Journal of Social Sciences Research & Policy (JSSRP)

GISSR Global Institute of Social Sciences Research

Advancing Digital Learning in Pakistani Universities: A Mixed-Methods Analysis of Achievements, Obstacles, and Future Prospects

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ISSN: 3006-6557 (Online)
ISSN: 3006-6549 (Print)

Vol. 3, **No.** 2 (2025)
Pages: 350-366

Key Words:
Digital Education Initiative, Teaching Efficacy, digital Infrastructure, digital Technology, and Mixed Method Research

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Abstract: *The Higher Education Commission (HEC) initiated the "digital learning" (DL) program to modernize the educational processes at Pakistan's universities so that they are more professional and useful in the 21st century. The purpose is to better meet the demands of Pakistan. We tried to find out how well the DL project worked at the graduate level, but we had trouble with digital tools and keeping the classroom organized. The article also talked about the main parts of the DL project that the HEC worked on. A sample of 100 persons (70 students and 30 teachers) was chosen using a method that made sure the results could be used for a wider group of people, such as teachers and students at higher levels. A well-planned questionnaire was filled out that asked about digital gadgets and how students and teachers use them at higher education institutions (HEIs). Using SPSS 26.0 to do both descriptive (frequencies and percentages) and inferential (chi-square test) analysis of the data. It's found out those students at higher education institutions in Pakistan realized how vital digital bags and other tools were. But people needed to be able to get to these materials more easily. This study fills in the gaps between the DL system's results at colleges and universities of province Punjab, Pakistan and the abilities that are needed. A paradigm is proposed that brings together the most important parts of digital classrooms in higher education.*

Introduction

Digital learning environments use a range of digital resources to make studying and teaching easier. They also give ideas for how learning spaces can be set up in the future. The old way of doing things is likely to go away in the future because of this new area of digital education in digital cities. This area is looking for ways to make education better. This is especially true in developing countries like Pakistan. "Communities of different cultures live together as one talented community to transform into an urban culture based on ICT (Information Communication Technology) for sustainability in collaborative and participatory environment" is a clear definition of a digital city.

There isn't just one definition of digital education, although a lot of people throughout the world have worked on it. ICT tools and methods are changing the way schools teach in the past. More and more people are talking about the idea of a digital City because it may help individuals learn and get better at

their jobs. The study's purpose is to help students become more creative and gain 21st-century abilities. The study's goal is to improve learners' 21st-century skills and inventiveness. New technologies are always making things better all around us. New technology are continually improving things and making them easier for us. A number of students did well in school, but they lost enthusiasm in learning. The purpose of this study is to look into the good and bad points of HEC's digital education program for graduate students in Pakistan. But there are other issues, like keeping the classroom in order and employing digital tools. This study fills in the gap between the abilities that are needed and the results of the digital education system in Pakistan's colleges and universities. The growth of ICTs has an effect on most schools and universities. It's vitally important to lessen the negative effects of technology on teaching and learning so that teachers can better understand what their pupils need. Wikramanayake (2005) says that the world is moving from an information society to a knowledge society. We should also think about how the education system in Pakistan may get better if all teachers, parents, students, and other "digital natives" had a fresh sense of duty. We also need to think about how the Pakistani education system may improve if all teachers, parents, students, and other "digital natives" feel a new sense of obligation. We need to close the opportunity gap and make sure that all of Pakistan's kids have the same chances to get a solid education.

The New Society of Information in Pakistan

Pakistan has come a long way in digital transformation in the previous few years. There are many things that have helped Pakistan's information society grow faster, such as better IT and telecom services, faster growth of telecommunications infrastructure, and the internet and online learning making it easier for people to share information.

The purpose of making it easy for students to get online or utilize the Internet at all university campuses was to help them learn better and close the digital gap. Another important part is that LMS helps students study, get their grades quickly, and improve the quality of their education.

Review of literature

The HEC's digital Revolution in Higher Education project intends to modernize Pakistan's universities' current educational system so that it teaches information and skills that are valuable in the workplace in

the 21st century. This will help the country meet its needs better. Digital education includes digital classrooms, digital teaching and learning, digital technology, and, of course, brain power or a clever brain or a digital citizen—someone who knows how to use digital technology. Even though digital literacy is clearly important, there is a big difference between the digital abilities students have when they graduate and the ones companies want. This gap is commonly known as the "digital skills gap," and it poses a significant obstacle for both students and educational institutions (Feijao et al. 2021). A survey of companies in a variety of fields shows that there is always a gap between the abilities taught in schools and the skills needed on the job. Digital skills are often cited as a worry. This disparity not only hurts students' chances of getting a job, but it also hurts the general productivity and innovation of the workforce (Kayyali, 2024). To fill this gap, colleges and universities need to make digital literacy a top priority and include it in all of their teaching and learning activities. But there are challenges with adding digital literacy to higher education. Institutions have numerous challenges, such as limited resources, poor staff training, and the varying levels of digital competency among incoming university students. Also, because technology changes so quickly, the digital skills needed now may be very different from those needed in the near future. This means that curriculum development needs to be flexible and forward-thinking.

