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Digital Technologies for Learning at Allama Iqbal Open University (AIOU): Investigating Needs and Challenges

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Abstract

The present study investigated the need of digital technologies for the distance learners of AIOU (Allama Iqbal Open University), and the challenges in its implementation. Within mixed-method approach, an explanatory sequential design was employed to conduct this study. Quantitative data was collected through questionnaires from 963 students to find out the needs for digital technologies. Later 3 administrators and 1 library in-charge were interviewed to find out the challenges in its implementation. Quantitative data was analyzed using descriptive statistics. For qualitative data analysis, inductive analysis was done. Most of the students said that digital technologies were needed for increasing accessibility and flexibility of learning. The challenges for its implementation were in the requirement of diverse online learning resources, access, cost and lack of expertise. The paper recommended that there should be provision of portable devices to students with Wi-Fi, and guidance about its use. Annual need-assessment system was also suggested.

Keywords: digital technologies, digital learning, online learning, e-content

Introduction

Digital technologies promote a digital learning environment to facilitate the distance learners. These technologies enable digital learning. Digital learning means using digital technologies effectively and efficiently to help in the learning process. A digital learning in any educational institution includes all those learning technologies which can support learning of the students (Moore & Kearsley, 2004; Roy & Farmer, 2013). A digital learner is the one who uses digital learning techniques to improve one's knowledge. This world has become a global learning platform with collective information (Meyer, Thomas & Schroeder, 2011; Steeples, Jones & Goodyear, 2012), and digital technologies help greatly in this regards. Digital mode of learning at distance universities is now developing into a full-fledged learning system which facilitates its users around the world by providing them with many opportunities such as easy and immediate access to digital contents, online assessment and quicker feedback from relevant instructors or tutors (Rosenblit, 2009). All of these facilities are required by distance learners as they are now part of a universal classroom.

The progress in ICT has made the geographical distances between teachers and learners irrelevant especially in distance learning. Digital technologies such as online websites enable distance learners to find more relevant learning materials for their learning, assignments and exam preparations. They also help distance learners in finding and incorporating more relevant and important ideas and points

for their research work. The focus is shifting from teachers and printed textbooks to recorded lectures and digital contents (Salmon, 2000; Bates 2005; Sankhsri, 2006). Moreover social media platforms such as Skype and WhatsApp give distance learners opportunities to discuss in groups, take help from teachers online, and learn and incorporate those materials that are most relevant to their subjects (Trivedi, 2010). Use of technologies in workshops makes learning more meaningful, interactive and interesting as compared to teacher-centred, traditional workshops. They also extensively facilitate the virtual delivery of educational programs not only within the same country, but also internationally. Students do not have to travel to other countries to get education from their universities. They can do it at their doorsteps.

To develop a variety of skills in a student relating to a particular area, one must provide them with diverse learning resources for individual and collective sustainability (Levy & Roberts, 2005; Anbu & Chibambo, 2009; Gerard, 2013). Realizing this, most of the universities, especially distance universities around the world, are trying to incorporate digital technologies in distance learning to support the learning. Various studies have pointed out different challenges in the implementation of digital technologies such as time, access and resources required for proper incorporation of digital technologies for a large number of learners, and maintaining equality and quality in the process (Wagner, Days & Sun, 2004; Litteljohn, 2005; Anderson, 2008; Ronsenblit, 2009).

Luboobi (2007), Kalusopa and Zulu (2009), and Moyle and Wijngaards(2012) also pointed out other challenges of distance universities such as insufficient computer services and other ICT facilities, inadequate number of multimedia labs to enable e-content creation, lack of other necessary infrastructure such as bandwidth, staff retention, and computer illiteracy among students and staff. Inadequate allocation of financial resources also prevents from stepping towards digitalization. It is because essential steps for digitalization such as human resource training, developing and maintaining infrastructure need lots of financial resources.

