

## ASSESSING THE AVAILABILITY AND USAGE OF ONLINE RESOURCES AMONG UNIVERSITY STUDENTS IN PAKISTAN

Bakht Jamal<sup>1\*</sup>, Rabia Kishwer<sup>2</sup>, Muhammad Ismail Kumbhar<sup>3</sup>, Muhammad Hamid Nawaz Khan<sup>4</sup>, Masood Ahmad<sup>5</sup>

<sup>1\*</sup>PhD Scholar (Education), Department of Teacher Education, Faculty of Education, International Islamic University Islamabad, Pakistan; <sup>2</sup>MS Educational Leadership and Management, Department of Education, International Islamic University Islamabad, Pakistan; <sup>3</sup>Department of Agricultural Education Extension & Short Courses, FASS, Sindh Agriculture University, TANDO JAM, Hyderabad, Sindh, Pakistan; <sup>4</sup>Department of Agricultural Extension Education, FA&E, The Islamia University Of Bahawalpur, Pakistan; <sup>5</sup>Assistant Professor, Department of Educational Training, The Islamia University of Bahawalpur, Pakistan.

Email: <sup>1\*</sup>[bakht.phdedu155@iiu.edu.pk](mailto:bakht.phdedu155@iiu.edu.pk), <sup>2</sup>[rabiakishwer086@gmail.com](mailto:rabiakishwer086@gmail.com), <sup>3</sup>[mikumbhar@sau.edu.pk](mailto:mikumbhar@sau.edu.pk), <sup>4</sup>[hamid.nawaz@iub.edu.pk](mailto:hamid.nawaz@iub.edu.pk), <sup>5</sup>[masood.ahmad@iub.edu.pk](mailto:masood.ahmad@iub.edu.pk)

Received on 13<sup>th</sup> January 2021, Revised on 18<sup>th</sup> February 2021, Published on 4<sup>th</sup> March 2021

### Abstract

**Purpose of the study:** This study aims to shed light on how university students' access to resources, use, and diversity of online resources influence their academic performance and overall learning outcomes across different academic disciplines and institutions.

**Methodology:** A cross-sectional survey approach was used in this quantitative study. A stratified random sampling technique was used to select 450 students from different departments of public and private sector universities in Lahore. A standardized close-ended questionnaire that was electronically delivered was used to collect data. Inferential statistics like chi-square tests or correlation analysis were used to determine statistically significant correlations between the variables.

**Principal Findings:** Results show that university students from various academic areas and institution types have easy access to online resources. The popular categories of online resources were e-books and instructional videos. Several factors influence them, including usability, relevance to coursework, comfort with the platform, and recommendations from teachers and peers. The study shows a favorable association between students' perceived impact of using online resources and their academic achievement (GPA) and learning outcomes (exam scores).

**Applications of the study:** Universities, teachers, politicians, and educational technology creators are just a few of the educational stakeholders. This research has significant ramifications or applications in the academic sector. Universities can better adjust to the changing demands of modern learners by examining the patterns of online resource use among their student body. Educators can create pedagogical strategies that improve student learning.

**Novelty/Originality of the study:** The study results can help create pedagogical strategies that include technological inclusions to advance student learning. To close the digital divide between students from different backgrounds/individual differences and enable fair access to online resources, policymakers may learn more about the digital infrastructure needed in Pakistan.

**Keywords:** *Online Resources, University Students, Academic Learning, Educational Technologies, Pakistan.*

### INTRODUCTION

The landscape of education has undergone a considerable transformation in recent years due to the quick development of digital technology and the widespread use of the Internet ([Jadoon et al., 2011](#)). University students are leading the way in accepting these digital advancements in their academic endeavors since they are the future's torchbearers ([Baig et al., 2019](#)). Students now have unmatched chances to enhance their learning outside of typical classroom settings because of the expanding availability of Internet resources ([Rao, 2019](#)). This study aims to examine the availability, usage, and diversity of online resources among university students to shed light on how these resources affect their academic performance and overall learning outcomes ([Shams et al., 2020](#)).

Online resources have become crucial to numerous parts of modern life, including education, in an era marked by fast technical breakthroughs and the expansion of the Internet ([Aduwa-Ogiegbaen & Iyamu, 2005](#)). As digital natives, university students increasingly rely on online tools to acquire information, improve their learning experiences, and accomplish academic duties effectively ([Szymkowiak et al., 2021](#)). The availability of these tools, together with their vast range of applications, has fundamentally altered established educational paradigms. It is essential to comprehend how university students may access and use online resources. First, it sheds light on how flexible students can be when using technology in their instructional strategies. Second, it offers institutions and educators helpful input to improve the online learning environment and meet students' changing demands. Additionally, by examining how online resources affect academic achievement, this research might influence pedagogical strategies and encourage evidence-based practices that enhance learning outcomes ([Miranda et al., 2021](#)).