Because of this, cognitive capacity is becoming more and more recognized as the most important part of any organization (Wikramanayake, 2005). This change is happening because people are improving their ability to think critically and solve problems to the level that modern learners need. On the other hand, digital thinkers are those who are good at what they do and think outside the box when they have a difficulty. A digital educational effort is the result of putting together basic parts like digital infrastructure, knowledgeable teachers, interested students, and cutting-edge technology. This study aims to look into the connection between digital students, teaching methods, and the role of ICT in promoting better educational systems and urban growth through the use of different technological advancements. The following article will explain the current status of HEC's goals and its progress toward successfully completing its mission through a detailed questionnaire given to key stakeholders. To plan research initiatives that meet the skill-based needs of emerging Pakistan, it is important to support institutional financing.

The HEC's digital Education Initiative can help colleges and universities, as well as other interested parties, improve the quality of higher education and promote research in the country. The purpose of bringing technology into schools in Pakistan was to make university education better, increase research, boost the economy, and make ICT easier for students, teachers, and schools to use. The digital education project is what higher education will look like in the future. It would be a significant step toward improving teaching and learning if colleges and universities could figure out what the likely challenges are with adopting these technologies. The change develops slowly and sometimes in small ways, but when we look at it from a distance, we see that it has vast repercussions and big consequences. These fake concepts help us improve our society. The same thing happens in school. The most vital parts of making, sharing, talking about, and using talents properly are students who are taught and competent.

Now, digital access is everywhere, and technology is coming together in many areas, such as education. This has made new things possible. Al-Ansari (2006) observed that university professors use the Internet a lot to send and receive emails, look for material, talk to each other, and publish their research. He went into detail about how access to the Internet in college is still very limited. The purpose of making the Internet available to everyone is to help students learn better and close the digital divide between

students at all universities across campuses. Trilling and Fadel (2009, p.176) said that digital learningers should have seven skills along with the digital content: "Critical thinking and problem solving, Creativity and innovation,

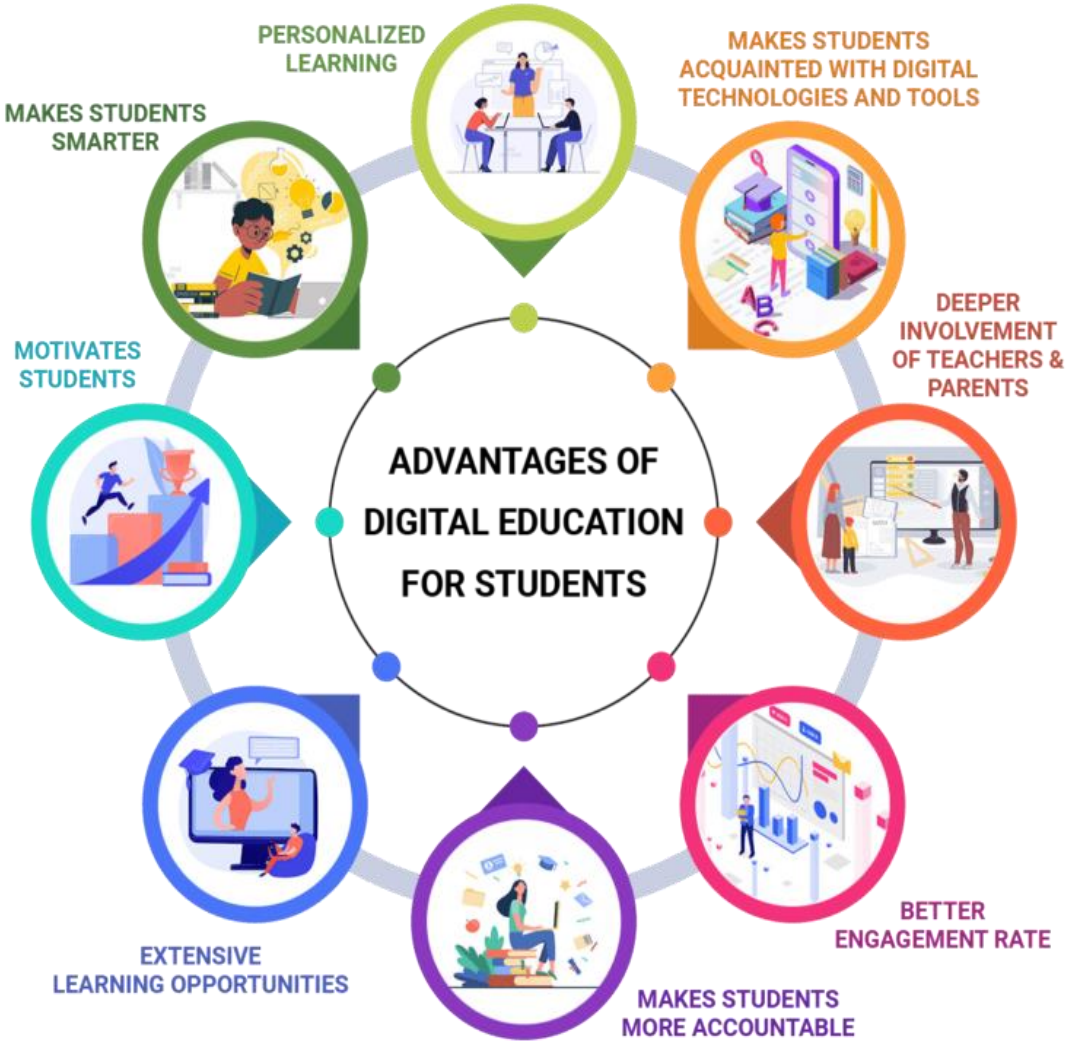
Collaboration and leadership, Cross-cultural understanding, Communication, ICT literacy, Career and life skills." Because of this, digital learning can use digital knowledge to finish and create study plans that are easy to share. Digital instructional content may assist students work together and improve their overall intelligence, which will always make sure that their study results are of top quality. Students can successfully use and access a variety of gadgets, and contact between students and teachers can lead to different kinds of collaboration. These make people work together, which will make sure that the quality of their study results never changes. Students can utilize and access a wide range of devices without any problems, and there are many ways for students and teachers to work together. Of course, the best way to make digital teaching simpler is to give the teacher more power. The training is aimed to assist instructors understand about the digital classrooms, the materials they will be utilizing, and the best ways to learn.

