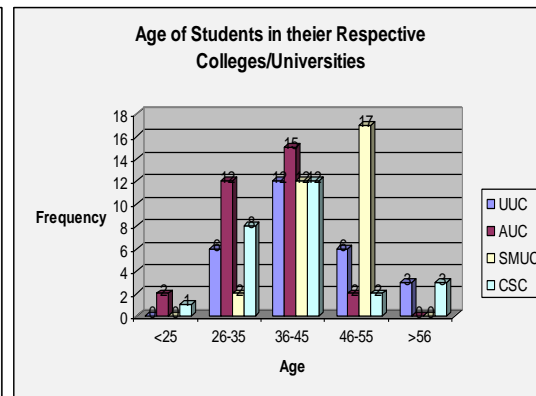


Figure 2. Graphic Representation of Age Profile

The third question attempts to address the need for integrating existing technologies with instructional design elements. The use of technologies should be to enhance instruction. Thus, it should be checked that whether or not the technology is well integrated with the five instructional design elements such as learning objectives, learning contents, learning delivery, learning interactivity and learning assessment.

The fourth question is concerned with the application of technologies in the learner support systems. A distance learner should be given a regular and continuous support due to learner's separation from instructor both by time and space. The learner support system is believed to be best delivered when an Information Communications Technology (ICT) is used in the system (Mills, 2003:67).

In the fifth question, an attempt is made to know the attitudes of learners and the academic staff both towards technology in general and the application of technologies in the distance learning in particular. It also attempts to find the correlates between some independent variables of both the learners and the academic staff with their attitude. This is done so for the very reason that if unaccepted due to negative attitude, it might fail the initiative of utilizing the capabilities of technology in enriching learning.

The sixth question relates to the initiatives taken by the government as an important stakeholder. Pandey (2007:78) argues that acceptance of technology is related to the level of political support or resistance at local and national levels. National governments have been key players in the expansion of educational projects that depend on technology. Most mega-universities have privileged access to telecommunication systems that are controlled or regulated by the government in their base country.

The last research question addresses the problems encountered by the colleges/universities. These technology-associated problems can affect Distance Learning regardless of the level at which it is being

offered. Perraton and Moses (2004:143) state many of the problems that are related to the use of technology in Distance Learning "Local and National Constraints". Knowing the challenges that the universities/colleges are facing in developing countries, it is very crucial that proactive practitioners do not get disheartened, for already thought of being a 'ahead' of time. A proactive measure is usually taken when problems are anticipated at first.

Sample, Data and Method

Data

The study involved different groups directly or indirectly related to the distance learning programs, so that relevant data on the use of emerging technologies in the respective program are investigated. Accordingly, data were gathered from deans, experts, program coordinators, distance education experts, tutors and students of the colleges/universities.

Relevant documents of the universities and colleges, policy guideline documents of the government, books, journals, other countries' experiences, reports, research articles, website information from the internet related to the use of emerging technologies in distance learning were supplemented to enrich the data gathered from the primary sources.

Sample

Simple random sampling technique was used to select the universities and colleges. Accordingly, Unity University, Alpha University College, Saint Mary's University College, and Ethiopian Civil Service College were selected. Regional centers were selected in the study using stratified sampling technique for the

