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## **An Investigation into the Application of Information Technology in Distance Education – Present Status, Future Possibilities**

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### **Abstract**

Education plays a vital role to develop the nation culturally, economically and socially. That is why every nation has main focus on this sector. For its improvement all endeavours are being made through formal education, non-formal and distance education. The trend of distance education has developed considerably in developed countries and developing countries. Information Technology plays a pivotal role for the development of Distance Education. Keeping in view, study was developed to investigate the use of information technology in distance education.

Population comprised of the I.T users; persons were helping, operating or supervising the IT tools as Planners, accamidicians, designers, programmers, producers, operators, regional directors was taken as one sample while 100% of Deans population was taken as second sample. For investigation all the related material/ reports profile of the concerned distance organization were studied and questionnaires were also developed on five points rating scale after the consultation of different scholars. The questionnaires were

Language in India [www.languageinindia.com](http://www.languageinindia.com)

11 : 11 November 2011

Ali Murtaza, Ph.D., Abdul Majeed Khan, Ph.D., Muhammad Javid Iqbal. Ph.D Scholar

An Investigation into the Application of Information Technology in Distance Education –  
Present Status, Future Possibilities

distributed by hand and by post. The collected data was tabulated and analyzed. Conclusions drawn from the study are as under:

The use of IT is still limited. Computer net work was not used for distance learners, radio, T.V. programmes and relevant material audio, videocassettes were prepared and CDs, software still not prepared. University library was not computerized. Staff got training from time to time in IT education in their specialization. But there is need to make IT system more sophisticated according to new trends and students' needs. There is also need to develop regional centres, which should serve as resource centres to the facilitation of distance learners.

**Key Words: Information Technology, Application, Distance Education**

## **Introduction**

The development requires the participation of the whole segments of society including men and women, young and old, rural and urban. Obviously the survival of a country in the present era is impossible without enhancement of education. Pakistan is a developing country and currently facing a lot of problems. All these problems can be solved by enhancing education (Siddiqui, 1999, p.1). To impart education various systems have been introduced. These systems are formal, informal, non-formal and distance education. Formal system of education does not fulfil the entire needs of the concerned society adequately. Due to internal differences, inequalities and injustices all members of society cannot avail equal opportunities of education hence some are left behind who need second chance of education in life. In these circumstances, distance education provides opportunities to enhance education and skills

To disseminate knowledge and information, various teaching techniques are used in this system. These techniques include print and electronic media, newspapers, radio, TV and audiovisual equipments. In the present age of knowledge and awareness, the world scenario is rapidly changing. The tremendous achievements in the field of information have transformed the world into a global village. The things which were impossible and unimaginable even in the near past are now part and parcel of our daily life. The electronic mail and internet are the most significant achievements of the present age.

Although, development of IT has influence the whole sphere of human activity, the distance education is most susceptible. It is very easy for distant learners to make the best use of information technology techniques. Now to be familiar with the term information technology, let us see the definitions.

“The whole gamut computer and communication is the subject of information technology. It includes all activities connecting with fabricating of computers; producing

Language in India [www.languageinindia.com](http://www.languageinindia.com)

11 : 11 November 2011

Ali Murtaza, Ph.D., Abdul Majeed Khan, Ph.D., Muhammad Javid Iqbal. Ph.D Scholar  
An Investigation into the Application of Information Technology in Distance Education –  
Present Status, Future Possibilities

peripherals spares and accessories; and developing software dealing with collection, processing, transmitting and presentation of data in the form of meaningful information in any medium. The data may relate to any walk of life”(H.R.Banarjee,1966,p98)

“The technology involved in acquiring, storing, processing and distributing information by electronic means (including radio, television, telephone, computer)”  
(Khana Anil, 1994)

“Information Technology that merges computing with high speed communications links carrying data, sound, and video.” (Williams, 1999)

It means information technology provides rapid, latest and accurate information in very limited time to the clientele. By using this most modern technique efficiently, standard can be achieved. It helps to eradicate the problems of distance learners and makes teaching learning process most effective and fruitful. **Information Technology** is concerned with improvements in a variety of human and organizational problem-solving endeavours through the design, development, and use of technologically based systems and processes that enhance the efficiency and effectiveness of information in a variety of strategic, tactical, and operational situations. ( <http://www.answers.com>.) NRC, stated, Most people can agree that an ideal information infrastructure would have such qualities as extended interoperability, broad accessibility, and support for broad participation.

