Exploring Managerial Barriers and Strategic Opportunities for E-Learning Deployment in Afghanistan

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A B S T R A C T

E-learning has common meanings with the terms network-based education, distance learning, web-based education, and computer-based education. Today, e-learning is a common learning tool for education due to its effectiveness. Due to the Covid-19 lockdown, governments shifted their regular education to an e-learning system. Apart from opportunities, this shift created challenges and obstacles to its implementation. We aim to investigate the barriers and opportunities of e-learning deployment in public universities. Hence, a case study research was designed, and data was gathered through questionnaires and interviews with 96 individuals from Kunduz, Parwan, Kabul, Takhar, Ghor, and Samangan universities, encompassing diverse fields of study. The data were analysed using SPSS 26. According to this research, 63% of participants strongly agreed with the effectiveness of e-learning implementation. Furthermore, certain opportunities and obstacles emerged after the utilization of e-learning platforms by both students and lecturers. The challenges of e-learning deployment were lack of access to the internet, lack of stable electricity, and poverty. Contribution to the literature: In comparison with the existing literature, the current study provided an analysis of e-learning in its tension-filled relationship with the broader institutional structures and sociocultural realities of public universities in Afghanistan that circumscribe teaching and learning. The analysis provided entrées into infrastructural conditions, economic contexts, and socio-political circumstances that facilitate and inhibit the implementation of e-learning while offering suggestions for policymakers and practitioners in similar consideration of areas that are similarly unstable.

1. INTRODUCTION

The rapid advancement of technology has profoundly changed various aspects of human life, including education (Dubey et al., 2023; Musawi and Baktash, 2021). In particular, e-learning has emerged as a transformative innovation in educational practice, changing how knowledge is shared and acquired on a global basis. Nonetheless, research demonstrates that the reception and execution of e-learning is a slow cycle and not something that can be accomplished for the time being (Salehi and Hosseini Largani, 2020). This is apparent while considering the authentic improvement of distance realizing, which originates before the advanced age.

Distance learning has advanced through different stages, beginning with correspondence-based schooling worked with by postal administrations. The resulting presentation of radio and TV advances additionally changed distance picking up, permitting instructive substance to contact more extensive crowds through varying media (Kapenieks and Zuga, n.d.; Alruwais et al., 2018). The ascent of PCs and minimal plates (Albums) denoted the following stage, which was still to a great extent dependent on actual modes of data move.

E-learning, a more complex type of distance learning, addresses another part in this development. The appearance of the Web in 1989 made a novel stage for the fast development of e-picking up, giving new apparatuses to correspondence and asset sharing, for example, email, record moves, and video conferencing. These apparatuses have since become major to the conveyance of training in both created and agricultural nations (Musawi and Baktash, 2021).

Past exploration has principally centered around the advantages and difficulties of e-learning in different settings. For example, Al-Azawei et al. (2016) investigated the obstructions and chances of e-learning in Iraq, featuring infrastructural challenges. Technology has advanced rapidly and has already impacted multiple domains

of human life, including education (Dubey et al., 2023; Musawi and Baktash, 2021). e-learning is one of the more recent innovations that has changed educational practice, transforming the way knowledge is shared and constructed globally.

This study means to fill that hole by basically dissecting the boundaries and potential open doors for e-learning execution in Afghanistan's state funded colleges. By looking at both the infrastructural and monetary difficulties as well as the potential for remote learning, self-study, and mechanical reception, this exploration adds to the current group of writing by giving setting explicit discoveries that can illuminate policymakers and instructive foundations. Not at all like different examinations, which center around broad difficulties looked by emerging nations, this exploration underscores the novel difficulties of Afghanistan — a country wrestling with progressing struggle and underdevelopment. Moreover, the review reveals insight into the potential for e-figuring out how to conquer geological and financial requirements, consequently offering a decent viewpoint that thinks about both the challenges and the ground-breaking capability of computerized training in such settings.