Knowledge-based civilizations wanted to boost the economy and make technology better. According to researchers a good democracy and a stable economy would also turn tough problems into possibilities to save money and improve services. Jo, Park, Ji, Yang, and Lim (2015) agreed with what Trilling et al. (2009) said about digital courses making it easier for teachers and students to work together, collaborate, and participate. Because of this idea of education, experts in technology say that the old way of doing things will probably go away in the future, especially in poor countries. People in Pakistan haven't done much yet, but they're working on how to use technology correctly and create a new learning environment, just like people all across the world are doing. Many cities are using technology more to gather information, come up with innovative ideas, and improve the lives of their citizens. Teaching has changed from traditional methods that put the teacher at the center to ones that put the student at the center, encourage participation, cooperation, and expand the learning environment beyond the classroom. A lot of things have been done to improve education in order to remedy this issue. To fix this problem, numerous steps have been taken to make education better.

Technology should be used to assist education flourish, which is very important in our culture. According to the HEC study report, Mahmood (2016) believes that the current status of the country shows a lot of promise and improvement in higher education institutions since 1998. The country now has 99 universities and 34 schools that offer degrees (Higher Education Commission 2010). But it might not be simple to fulfill this potential because Pakistan's schools have largely been focused on teachers until recently. It would be a major and hard step toward making teaching and learning better to find the probable concerns with using these technologies in higher education. The HEC has made a lot of progress in the last few years when it comes to information society metrics. The sector that uses the most information is higher education. But it might not be simple to realize this potential because Pakistan's education system has largely been focused on teachers until received. Finding the challenges that might come up when implementing these technologies in higher education would be an important but difficult step toward improving the quality of teaching and learning. HEC has already made a lot of progress when it comes to information society metrics. Higher education is the most important sector when it comes to accessing information.

According to Nasir (2017), online learning is growing more and more essential and is free to access. This includes Massive Open Online Courses (MOOCs) and DigiSkills from the Virtual University of Pakistan. But you do have to pay to acquire a certificate for MOOCs. According to Nasir (2017), most of the

students at the University of Azad Jammu and Kashmir (UAJK) use the Internet for schoolwork, whereas most of the students at IIUI use it to talk to friends and stay in touch with them. Students in colleges and universities can use the internet at home and at school. This can be because they have more time for things that aren't schoolwork. It is safe to say that students use the Internet in school for school-related purposes. Also, for enjoyment and to hang out with friends in their free time. We could talk about how students really feel about digital education, such how both sounds and pictures are crucial in our classrooms. They also learned that the Internet makes it easy for researchers to access information, but they don't get reliable information since libraries don't contain enough up-to-date and reliable research and information. Still, they can get to online databases for library and research publishing.



Achievements and Future Prospects

The digital revolution in ICT is making big and crucial changes in Pakistan. Taking these data into account, it is expected that the trend will speed up. In 2017, the Higher Education Commission (HEC) began the essential task of giving away 500,000 digital backpacks to students. The pupils got laptops that could be used as tablets and had touch panels that could be taken off. These digital bags would help students learn better in and out of the classroom, making them more creative learners. As a result, the tech tools will give students access to resources that will help them do better in school and meet the needs of the higher education business over the next five years. The Higher Education Commission

(HEC) wants to build 30 Open-Source Laboratories, each with at least 25 computer terminals, to help with research and the growth of higher education. The main purpose of our universities was to improve the education system, but not completely through technology because it was hard for teachers and students to acquire or adapt to new skills because they didn't have enough resources. Another report from the Higher Education Commission, I.T. Embedded HE (2017), claims that from 2017 to 2019, HEC supplied universities 300,000 laptops that could connect to the Internet. The digital initiative's goal is to give 94 public colleges access to high-quality Wi-Fi. It will assist teachers and students become ambitious knowledge workers, and researchers will be able to readily find Internet materials when their responsibilities alter to meet professional needs. Another significant component is that LMS is utilized to make education better, get grades back faster, and help students learn more. Learning Management System (LMS) is now being used by fifty new schools and universities to grade students online. Students would have to report on the results of all the tasks they have finished from 2017 to 2020. The government would pay for all universities to utilize a Learning Management System (LMS) for all of their classes. HEC has improved the system so that individuals can more easily access journals and e-books online. This will assist colleges and universities do more research. HEC has made it easier for people to get to journals and e-books online (Younas, SairaTaj, et al., 2023) in order to make the function of higher education sectors in research programs stronger.