To achieve this standard and strengthening the distance education system different latest tools/techniques of information technology (Computer Software) internet, e-mail, web page, CD Rom, On-line Services, Phone, Fax, voice and Video Communications, Satellite, Tele-Conferencing, Radio & TV Programmes, LAN, WAN Projects, Computerized Library) can be used in each module of the University.

Information Technology is divided into two parts first hardware wise and software wise. Hardware is concerned with physical classification of all devices and software is concerned with services and applications. Main emphasis is given on databases, web services, Internet and on-line services.

### **Objectives of the study**

The objectives were as: 1.to identify the use of Information Technology in distance education by users (academicians, officers concerned with Administration and Computer Professionals).2. to find out the use of Information Technology in the university courses at different levels/programmes.3. to make recommendations for the improvement and uplift of information technology system in distance education.

### **Methodology**

Related literature was studied for an overview of the theoretical framework of the

Language in India [www.languageinindia.com](http://www.languageinindia.com)

11 : 11 November 2011

Ali Murtaza, Ph.D., Abdul Majeed Khan, Ph.D., Muhammad Javid Iqbal. Ph.D Scholar  
An Investigation into the Application of Information Technology in Distance Education –  
Present Status, Future Possibilities

information technology in Distance Education. Descriptive method of research was adapted. .” Surveys may be used for descriptive, explanatory, and exploratory purposes. Survey research is probably the best method available to the social scientist interested in collecting original data for describing a population too large to observe directly” (Bubbie,E. 1998,p.256).

A comprehensive questionnaire on five point rating scale was developed and structured interviews from the Deans of four faculties conducted. there were one hundred twenty eight IT user, comprises on Planners, academicians, designers, programmers, producers and operator of Allama Iqbal Open University ( AIU) selected as population. Sample of the study was 70% of the whole population and 100% Deans. Scale values of each response were: Strongly Agree=5 Points, Agreed=4 Points, Uncertain= 3 Points, Disagree = 2 Points, Strongly Disagree = 1 Point. To obtain mean score f each below formula was used: SDA=1-1.5, DA=1.5-2.5, UNC=2.5-3.5, A=3.5-4.5, SA=4.5-5.00

Summary of the returned questionnaires is given below;

Population	Sample	Questionnaire returned	% Q. returned
128	91	80	88

The IT user qualification was as; Bachelor level twenty four, Master level forty two, Master of Philosophy Six and Ph.D eight.

Regarding the application of Information Technology questions were asked those are described on these tables;

Q.1. All the offices and regional Offices are connected through the computer Network.

Level	Frequency	Percentage	Mean Score
SA	05	05	2.8
A	15	19	
UNC	26	34	
DA	29	37	
SDA	05	05	

On the above table shown only 24% were agreed while 42% disagreed. While Mean score 2.8 was also falling in between uncertain range therefore the respondent not supported the statement; There is need to increase networking with in Regional Offices and main campus.

Q.2. Concerning all educational programme CDs and videocassettes are provided to the learners.

Level	Frequency	Percentage	Mean Score
SA	-	-	2.8
A	25	32	
UNC	19	24	
DA	33	42	

Language in India [www.languageinindia.com](http://www.languageinindia.com)

11 : 11 November 2011

Ali Murtaza, Ph.D., Abdul Majeed Khan, Ph.D., Muhammad Javid Iqbal. Ph.D Scholar  
An Investigation into the Application of Information Technology in Distance Education – Present Status, Future Possibilities

The above table revealed that the IT user 32% agreed and 44% were disagreed. While the mean score 2.8 was in between the level of uncertain. Result shows that: CDs and Videocassettes of all programmes are not prepared in the system. The result was not supported the statement.

Q.3. University has designed its own web page.