E-Learning

The use of e-education in advanced societies is not new to our contemporary world. Developed countries have reached the stage of implementing distance education by using postal services, radio and television, and computer-based services. The first educational program on television was broadcast in 1959. Computers as tools for distance education and the preparation of educational materials using video, and compact discs are some of the steps in distance education (Alanazi et al., 2023). The one-sided nature of education was a major drawback of distance learning, which utilized postal, radio, television, and computer tools. Teaching involves interaction between learners and teachers. Distance education was only one way to learn. It wasn't more efficient or effective in this particular case. It's because only the teacher gets involved. Another phase of distance education has used the Internet or the Web. A new chapter in distance education can be considered the use of the Internet (Dubey et al., 2023) and its effective tools such as conferences and meetings. Contrary to previous methods, this type of instruction involves the student being accompanied by the instructor in person and obtaining online quasi-in-person instruction (Sönmez & Korucuk, 2023). This also has its concerns, and social relationships are weakened and lead to imaginary relationships in this type of education.

E-learning has common meanings and concepts with the concept of remote learning, network-based education, computer-aided education, and web-based education (Nouraey & Al-Badi, 2023). The concept of electronic education can be elucidated as follows: Electronic education encompasses a range of educational activities that are executed through the utilization of electronic tools, including but not limited to audio, video, computer, network, and virtual, among others (Musawi & Baktash, 2021),(Lockee & Gros, 2020). In other words, the Internet and all programs that lead to learning through computer networks are known as e-learning. E-learning is a tool that facilitates the learning process.

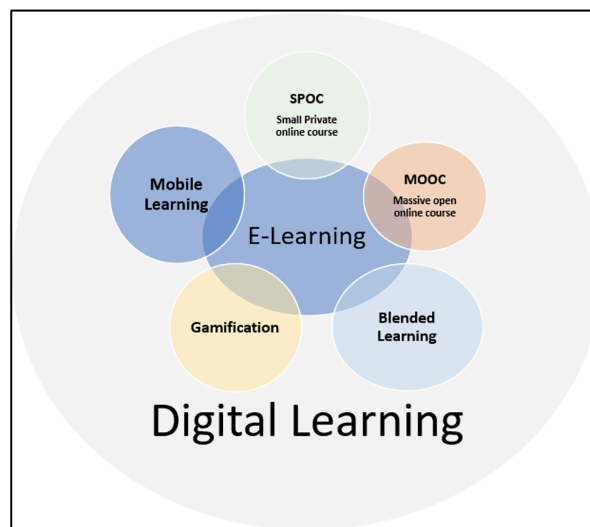**Components of Digital Learning within the E-Learning Ecosystem**

Figure 1. Diagram Components of Digital Learning: E-Learning, Mobile Learning, and Emerging Educational Models

The diagram provides a composite glance of Digital Learning by showing the intersections of various components on the larger scale of E-Learning. At the base of digital learning is E-Learning, coined as the umbrella term for different modes of online education. The diagram includes five major components of Mobile Learning (M-Learning), Gamification, Blended Learning, SPOC (Small Private Online Course), and MOOC (Massive Open Online Course). Each component represents a unique perspective of an approach within the E-Learning ecosystem (Barikzai et al., 2024; Nouraey, 2023).

Mobile Learning delivers education to learners via mobile devices of any kind and thereby provides for flexibility and reachability to the students wherever they are and at any time they want. Blended Learning has blended face-to-face education with online learning and is therefore preferable in formal educational setups. MOOCs are offered on a much larger scale to students with a free and open access, whereas SPOCs refrain from being larger in size and thus enable more personalized learning. Gamification incorporates gaming techniques and mechanics into educational platforms in order to enhance student engagement and motivation. Such learning paths collectively represent the foundation of Digital Learning, integrating art forms into E-Learning for more flexible, accessible, and scalable delivery of education. This integration has ushered in a revolution for modern learning within these emerging economies (Dubey et al., 2023; Hakimi et al., 2024).