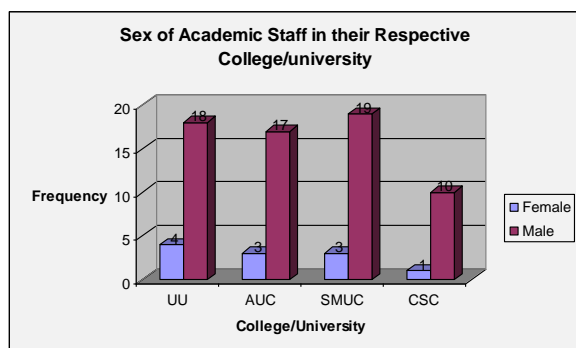


Figure 3. Graphic Representation of Sex Profile of Academic Staff

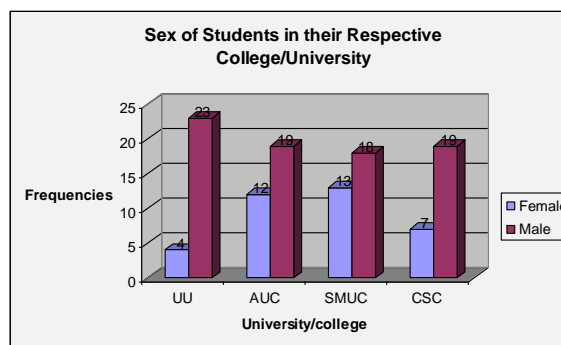


Figure 4. Graphic Representation of Sex Profile of Students

technique allows the researcher to consider some variations like geographical distance from the main center. The stratum was made based on geographical inhabitations of the centers. To this effect, three strata called North, Central and South which included their East and West peripherals were formed. Accordingly, three regional coordination centers; namely Bahir Dar, Adama and Hawassa were selected for the study using this technique.

From the aforementioned colleges/universities and regional centers, a total of 200 respondents were selected using both probability and non-probability sampling techniques. Out of the 200 respondents, 77 were academic staff selected from the national center and 123 were students selected from the three regional centers. (fig 1 and 2 above)

As can be seen from the above graph (Fig 1), more (41.33%) respondents belonged to the age group of 36-45 years followed by 46-55, 26-33, less than 25 and greater than 56 years in their respective order. Though none of the respondents was older than 56, it can be said that the distribution is more in the matured age category. Unity University College is represented by more youngsters. A relatively fair distribution among the age groups is seen in all the colleges except for Civil Service College where 90.09% of the respondents belong to the age group 26-35 years and only one in the group 46-55 years.

This indicates that respondents of the academic staff are mature enough to give relevant information, enriched by their valuable experience in both the distance learning system and their lives. As far as students were concerned, the majority of the respondents were in the age category 36-45. Expectedly so, many of the student respondents are aged. The graph above depicts that 73.04% of the respondents are older than 36 years. It is interesting to note the presence of 6 respondents above 56 yrs.. It is encouraging to note the presence of one of the characteristics of distance learning, that is, lifelong learning, where in any age group could benefit (Keegan, 2000:20). Hence, it can be said that the

colleges/universities are opening opportunities for the older people too, to attend their lessons without necessarily being in the institutions' compounds. (fig 3 and 4 above)

Parity of esteem for men and women is one of the major characteristics of distance learning (Keegan, 2000:20). Only an insignificant contribution of female was found as members of the academic staff for their share depicted only 14.67% of the total respondents. It was found to be predominantly male dominated. Though this may not have anything to do with distance learning directly, a fair share might work as a motivation for female learners who might want to be considered as role models.

Close matches between the number of female and male students was seen in Saint Mary's University College. Only 14.81% of the respondents from Unity University were female. In general terms, 31.30% of the respondents were female which still happens to be far less for maximizing the benefits of distance learning. The need for working towards increasing the number of female learners emanates from the fact that this deprived section of the society, particularly in the rural areas, are mostly housewives and do not get a chance to attend the conventional face-to-face colleges/universities.

Method

The study employed the descriptive survey method for it provides a choice in place and enables the researcher to obtain information on the current status of the intervention and use of technologies in the universities/colleges, covering a fairly wide area of technological elements like the generation, factors, integration with technological elements, learner support system, problems encountered, initiatives taken by the government and attitude. The appropriateness of this approach for such a study is noted by Seyoum and Ayalew (1998).