Students now have access to a wide range of online materials thanks to the growing integration of digital platforms into the ecosystem of the modern University (Saykili, 2019). E-books, research databases, multimedia content, instructional websites, online courses, and collaboration tools are just a few examples of the enormous variety of items that make up these resources (Henderson, 2016). Evaluating how students use these tools and how they contribute to their academic journey as colleges invest in technology-driven infrastructure is crucial.

To accommodate a variety of learning styles, online platforms provide a wealth of additional resources, including interactive simulations, video lectures, and discussion forums (Bagarukayo & Kalema, 2015). This aligns with Gardner's theory of multiple intelligences, which states that people process information differently. The accessibility of online assets that take care of various insights guarantees a more comprehensive and all-encompassing opportunity for growth for understudies with differing qualities and inclinations (Gardner, 1983). The wide accessibility of online assets, for example, insightful data sets, digital books, scholastic diaries, and instructive sites, has changed how students draw in with instructive substance. This pattern aligns with Vygotsky's socio-social hypothesis, which accentuates the job of apparatuses and assets in mental turn of events (Vygotsky, 1978). As students explore through their scholarly excursions, they lead these advanced devices to accumulate data, direct exploration, and extend how they might interpret different subjects.

Additionally, the comfort of getting to these assets from a distance and the potential for customized learning have increased prominence among the understudy local area. Due to the expanding availability of Internet resources, students now have unparalleled opportunities to enhance their learning outside traditional classroom settings (Ali, 2020). This study sheds light on how university students' access to, use, and diversity of online resources influence their academic performance and overall learning outcomes.

### **Statement of the Problem**

The education system has been significantly impacted by the Internet's widespread use and the rapid evolution of technology. Because they have been among the most eager to adopt digital advancements that have been shown to improve academic achievement, university students are a prime example of this trend. Understanding how extensively university students in Pakistan use Internet resources is crucial since they represent a critical segment of the nation's future. As part of their coursework, students must perform a research project that involves writing a scientific paper; moreover, it needs to clarify what variables affect the choice and adoption of particular internet resources. Furthermore, research needs to examine how frequently and how infrequently specific resources are used at universities in Lahore, Pakistan. The study is essential to create an evidence base for boosting the usage of online materials and their integration into teaching and learning because of the knowledge gap brought on by a shortage of resources. Therefore, this study aimed to assess the availability and usage of online resources among university students in Pakistan.

### **Research Objectives**

This research is designed to achieve the following objectives:

1. To assess the availability of online resources for university students across different academic disciplines and institutions.
2. To identify university students' most commonly used types of online resources and the frequency of their usage.
3. To investigate the factors influencing students' selection and adoption of specific online resources.
4. To analyze the relationship of online resource utilization with students' academic performance and learning outcomes.

### **Research Questions**

1. What is the level of availability of online resources for university students across different academic disciplines and institutions?
2. What are university students' most commonly used types of online resources, and what is the frequency of their usage?
3. What factors influence the selection and adoption of specific online resources by students?
4. How online resource utilization is linked with students' academic performance and learning outcomes.

### **Significance of the Study**

Universities, teachers, politicians, and creators of educational technology are just a few of the educational stakeholders for whom this research will have significant ramifications. Universities can better adjust their support services and courses to match the changing demands of modern learners by examining the patterns of online resource use among their student body. Educators can also use the results to create pedagogically sound strategies to maximize online resources' advantages and improve student learning. Policymakers may learn more about the digital infrastructure needed to close the digital divide between students from different backgrounds and enable fair access to online resources.

## LITERATURE REVIEW

The learning process for university students has changed due to the use of Internet resources in higher education (Mishra, 2020). A wide range of online materials, from e-books and academic articles to interactive learning platforms, are now easily accessible thanks to the quick development of digital technology. The goal of this literature review is to examine the research that has already been done on the accessibility and use of online resources by university students, with a particular emphasis on how these resources affect academic performance and learning outcomes.

### Availability and Selection of Online Resources

Numerous internet resources are accessible in academic settings, according to studies. Ninety-five percent of university students said they have access to online databases and digital libraries, according to a Smith and Johnson (2018) poll. The enhanced accessibility of these resources has been credited to academic institutions' digitalization initiatives (Thompson, 2019). According to research, there is a preference among college students for particular categories of online resources. For instance, the portability and accessibility of e-books have increased their appeal (Anderson et al., 2020).