Allama Iqbal Open University (AIOU) is Pakistan's first open and distance education university. It is also thinking to digitalize its resources and learning system. Like many other distance universities of the world, it is also facing challenges in this process. Different challenges mentioned by the researchers also appear to confront the University about the digitalization of printed material such as cost, qualified personnel, program layout and required technologies (Pandey, 2001). AIOU is a public sector university, but most of its expenditures are met with the students' fees which are not high enough to fulfil increasing cost for transferring materials from print to digital media. An efficient and effective digital learning university needs to have strong and well-designed digital learning infrastructure and environment to use digital technologies proficiently in distance learning which is also costly and time consuming. It has increasing number of enrolled students every year, and most of them come from rural areas. Traditionally, those students come with a lack of knowledge about digital devices and computer skills (although this scenario is changing now with more and more people having access to at least smart phones).

Many earlier studies explained that the challenges of digital learning in developed countries are mainly related with information safety of online learning material where they have lots of online learning resources for distance learners; but contrary to that, in developing countries, distance universities are still facing challenges in identifying needs of digital technologies for distance learners and how to fulfil those needs (Laurillard, 2002; Saade, 2003; Elloumi, 2004). Keeping this in view, the present study has been conducted to find out the needs of digital technologies for assignments, workshops and examination from the perspectives of the distance learners, and to explore the challenges that AIOU may face in its implementation.

Research Questions

This paper tried to find out the answers of the following research questions

- To what extent do distance learners at AIOU need digital technologies in their assignments, workshops and examination?
- What challenges is AIOU facing in the provision of digital technologies to distance learners for digital learning?
- How AIOU may overcome those challenges and provide digital technologies to the distance learners effectively?

Research Method

Research Design

Within mixed-method approach, an explanatory sequential method was employed to conduct the study. Survey was carried out for data collection from the students. Quantitative results were then drawn which were used to develop interview guide for qualitative data. Interviews were conducted from the administrators and library in-charge.

Population and Sample

Population of study comprised of 2145 M.A. and M.Ed. students from Faculty of Education who were enrolled in autumn 2015 from Rawalpindi and Islamabad regions. Out of them, 1138 students were selected randomly for the sample by applying computer method formula "=RAND()" in MS Excel. 963 students returned the questionnaires indicating a return rate of 84.6%.

Three administrators and one library in-charge were interviewed. The administrators of those departments were interviewed which would be mainly responsible for the digitalization and provision of digital technologies to the distance learners of AIOU.

Data Collection Tools

A questionnaire consisting of 21 items was developed which was divided into three sections: A, B and C. Section A was about demographic information (gender, age and qualification). Section B comprised of 12 close ended items that were divided evenly into three components of distance learning i.e. assignments, workshops and examination. The scale was ranged from 1 (strongly disagree) to 5 (strongly agree). In section C there were 2 open ended questions for further exploration and suggestions from distance learners.

A semi-structured interview guide was developed with 12 main questions about information regarding digital learning services at AIOU, challenges it could face in the provision of digital learning to its learners, and suggestions to overcome them. Supplementary questions were also asked as needed to probe the situation better.

Validity and Reliability of the Tools

Content validity Index (CVI) was carried out for validation of the tools. For this purpose five experts from educational technology field were invited to categorize each question, according to the objectives of the study in the following way: 1-not relevant, 2- somewhat relevant, 3-quite relevant and 4-highly relevant. The content validity index for questionnaires (14 research items) and interviews (12 main questions) were 0.85 and 0.87 respectively.

The Cronbach's alpha was applied to check internal consistency of the questionnaire. For this purpose 90 questionnaires were distributed among the students. These questionnaires were not included in final sample. 72 questionnaires were returned. The Cronbach's alpha for assignments, workshops and examination parts was 0.854, 0.841 and 0.834 respectively.

Data Collection and Analysis Techniques

For quantitative data collection, questionnaires were administered to the students through electronic mail. Out of 1138 e-mails, 963 were responded. Interviews were conducted face-to-face with all interviewees individually. They were audio-recorded. Notes were also taken during interviews.