E-Learning in Afghanistan

The establishment of the IT center of Kabul University in 2003 has established a link between Afghanistan's universities and international institutions. The Afghan universities have been linked up with global ones since then. Students and lecturers were able to access the internet and chat with friends online. The chance to chat with their friends after several years of war could be a dream for everyone, especially for students. Since 2005, many international universities have attempted to develop an e-learning platform. Thanks to this effort and the ongoing support from our Afghanistan International partners, all universities in Afghanistan now have fiber optic connections and have already gained internet access. The Kunduz University has an internet speed of 40 megabits per second. It could be a successful example of improvement between 2003 and 2020.

The emergence of COVID-19 has necessitated the adoption of e-learning devices and platforms (Zandi et al., 2003). E-learning was a top priority for the Afghanistan government because it outperforms its programs. Some research was done and proposed solutions. In Afghanistan, the initiative was implemented in two phases. In the first phase, the Ministry of Higher Education (Mohe) implemented e-learning using Google Classroom and continued the lesson during the COVID-19 outbreak. In the second phase, the MOHE collaborated with the University of Kabul Polytechnic to develop e-learning in public universities, and HELMS was developed. But, shifting from traditional learning to e-learning could have challenges in implementation. Afghanistan, like other countries, is suffering from different challenges when it comes to e-learning deployment. Challenges and opportunities are discussed in previous research in other countries. In (Al-Azawei et al., 2016; Oryakhail et al., 2021; Sağlam, 2019) challenges of e-learning were pointed out, but e-learning opportunities were not discussed. The opportunities for the implementation of e-learning in Afghanistan will be explored in this study.

The remainder of the paper is structured in the following manner. Section II presents the relevant research. Section III discussed the proposed method and material in detail. Results and discussion of the study are explained in Section IV. Finally, the conclusion is presented in Section V.

State Of the Art

(Oryakhail et al., 2021) study to identify barriers to e-learning implementation in Afghanistan's higher education by reviewing literature and identifying 17 main barriers, grouped into four dimensions: lecturers, students, infrastructure and technology, and university management. A survey of 783 participants from ten universities, with 670 responses analysed, found that most lecturers and students have varying ICT knowledge levels but lack access to ICT and e-learning tools. The results confirmed all 17 barriers except for "Lack of ICT expertise." The findings highlight significant challenges in adopting e-learning in Afghan higher education institutions.

(Salehi & Hosseini LARGANI, 2020) examine the current status and structural shortcomings of e-learning in Iran's higher education system, focusing on challenges and implications for effective governance from an e-governing perspective. Using a descriptive-analytical research method, it analyzes data from Iran's Ministry of ICT, theoretical literature, and existing studies to present a comprehensive view of e-learning and its governance implications. The literature review synthesizes findings from various scientific publications. The results indicate significant challenges to good governance in Iran due to underdeveloped educational and social infrastructures, political issues, low public awareness, insufficient national budget allocation, lack of innovation, and weak management.

(Salih & Taniwall, 2020) studied on Issues and Challenges of E-Learning System Adoption at a Public University in Afghanistan. This study at Shaikh Zayed University in Khost, Afghanistan, surveyed university administrative staff, students, and academic staff to identify and address e-learning challenges. Using an in-depth

literature review and a questionnaire, data were analyzed with SPSS to uncover prevalent issues. The findings revealed that the main barriers to e-learning integration include lack of awareness, linguistic skills, full-time power supply, institutional support, computer access, cultural barriers, and technical difficulties.

(Nasrat et al., 2020) studied the Challenges and Hurdles to E-learning Implementation During COVID-19 Outbreak from May to June 2020. An online survey was conducted at Shaikh Zayed University (SZU), Khost, Afghanistan, to assess the current status and identify key challenges hindering e-learning implementation amidst COVID-19. In a structured questionnaire via Google Forms, 216 responses were collected through social media and email. Findings indicate a general lack of ICT awareness and e-learning knowledge among participants, with most using WhatsApp for e-learning and material sharing. The study identified significant financial, technical, human, and regulatory challenges and provided crucial recommendations for effective e-learning implementation at SZU and other public universities.