The HEC created the University Industry Technology Support Program (UITSP) in 2017 to help PhD students undertake better research in Pakistan and make the country more competitive in the global market. The initiative can spend up to Rs.6 million over the course of two years. This is a significant step toward getting a lot of people to truly interact with academia.

Obstacles

The economic report for Pakistan says that the literacy rate is quite poor and has declined from 60% to 58% (Derbyshire, 2020). But when you look at its Asian neighbors, Pakistan is still very far behind. This is because pupils aren't doing well in school or in other areas, and the country doesn't have the right infrastructure. There is also a difference between the capabilities that the government has and the skills that the private sector needs. The government needs to pay to close this gap. Digital learning (DL) in a city needs research and development (R&D), but most schools don't have the tools and systems they need for it. A resource-based city depends a lot on its own natural resources, but for technical improvement, the most important elements are economic expansion, financial development, and technology advancement. These challenges are caused by digital schooling. The Pakistani government began to put together plans to use digital technology in classrooms. They made plans for how to use assistive technology in schools. This transition in education might be a turning moment when educating about technology changed how ICT was used in every part of school.

The problems in Pakistan are with the government's vision and the school's plan. "Vision 2025" is a plan by the government of Pakistan to use ICT in education to provide teachers and students greater control and improve their skills. Pakistan really requires a strong plan of action and rules in order to get things done. Most researchers agree that the activities that were taken are undoubtesey linked to ICT integration. It is simply a dream to use ICT in higher education in Pakistan. Most schools in big cities have ICT tools, but they don't know how to use them well since they don't have a clear goal or vision. Pakistan can't use the excuse of being a "developing country" to avoid adopting technology in schools anymore. The government should employ digital tools to improve its cities and make life better for the people who live there. According to Aghimien, Aigbavboa, Thwala, and Ohiomah (2019), the first stage is to fix the country's problems with digital ideas that might go in the way of change by thoroughly

measuring and resolving the problems. The government also needs to work more to make sure that the electricity is always on, since this has been an issue in the past. Digital technologies need a steady power source to reshape cities. It is also vital to set strict guidelines for internet service providers because they are a significant element of making digital cities happen. The government should cooperate with these groups to help them provide better services. This would make it easier for cities to change. The plan's purpose is to be a driving force that encompasses a wide range of self-directed, motivated learning materials and the use of ICT. In this way, we make it possible for cities to change. The plan aims to be a driving force that incorporates a lot of learning resources that people can use on their own and ICT.

Resistance to Change inside Institutions

Another problem that can make it harder for higher education to incorporate digital literacy is institutional resistance to change. Like many big businesses, universities can have a hard time getting used to new methods, especially when they involve big changes to how students learn and teachers educate. Resistance might come from institutional culture, long-standing traditions, and bureaucratic processes, which can make it hard to carry out large-scale digital literacy efforts. For instance, if digital literacy is not seen as important by

University leadership may not provide the necessary support or funding for its proper integration into the curriculum (Anderson & Tushman, 2018). Also, people may be against digital literacy initiatives because they are worried about how they may affect academic rigor and traditional teaching methods. Some teachers and administrators could be worried that focusing more on digital skills will take away from the main academic purpose of schools, which has always been to teach critical thinking, theoretical knowledge, and competence in certain fields (Janssen et al. 2020). To get beyond this opposition, you need to help everyone understand how important digital literacy is and how it can help and improve traditional academic goals. This could mean talking about best practices, sharing success stories, and getting people involved in conversations about how digital literacy is becoming more important in higher education.

Privacy and Moral Issues

Adding digital literacy also brings up important ethical and privacy issues. Colleges need to deal with issues like data privacy, cybersecurity, and the moral use of technology when they start using digital tools and platforms. For example, the use of online tests, learning management systems, and data analytics might make people worry about how student data is collected and used (Spante, 2018). Both students and staff may be worried about how their personal information is being used, who has access to it, and the chance of data breaches. If these problems aren't dealt with correctly, they could make people against efforts to improve digital literacy. Digital literacy instruction must encompass the ethical dimensions of technology utilization, including comprehension of digital rights, identification of misinformation, and promotion of responsible online conduct. However, adding these moral issues to the curriculum might be hard because it needs to be done on purpose and with the right teaching materials (Pangrazio & sefton-Green, 2021). Universities need to take the initiative to deal with privacy and ethical issues by making clear policies, teaching digital citizenship, and making sure that digital literacy classes teach students how to use technology safely and responsibly.

Objectives

1. To find out what the Higher Education Commission (HEC) of Pakistan thinks about digital Education.
2. To establish a digital Education model for Pakistan.

Research questions

The major goals of this study were to answer two questions:

1. What problems make it hard to attain digital Education and use it a lot in higher education institutions in Pakistan?
2. What can be done to close the gap between what a digital learning systems in Pakistani HEIs should be able to do and what it actually needs to be able to do?