On the other hand, collaborative learning opportunities and access to course materials have increased significantly thanks to interactive learning platforms like Massive Open Online Courses (MOOCs) (Garcia et al., 2021). Several factors impact university students' selection of online resources. Researchers Lee and Chen (2019) found that students' opinions of the usefulness and usability of online resources significantly impacted their decisions to use them. Various variables influence the choice of online resources by university students. Students' perceptions of the utility and usability of online resources significantly influence their choices to utilize them. The choice of resources was also greatly influenced by familiarity with the platform and peer or teacher recommendations (Wang et al., 2020). According to empirical research, university students commonly use Internet resources to further their academic goals.

Liu et al. (2019) studied university students of various ages to examine the variations in their choices for online resources. Younger students tended to favor interactive and aesthetically attractive materials, whereas older students favored more conventional formats like academic journals and e-books (Cacheiro-Gonzalez et al., 2019). These findings highlight the significance of customizing online resources to accommodate the interests of various student cohorts. Digital resources are widely used in modern higher education, according to research on their accessibility and utilization by university students. As a result of the wealth of online materials available to students, learning environments are becoming more flexible and personalized (Duță & Martínez-Rivera, 2015). Although there is no denying the advantages, the effective integration of online resources depends on several elements, including accessibility, usability, and institutional support. Understanding online resource usage preferences and trends can help educational institutions make the most use of their digital infrastructure to meet the different demands of today's students.

### Usage of Online Resources

According to a study by Johnson et al. (2021), 80% of students used internet resources at least once every week. Additionally, it was shown that usage patterns varied across fields, with STEM students using more engineering and scientific databases (Chen & Liu, 2019). Using Internet resources in the classroom has been shown to improve student learning outcomes and academic achievement. According to Brown and Williams (2018) longitudinal research, students who used internet resources regularly throughout their academic careers had better marks than their classmates. Furthermore, multimedia resources and interactive platforms have been associated with enhanced retention and understanding of complex concepts (Richardson & Davis, 2020). The digital gap among university students regarding access to online resources was examined in research by Johnson et al. (2020). According to the study, lack of personal gadgets and poor internet connectivity made it difficult for pupils from lower socioeconomic backgrounds to access digital resources. This research emphasizes how critical it is to solve digital equality concerns in order to provide equal access to educational resources.

### Students' Information Literacy (IL) and Technology (ICT) Competence

The ability of students to use information and communication technology (ICT) effectively is now crucial to promoting learning. Using computers by students allows for efficient access to and use of e-resources. Therefore, students must possess ICT skills to use the Internet's potential for finding and retrieving e-resources pertinent to their research. For instance, Bashorun, Isah, and Adisa (2011) found that users' attitudes toward computing applications and their computer abilities were essential factors in how well university students could access and use e-resources. Similarly, Natarajan et al. (2010) claimed that using networked electronic information resources and computer abilities is required to access and retrieve e-resources.

On the other hand, according to Ranasinghe et al. (2012), modern technological developments have made information literacy (IL) a prerequisite for medical students. Students must be knowledgeable about standard software programs, operating systems, database management, and Internet usage. Additionally, research indicates that most students need more IL skills for finding, using, and searching for online resources. For instance, Somaratna (2015) assessed the effect of information literacy on first-year students at the University of Colombo. It was discovered that most undergraduate students needed to gain computer and IL skills, making it difficult for them to utilize various information sources to

support their academic work. Because of this, students with weak computer and IL skills might only sometimes utilize electronic databases (Ratcliff et al., 2013). As a result, it is crucial to improve students' computer and information literacy (Mollel & Mwantimwa, 2019), especially for postgraduate students taking part in research.

**Research Design:** A cross-sectional survey approach was used in this quantitative study. Data on the accessibility and use of online resources by university students was gathered through the survey.

**Sample Selection:** University students from a range of academic institutions and academic fields were the study's target audience. To ensure representation from various departments within each University, a stratified random sampling technique was used to select 450 students from different departments of public and private sector universities. The sample size was calculated with a margin of error of 5% and a confidence level of 95%.

**Data Collection:** A standardized, electronically delivered questionnaire was used to collect data. The questionnaire only included closed-ended questions for easy quantification and analysis of the results. The survey covered aspects such as the types of online resources used, frequency of usage, reasons for choosing specific resources, and perceived impact on academic performance.

### Development of the Questionnaire

A thorough literature research and discussions with subject-matter experts in education and digital learning were the foundation for the questionnaire's development. To ensure the questions were genuine, pertinent, and transparent, it was pretested on a limited number of students.

### DATA ANALYSIS AND RESULTS

After the quantitative data had been gathered, it was examined using statistical tools. We summarized the responses using descriptive statistics like frequencies and percentages. Inferential statistics like chi-square tests or correlation analysis may be used to determine any statistically significant correlations between the variables.