(Sarwari et al., 2022) studied Distance learning during COVID-19 in Afghanistan: Challenges and opportunities. This study explored students' attitudes toward distance learning and its relation to their use of Telegram and duration of schooling during the COVID-19 pandemic. Two null hypotheses were tested: no significant relationship exists between students' attitudes toward distance learning and their duration of Telegram use or schooling. Data from surveys and semi-structured interviews with English Department students at Herat University were analyzed using SPSS, independent samples t-tests, and ANOVA. The results supported both null hypotheses, indicating no relationship between attitudes and duration of Telegram use or schooling, while qualitative findings highlighted context-specific challenges and opportunities associated with distance learning via Telegram.

(Quraishi et al., 2024) studied on Integration of Mobile Learning Technologies in Afghanistan Universities: Opportunities and Challenges. This study examines the adoption and integration of mobile learning technologies in Afghan universities, focusing on current status, challenges, opportunities, and perceptions. Using a quantitative approach, surveys were distributed via Google Forms to 200 students and educators across various disciplines and locations. Findings include equitable gender representation, reliable and valid measures, higher adoption rates among females, positive views on infrastructure and initiatives, moderate curriculum integration, and general satisfaction with accessibility. However, gender disparities in perceived effectiveness and accessibility were noted, highlighting the need for targeted interventions and gender-sensitive approaches to enhance mobile learning in Afghan universities.

Table 1. Related works to a state-of-the-art

ID	Ref	Identified Challenges	Identified Opportunities
1	(Salih & Taniwall, 2020)	Technical difficulties, Lack of foreign language skills, Lack of wariness, Lack of computer literacy, Unstable electricity	Null
2	(Oryakhail et al., 2021)	Lack of English language skills, Lack of ICT expertise, Lack of e-learning knowledge, Lack of motivation, resistance to change, Lack of e-learning knowledge, Lack of technical support, Lack of infrastructure, Lack of reliable internet connection, Lack of e-learning training programs, Inadequate financial support, Lack of clear plan	Null
3	(Nasrat et al., 2020)	Financial barriers, Technical barriers, Human barriers, Regulatory barriers	Null
4	(Frugh, 2019)	Lack of leadership support, Lack of adequate internet, Lack of student familiarity with IT Tools, Lack of IT facilities	Null
5	(Sarwari et al., 2022)	Low-speed internet, High internet package prices, Technical issues, Medical issues, Technological tools shortage (smartphone and laptop), Workload and pressure	Quick access to feedback, Telegram less internet, consumption, Easy file uploading and downloading, Telegram safe and secure messaging platform, Telegram texting, calling, and video/audio sharing features, Telegram collaborative atmosphere

2. RESEARCH METHOD

Data Sampling

The information was gathered involving a web-based poll conveyed across six state funded colleges in Afghanistan: Kunduz, Samangan, Takhar, Parwan, Ghor, and Kabul Training colleges. These colleges were picked in light of their topographical variety, portrayal of various financial circumstances, and their importance in offering advanced education in Afghanistan, giving a complete perspective on e-learning sending in both metropolitan and rustic regions.

The examination populace comprised of understudies and speakers from these colleges. A purposive inspecting strategy was utilized to guarantee that members from different scholastic fields and expert jobs (understudies and teachers) were addressed, as this variety would offer a reasonable point of view on the open doors and difficulties of e-learning. The testing additionally included people from various fields of review, in particular English writing, Persian writing, Science, Farming, and Software engineering, which are normally presented in the chosen colleges, giving bits of knowledge into e-learning reception across different disciplines.