TABLE 1: Technology Intervention

		Generation of Technology
a.	Technologies being applied	Printed material/ Radio broadcasting?/ Audio cassettes? ...
b.	Types of print-based technologies	Courseware leaflets/ Text books/ Journals/
c.	Second generation (Purposes)	Documentaries/ Archive materials Speech
		Factors in Selecting a Technology
a.	Organizational issues	Opportunities/ Threats/ Organizational barriers & requirements?
b.	Accessibility of technology to Support staff	Learners/ Tutors/Administrative staff/
c.	Cost of the technology personnel/Support system	Maintenance/ Dedicated technology
d.	Others	Novelty? User friendliness? Duration of courses
		Integrating Technology with Instruction
a.	Learning objectives	Media are used in ways that facilitate objectives.
b.	Learning contents	Designed such that varied deliveries could be used.
c.	Learning delivery	Course incorporates a variety of instructional media.
d.	Learning interactivity	Learners are provided with list of technologies required.
e.	Learning assessment	Make use of varieties of technologies.
		Technology and Learner Support System
a.	Individualized learner support assisted by emails, telephones, fax?	To what extent is the individualized learner support
b.	Group-based learner support exist (tutorials, audio conferencing, peer group support)?	What form of group-based learner support systems
c.	Counseling learner support	What technologies are used in the counseling service?
d.	Center-based learner support	What kinds of supports are given in the center?
		Attitude of Learners and Academic Staff
a.	General	Working with technologies makes me very nervous.
b.	Distance learning all subject areas of distance learning.	Technology can be a useful instructional aide in almost
		Problems Encountered
a.	Access	Computers? Tape recorder? Television? Internet?
b.	Attitude of	Learners? Tutors? Administrative staff?...
c.	Infrastructure connectivity?	Technology based training centers? Band width
d.	Others Donor interest?...	trained human resources? Integrating problem?

The responses found from students were compared with those of the academic staff. For this a t-test was used. One way ANOVA was used where there was a need to make a comparison among the four colleges/universities of the study. A chi-square was also employed to measure the degree of agreement between sets of responses of the same group.

The following table 1 above summarizes the sample items used in collecting data for the purpose of the study

RESULTS

Generation of Technology

The following table summarizes responses found from both groups of respondents as to the application of

technologies in the different generations by the selected universities/colleges. (table 2 below)

It was found that print was the technology always used in the distance learning program as confirmed by the majority of respondents. Technologies like radio, television, video conferencing, electronic mails, computer conferencing, CD-ROMs and the World-Wide-Web were not used by the colleges to support the teaching learning process. It was revealed that audio cassettes and video tapes were used occasionally in the teaching learning process as depicted by mean values ranging from 2.34 to 2.75, the average mean being 2.5. Print-based technology was confirmed to be used always in the above section but did not include print types called journals and articles. Hence, the colleges/universities were found to be only in the first generation in terms of the use of Technology.

Table 2. Frequencies and Mean Distribution in relation to Generations of Technology

No.	Item Description	Respondents										X ²	t	
		Academic Staff (N=75)					Students (N=115)							
		AL	MO	ST	RA	NE	AL	MO	ST	RA	NE			
		(5)	(4)	(3)	(2)	(1)		(5)	(4)	(3)	(2)	(1)		
1	Printed Material	66	9	-	-	-	4.88	101	10	-	4	-	4.81	0.93
2	Radio broadcasting	-	-	6	21	48	1.44	3	15	3	43	51	1.92	-3.40**
3	Audio cassettes	-	26	4	15	30	2.34	6	48	17	19	25	2.92	-2.97**
4	Video tapes	-	21	3	9	42	2.04	6	52	7	7	43	2.75	-3.37**
5	Television	-	3	7	9	56	1.43	10	40	4	10	51	2.55	-5.78**
6	Audio-conferencing	-	8	-	3	64	1.36	7	21	10	26	51	2.19	-4.68**
7	Video-conferencing	-	4	3	6	62	1.32	3	27	-	34	51	2.19	-4.77**
8	Electronic Mail (E-mail)	4	9	6	11	45	1.88	10	12	4	35	54	2.03	-0.80
9	Computer-conferencing	-	4	-	3	68	1.20	10	14	4	33	54	2.07	-5.15**
10	CD-ROM*1	-	20	-	3	52	1.84	3	22	8	31	52	2.09	-1.31
11	World-Wide-Web (WWW)	-	13	4	3	55	1.67	10	8	-	49	48	1.98	-1.76