Level	Frequency	Percentage	Mean Score
SA	35	45	
A	32	41	
UNC	04	04	4.1
DA	09	10	
SDA	-	-	

The above table shown 86% IT users were agreed and only 10% disagreed. While mean score 4.1 was in the level of agreement. The respondents mostly were in the favour of the statement; “The University developed the web. Page”

Q.4. All information about admission programmes and fee structure is available on web.

Level	Frequency	Percentage	Mean Score
SA	19	24	
A	29	37	
UNC	19	24	3.6
DA	13	15	
SDA	-	-	

The above table shown 61% respondents were agreed and 15% disagreed. While mean score 3.6 revealed in the level of Agreement. Hence the statement “All information about admission programmes and fee structure is available on web” was accepted.

Q.5. All the data and basic information are provided by the computer to the distance learners

Level	Frequency	Percentage	Mean Score
SA	-	-	
A	09	11	
UNC	23	29	2.2
DA	25	31	
SDA	23	29	

The above table revealed only 10.5 % IT User were agreed and 60.5% were disagreed. While mean score 2.2 was in the level of disagreed. Mostly respondents were not

Language in India [www.languageinindia.com](http://www.languageinindia.com)

11 : 11 November 2011

Ali Murtaza, Ph.D., Abdul Majeed Khan, Ph.D., Muhammad Javid Iqbal. Ph.D Scholar  
An Investigation into the Application of Information Technology in Distance Education –  
Present Status, Future Possibilities

supported the statement; All the data and basic information are provided by the computer to the distance learners.

. Q.6. Tele/Video conferencing opportunities are sufficiently available at each level/courses.

Level	Frequency	Percentage	Mean Score
SA	-	-	
A	-	-	
UNC	26	32	1.9
DA	27	34	
SDA	27	34	

On the above table shown 68% respondents were disagreed while mean score 1.9 was also in the level of disagreed. Hence mostly respondents were not in the favour of the statement; Tele/Video conferencing opportunities are sufficiently available at each level/courses.

Q.7. Telephone /Fax is available for the students to get their queries solved.

Level	Frequency	Percentage	Mean Score
SA	09	10	
A	25	32	
UNC	14	19	3.0
DA	25	32	
SDA	07	07	

On above table revealed that 42% were respondents agreed and 39% disagreed. While mean score 3.0 was in the level of uncertain. The respondents were not supported clearly the statement; Telephone /Fax is available for the students to get their queries solved.

Q.8. AIOU computerized library facilitates the distance learners.

Level	Frequency	Percentage	Mean Score
SA	-	-	
A	15	19	
UNC	23	29	2.5
DA	29	37	
SDA	13	15	

Above table shown only 19% were agreed while 52% were disagreed. While mean score 2.5 was between the level of disagreed. The statement; AIOU computerized library facilitates the distance learners, was not supported from the respondents.

Q.9. Computer is frequently used in the system of distance teaching/learning.

Level	Frequency	Percentage	Mean Score
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Language in India [www.languageinindia.com](http://www.languageinindia.com)

11 : 11 November 2011

Ali Murtaza, Ph.D., Abdul Majeed Khan, Ph.D., Muhammad Javid Iqbal. Ph.D Scholar  
An Investigation into the Application of Information Technology in Distance Education –  
Present Status, Future Possibilities

SA	07	07	
A	24	30	
UNC	22	29	3.0
DA	17	22	
SDA	10	12	

The above table shown 37% respondents were agreed and 34% were disagreeing. While the mean score 3.0 was not in the level of agreement. The statement; Computer is frequently used in the system of distance teaching/learning, was not favour from the respondents.

Q.10. Radio programmes are prepared for all courses at each level.

Level	Frequency	Percentage	Mean Score
SA	03	02	
A	41	53	
UNC	09	12	3.1
DA	22	28	
SDA	05	05	

The above table revealed 55% were agreed and 33% were disagreed. While the mean score 3.0 was in the level of uncertain. Mostly respondents agreed but not supported fairly with statement; Radio programmes are prepared for all courses at each level.

Q.11. Satellite Technology is used according to the requirements of coverage.