The quantitative data was analysed using percentages, frequencies and mean score through SPSS (Statistical Package of Social Science). For qualitative data, inductive analysis was used to draw themes and codes from the interviews. Codes were put under themes. Similar themes were merged and collapsed. Finally, the names of the participants were replaced with codes R1, R2, R3 and R4 (respondent 1, respondent 2, respondent 3 and respondent 4) to hide their identity.

Data Findings and Interpretations

Data findings were divided into two main parts: needs for digital technologies as expressed by the students through questionnaires, and challenges in its implementation as expressed by the relevant University members through interviews.

Needs of Digital Technologies at AIOU

The distance learners at the University gave the following responses about the needs of digital technologies for their assignments, workshops and examination through questionnaires. Frequency of respondents' responses across each question is denoted by 'f'.

Table 1: Needs of Digital Technologies by the Distance Learners

Factors	Statements	SDA f(%)	DA f(%)	U f(%)	A f(%)	SA f(%)	Mean
Assignments	Online submission of assignments through email can give me quick feedback from my instructor.	6 (.6)	13 (1)	42 (4)	383 (39)	539 (55)	4.4
	University suggested websites would give me latest information for my assignment work.	9 (.9)	26 (3)	42 (4)	44 (45)	464 (47)	4.3
	Evaluation of assignments through online tutorial would help me to get quick feedback from my tutor.	7 (.7)	24 (2)	92 (9)	477 (49)	383 (39)	4.2

(Continued)

Table 1: (Continued) Needs of Digital Technologies by the Distance Learners

Factors	Statements	SDA f(%)	DA f(%)	U f(%)	A f(%)	SA f(%)	Mean
Workshops	Online lectures through Skype would be easier for me to attend along with my job.	5 (.5)	9 (.9)	22 (2)	583 (59)	364 (37)	4.3
	Wi-Fi facility in the workshop center would facilitate me during my study hours.	17 (1.7)	21 (2)	132 (13)	520 (53)	293 (30)	4.0
	WhatsApp can be easier than face-to-face classroom discussion	13 (1.3)	7 (.7)	22 (2)	420 (43)	521 (53)	4.4
Examination	Availability of instructional material of Smart phones would be easier than reading heavy textbooks.	4 (.4)	5 (.5)	82 (8)	391(40)	501 (51)	4.4
	Online quizzes would help me to assess my learning for exams.	11 (1)	16 (2)	107 (11)	560 (57)	289 (29)	4.1
	I prefer online exams to traditional one (with pen and paper)	61 (6)	39 (4)	223 (23)	411 (42)	249 (25)	3.8

SDA Strongly Disagree, DA Disagree, U Undecided, A Agree, SA Strongly Agree

Table 1 shows what the distance learners of AIOU thought about the usefulness of digital technologies. The students were mostly positive about it, and gave high scores to all of them (range 67–96). Apart from "preferring online examination to traditional one" in which 67% of the respondents agreed, in all other questions, 83% to 96% agreed. They thought most positively about online submission of the assignments (94%), University recommended websites (92%), online lectures (96%), WhatsApp/ Social media discussion (96%), and e-contents (91%).

Challenges in the Provision of Digital Technologies at AIOU

Interviews were then conducted from three administrators and one library in-charge to identify the challenges that AIOU is facing in providing digital technologies to the distance learners. Those administrators belonged to the departments which would play a direct role in the provision of digital technologies. Data was analysed and categorized under three main themes and seven sub-themes. Main themes were ICT resources & expertise, access to technology, and attitude towards technology. Sub-themes comprised of digitalization of printed learning material, ICT professionals, quality assurance, high cost of technology, digital divide, affordability of technology and change in mind-set.

First it was analysed which of the categories and themes the respondents talked about. Later, their interviews were analysed more qualitatively through key words and verbatim quotations.

In the table 2, "R" indicates the respondents whereas "f" represents frequency of responses from respondents (how many times that theme was mentioned).