A sum of 96 members were chosen for the review, including 28 females and 68 guys. This example not entirely settled to guarantee sufficient portrayal while staying practical for information assortment and examination. Members were drawn from the two understudies and teachers, with the breakdown as follows: N=72 understudies and N=24 speakers, catching the points of view of the key partners engaged with the e-growing experience.

The information assortment device was an organized poll that included two primary sorts of inquiries: Five-point Likert scale questions intended to gauge perspectives towards e-learning and its apparent adequacy. Three inquiries without a right or wrong answer, which were utilized to gather subjective information and were led in interview mode to give a more profound comprehension of the particular difficulties and potential open doors connected with e-learning. To substantiate the study's rigor, the survey was distributed systematically in an online format, thereby allowing everyone to have an opportunity to participate in the survey, especially due to the Covid-19 lockdown. The sample size of 96 was based primarily on logistical difficulty, while ensuring the sample size had enough statistical power to report meaningful results. The reader can find additional detail information related to the demographic and participant information in Table 2.

Questionnaire

The study began with a collection of articles discussing the difficulties and opportunities associated with online learning in developing countries. The next step involved examining relevant articles related to Afghanistan to prepare the questionnaire regarding Afghanistan's education status. Based on research, there could be two main questions. Moreover, we needed a lot of data to receive via open questions. Therefore, open (Q3, Q4) and Likert scale (Q1, Q2) questions are formulated.

Q1. E-learning is the most effective learning system in universities. (1. Strongly Disagree 2. Disagree 3. Neural 4. Agree 5. Strongly Agree)
Q2. Students and lecturers are satisfied with the implementation of electronic learning? (1. Strongly Disagree 2. Disagree 3. Neural 4. Agree 5. Strongly Agree)
Q3. In your opinion, what are the challenges of implementing e-learning?
Q4. In your opinion, what are the opportunities for implementing e-learning?

Table 2. Demographic Information of the Participants

Variables		Lecturer N (%)	Student N (%)
Gender	Female	5(4.8%)	23(22.0%)
	Male	10(9.6%)	58(55.68%)
Age	18-19	0(0.0%)	8(7.68%)
	20-25	4(3.84%)	67(64.32%)
	26-30	2(1.92%)	4(3.84%)
	31-35	4(3.84%)	2(1.92%)
	36-40	3(2.88%)	0(0.0%)
	41-45	2(1.92%)	0(0.0%)
Job		15(14.4%)	81(77.76%)
University	Ghor university	2(1.92%)	1(0.96%)
	Kunduz University	5(4.8%)	31(29.76%)
	Parwan University	2(1.92%)	9(8.64%)
	Samangan Institute of Higher Education	2(1.92%)	20(19.2%)

	Shaheed Rabbani Education University	2(1.92%)	18(17.28%)
	Takhar University	2(1.92%)	2(1.92%)
Field	English Literature	2(1.92%)	20(19.2)
	Persian Literature	2(1.92%)	19(18.24%)
	Computer Science	9(8.64%)	30(28.8%)
	Biology	1(0.96%)	(0.96%)
	Agriculture	1(0.96%)	6(0.96%)

3. RESULT AND DISCUSSION

The consequences of this study give significant bits of knowledge into members' impression of e-learning and the related difficulties. The information reflects both the open doors and obstructions looked in the execution of e-learning in state funded colleges.
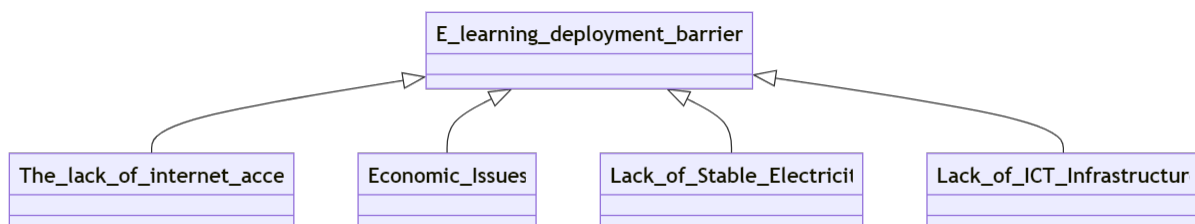
Table 3: Perception of E-learning Effectiveness