[4.50-5.00=Always, 3.50-4.49= Mostly, 2.50-3.49= Sometimes, 1.50-2.49=Rarely, 1.00-1.49=Never]

*1=Compacted Disc Read Only Memory *2=Calculated Means across Cells

**=Statistical Difference among Mean Values at $\alpha = 0.05$ and $df = 188$

Table 3. Mean Distribution/ One-way ANOVA Results in relation to Factors Considered in Choosing Technologies (Organizational Issues)

No.	Item Description	Mean Values				F	
		UU (N=22)	*1	AUC*2 (N=20)	SMUC*3 (N=22)		CSC*4 (N=11)
Opportunities							
1	Working government policy	4.45		3.60	3.18	4.54	7.02
2	Students mental preparedness	4.09		3.50	3.50	3.91	1.20
3	Students' positive attitude	4.05		3.65	3.14	4.00	4.16
4	Availability of materials	3.77		3.85	3.64	3.91	0.30
5	Reasonable cost of technology materials	4.36		4.25	3.77	4.18	2.03
6	Availability of funds	3.77		2.80	2.95	3.36	2.72
Threats							
7	Poor infrastructure	4.09		3.35	3.18	4.55	6.59
8	Negative attitude of students	3.91		2.95	3.36	2.82	4.49
9	High cost of technology materials	4.27		2.80	3.27	3.73	7.28
10	Lack of support from the government	4.09		2.70	2.95	4.18	7.69
Organizational Barriers							
11	Negative attitude of tutors	3.91		4.25	3.00	3.09	8.34
12	Negative attitude of administrative staff	3.91		4.20	3.55	3.18	3.34
13	Knowledge/skill of tutors	4.14		3.35	3.55	3.45	2.29
14	Knowledge/skill of administrative staff	3.91		3.70	3.18	3.18	1.40
15	Lack of working technology plan	3.68		4.20	3.23	4.00	3.13
16	Inadequate financial support	4.14		3.95	3.45	4.27	3.32
17	Poor supply of facilities	4.00		4.25	3.32	4.09	4.83
Organizational Requirements							
18	Commitment of the management	4.23		3.30	3.77	4.55	3.62
19	Proper resource availability	4.55		3.50	3.45	4.64	9.08**
20	Readiness for change	4.18		2.75	3.59	4.64	8.81**

[4.50-5.00=Strongly Agree, 3.50-4.49=Agree, 2.50-3.49=Uncertain, 1.50-2.49=Disagree, 1.00-1.49=Strongly Disagree]

*1=Unity University, *2= Alpha University College, *3= Saint Mary's University College, *4= Civil Service College

**=Statistical Difference among Mean Values at $\alpha = 0.05$ and $df = 74$

Factors in Selecting Technologies

While selecting a technology for application in the distance learning program some factors need to be considered. Table 3 above summarizes responses from respondents.

It is disclosed that the colleges/universities considered the factors related to opportunities that exist in the external environment, accessibility and cost while selecting the existing technologies. Many other factors related to novelty, user friendliness, teaching and learning process, interactivity and speed of the technology were indicated to be either inexistent or respondents were uncertain about them.

Instructional Design Elements

Hereunder, is a table summarizing the response found from both groups of respondents on the instructional design elements (table 4 below).

Existing technologies were reported by both groups of respondents to be integrated with the learning objectives and content as the majority of such items were rated above the average rate. However, the technologies being used have not been properly integrated with the instructional design elements related to delivery strategy, interactivity and learning assessment in the colleges/universities.

Technologies for the Learner Support System

There are different technologies used for the learner support system. The following table summarizes questions asked and results found as to what technologies were being used to support the individualized learner support system (table 5 below).

It was found that there existed an individualized learner support system as confirmed by 54.7% and 71.7% of the academic staff and students respectively. Responses also indicated that this system was supported to a greater extent by telephone and face to face meetings while mails were being moderately used. The individualized learner support system was not found to be supported by technologies like emails and fax.