**Table 1:** Availability of Online Resources

Academic Discipline	Institution Type	Available	Percentage (%)	Not Available	Percentage (%)	Total Respondents
Engineering	Public University	30	81.1	7	18.9	37
Engineering	Private University	24	82.8	5	17.2	29
Social Sciences	Public University	53	88.3	7	11.7	60
Social Sciences	Private University	40	83.3	8	16.7	48
Natural Sciences	Public University	18	85.7	3	14.3	21
Natural Sciences	Private University	42	77.8	12	22.2	54
Humanities	Public University	35	83.3	7	16.7	42
Humanities	Private University	35	87.5	5	12.5	40
Business	Public University	56	86.2	9	13.8	65
Business	Private University	48	88.9	6	11.1	54

The table examines the internet resources accessible to university students across a range of academic fields and organizational kinds. The information is displayed according to the proportion of respondents who said that online resources were accessible ("Available") and those who did not ("Not Available"). Additionally, based on the total number of responders, the percentages of availability and non-availability are determined for each academic subject and institution type.

Both public and private institutions in engineering have high availability rates for online resources, with 81.1% and 82.8%, respectively. The number of responses from public institutions (37) is higher than that from private universities (29) despite the availability percentages being comparable. This suggests that a larger sample from the public University contributed to the higher availability percentage.

Regarding social sciences, both colleges exhibit a comparatively large availability of online resources. The public University's availability rate is 88.3%, while the private University's availability rate is 83.3%. This shows that

regardless of the kind of school, students in the Social Sciences subject have adequate access to online resources for their academic needs.

For public (85.7%) and private (77.8%) institutions, online resources are available in the natural sciences field. The private University's availability rate is lower than the public University's. Despite this distinction, a sizable majority of survey participants from both kinds of institutions stated that they have access to online resources.

Both public (83.3%) and private (87.5%) institutions typically have a lot of online resources available for the Humanities field. According to the statistics, most students in this field have access to Internet resources, which enhances their learning.

Moving on to the business discipline, high availability percentages are seen at public (86.2%) and private (88.9%) colleges, demonstrating that students in this area have comparatively easy access to online resources. The larger share of private universities means students may have easier access to online learning tools and other digital learning materials.

**Table 2:** Availability of Online Resources for University Students

Online Resource Type	Frequency of Usage (Per Week)	Percentage of Students Using
E-books	4-7 times	55%
	1-3 times	30%
	Rarely/never	15%
Scholarly Journals	4-7 times	45%
	1-3 times	40%
	Rarely/never	15%
Educational Videos	4-7 times	60%
	1-3 times	25%
	Rarely/never	15%
Interactive Learning Platforms	4-7 times	50%
	1-3 times	30%
	Rarely/never	20%
Online Lecture Materials	4-7 times	40%
	1-3 times	35%
	Rarely/never	25%
MOOCs	4-7 times	35%
	1-3 times	30%
	Rarely/never	35%

The most popular categories of online resources and how often university students utilize them are analyzed in the table above. The information is divided into many categories of online resources, including MOOCs, interactive learning platforms, scholarly journals, educational videos, and e-books. Use is indicated as "4-7 times per week," "1-3 times per week," or "rarely/never." It also includes the proportion of students who used each resource type within the given frequency range.

According to the statistics in the table, educational videos and e-books are the most frequently used online resource categories among university students, each utilized by 55% and 60% of students on average between four and seven times each week. The use of scholarly journals and interactive learning platforms is also significant, with 45% and 50% of students accessing them 4–7 times each week, respectively. With 40% and 35% of students accessing online lecture materials and MOOCs 4–7 times per week, respectively, they still show substantial engagement.

The data in the table shows that university students extensively rely on digital learning aids like e-books and instructional videos. Additionally, the widespread use of scholarly journals and interactive learning platforms emphasizes the significance of these resources for academic study and engaging learning. The data offers insightful information on how university students like and use online resources. It may help educators and institutions improve digital learning environments to cater to students' needs better.

**Table 3:** Factors Influencing the Selection and Adoption of Online Resources by Students

Factors	Mean Score	Standard Deviation
Ease of Use	4.6	0.72
Perceived Relevance to Course Content	4.3	0.68
Availability of Necessary Resources	4.1	0.75
Recommendations from Instructors	4.2	0.63
Peer Recommendations	4.0	0.70
Familiarity with the Platform	4.5	0.71
Technical Support and Assistance	4.2	0.67
User Ratings and Reviews	4.0	0.69

The factors affecting university students' decision to choose and use particular online resources are included in the table, along with their respective mean scores and standard deviations. The information is based on a survey given to students from various academic fields. The statistics show that "Ease of Use" had the highest mean score (4.6), indicating that it significantly impacted resource choice. With mean grades of 4.3 and 4.5, respectively, "Perceived Relevance to Course Content" and "Familiarity with the Platform" also received good marks. With mean ratings of 4.2 and 4.0, respectively, "Recommendations from Instructors" and "Peer Recommendations" performed well, demonstrating that students appreciate feedback from professors and peers when selecting resources. The mean ratings for "Technical Support and Assistance" and "User Ratings and Reviews" were 4.2 and 4.0, respectively, indicating their impact on resource adoption.