Perception of E-learning	Percentage	Description
Strongly Agree	63%	The majority of participants view e-learning as effective.
Disagree	20%	A portion of participants did not agree with the effectiveness of e-learning.
Neutral	17%	Some participants remained neutral on the effectiveness of e-learning.
Satisfaction with Implementation	Mixed Views	Varied opinions; some participants found e-learning effective but were dissatisfied due to obstacles such as internet access and electricity.

Table 3 shows the members' perspectives on e-learning and its adequacy. By far most of respondents (63%) firmly concur that e-learning is a powerful instructive methodology, proposing a feeling of idealism about its convenience. In any case, the possible conflict of 20% of respondents shows that there is a piece of the example that disagreed, demonstrating distrust according to e-learning viability. Furthermore, 17% of participants remain neutral. The table also illustrates how the views of participants on satisfaction with the implementation of e-learning are mixed, indicating that some participants acknowledge it as effective, but still many express disappointment, due to issues such as interconnectivity and existence of electricity. In a developing educational system, this tells us a mixed story about e-learning effectiveness.

Table 2 presents a comprehensive overview of the demographic and academic characteristics of lecturers and students. There is a notable gender disparity (Hakimi et al., 2024), with males being more prevalent among both lecturers (9.6%) and students (55.68%). The age distribution shows that most students are between 20 and 25, with no students over 35. Lecturers are spread across a wider age range, predominantly between 20 and 45. The employment status indicates that a significant proportion of students are between 20-25 years, suggesting that they are balancing work with their studies. Furthermore, the data reveals that students are predominantly from Kunduz University (29.76%), Samangan Institute of Higher Education (19.2%), and Shaheed Rabbani Education University (17.28%), while lecturers are evenly distributed across several institutions. Regarding the fields of study, Computer Science is the most popular among both lecturers (8.64%) and students (28.8%), followed by English Literature and Persian Literature. Fields such as Biology and Agriculture are largely underrepresented. This information highlights significant gender and field of study disparities, as well as the diverse age and employment backgrounds of the academic community.

Challenges of E learning

Figure 2: Diagram E-learning Development Barrier

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E-learning deployment barriers

The implementation of e-learning, similar to other programs, necessitates the provision of infrastructure and equipment. Therefore, the lack of necessary equipment may be the biggest obstacle and challenge for the implementation of e-learning in underdeveloped countries. According to Al-Azzawi et al. (2016) and Rahimi et al., 2024, poverty and the absence of e-learning equipment constitute the primary impediments to the implementation of e-learning According to this study, the aforementioned obstacles hold the greatest significance in the e-learning system of public universities in Afghanistan.

The lack of internet access

E-learning is dependent on an internet connection, and in some places, lack of internet high price of internet packages, or low-speed bandwidth are major problems in using the internet in Afghanistan. Because a 3 GB internet package that may not have 3G speed may cost around $7. Due to the limited internet bandwidth, it is necessary to wait for a few hours before uploading or downloading the file. Another important challenge is the lack of access to the Internet and telephone networks.

Economic Issues

Afghanistan is one of the most low-income countries in the world. In this study, the respondents indicated that poverty was the primary concern they identified when completing the questionnaire. According to Molina et al. (2017), and Barikzai et al., 2024 approximately 35.8% of Afghans reside below the poverty line. Furthermore, this survey shows that a significant number of students cannot access the Internet and other electronic devices. To participate in e-learning, every student and teacher must spend at least $ 7 for 3 to 5 GB of internet for a month.

Lack of Stable Electricity

Salehi and Hossieni (2020) stated that e-learning involves the use of electronic devices in learning. Therefore, electricity is the most significant issue when implementing or establishing e-learning, but the lack of electricity during 24 hours is the most significant issue in many places and villages in Afghanistan.