Methodology

This study helped us grasp how important digital technology is. We collected information from both primary and secondary sources. Published works, reports, the Internet, and newspapers were all sources of secondary data. Students and lecturers from universities in Pakistan filled out a questionnaire to give us primary data. The goal of this study was to describe. We sent out surveys to look at the data and learn more about how the digital Education program is doing in Pakistan's universities, which was initiated by HEC. This study utilizes both quantitative and qualitative data (a mixed method) to look into the efforts that HEC has taken and the challenges that are coming in the way of digital education and its widespread use in higher education institutions in Pakistan. It also seeks to find out how to reduce the gap between the abilities that are needed and the results of the digital education system at Province Punjab, Pakistan's colleges and universities. There are 20 questions in the qualitative method, and one of them is open-ended while the others are closed-ended. These questions are for lecturers and students at universities. Then, the data were analyzed statistically using SPSS techniques to make clear correlations and links.

Samples and Surveys

Google™ Form, a free online service from Google, was used to send out the survey to the people we wanted to hear from. There was a poll of pupils and teachers that asked them general questions. Age, gender, city, name of institution, qualification, field of study, or discipline were all part of the demographic information. Questions about how HEC's current infrastructure is used for teaching and learning, as well as how the digital teaching and learning environment has changed the way students and teachers interact with each other. The idea is to see how students are using the digital environment. The method used is based on primary data that was gathered through a survey with one open-ended question and all other questions that were closed-ended. HEC has done things like give students and researchers digital backpacks or tablets, as well as Internet access, multimedia, and the LMS system for online tests at universities. These things could assist students learn and improve their talents in various aspects of life, notably in the context of education and training. This study will take a critical look at Pakistan's higher education system and its current situation, keeping the HEC purpose in mind. It will also tell you what you should do next. This study will look closely at the HEIs in Pakistan and the current condition of affairs in light of the HEC's goal. It will also give guidance on what to do next.

Sample Size

The people who took part in the study were picked at convenient sampling technique. People from several universities in Pakistan were picked to be students and teachers. The survey got their ideas and opinions, which helped make schools a better place to learn. So, the main information collected in Pakistan didn't look at gender discrimination at all. Instead, it concentrated on leveraging ICT to change the style of teaching to new ways in order to reduce the gap between digital education and the education system in the country's higher education institutions. The people that were chosen came from different backgrounds, and they were only allowed to join depending on how serious they were, which was primarily obvious from their occupations. The persons who answered were students and teachers at universities in Pakistan. The only criteria were that they have gotten digital bags from the HEC. So, people from many different fields, such as the humanities, social sciences, computer

technology, business and management, healthcare and medical sciences, engineering, fine arts, and more. But they all knew at least the basics of ICT. A survey was done online to find out what students and teachers thought about the DL program that the HEC initiated in the universities of Province Punjab, Pakistan's Punjab area. 70 students (64.7%) and 30 teachers (35.3%). They were picked utilizing a good way to choose.

Instrument

We did the online poll with Google™ Form, a free application on the web. This form collected the participants' ideas and comments, which helped make schools better places to learn and teach. The questionnaire had 27 questions. Demographic information includes things like gender, how you teach and study, your qualifications, the subject you study, and general questions. People from many different fields, including the humanities, social sciences, information technology, business and management, medical, and others, filled out the survey. Everyone knew the basics of ICT. In addition, everyone who answered was asked an open-ended question concerning the issues that the DL project encounters in higher education institutions in Pakistan.

The tool queried the respondents about (a) their access to digital devices, (b) the electronic gadgets that the HEC gives to students, teachers, and schools, (c) learning and teaching, (d) competency, (e) ability, and (f) educational platforms. (g) how useful LMSs are and why you should utilize them (h) things to help you study and (i) what people think about the HEC's proposal for the DL project in colleges and universities of province Punjab, Pakistan

People ask inquiries concerning the HEC's current infrastructure for teaching and learning. A digital teaching and learning environment has changed the way students and teachers talk to one other. We looked into how the students felt about DL. We also looked at what the HEC did, such giving out computer tablets, Internet access, multimedia, and bringing LMS to colleges and universities for students and researchers.

We looked at the literature, did some pilot testing, and got professional opinions in the field of education to come up with the final draft. It includes modifying the language of some sentences, defining words, and putting everything in order. Experts checked to make sure that the information was correct.

The main purpose was to modify how teachers teach by using ICT in new ways to make the education system in the country's HEIs more like DL. The persons who answered were students and teachers from universities in Pakistan.

Data Analysis

To statistically evaluate the data, we employed reply frequencies and percentages. In order to determine the respondents' DL perspective on HEC, we employed the chi-square test to search for significant differences between survey questions. The data analysis is divided into two sections.

Descriptive Analysis

Examining Inferences

The data was examined using SPSS 26.0. The descriptive analysis consisted of percentages and numbers. To perform inferential analysis, we employed the Pearson chi square (Daniel & Cross, 2018) test.