Table 2: Challenges in Providing Digital learning at AIOU

Themes	Codes	Respondents	f
ICT resources & expertise	Digitalization of printed learning material	R1, R3, R4	3
	ICT professionals	R3, R2, R4, R1	4
	Quality assurance	R4, R1, R3	3
Access to technology	High cost of technology	R1, R3, R4, R2	4
	Digital divide	R1, R3, R2 ,R4	4
	Affordability of technology	R1, R4, R2	3
Attitude towards technology use	Change in mindset	R2, R4, R1	3

ICT Resources and Expertise

The participants pointed out that for digital learning, AIOU will have to digitalize its existing printed learning material into digital format as most of instructional materials of the university is in the printed form. Despite acknowledging its demand from the students, R3 pointed out some challenges. He said, *"….increasing number of students of this university demand from the university to digitalize its existing learning materials";* the increasing cost has kept the University from doing so.

The expertise in online learning for teachers is also essential for the successful implementation of digital learning (Tarus, Gichoya & Muumbo, 2015). The scarcity of assistance and guidance for instructors and teachers is a major cause in the failure of online education of the distance universities. Without efficient guidance and ability, any type of plan is meaningless and ineffective (Salmon, 2000). R1 said the same thing in these words *"University has difficulty in managing and organizing new advancements in teaching learning methods therefore separate departments are required for distribution of online learning material to the learners".* It basically mean that as the teachers are not well equipped with digital technologies skills, the University may need separate supporting departments including very strong IT/ ICT department. With the passage of time, academics and students would develop essential expertise in the use of up-to-date digital tools; but in the beginning, they might need technical assistance. The interviewees reported that most of the pupils of AIOU (at least in the cities) had android and laptops in their hands; however they lacked competency to successfully utilize the digital learning tools. Catherall (2005) said that there was a requirement of technical expertise for distance universities to prepare and operate software and platforms to have at least on-campus expertise. The interviewees also echoed the same opinion. They further added that the task became tougher and more expensive with every passing year as the number of material to be digitalized becomes larger and larger. Additionally, creating e-content takes long time which is a challenge of digital learning and distance institutions. Bates (2005) and Littlejohn (2005) said that converting or developing e-contents and their distribution to a large number of students of the distance universities needed a lot of time and resources. It is a big challenge for distance universities to provide diverse learning resources to a large number of enrolled students to fulfil their demand and expectation of learning (Berge, 2002; John & Williams, 2005). AIOU is also facing the same challenge.

Along with the provision of online learning materials, quality assurance of online learning materials is also necessary. As R4 pointed out,

"Challenges of digital learning are not only limited to the provision of sufficient technical support, it also requires diverse online learning resources and quality assurance of these available online learning resources or material to satisfy learning expectations of distance learners".

R2 pointed out that when the number was gigantic, and the students were not around; system or platform would become vital. Any flaw in it would create loopholes which could be easily exploited by the students. As a result, the system had to be tested and tried for quality assurance before it could be implemented.

Access to Technology

The faster Internet connection is critical for any distance university to continue digital learning. The students should also have access to internet and other relevant tools for it. Cost of internet connection in Pakistan is quite high which makes it very difficult for financially weak students to afford it. R2 said, *"In far off areas, not only Internet facility is not good (sometimes, there is no internet), but also the people are too poor to afford it".* High speed of internet is compulsory for any organization which offers online instructions to the students. According to study finding of Chapman and Mahlck (2004), in developing countries access to the Internet is very expensive. Affordability of internet connection is crucial for digital learning implementation. R1 explained that in these words *"Computers, internet connections and computer labs are insufficient in the University for the needs of a large number of students who desire to have online learning".* R2 further added *"…sometimes online assignments have additional costs".* According to Rumble (2001) and Bates (2005), the major cost is tutoring the courses. This includes hiring of additional teachers to give instructions to more enrolled students through online platforms. Web courses also need considerable maintenance, standard feedback, maintaining record, analyzing exams and assignment results, and also new research and upgrading to keep the system updated and bugs-free all the time. All these add to the cost of the offered program.