Level	Frequency	Percentage	Mean Score
SA	08	11	
A	38	49	
UNC	12	15	3.4
DA	18	23	
SDA	03	02	

The above table shown 60% were agreed and 25% were disagreed. While the mean score 3.4 was between the level of uncertain. The statement; Satellite Technology is used according to the requirements of coverage, was not supported from the respondent clearly but near to the agreement.

Q.12. A separate Broadcast channel is specified for distant learners.

Level	Frequency	Percentage	Mean Score
SA	09	11	
A	13	15	
UNC	20	27	2.7
DA	26	33	
SDA	12	14	

Language in India [www.languageinindia.com](http://www.languageinindia.com)

11 : 11 November 2011

Ali Murtaza, Ph.D., Abdul Majeed Khan, Ph.D., Muhammad Javid Iqbal. Ph.D Scholar  
An Investigation into the Application of Information Technology in Distance Education –  
Present Status, Future Possibilities

The above table shown 26% were disagreed while 47% were disagreed. While the mean score 2.7 was in the level of uncertain. Mostly respondents the statement; A separate Broadcast channel is specified for distant learners, were not supported.

Q.13. The IT tools are mostly used in professional education for experiments and practical.

Level	Frequency	Percentage	Mean Score
SA	03	02	
A	37	48	
UNC	13	17	3.0
DA	14	17	
SDA	13	16	

The above table revealed 40% were agreed and 27% were disagreed. While the mean score 3.0 fall in the level of uncertain. The statement; The IT tools are mostly used in professional education for experiments and practical, was not supported from the respondents.

Q.14. The AIOU, IT infrastructure is developed according to the students needs.

Level	Frequency	Percentage	Mean Score
SA	07	07	
A	37	47	
UNC	11	14	3.2
DA	19	24	
SDA	06	08	

The above table shown 54% agreed with the statement and 32% were disagreed. While the mean score 3.2 was in the level of uncertain. The statement; The AIOU, IT infrastructure is developed according to the students needs, was not accepted from the respondents.

Q.15. Opportunities for IT education and training of teaching staff are available in the University.

Level	Frequency	Percentage	Mean Score
SA	04	04	
A	56	73	
UNC	13	16	3.7
DA	07	07	
SDA	-	-	

The above table revealed 60% respondents were agreed and 7% disagreed. While the mean score 3.7 was in the level of agreement. The statement; Opportunities for IT education and training of teaching staff are available in the University, was supported.

Q.16. The AIOU, IT system is designed according to the future needs.

Level	Frequency	Percentage	Mean Score
SA	11	13	3.6
A	43	56	
UNC	13	17	
DA	08	09	
SDA	05	05	

The above table shown 54 % respondents were agreed and 13% disagreed. While the mean score 3.6 was in the level of agreement. The statement; the AIOU, IT system is designed according to the future needs, was strongly supported.

Q.17. Quality of education in distance learners can be improved through IT techniques.

Level	Frequency	Percentage	Mean Score
SA	44	55	4.3
A	22	28	
UNC	14	17	
DA	-	-	
SDA	-	-	

The above table revealed 66% respondents were agreed and nobody disagreed. While mean score 4.3 was in the level of strongly agreed. The statement; Quality of education in distance learners can be improved through IT techniques, was supported.

Q.18. IT provides the fastest, richest, latest and accurate information.

Level	Frequency	Percentage	Mean Score
SA	49	62	4.6
A	31	38	
UNC	-	-	
DA	-	-	
SDA	-	-	

The above table shows 100% were agreed while mean score 4.6 was in the level of strongly agreed. The statement; IT provides the fastest, richest, latest and accurate information, was supported from the respondents.

Q.19. The involvement of private sector is also helpful to develop the IT infrastructure.

Level	Frequency	Percentage	Mean Score
SA	25	32	

Language in India [www.languageinindia.com](http://www.languageinindia.com)

11 : 11 November 2011

Ali Murtaza, Ph.D., Abdul Majeed Khan, Ph.D., Muhammad Javid Iqbal. Ph.D Scholar  
An Investigation into the Application of Information Technology in Distance Education –  
Present Status, Future Possibilities

A	48	62	
UNC	02	01	4.1
DA	-	-	
SDA	05	05	

The above table revealed 73% respondents were agreed and 5% disagreed. While the mean score 4.1 was in between the level of agreement. The statement; the involvement of private sector is also helpful to develop the IT infrastructure, was supported.