Descriptive Analysis

To find out how people used their digital backpacks, ten questions in total were asked. Each question had two possible answers: 1 for "yes" and 0 for "no." We calculated a "sb_score" by summing the academic activity scores for each of the ten questions. With 0 representing the lowest academic activity score and 10 representing the highest, the overall score could range from 0 to 10. Respondents were

divided into three groups based on these ratings: "0-3: low academic activity," "4-6: medium academic activity," and "7-10: high academic activity." Those in the "low academic activity" group with digital bags expressed "hype," while those in the "high academic activity" group expressed "hope" for the HEC's se initiative. In a similar manner, we also examined the rationale, efficacy, and goals of using LMS. In other words, we calculated the LMS combined score "lms_score" by summing up the responses to all 13 questions and classifying them into three groups according to their order. The DL environment, multimedia tools in the classroom, the use of audio-visual aids for teaching and learning, Wi-Fi access, fully furnished labs with the newest operating systems and software, institutional LMS access, and free access to digital libraries in institutions were among the other factors we examined (Table 2). Table 1's alpha coefficient of.720 demonstrates how reliable the tool was.

Table 1: Descriptive Statistics Of the responses of students and teachers with respect to these Initiative in Pakistan universities

Variable/combined scores	Code	Categories	Respondents (students and teachers)	
			Frequency	%
digital bags	sb_score	Low	66	32%
		Medium	86	42.2%
		High	52	25.5%
LMS	lms_score	Low	38	18.6%
		Medium	28	13.7%
		High	138	67.6%
Teaching modes and materials	Te_mode_mat	Low	28	13.7%
		Medium	78	38.2%
		High	96	47.1%
Level of access	lvl_access	Low	24	11.8%
		Medium	64	31.4%
		High	116	56.9%

14 questions were posed to gather opinions on the DL project in universities and its impact on teaching and learning (Table 3). We divided the opinions of teachers and students into two categories: "hype" and "hope." The majority of respondents claimed that effective use of ICT in the classroom improved instruction and facilitated communication between educators and students. The majority of respondents believed that technology-enabled instruction was a beneficial supplement to in-person interactions. Additionally, they believed that having access to a digital library facilitated knowledge discovery and that receiving prompt assignment feedback online or through email was beneficial. We discovered that 77.8% of teachers and 83.3% of students desired to use ICT in the classroom, demonstrating the significance of ICT tools. Additionally, 75.8% of students and 75.0% of teachers agreed that digital technology made it simpler for them to communicate with one another at university. Since they must be able to use ICT in the classroom and new teaching tools make them more competitive and help them retain their jobs, our teachers and students receive training in both technology and their jobs. The majority of respondents claimed that because utilizing ICT in the classroom reduced the amount of time required for subsequent lessons, DL had a noticeable impact on both teaching and learning.

Table 2. Opinion on the se initiative in institutions and impact on teaching and learning.

Variable	Code	Category	Number of respondents (204)	
			Students (132)	Teachers (72)
Adding ICT to education is vital.	Ict_imp	Hope	110(83.3%)	56(77.8%)
		Hype	22(16.7%)	16(22.2%)
Technology has an impact on our daily lives.	tech_lif	Hope	105(79.5%)	57(79.2%)
		Hype	27(20.5%)	15(20.8%)
Effective use of technology raises educational standards	edu_st	Hope	113(85.6%)	59(81.9%)
		Hype	19(14.4%)	13(18.1%)
ICT improves communication between teachers and students	enh_co	Hope	106(80.3%)	52(72.2%)
		Hype	26(19.7%)	20(27.8%)
Technology-enhanced education is a valuable complement to in-person interaction.	good_inc	Hope	111(84.1%)	53(73.6%)
		Hype	21(15.9%)	19(26.4%)
Online learning materials for additional reading alleviate the burden.	light_ld	Hope	100(75.8%)	52(72.2%)
		Hype	32(24.2%)	20(27.8%)
Accessing a digital library constitutes the most straightforward method of information retrieval.	dig_lib	Hope	98(74.2%)	48(66.7%)
		Hype	34(25.8%)	24(33.3%)
Submitting assignments through email or online platforms with immediate feedback is advantageous.	Feedbk	Hope	106(80.3%)	54(75.0%)
		Hype	26(19.7%)	18(25.0%)
digital technology has made it easier for people at universities to talk to each other.	simp_com	Hope	100(75.8%)	54(75.0%)
		Hype	32(75.8%)	18(25.0%)
Computer labs and Wi-Fi on campus are some of the things that help people learn.	fac_skil	Hope	108(81.8%)	56(77.8%)
		Hype	24(18.2%)	16(22.2%)
Online video lectures are productive	vid_lec	Hope	90(68.2%)	50(69.4%)
		Hype	42(31.8%)	22(30.6%)
Digital technology helps you learn and teach ideas.	Concepts	Hope	96(72.7%)	52(72.2%)
		Hype	36(27.3%)	20(27.8%)
digital technology can help you do better in examinations	exam_res	Hope	85(64.4%)	41(56.9%)
		Hype	47(35.6%)	31(43.1%)
Using new tools to teach makes	Compet	Hope	91(68.9%)	53(73.6%)

businesses more competitive and helps them hire and keep employees.	Hype	41(31.1%)	19(26.4%)