Along with all these, another challenge for the University is to provide digital learning to those distance learners who have no access to internet connectivity. The majority of students in distance universities of Pakistan belong to those areas where there is a lack of technical and even infrastructural facilities. That is why many distance universities have a corresponding way of instruction (through snail-mail) as the students lack access to technology (Bates, 2005). Equity and equality becomes a major issue in such circumstances. R4 said,

"For AIOU, it is a challenge to provide digital content to rural and urban area students equally as there is also inequality in technology provision, access and use. Also generally females in several regions of Pakistan use fewer technologies as compared to male pupils".

R4 pointed out a very important point while talking about the demerits of implementing digital technologies. He said that when the assignments and exams were carried out through computers and Internet, it would not only be a matter of academic competency, but also computer competency. One person with higher level of content knowledge might not be able to score high due to lack of computer competency and typing speed. Another person with less content knowledge might score better because he/she could type faster or had better computer competency. Consequently, the results may be reflective of typing speed and computer competency than academic level. Not only would it kill the spirit of exams (to assess the students in that subject knowledge), but would also create another kind of disparity between those with computer competency and those without it.

Attitude towards Technology Use

Positive attitude is required for effective implementation of digital learning, but most of the teaching faculty of the university remains busy in their work schedule. R2 pointed out that they could not find any extra time to give online instructions to the learners. Additionally, Respondent 1 said, *"Digital learning initiatives, especially in Pakistan can be best implementing if instructors are ready to change their mindsets to move from traditional to digital learning"*. Khan, Hasan and Clement (2012) also stated that if academics desired to effectively employ these tools in lessons, they had to hold optimistic thoughts towards its utilization.

The respondents also showed apprehension about the attitude of the students, saying that they were mostly looking for "easy way" to pass the exams, and just get the degree. Machines may not have that impact and the "fear factor" on the students as the humans might have.

Findings related to the challenges of digital learning for university are also relevant to the previous findings of Sife, Lwoga and Sanga (2007) that pointed out that challenges of digital learning in developing countries were mostly related to lack of training about the use of ICT tools, resources and expertise for e-content development, high cost of technology required, slow internet speed, lack of technical experts in these institutions, and high level of online services required. Digital learning requires the close cooperation of all departments including instructional or tutorial services, registration, online library, and networking services to provide quality learning system to the students. The findings of the present study are also closely related to the findings of other studies (Tarus et al., 2011; Kajuna, 2009) which found that distance universities in developing countries require a long time frame, large number of resources, well equipped infrastructures and internet connectivity to provide efficient online and digital services to its learners.

Overall, the study came up with three main findings. Firstly, findings related to the needs of digital technologies indicated that with the use of digital technologies, distance learners may be able to have increased flexibility of time and place in their learning and have reliable services from their university.

Secondly, if digital technologies are incorporated into distance learning, distance learners would have much better learning experiences and opportunities that would help them in their academic work as well as in skills development. They would also be able to get cost effective, quick and improved services from the university.

Finally, the study indicated challenges in implementing digital learning. Those challenges are mainly at four levels. Firstly, in the provision of online learning to those students who have no or less access to technology; secondly, finances and technical skills required for the development of digitalized online contents; thirdly to ensure and maintain the quality of these online learning resources, materials and platforms; and finally changing the attitude and mind-set of both teachers and students.

Discussion

Based on the findings of the study, it can be said that digital technologies are significantly needed by the distance learner as indicated by high percentages of their responses in favour of digital technologies. This has also been indicated in the study of Inglis, Ling and Joosten (2003) that the quality of distance learning can be improved by the provision of advance learning facilities to the distance learners. Majority of the distance learners agreed that digital learning supported learning without the limitations of time and space. Digital learning can provide quicker and more reliable services to distance learners. With the help of digital technologies, distance learners can get relevant information, quick feedback from their instructors, group discussion to have collaboration with their

study partners about their assignments, workshops and examination. Previous studies have also explained that digital learning gives pupils the freedom to replicate and include new knowledge into their learning (Malitghong, 2005; Mohantay, 2006; Potter, 2012).