The group-based learner support system was found to be tutorials while audio conferencing and peer group learner group support system did not exist. The tutorials were found to give major emphasis to only introducing contents in broad terms.

Respondents showed that counseling was used by the colleges/universities' learner support system as confirmed by 90.7% of the academic staff and 91.3% of students. The counseling service was assisted only by telephone and face to face meetings while technologies like mail, emails and fax were not used.

It was found that center based learner support system existed in the Distance Learning system of the colleges/universities as responded by 85.3% and 97.4% of the academic staff and students respectively. The center-based support system was limited to providing only library and bookstore services. Other services like news papers, setting up computers, downloading software's, operating programs, institutional and course based website, financial aid and providing course syllabus were not provided.

Attitude

The attitude of the academic staff towards technologies in general was found to be positive as depicted by the gross mean values 3.84 unlike the students who were found to be just moderately affiliated towards technology. The academic staff was found to have positive attitude towards the application of technology in Distance Learning, while students were uncertain about using technology in Distance Learning. The study disclosed that there was a minimal relationship between the independent variables such as age, sex, academic status, specialization and year of study and attitude towards the use of technology in distance learning.

Government Initiatives

Significant level of uncertainty was indicated as to whether the government took initiative to promote technology-assisted distance learning programs in the country. The following table depicts the same (table 6 below).

Problems Encountered

Having access to computer and internet technologies was found to be a problem. Access to technologies like tape recorder, television and telephone were found to be a problem to a moderate level while scarce financial resources, attitude of learners towards technology, lack

Table 4. Frequencies and Mean Distribution in relation to Integration of Technology with instructional Design Elements

No.	Item Description	Respondents											t	
		Academic Staff (N=75)						Students (N=115)						
		SA (5)	A (4)	U (3)	D (2)	SD (1)	X	SA (5)	A (4)	U (3)	D (2)	SD (1)		X
1	Are defined as part of the instructional design	41	18	-	15	1	4.12	48	43	12	7	5	4.06	0.27
2	Are explicitly communicated to learners	43	18	7	6	1	4.28	31	65	11	5	3	4.01	1.94
3	Instructions include skills to meet the objectives	24	33	-	14	4	3.79	42	54	13	6	-	4.15	-2.43**
4	Instructions include knowledge to meet the objectives	31	24	-	13	7	3.79	48	46	17	4	-	4.20	-2.58
5	Instructions include experience to meet the objectives	17	28	11	16	3	3.53	23	65	16	7	4	3.83	-1.96
6	Related to real life experiences through examples	18	34	8	14	1	3.72	31	37	14	30	3	3.55	0.99
7	Are designed to accommodate differences in learning styles	24	27	7	12	5	3.71	16	54	26	13	6	3.53	1.05
8	Are stated in measurable terms	24	32	7	12	-	3.91	26	57	7	18	7	3.67	1.43
9	Contain action for performance	22	35	12	6	-	3.97	33	57	14	6	5	3.93	0.30
10	Contain conditions for performance	14	42	4	10	5	3.67	42	48	14	9	2	4.03	-2.38**
11	Contain criteria for performance	17	27	16	7	8	3.51	29	50	10	26	-	3.71	-1.21
12	Are sequenced appropriately	39	18	1	16	1	4.04	19	43	32	18	3	3.49	3.29**
13	Media are used in ways that facilitate objectives	14	38	7	11	5	3.60	30	57	10	15	3	3.83	-1.46
14	Evaluation is directed towards measuring objectives	26	26	7	16	-	3.83	32	52	5	23	3	3.76	0.42

[4.50-5.00=Strongly Agree, 3.50-4.49=Agree, 2.50-3.49=Uncertain, 1.50-2.49=Disagree, 1.00-1.49=Strongly Disagree]

*1=Calculated Means across Cells **=Statistical Difference among Mean Values at $\alpha = 0.05$ and $df = 188$

Table 5. Frequencies and Percentage Distribution in relation to Learner Support System (Technology in Individualized Learner Support)