Table 2 shows what 132 students and 72 teachers think about the SE initiative and how it affects teaching and learning. It shows the balance between "Hope" and "Hype" attitudes. Most students and teachers think that adding ICT to education is important. 83.3% of students and 77.8% of teachers think it is promising, while smaller percentages think it is hype. Both groups also firmly agree that technology plays an important part in everyday life, with 79.5% of students and 79.2% of teachers saying it has a positive effect. A lot of people think that using technology well will improve education standards. This is backed up by 85.6% of students and 81.9% of teachers. Teachers (72.2%) were less likely than students (80.3%) to agree that ICT improves communication. Students (84.1%) are more positive than teachers (73.6%) when it comes to technology as a supplement to in-person learning. Seventy-five percent of students and seventy-two percent of instructors think that online learning materials make their lives easier. Digital libraries are likewise mostly perceived as helpful, but teachers (66.7%) agree with students (74.2%) a little less. 80.3% of students and 75.0% of professors agree that submitting homework online and getting feedback right away is a good idea. Digital technology is also thought to make it easier for people to talk to each other at universities, with about the same number of people (around 75%) agreeing with both groups. Most people (81.8% of students and 77.8% of teachers) think that things like computer laboratories and Wi-Fi are good for learning. 68.2% of students and 69.4% of instructors think that online video lectures are useful. 72.7% of students and 72.2% of teachers think that digital technology helps with learning and teaching ideas. However, fewer people were quite sure that technology will help children do better on tests. Only 64.4% of students and 56.9% of teachers were hopeful, while a large number still thought it was just hype. Finally, 68.9% of students and 73.6% of teachers agree that employing modern tools in education makes students more competitive in the labor market. Overall, the chart shows that most people have a mostly positive view of ICT integration. Hope is more important than hype in most categories, although there is still some doubt, especially about how well students would do on tests.

Inferential Analysis

Table 3: Bivariate analyses

Variable	Value	P-value
sb_score vs. imp_compet	χ2 (2)= 42.443	0.000
gad_hec vs. tech_skill	χ^2 (1)=4.879	0.023
gad_hec vs. exp_content	χ^2(1)=5.412	0.016

Table 3 shows bivariate analyses that show important connections between the variables that were analyzed. The association between self-belief scores and the importance of competence is highly significant, as evidenced by $\chi^2(2) = 42.443$, $p < 0.001$. This research indicates that persons possessing elevated self-belief are more likely to prioritize competence, implying a strong correlation between confidence in one's abilities and views of competence. In the same way, the link between guidance from the Higher Education Commission (HEC) and technology skills was significant, $\chi^2(1) = 4.879$, $p = 0.023$, showing that institutional guidance helps students or teachers improve their technological skills. The association between HEC guidance and content experience was similarly significant, $\chi^2(1) = 5.412$, $p = 0.016$, indicating that HEC support is important for improving the ability to interact with and create instructional content. In general, these results show that both personal elements, like self-belief, and institutional assistance, such coaching from HEC, are important for competence, technological skills, and

content-related experiences. several significant recommendations resulted from the open-ended question. For all students to benefit from DL, the HEC should provide it in locations that are difficult to access. To allow students and teachers to learn at their own pace, schools must ensure that everyone has access to fast, reliable, and affordable Internet. Students will also learn more efficiently with the aid of LMS. According to the majority of respondents, in order to bridge the digital divide, each teacher and student should receive a digital bag. Additional actions that were documented to improve teaching and learning environments included teacher education workshops, assistance with online assessment tools, and improving the relevance of online content.

Discussion

The digital learning (DL) initiative's research has garnered increasing attention and remains crucial for comprehending and enhancing the use of ICT in the classroom (Gros, B. 2016). According to the findings, 39.2% of researchers and students were provided with digital tools like laptops, learning management systems, Internet access, tablets, and other devices. The majority of educators and learners are able to access digital resources and use digital devices. According to the study's findings, more than half of the participants had access to digital technology, regardless of whether the HEC provided it to them. The majority of survey respondents (80.0%, hope) stated that they were "hopeful" about the DL effort and had a rudimentary understanding of ICT at the graduate level. According to the findings, neither teachers nor students knew enough about ICT or how to use it in the classroom. They were more adept at using digital bags than other digital tools because they use computers on a daily basis. Sending emails (68.6%, hope), using LMSs (66.7%, hope), completing assignments and lab work (71.6%, hope), using a digital library or downloading e-books (43.1%, hope), using social networking sites (67.8%, hype), and downloading music, movies, and games (60.8%, hype) all required digital bags. According to this research, the DL program gave students hope that they would be able to adjust and use ICT in the classroom, but teachers ought to have the same opportunity. We must bridge the gap between a DL project's outcomes, skill level, and access level. Lack of infrastructure, a lack of digital resources, and the inability of institutions to collaborate were among the issues raised by the study. It appears that the institution lacked the necessary staff and funding to manage digital bags (39.2%), the burden and overload of the syllabus (79.4%), expensive online content or digital learning tools (53.9%), a shortage of digital resources (75.5%), or institutional incompatibility (73.5%). The failure of the DL initiative may also be ascribed to a lack of available ICT professionals, shaky online content (65.7%), and limited bandwidth (72.5%). Higher education institutions (HEIs) must host training workshops, improve the relevance and reliability of online information, provide funding and resources, and bridge the digital divide in order to stay up to date with evolving technologies and the skills required for professional development. The hypothesis that all students and teachers in higher education should have access to intelligent resources is strongly supported by research findings (Deursen & Dijk, 2011). The figure below provides an overview of Pakistan's DL industry based on the fundamental components of DL.