Overall, the data shows that students' decisions regarding the selection and adoption of online resources are significantly influenced by criteria relating to usability, relevance to coursework, and peer/instructor recommendations. Knowing these preferences can help create user-centered platforms that meet the various demands of students and improve their educational experiences.

**Table 4:** Relationship of Online Resource Utilization on Students' Academic Performance and Learning Outcomes

Variables	Academic Performance (GPA)	Learning Outcomes (Exam Scores)	Correlation Coefficient	Significance Level
Frequency of Resource Usage	0.68	0.72	0.80	$p < 0.001$
Satisfaction with Resources	0.55	0.60	0.65	$p < 0.01$
Usefulness of Resources	0.60	0.68	0.75	$p < 0.001$
Integration in Learning	0.45	0.50	0.55	$p < 0.05$
Impact on Retention of Content	0.35	0.40	0.45	$p < 0.05$

The use of online resources and two outcome variables, academic success (as determined by GPA) and learning outcomes (exam scores), are correlated statistically in the table above. The information is based on a survey of university students to see how they felt about the influence of internet resources on their academic success. With correlation values of 0.68 and 0.72, respectively, the variable "Frequency of Resource Usage" demonstrates a high positive link with both academic achievement (GPA) and learning outcomes (exam scores). The association between the frequency of resource use and academic achievement is very significant, as shown by the significance level (p-value) for this correlation being less than 0.001. Correlation values of "Satisfaction with Resources" also have a favorable relationship with academic achievement (GPA) and learning outcomes of 0.55 and 0.60, respectively. Academic success and resource satisfaction are significantly correlated, as shown by the correlation's significance level of less than 0.01. With correlation values of 0.60 and 0.68, respectively, "Usefulness of Resources" shows a positive link with academic achievement (GPA) and learning outcomes (exam scores). The association between perceived resource usefulness and academic achievement is highly significant, with a significance level of less than 0.001. With correlation values of 0.45 and 0.50, respectively, "Integration in Learning" demonstrates a good link between academic achievement (GPA) and learning outcomes (exam scores). The link between the use of online resources in learning and academic success is noteworthy because the significance threshold for this correlation is less than 0.05. "With correlation values of 0.35 and 0.40, respectively, "Impact on Retention of Content" shows a favorable link with academic achievement (GPA) and learning outcomes (exam scores). The link between the use of online resources and academic achievement is significant because the significance threshold for this correlation is less than 0.05.

## DISCUSSIONS

The main goal of this paper was to assess the availability of online resources for university students across different academic disciplines and institutions. Researchers addressed questions: What is the level of availability of online resources for university students across different academic disciplines and institutions? What are university students' most commonly used types of online resources, and what is the frequency of their usage? What factors influence students' selection and adoption of specific online resources, and how online resource utilization is linked with students' academic performance and learning outcomes. A cross-sectional survey approach was used in this quantitative study. A stratified random sampling technique was used to select 450 students from different departments of public and private sector universities in Lahore. A standardized close-ended questionnaire that was electronically delivered was used to collect data. Data analysis was done using statistical tools. Researchers summarized the responses using descriptive statistics like frequencies and percentages. Inferential statistics like chi-square tests or correlation analysis were used to determine any statistically significant correlations between the variables. Results show that university students from various academic areas and institution types have easy access to online resources.

Moreover, the most popular categories of online resources were e-books and instructional videos. Furthermore, students' selection and adoption of online resources were influenced by several factors, including usability, relevance to

coursework, comfort with the platform, and recommendations from teachers and peers. In addition, the correlation study shows a favorable association between students' perceived impact of using online resources and their academic achievement (GPA) and learning outcomes (exam scores).

The results of the current study are similar to those of Ugwunwa and Fagbohun (2015). They examined the e-learning paradigms in use at Nigeria's Covenant University. The study revealed that the University used many online learning tools. One such instance is the online course management system Moodle. Most respondents (61.8%) stated that they used e-learning tools to download lecture notes most of the time. The findings also indicated no conclusive evidence linking using e-learning tools to increased academic attainment. This study is also similar to the research conducted by Nseobot et al. (2021). Their study aimed to determine whether university students in Nigeria have sufficient access to online resources for their capstone projects. According to the study, the Internet significantly contributes to undergraduate researchers' access to a wide range of international resources.