Item Description(Technology used in individualized form of support)	Respondents						
	Academic Staff (N=41)				Students (N=82)		
		App.	NotApp	X ²	App.	Not App.	X ²
Telephone	f	37	4	26.50*	70	12	41.02*
	%	90.2	9.8		85.4	14.6	
Mail	f	13	28	5.49	34	48	2.39
	%	31.7	68.3		41.5	58.5	
Email	f	7	34	17.78*	-	82	-
	%	17.1	82.9		0	100	
Faxes	f	7	34	17.78*	10	72	46.88*
	%	17.1	82.9		12.2	87.8	
Face to face	f	37	4	30.45*	66	16	30.49*
	%	90.2	9.8		80.5	19.5	

Applicable *Statistically Significant Chi-square Value at $\alpha = 0.05$

of infrastructure, lack of technological capability and trained human resources were indicated to be some of the major problems encountered in attempting to assist distance learning with technology.

CONCLUSION AND DISCUSSION

The prominent technology being applied in the colleges/universities was print medium, which indicates that the selected Colleges/Universities are still in the first generation in use of Technology. Students get printed materials in the form of modules and assignment papers for their studies. The print technology being used in the colleges/universities was limited to course materials and not supplemented by journals and articles. Only a limited use of video tapes and audio cassettes was found to exist as supplement to the course material which could be a good input to the teaching learning process for some lessons, which might not be well taught using print technologies alone. The colleges/universities were not found using other generations of technologies like radio, television, video conferencing, emails, CD-ROMs and the World Wide Web which could contribute a lot in improving access, increasing efficiency, improving quality, providing just in time learning and allowing learner-centered approaches. As there was a limited application of technologies of the second generation to back the print based distance learning program, it can be concluded that the colleges/universities were predominantly found only in the first generation of distance learning technologies in this 21st Century, while many countries in Africa too are in the fourth and Fifth Generations in the Use of Technology.

This implies that the selected Colleges and Universities in Ethiopia are missing out on technologies that could enhance their Distance Education programs by presenting information in the form of text, graphics, audio and video, making it more interactive and sustaining. The technologies in the first generation do not provide benefits like time, pace and place flexibility for learners, which define a distance learning program. The lack of use of technologies in the recent generations in the universities/colleges could be one of the prime reason for poor learner-learner, learner-content, learner-tutor and learner-institution interactivity. The inability to use technologies of the other four generations might also

impede the effective provision, distribution and delivery of lessons for the distance learners.

A technology should not be used in Distance Learning only because it is available but to enhance and empower the distance learning. It should supplement learning and not overpower the essence of the learning process. Thus, it becomes necessary to consider the factors that help in the selecting apt technologies to be used to facilitate the teaching-learning process. Factors related to opportunities that exist in the external environment, accessibility of the technology and costs of the technology material were some of the factors considered by the selected colleges/universities in selecting technologies to be used in Distance Learning.

Other factors related to novelty, user friendliness, teaching and learning process, interactivity and speed of the technology were found to be not considered while selecting technologies, although these factors are equally important to facilitate learning using new technologies that are tried and tested. The consideration of only three of the factors does not suffice to say effective selection of technologies in the institutions. One of the missing factors might adversely affect the other due to inappropriate selection of technologies and hence adversely affect the teaching-learning process in general.

The study revealed that the existing technologies in the colleges/universities were well integrated with only two instructional design elements that are learning objectives and learning contents. It can be said that this integration helps the institutions in clearly defining, communicating and designing objectives and instilling different ideas and points in the content that go in line with the existing technologies. However, it was also found that the technologies being used were not properly integrated with the other important components of instructional design such as learning delivery/pedagogy, learning interactivity and learning assessment. To this effect, it may be safe to conclude that the existing technologies were not integrated with all the instructional design elements and as these elements are inter-related, it might impede the holistic approach to instruction. The effectiveness of the lessons given for learners would be under question if the technologies being applied are not integrated well with the instructional design and thus affect the quality of

Table 6. Frequencies and Mean Distribution in relation to Evaluation of Learner Support System

