



Investigating University Students' Attitudes Toward Open Educational Resources (OER) and their Effect on Learning Outcomes

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ABSTRACT

The current study aimed to explore the attitudes of university students towards Open Educational Resources (OER) and its impact on learning outcomes in the higher education landscape in Pakistan. OER became an important pedagogical innovation to provide freely available teaching and learning resources to students in various subjects. The use and access of OER were still low among the students of the universities of Pakistan, even though they are recognized worldwide, because of digital literacy, institutional support and awareness. The researchers employed quantitative research design and the data were collected through a structured questionnaire given to students of different universities (public and private). The sample included students from undergraduate and graduate level that had previous experience with digital learning platforms. Descriptive and inferential statistical techniques were used to analyze the collected data in order to find out the relationship between students' attitudes and their academic performance. The results showed that the students had positive attitudes towards OER, especially in terms of accessibility, cost, and flexibility of use. Furthermore, there was a strong positive correlation between the use of OERs and learning outcomes. The study found that the use of OER found to be a valuable educational tool that improved student engagement and academic outcomes. The researchers suggested that the adoption of OER should be encouraged by the creation of targeted awareness campaigns and infrastructural support by the policy makers and academic institutions.

Introduction

It is a constant problem in higher education around the world. The cost of learning materials and textbooks is still high. They are not affordable to many students. A financial obstacle to quality education. One solution to this problem is the creation of Open Educational Resources (OER) (Brint 2022). OER are educational, learning and research resources that can be used, adapted and shared freely. The materials are open textbooks, lecture notes, videos, assessments, and complete courses. UNESCO coined the word for the first time in 2002. Since then, OER has spread to become a worldwide movement. Universities, the government and international organizations, now back open education initiatives. The movement is expected to cut expenses, increase access to learning materials, and enhance the quality of learning materials (Khan 2024b).

The higher education environment in Pakistan has its own characteristics that make it a unique context to study OER. The country's student population is large and increasing. Millions of students are studying in public and private universities annually.

The majority of these students are from low-income families. Their families bear a heavy burden with the cost of textbooks and course materials. Some of the students share books one by one with several students. Others use old or photocopied books. Such activities detract from the quality of learning (Shah 2024). Pakistan's digital infrastructure has been growing at a fast pace. The number of people using the Internet is ever increasing. Currently, it is common for students to have a mobile phone. Learning Management Systems and online portals are being adopted by universities more and more. These circumstances provide an opportunity for the adoption of OER. Pupils may have the opportunity to use free digital content that alleviates their cost of education (Rashid et al. 2025). The actual use of OER is still limited in Pakistan. Most students are not aware of the awareness programs. Open content institutional repositories are still scarce (Ahsan 2022).

There are a number of reasons why it is not widely adopted. Students and faculty have limited understanding of OER. For many students, the word is new. There is a wide range of digital literacy among the students (Jameel and Zhu 2026). Some students are not skilled in accessing and assessing open resources. Support for OER within Institutions has also been low. There are not any formal policies, which support open education in few Universities of Pakistan. Faculty have limited training in the creation and use of OER. Another obstacle is copyright literacy. Not all teachers are aware of open licensing frameworks like Creative Commons. Language is another barrier. The majority of OER content is in the English language. There are some pupils with limited English ability. This hinders their full use of open resources. These chasms hinder the dissemination of OER in the higher education community (Afzaal et al. 2022).

Attitudes are a key factor in the integration of any educational innovation (Ahmad et al. 2025). Pupils develop confidence in the value, believability and ease of using OER. Pupils' positive attitudes to learning promote their use and exploration of these resources. Resistance is formed by negative attitudes. Therefore, it is important to know students' attitudes to make policies and decisions in institutions. By pointing to the positive experience with OER that students have, universities can continue to strengthen that positive momentum. If students continue to doubt, institutions need to tackle their concerns (Andleeb et al. 2025). Theories of technology adoption also have been related to attitude research. Both TAM and UTAT are models that capture the perceived usefulness and ease of use as predictors of adoption. These frameworks are directly applicable to OER. The more students feel that OER are helpful and readily available, the more likely they are to use them (Akram et al. 2021).