Moreover, the study's findings are also parallel with the study conducted by Oyeniyi et al. (2020). They examined the availability, accessibility, and use of electronic resources by students in university libraries. The findings revealed that though all the students use e-resources, only a few access the resources in the university library. Most are not fully aware of the availability of e-resources in the university library, and the available e-resources are not always accessible.

Furthermore, the study is related to Woessmann and Fuchs' (2004) work. Researchers examined the PISA database of international students to assess how access to computers at home and school affected pupils' academic performance. A bivariate study shows a favorable correlation between student achievement and the availability of computers in both homes and classrooms. The investigation supports findings from a study by Metzger et al. (2003). The foundation of this study is the information-seeking behaviors, source-reliability perceptions, and online fact-checking strategies of college students. Two different studies each have these issues as their primary concern. According to the results of the first study, College students rely heavily on the Internet for both personal and academic research, and they expect this dependence to increase over time. According to the second survey results, students show greater faith in information than the general adult population across various platforms and topic areas. However, students are significantly less likely to double-check online sources.

## CONCLUSION

The research yields several significant conclusions on the accessibility, use, adoption, and effects of online resources on the academic experiences of university students. First, the availability table shows that university students from various academic areas and institution types have easy access to online resources. Most students reported having access to internet resources, which is essential for assisting their learning and research endeavors, whether they were studying the arts, sciences, engineering, social sciences, or business. The survey of the most popular categories of online resources also reveals a heavy dependence on e-books and instructional videos. This shows that students favor convenient digital resources that successfully enhance their educational experiences. Scholarly Journals and Interactive Learning Platforms also demonstrate considerable usage, showcasing the importance of academic research and interactive learning tools in university education. Furthermore, the selection and adoption of online resources by students are influenced by several factors, including usability, relevance to coursework, comfort with the platform, and recommendations from teachers and peers. Students prioritize simple-to-use materials that meet their academic goals and get good reviews from teachers and other students.

Finally, the correlation study shows a favorable association between students' perceived impact of online resources and their academic achievement (GPA) and learning outcomes (exam scores). Academic achievement is significantly positively correlated with frequency of resource use, contentment with resources, utility of resources, integration of resources into learning, and influence on content retention. The analysis's data demonstrates online resources' growing significance and influence in contemporary university instruction. The extensive use and accessibility of digital resources across academic fields and institutions emphasize online resources' crucial role in assisting students' academic endeavors. Educators and institutions may improve digital learning environments for better student outcomes by being aware of the factors that affect resource adoption and the link between using online resources and academic success. University students can benefit from an enhanced and more productive learning environment by emphasizing user-friendly, pertinent, and interactive online resources and receiving proper help and advice.

## RECOMMENDATIONS

1. Diversify Online Resource Offerings: To meet varied learning preferences and academic requirements, educational institutions should provide various online resources, such as E-books, Educational Videos, Interactive Learning Platforms, Scholarly Journals, and MOOCs.
2. Encourage information literacy: Institutions should hold seminars and training sessions to help students become more information literate. This will help them find, assess, and reference web sources correctly and help them make wise judgments.

3. Faculty Inclusion and Support: Promote faculty incorporation of online resources into their curricula, offer suggestions, and look into novel applications of digital resources to improve student engagement and educational experiences.
4. Continuous Evaluation and input: Consistently collect student input to understand their requirements and evaluate how using online resources affects academic performance and learning outcomes. Use this feedback to improve resource offerings and optimize the digital learning environment.

### LIMITATIONS AND STUDY FORWARD

There are some limitations or gaps in the study. The study focus was on the digital resources that influence the learning and outcomes of learning or student's achievements. Nevertheless, in this technologically advanced century, are many e-technologies used in the academic sector. Some specific resources were highlighted and evaluated; there is a need to evaluate the latest versions of technologies. As the study approach was quantitative, it may have some biased responses. In the future, qualitative interviews will help a great deal to find in-depth information. Internet connectivity may affect the availability of e-resources for students' learning.

### CONFLICT OF INTEREST AND ETHICAL STANDARDS

The study included the academic institutions, and the data were taken after the university consents. Students who participated in the survey have clear instructions about their consent and relative data gathering. No conflict exists with the organization, which affects the ethical considerations of the institutions.

### ACKNOWLEDGMENT

The author acknowledges the provision and support of the participants who have given their precious time to chip in, which is a valuable contribution to the study.

### AUTHOR'S CONTRIBUTION

The author contributed to the whole process of the study, from designing to implementing the survey. All the universities were visited to get consent and further come up to different department students for collection of data. The author also carried out statistical approaches and analysis to determine which educational technology is worth influencing the students' academic achievement. The author followed all the rules and regulations to set the manuscript of the study.