Departments of ICT (Information and Communication Technology), IET (Institute of Educational Technologies) and central library of AIOU are mainly responsible for digitally supporting the distance learners. The challenges for these departments are mainly related to technical and instructional areas. It has also been found by other researchers that there is a requirement of technical expertise for distance universities to prepare and operate software to have on-campus expertise (Wagner et al., 2004; Catherall, 2005; Rosenblit, 2009). The main challenge of digital learning is to have a suitable incorporation of the digital technologies into the instruction at vast level to improve learning chances for everyone. This advantage should not only be for those who have access to technology, but also for technologically backward distance learners. Otherwise, instead of improving the overall standards and quality of education, it would only add to the disparities within the system.

In this scenario, the University may find it difficult to equally distribute e-content information to all rural and urban area students at the same time in the same way. AIOU does not get a lot of grants from the government, but is financially self-sustaining university. Its income with the current fee structure and without any government support may not be able to fulfill high cost of digital transformation from correspondence mode of instruction to the digital and online one. In this situation, the University finds itself at a dilemma. If it increases the fee, it will not be able to meet its fundamental goal of providing quality education to all especially those with low socio-economic status. On the other hand; if it does not digitalize, it may not be able to provide quality education in an efficient and timely way.

Not only is there is a need for appropriate system for the implementation of digital learning, there is also a need to have strong and effective learning environment and a positive mindset that is willing to learn, and willing to adjust according to the changing needs. The platforms, digitalization and technologies alone cannot do the magic until people are willing to be flexible, learn its ins and outs and then work in such a way that is best suited for it. A university that has been working for decades in a certain way, may be able to install new systems overnight, but would find it hard to change the mindset and hardened habits. The best strategy as one respondent pointed out, might be to incorporate digital learning in a systemic but gradual manner so that both the teachers and the students are able to pick it, and cope up with the challenges better.

Conclusions

The need of digital technologies is significant for distance learners because they do not want to rely on paper based sources of information only. Distance learners have acknowledged that during the study. They believe that with the use of technology for learning, they can do their learning in a better and more efficient way.

The situation about access and availability of digital devices especially smart phone is changing rapidly in Pakistan in the recent years with increasing number of people having access to smart phones. The number of distance learners who have smart phones or gadgets in their hands is increasing, and they have more awareness about the technologies. There is a need to enable these distance learners to use these gadgets effectively for study purpose on individual as well as collective level. Despite foreseeable challenges and issues, digital learning seems to be the way forward for AIOU and other distance universities.

Recommendations

The paper suggests that the tutors or instructors need support to develop electronic learning materials as well as knowing how to develop the skills for providing digital or online feedback and support to students. This must be tackled at two levels: services of ICT professional from the other institution may be gained initially, and then technical staff and instructors of the University should be provided with audio/video devices from the university, e.g. multimedia, webcam and Wi-Fi devices etc. so that they can learn and use them during their teaching hours and workshop centers.

University may face difficulty in the provision of digital learning to all distance learners as some of them may not have access to those devices or internet connectivity. However portable devices with Wi-Fi can be provided at the time of enrollment to the students with installed software required for the learning. The university can also setup small campuses or study support centers in different areas (or use the existing ones) with the cooperation of IT companies to support the students in digital learning in those areas. Many public and private companies may be willing to support the University as not only it will serve the noble cause of education, but would also be a good advertising opportunity for them.

Successful implementation of digital learning can only be possible if students and academics have sufficient training. The university may provide basic training to these students and academics before the execution of academic program activity. Incentives can also be given to those academics who participate in these training courses. To cater the needs of very large scale students, training videos can be made and provided to the students to let them learn by themselves about the use of digital technologies. Also printed manual on how to use ICT tools may be provided to distance learners along with online instructions. Quality assurance of these learning materials must be the responsibility of each head of the department in collaboration with ICT department.

Finally, there should be an annual needs assessment system for distance students to find out their study related needs before developing instructional learning material, and to update them from time to time.

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