NO	Item Description	Respondents										t
		Academic Staff (N=75)					Students (N=115)					
		M (4)	PM (3)	DM (2)	NA (1)	X*1	M (4)	PM (3)	DM (2)	NA (1)	X*1	
1	Assisting the learner in effectively utilizing resources provided	24	27	21	3	2.96	52	33	23	7	3.13	-1.25
2	Technology support	20	23	29	3	2.80	52	30	33	-	3.16	-2.85**
3	Technical support	14	33	19	9	2.96	58	27	27	3	3.22	-3.91**
4	Access to library	11	34	28	2	2.72	15	71	25	4	2.84	-1.18
5	Advising/counseling	14	27	22	12	2.57	17	46	43	9	2.62	-0.33
6	Problem solving	7	33	27	8	2.52	47	33	28	7	3.04	-3.93**
7	Convenience to diverse group	11	30	27	7	2.60	42	57	36	-	2.88	-2.45**
8	Efficiency to diverse group	5	33	25	12	2.41	21	57	37	-	2.86	-3.98**
9	Responsiveness to diverse group	11	25	29	10	2.49	3	75	34	3	2.68	-1.73
10	Accurate disclosure of information	12	33	18	12	2.60	13	72	30	-	2.85	-2.26**
11	Orientation on all information	12	22	32	9	2.49	24	61	24	6	2.90	-3.24**
12	Regular revision of support system for their currency.	7	29	29	10	2.44	17	54	41	3	2.74	-2.58**
13	Regular revision of support system for their effectiveness.	7	25	25	18	2.28	24	42	43	6	2.73	-3.42**

[1.00-1.25=Not Applicable, 1.26-2.25=Do not Meet Evaluation Criteria, 2.26-3.25= Partially Meets Evaluation Criteria, 3.26-4.00=Meets Evaluation Criteria]

*1=Calculated Means across Cells **=Statistical Difference among Mean Values at $\alpha = 0.05$ and $df = 188$

distance education provided to the distance learner.

The study also disclosed that all the three forms of student learner support systems namely: individualized learner support system, group-based learner support system and center-based learner support system existed in the colleges/universities. These support systems help the learners in getting information related to their study from the convenient form. Nevertheless, while the group based learner support system was reported to be limited only to tutorials, the individualized and counseling learner support systems were revealed to be supported only by telephone and face- to - face technologies.

Technology related support systems were also not found to be used in the center-based learner support systems for it mainly focused on library and book store services. Neither fax nor emails were used in the individualized learner support and counseling learner support systems nor were setting up computers, downloading software, operating programs, provision of instructional and course based websites were there to support the learner support system. Therefore, it can be concluded that the learner support systems in the colleges/universities was again not found supplemented by newer and emerging technologies which could hasten and improve communications in the learner support

system.

The study also revealed that the government of Ethiopia did not take significant initiatives to support the attempt of the colleges/universities in promoting use of technology in the Distance Learning, for majority of the respondents were uncertain about the same. Not much seems to have been done in: investing in infrastructures, reviewing policies, funding technology mediated projects; promoting teacher training that uses technology, implementing standards of quality and networking educational institutions. The fact that the universities/colleges function without a technology plan is an indication of the lack of control and initiatives taken by the government. Hence, it would be safe to conclude that the government took a minimal initiative to promote technology-assisted distance learning. The sole effort from the colleges/universities might not be sufficient to effectively promote the application of technology in the Distance Learning system, without getting the required support by the Government.

Awareness of problems that hinder effective application of technology in distance learning system is also very important. It helps in taking proactive measures and actions ahead of time. Consequently, the major problems in promoting technology assisted Distance Learning as disclosed were access to computers and internet, scarce financial resources, attitude of learners towards technology, lack of infrastructure, lack of trained human resources and technological capability. It can therefore, be concluded that the universities/colleges faced many constraints that refrained them from introducing newer technologies in their Distance Learning Programs. Problems usually result in disappointments leading to frustration if not handled properly and technically. The problems faced by the Distance Education colleges/universities of Ethiopia may be the possible reasons for their having taken a back step, resulting in still being the first generation users of Technology, while the other countries in Africa are embracing the newer and emerging technologies to advance their Distance Education.