The difficulties that arise when attempting to attain DL in HEIs and the necessary skills will now be covered in this section. Pakistan's literacy rate has decreased from 60% to 58%, per an economic survey (Derbyshire, 2020). In many crucial areas, such as student learning in both academic and extracurricular domains, Pakistan lags well behind its Asian neighbors. In line with Mikre's (2011) findings, this is caused by a lack of infrastructure. The skills required by the private sector and those held by the government are not aligned. In a city, research and development are crucial components of DL, but many schools lack the resources and assistance necessary for conducting research. Technical success depends on a city's natural resources, but it also depends on other factors like financial development, economic

growth, and technological advancement. The planned reforms for DL were initiated by the Pakistani government. The way that ICT is used in all areas of education may have changed as a result of technology (Deursen & Dijk, 2011).

Making digital resources in higher education institutions less complex and more affordable is one of the issues the government has recently had to deal with. This is a crucial point because when online resources and learning tools are too costly, it becomes more difficult for educational stakeholders to alter the teaching and learning environment to promote the use of technology. Unreliable internet content makes it more difficult for teachers and students to perform their jobs, so an additional issue could arise from the pressure of the syllabus and excessive workload. Fast and inexpensive Internet access will be a significant and beneficial supplement to ICT in the classroom. Learning at any level will be difficult if there is insufficient bandwidth or no Internet (Mikre, 2011).

Conclusion

We found that students at HEIs were able to use and adapt technology, including laptops and other tools, even if DL is significant and has an impact. However, it was essential to facilitate access to these resources. This study bridges the gap between the skills required and the outcomes of the DL system in Pakistan's HEIs. Although these experiences have always been costly and exclusive to specific institutions, they still face significant challenges, including ensuring inter-institutional collaboration, the digital divide (Chetty, Aneja, Mishra, Gcora & Josie, 2017), a lack of digital resources, and seower internet speeds. Making changes at a higher level to address these issues is difficult; everyone involved in education must assist. This project will provide the best learning opportunities for researchers and students. Therefore, it makes sense to use this program to teach others how to use it efficiently. The DL project's issue isn't with the ICT tools per DL; rather, it's with how these digital technologies are used and how children learn. The scope of DL resources must also be expanded by ensuring that all higher education levels have adequate digital resources, training, and support to aid students in their studies. Therefore, learning resources will be used more efficiently by reducing the initial skill gap between students of different socioeconomic backgrounds, academic levels, genders, and levels of accomplishment.

The key components of digital learning's environments in colleges and universities are included in the proposed model.

Recommendations

1. Enhance ICT Training for Teachers and Students

   Conduct regular, structured workshops and training sessions to improve teachers' and students' ICT skills.

   Encourage the integration of ICT into everyday teaching practices beyond basic tasks like emailing or using LMS.

2. Improve Access to digital Resources

   Provide laptops, tablets, and digital devices to all students and teachers at higher education institutions (HEIs).

   Establish digital libraries and open educational resource (OER) repositories to reduce reliance on costly online content.

3. Address Infrastructure Challenges

   Ensure stable and affordable internet access by expanding bandwidth across campuses.

   Upgrade institutional ICT infrastructure (servers, labs, Wi-Fi, digital classrooms) to support digital learning's.

4. Bridge the digital Divide

Offer subsidies or financial support for students from low-income households to access digital devices and internet connectivity.

Implement inclusive policies to minimize disparities across socioeconomic, gender, and academic backgrounds.

5. Strengthen Institutional Collaboration

Promote partnerships among universities, private sector organizations, and government agencies to share digital resources and expertise.

Establish inter-institutional platforms for research collaboration and ICT resource sharing.

6. Curriculum and Workload Reforms

Revise academic curricula to integrate ICT-based learning methods while reducing syllabus overload.

Encourage project-based learning, digital assignments, and e-assessments to make ICT a natural part of the learning process.

7. Quality Assurance of Online Content

Develop national standards for reliable, authentic, and context-appropriate online educational resources.

Encourage faculty to create localized digital learning content tailored to students' needs.

8. Capacity Building of HEIs

Allocate sufficient funding for ICT infrastructure, ICT staff recruitment, and maintenance of digital resources.

Establish ICT support units in universities to provide technical help to faculty and students.

9. Sustainable se Implementation

Ensure that the digital learning (DL) project is not just tool-driven but focused on pedagogical practices that foster critical thinking, collaboration, and innovation.

Monitor and evaluate DL initiatives regularly to assess impact, challenges, and areas for improvement.

10. Policy and Government Support

Formulate national ICT in education policies that ensure equity, accessibility, and sustainability.

Provide incentives for institutions that successfully integrate DL models into their teaching and research practices.

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