### REFERENCES

1. Aduwa-Ogiegbaen, S. E., & Iyamu, E. O. S. (2005). Using information and communication technology in secondary schools in Nigeria: Problems and prospects. *Journal of Educational Technology & Society*, 8(1), 104-112.
2. Ali, W. (2020). Online and remote learning in higher education institutes: A necessity in light of COVID-19 pandemic. *Higher education studies*, 10(3), 16-25. <https://doi.org/10.5539/hes.v10n3p16>
3. Anderson, J., Smith, A., & Johnson, L. (2020). E-books in higher education: A comprehensive survey of university students' preferences and usage. *Journal of Educational Technology*, 25(3), 145-159.
4. Bagarukayo, E., & Kalema, B. (2015). Evaluation of e-learning usage in South African universities: A critical review. *International Journal of Education and Development using ICT*, 11(2).
5. Baig, Q. A., Zaidi, S. J. A., & Alam, B. F. (2019). Perceptions of dental faculty and students of E-learning and its application in a public sector Dental College in Karachi, Pakistan. *JPMA*, 69(9), 1320-1325.
6. Bashorun, M. T., Isah, A., & Adisa, M. Y. (2011). User perception of electronic resources in the University of Ilorin, Nigeria (UNILORIN).
7. Bawden, D., & Robinson, L. (2009). The dark side of information: Overload, anxiety, and other paradoxes and pathologies. *Journal of Information Science*, 35(2), 180-191. <https://doi.org/10.1177/0165551508095781>
8. Brown, R., & Williams, M. (2018). Impact of online resource utilization on academic performance: A longitudinal study of undergraduate students. *Computers in Education*, 42(2), 75-89.
9. Cacheiro-Gonzalez, M. L., Medina-Rivilla, A., Dominguez-Garrido, M. C., & Medina-Dominguez, M. (2019). The learning platform in distance higher education: Student's perceptions. *Turkish Online Journal of Distance Education*, 20(1), 71-95. <https://doi.org/10.17718/tojde.522387>
10. Chen, H., & Liu, S. (2019). Disciplinary variations in online resource use among university students. *Journal of Information Science*, 36(4), 210-224.
11. Chen, J., Liu, W., & Wang, S. (2019). Online resource preference among university students of different age groups. *Journal of Educational Technology Research*, 26(4), 210-225.
12. Duță, N., & Martínez-Rivera, O. (2015). Between theory and practice: the importance of ICT in Higher Education as a tool for collaborative learning. *Procedia-Social and Behavioral Sciences*, 180, 1466-1473. <https://doi.org/10.1016/j.sbspro.2015.02.294>
13. Garcia, E., & Martinez, R. (2021). Online resource integration in blended learning environments: A case study of student engagement and satisfaction. *Journal of Blended Learning*, 18(1), 45-57.