The attitude of the academic staff towards, both, technologies in general and technology for the Distance Learning system was revealed to be positive, which could in turn help the colleges/universities in introducing newer technologies as and when ready to do so, without major resistance from these groups. Thus the probability of using the technologies and maximizing their benefits would also be high. However, the attitude of learners towards technology was not found to be encouraging and the reason could be lack of awareness and exposure to such technologies. This could further result in resistance in use of technologies, so right proactive measures need to be taken and the mind sets need to be changed.

RECOMMENDATIONS

On the basis of the findings obtained and the conclusions reached, the following suggestions are forwarded:

1. As observed in the study, the colleges/universities are merely found in the first generation of technology application, which is a print dominated system. The sole application of print technology may not provide the colleges/universities with quality education system empowered with speed, interactivity, sustainability and flexibility. The Distance Learning program is believed to be most effective when ranges of technologies from the first generation to the fifth generation are used to supplement instruction. Therefore, it is suggested that the colleges/universities make a thorough analysis and investigate as to which other technologies could be used to maximize the benefits that newer technologies render. This could be done by first studying the accessibility of the technologies to the learners and then investing technologies which could facilitate the teaching learning process and the learner support system, and also increase access to computers, internet and manage financial issues of the institutions when the technological need arises, which ultimately would increase the technological capabilities and use. The colleges/universities could send teams to higher technology generation countries and use their experience and expertise in advancing its Distance Education.

2. The study disclosed that some of the factors worth considering in selection of technology to be used in Distance Learning program were missing. It is evident that there is no one best form of technology that an institution selects to employ in its Distance Learning program, however, it is appropriate to check on different variables in selecting technologies before using them. Hence, practical measures need to be taken in considering factors related to novelty, user friendliness, teaching learning process, interactivity and speed of technologies to be used. This could be done in two ways. One way of doing this is to form an interdisciplinary team which takes time and puts some effort in research and technology plan and feasibility for application. Then the agreed upon study would be presented to the concerned officials and the selection done. Other way of solving the problem could be developing a technology related policy that includes the need for developing factor checklist for selecting technologies.

3. The effort of integrating technologies being used with elements of instructional design needs to be made for all the instructional design elements and not only for learning objectives and contents. It is apparent that the instructional design elements go hand in hand and a

problem in one of the elements may result in an overall failure. It is, therefore, recommended that the colleges/universities take time in working towards the integration of technologies with the instructional technology elements. This could be managed by a collaborative effort of the different stakeholders in the Distance Learning program with initiation from the universities/colleges. The institutions may have IT specialists, instructional design experts, training professionals, tutors and students involved in the Distance Learning material preparation so that all could work towards achieving the needful.

4. The sole effort of the universities/colleges to promote the use of technologies in the Distance Learning system may not be enough. The government has to take some initiatives in supporting the colleges/universities in their endeavor. The study, however, disclosed that this was minimally done by the government. It is recommended that the government takes some initiatives to support the effort of the universities/colleges in advancing the application of technology. This could be done by reviewing policies related to technology, funding technology mediated projects, promoting teacher training that uses technology, investing on infrastructures necessary for technology application like telecommunications, electricity, implementing standards of quality, sending teams for training to countries that have excelled in the use of technologies in the Distance Learning program and also networking of educational institutions.

5. The study revealed that the colleges/universities faced different problems in the use of technologies which hamper the efforts in introducing newer technologies in Distance Learning program. It therefore, requires the colleges/universities and the government to proactively take some actions to overcome these problems. The colleges/universities need to hire trained teachers with technology knowhow either from within the country or expatriates. They should also arrange continuous awareness programs and conferences for educators and learners to increase their awareness towards technology and exposure to technologies, which may also help in changing the mind sets and making them technology pro. The government may also promote the application of technology in lower levels of education (high schools, junior schools) so that learners get exposure to technology from early years of schooling which helps develop a positive attitude towards the use of technology.

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