Lack of ICT Infrastructure

E-learning needs to provide multiple technological infrastructures. Its absence may lead to its non-implementation. Most of the university students in the country are poor. Among them, some students are not even able to buy the cheapest educational materials. This is one of the main obstacles to the participation of a large number of students in the e-learning process (Monib et al., 2023).

Opportunities of E learning
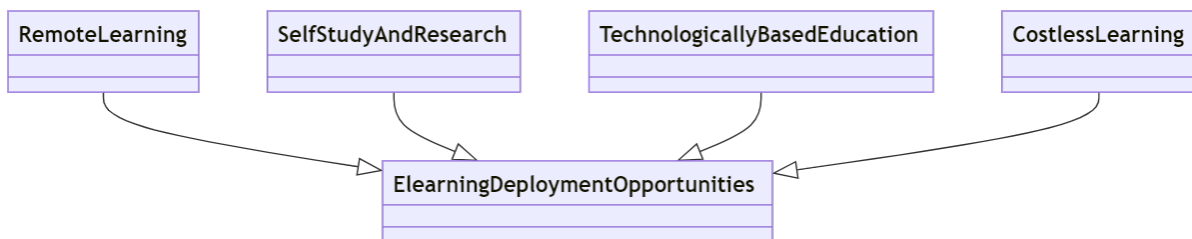
Diagram 3: E-learning Development Opportunities

E-learning Deployment Opportunities

Despite the mentioned obstacles, information and communication technologies and e-learning provided significant facilities and chances to both developing and developing nations. The survey data results in the following opportunities being conducted (Monib et al., 2023).

Remote learning

E-learning can be used for distance education. Most of the university students are from rural areas of the country. Online learning lets students connect with their teachers and classmates without having to leave home or pay for travel (Hakimi et al., 2024).

Self-study and research

In face-to-face training, students participate in class. In classes that are not standard in terms of number, the number of students may not be active. However, in electronic education, students' activities are registered and

reported through the system. In the study, the participants referred to the provision of field research and self-study as e-learning opportunities because they have used e-learning for independent study and research and thereby strengthened this characteristic in themselves.

Technologically based education

E-learning was implemented immediately after the emergence of the coronavirus, which led to the voluntary or involuntary use of e-learning in the education system. New educational technologies and tools were introduced to teachers and students who were not previously familiar with them.

Costless learning

One benefit of e-learning is that lecturers and students do not have to pay for travel, accommodation, and so on. The utility of e-learning has resulted in individuals who lack the financial means to reap the benefits of education.

4. CONCLUSION

The comprehensive demographic and academic data provided in Table 1 reveal significant disparities and trends between lecturers and students. The most significant observation is the pronounced gender disparity, with males being more prevalent in both groups (9.6% of lecturers and 55.68% of students) The age distribution indicates that the majority of students fall within the age range of 20-25, with no students exceeding 35, whereas lecturers are more evenly distributed across the age range of 20-45. This indicates a younger student body and a more diverse age range among lecturers. The employment status indicates that a significant proportion of students are balancing work and their studies, especially those aged 20-25.

According to the data on e-learning effectiveness, 63% of participants strongly agreed with its effectiveness, while 20% did not agree and 17% were neutral. Despite acknowledging the efficacy of e-learning, numerous participants expressed dissatisfaction with its implementation due to a multitude of obstacles. These challenges, particularly in Afghanistan's public universities, include a lack of internet access, high internet costs, insufficient bandwidth, frequent power outages, economic constraints, and inadequate ICT infrastructure. However, e-learning also presents significant opportunities for facilitating distance learning, promoting self-study and research, introducing new technologies, and reducing costs related to travel and accommodation. These insights highlight the dual nature of e-learning's impact, underscoring both its potential benefits and the significant barriers to its effective implementation in developing settings.

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