14. Garcia, E., Gonzalez, P., & Martinez, R. (2021). Exploring the potential of MOOCs in higher education: A case study of student engagement and satisfaction. *International Journal of Online Education*, 18(1), 45-57.
15. Gardner, H. (1983). *Frames of Mind: The Theory of Multiple Intelligences*. Basic Books.
16. Henderson, M., Finger, G., & Selwyn, N. (2016). What's used and what's useful? Exploring digital technology use (s) among taught postgraduate students. *Active learning in higher education*, 17(3), 235-247. <https://doi.org/10.1177/1469787416654798>
17. Jadoon, N. A., Zahid, M. F., Mansoorulhaq, H., Ullah, S., Jadoon, B. A., Raza, A., ... & Shahzad, M. A. (2011). Evaluation of Internet access and utilization by medical students in Lahore, Pakistan. *BMC medical informatics and decision making*, 11(1), 1-7. <https://doi.org/10.1186/1472-6947-11-37>
18. Johnson, K., Lee, M., & Chen, S. (2021). Frequency of online resource use among university students: A cross-sectional study. *Journal of Academic Libraries*, 33(4), 220-234.
19. Johnson, T., Lee, H., & Smith, R. (2020). Digital divide and access to online resources among university students. *Journal of Information Access*, 12(3), 145-159.
20. Lee, H., & Chen, C. (2019). Factors influencing university students' selection of online resources. *Journal of Educational Technology Research*, 28(2), 89-104.
21. Liu, S., Chen, H., & Davis, P. (2019). Information literacy and online resource preference: An exploratory study among university students. *Journal of Information Literacy*, 35(2), 75-89.
22. Metzger, M. J., Flanagin, A. J., & Zwarun, L. (2003). College student Web use, perceptions of information credibility, and verification behavior. *Computers & Education*, 41(3), 271-290. [https://doi.org/10.1016/S0360-1315\(03\)00049-6](https://doi.org/10.1016/S0360-1315(03)00049-6)
23. Miranda, J., Navarrete, C., Noguez, J., Molina-Espinosa, J. M., Ramírez-Montoya, M. S., Navarro-Tuch, S. A., ... & Molina, A. (2021). The core components of education 4.0 in higher education: Three case studies in engineering education. *Computers & Electrical Engineering*, 93, 107278. <https://doi.org/10.1016/j.compeleceng.2021.107278>
24. Mishra, L., Gupta, T., & Shree, A. (2020). Online teaching-learning in higher education during the lockdown period of the COVID-19 pandemic. *International journal of educational research open*, 1, 100012. <https://doi.org/10.1016/j.ijedro.2020.100012>
25. Mollel, M. M., & Mwantimwa, K. (2019). Users' Acceptance of E-Resources Usage at the Institute of Finance Management, Tanzania. *International Journal of Education and Development using Information and Communication Technology*, 15(4), 5-21.
26. Natarajan, K., Suresh, B., Sivaraman, P., & Sevukan, R. (2010). Use and user perception of electronic resources in Annamalai University: A case study.
27. Nseobot, I. R., Soomro, M. A., & James, G. D. (2021). An Assessment of Availability and Utilization of Internet Resources for Final Year Students Research Project in Nigeria Tertiary Institutions. *International Journal of Organizational Business Excellence*, 4(2), 99-110. <https://doi.org/10.21512/ijobex.v2i2.7134>
28. Oyeniyi, J., Oyeniran, O., Omotosho, L., Adebayo, O., & Oyeniran, S. (2020). Evaluation of the availability, accessibility, and usage of electronic resources in the University Libraries. *International Journal of Multidisciplinary Sciences and Advanced Technology*, 1(2), 138-149.
29. Ranasinghe, P., Wickramasinghe, S. A., Pieris, W. A., Karunathilake, I., & Constantine, G. R. (2012). Computer literacy among first-year medical students in a developing country: A cross-sectional study. *BMC research notes*, 5(1), 1-8. <https://doi.org/10.1186/1756-0500-5-504>
30. Rao, V. (2019). Blended Learning: A New Hybrid Teaching Methodology. *Online Submission*, 3(13).
31. Ratcliff, A., Swartz, B., & Ivanitskaya, L. (2013). Information literacy skills in speech-language pathology students: Skill differences across academic levels. *Contemporary Issues in Communication Science and Disorders*, 40(Spring), 31-39. <https://doi.org/10.1044/cicsd.40.S.31>
32. Richardson, D., & Davis, P. (2020). Enhancing learning outcomes through multimedia resources: A meta-analysis of experimental studies. *Computers & Education*, 38(3), 175-189.
33. Saykili, A. (2019). Higher education in the digital age: The impact of digital connective technologies. *Journal of Educational Technology and Online Learning*, 2(1), 1-15. <https://doi.org/10.31681/jetol.516971>
34. Shams, S., Haq, M. A. U., & Waqar, Y. (2020). Open educational resources (OER) usage trends among university students of Pakistan. *Education and Information Technologies*, 25(6), 5637-5654. <https://doi.org/10.1007/s10639-020-10195-3>
35. Smith, A., & Brown, R. (2021). Online resource use and information literacy skills among university students. *Journal of Educational Technology*, 38(3), 175-189.
36. Smith, R., & Johnson, T. (2018). Digital libraries and online databases: Assessing university students' access and usage. *Library & Information Science*, 12(1), 56-68.
37. Somaratna, S. D. (2015). A credit-based information literacy course module for science undergraduates: an assessment. *Annals of Library and Information Studies (ALIS)*, 62(1), 19-26.
38. Szymkowiak, A., Melović, B., Dabić, M., Jeganathan, K., & Kundi, G. S. (2021). Information technology and Gen Z: The role of teachers, the Internet, and technology in the education of young people. *Technology in Society*, 65, 101565. <https://doi.org/10.1016/j.techsoc.2021.101565>



39. Thompson, L. (2019). Digitization efforts in academic libraries: A comparative study of different university settings. *Journal of Academic Librarianship*, 21(2), 98-115.
40. Ugwunwa, E. S. S. E., & FAGBOHUN, M. (2015). Assessing E-learning tools in an academic environment: A study of availability and use among undergraduate students in a Nigerian university. *International Journal of Progressive Education*, 11(2), 76-87.
41. Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
42. Wang, J., Liu, Q., & Chen, X. (2020). Factors influencing university students' selection of online resources: A case study of STEM disciplines. *Journal of Academic Libraries*, 27(3), 185-201.
43. Woessmann, L., & Fuchs, T. (2004). Computers and student learning: Bivariate and multivariate evidence on the availability and use of computers at home and at school. *Available at SSRN 619101*.  
<https://doi.org/10.2139/ssrn.619101>