Q.20. IT is widely applicable to administrative/managerial activity.

Level	Frequency	Percentage	Mean Score
SA	30	38	
A	40	51	
UNC	10	11	4.2
DA	-	-	
SDA	-	-	

The above table shown 89% respondents were agreed and 11% were uncertain. While the mean score 4.2 was fall in the level of agreed. The statement; IT is widely applicable to administrative/managerial activity, was supported.

## Conclusions

- The use of IT in distance education was limited.
- Mostly the offices and regional offices have IT network but not used properly.
- Except a few software about all educational programmes was not prepared.
- University has designed its own web page but comprehensive information was unavailable on it.
- Sophisticated techniques of IT like, on line services, internet, tele/video conferencing were not used for distance learning.
- Adequate facility was available for students to get information by AIOU through phone and fax.
- The University was not computerized however; it is going to be computerized.
- Satellite Technology was used for TV programmes but on limited scale.
- University has yet not established its own broadcasting channel.
- Most of the IT users were agreed that the IT training programme may be conducted periodically.
- Basic information about IT tools was not included in all courses at all levels.
- Infrastructure of IT in the University was not developed as we see in other Universities.
- Most of the respondents were agreed that IT tools are helpful to minimize the problems of distance learners and improving the quality of education;

Language in India [www.languageinindia.com](http://www.languageinindia.com)

11 : 11 November 2011

Ali Murtaza, Ph.D., Abdul Majeed Khan, Ph.D., Muhammad Javid Iqbal. Ph.D Scholar  
An Investigation into the Application of Information Technology in Distance Education –  
Present Status, Future Possibilities

moreover, these will contribute a lot on the development of electronic governance and managerial activities.

- Lack of funds, planning, and coordination within departments, trained personnel, and commitment of the organization were the main problems of the University.
- The role of regional offices were limited, by expanding its infrastructure, the system of distance education can be strengthen.

### **Recommendations**

- University may plan to uplift the Information Technology system and provide all types of information and guidance by the computer network to the distance learners.
- Regional Offices should be connected through network and may be strengthened as real resource centres which provide all facilities by using IT tools for the benefit of distance learners
- Relevant material may be increased as audio, video, CDs, and software programmes also in all programmes.
- The web page should be more comprehensive to provide much more information to the distance learners.
- For the guidance and counselling on line services may be improved.
- The opportunity of Tele/video conferencing should be provided .
- University may establish its own separate Broadcast Channel.
- Basic knowledge about IT may be included at all levels of study.
- Satellite technology may be used sufficiently.
- Academic staff should be well-trained in IT Education.
- The use of Internet may enrich through Regional Offices for distance learners and especially for researchers.
- University library should be fully computerized.
- For better management and administration electronic governance system may be introduced.
- More funds may be allocated to uplift the IT system as a whole.

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Language in India [www.languageinindia.com](http://www.languageinindia.com)

11 : 11 November 2011

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An Investigation into the Application of Information Technology in Distance Education –  
Present Status, Future Possibilities

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11 : 11 November 2011

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An Investigation into the Application of Information Technology in Distance Education –  
Present Status, Future Possibilities

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Language in India [www.languageinindia.com](http://www.languageinindia.com)

11 : 11 November 2011

Ali Murtaza, Ph.D., Abdul Majeed Khan, Ph.D., Muhammad Javid Iqbal. Ph.D Scholar  
An Investigation into the Application of Information Technology in Distance Education –  
Present Status, Future Possibilities

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Language in India [www.languageinindia.com](http://www.languageinindia.com)

11 : 11 November 2011

Ali Murtaza, Ph.D., Abdul Majeed Khan, Ph.D., Muhammad Javid Iqbal. Ph.D Scholar  
An Investigation into the Application of Information Technology in Distance Education –  
Present Status, Future Possibilities