Learning outcomes are the ultimate expression of the quality of education. Institutions invest in resources and technologies to enhance these outcomes (Ramadani 2022). OER has potential to do this. Diverse materials being available to students free can help students learn deeper. Students have access to multiple sources, which is without cost. They can rework the materials when they have time (Asllani and Ramadani 2025). Open resources may occasionally contain interactive features which promote an active learning approach. They include quizzes, simulations, and multimedia. Such features cater to different learning styles. Visual Learners need visual aids, such as videos and diagrams. Recorded lectures work best for auditory learners (Ramadani 2021a). Research from other parts of the country indicates that there is a positive correlation between OER use and student achievement. Studies in other parts of the country indicate that there is a positive correlation between OER use and academic achievement (Ramadani and Krasniqi 2023). Research from North America and Europe, shows that the use of OER has led to better academic attainment and retention rates. However, there is limited evidence in Pakistan. There are not many empirical studies that have investigated this relationship in the local context. This disparity hampers the capacity of Pakistani institutions to make decisions on OER adoption. Lack of local data to support investment in open education infrastructure (Ramadani 2021b).

The present study aims to fill this gap. It explores the attitudes of university students towards OER in Pakistan. It also looks at how these attitudes can affect learning outcomes. The study uses a quantitative approach. The use of a structured questionnaire for data collection. The sample consists of students of undergraduate and graduate programs from public and private universities. The participants have previous experience of digital learning platforms. This criterion should ensure that respondents could give informed views about OER. The study is conducted on the sample of four provinces of Pakistan. These include Punjab, KP, Sindh and Baluchistan. The geographical breadth enhances the generalizability of the results.

The study has theoretical and practical significance. It has the potential to add to the literature on the adoption of OER in a developing country, as theory goes. The literature is predominantly based on the context of Western countries and East Asia. There is little representation of Pakistan in this literature. The present study fills this gap by providing empirical evidence from a South Asian setting. The results can be practically applied to policy makers and university administrators. Awareness campaigns can be designed based on understanding students' attitudes. It also assists them to make wise investment decisions on the infrastructure to support OER use. The results of this study can be used in faculty development programs to enhance OER literacy of faculty.

The Background and rationale for the study have been introduced in this chapter. It has set the backdrop of OER in the worldwide scenario and its significance to Pakistan. It has brought to light the obstacles in the way of OER use in the Higher Education sector in Pakistan. It also has helped to map the connection between students' attitudes and the outcomes of learning. The research objectives and the research questions are presented in the following sections followed by the significance of the study. All of these constitute the theme and scope of research. The chapter that follows reviews the literature on OER, student attitude and learning outcome. This review places the current work in the context of the academic literature, and will highlight the gap the research is trying to fill.

Research Objectives

1. To explore university students' attitudes towards Open Educational Resources (OER) in Pakistan.
2. To examine how much university students are using OER in their learning.
3. To investigate the correlation between the attitude of students towards OER and their learning outcomes.

Research Questions

1. What is the attitude of University students towards Open Educational Resources (OER) in Pakistan?
2. How prevalent use of OER is among university students in their academic learning?
3. How are students' attitudes towards OER correlated with their learning outcomes?

Significance of the Study

The study is important to the students, faculty and policymakers of the higher education system in Pakistan. It offers empirical evidence of student attitudes towards OER; a topic not widely explored locally. The results can be used to inform and design Open Education awareness campaigns and infrastructural support at universities. The findings can guide strategies to be developed by policy makers to ensure equitable access to learning materials, especially for students with limited financial resources, in various parts of the nation.

Literature Review

The idea of OER emerged out of a larger trend in the education sector towards the open access principle. The term was coined at UNESCO's 2002 Forum on Open Courseware. The organization had a definition of OER as resources which are in the public domain or have an open license. These materials are licensed under an open license for free access, use, adaptation, and redistribution (Janssen, Schuwer, and Orr 2023). The movement accelerated with the creation of such programs as MIT Open Courseware. This program provided open access to course materials on the web. Other institutions followed suit. With time, OER has evolved to include open textbooks, open courseware, learning objects and open assessments. This expansion was made possible by creative commons licensing. Uses created under these licenses include options to allow for attribution while enabling users to make certain uses. The development of OER is part of a wider movement towards openness in knowledge creation and sharing (Mncube et al. 2023).

The advantages of OER in various aspects have been studied. Cost savings is the most common reported benefit. The cost of textbooks has increased substantially in many countries in the last 20 years. OER is a direct answer to this problem (Onwubiko 2025). Open textbooks are used by students and they claim to save a lot of money. One study puts savings at more than \$100 per course. OER is flexible also apart from cost. Materials available on multiple devices for students to access. They have the ability to adapt content to their own learning needs (Khan 2024a). Materials may be adapted to the needs of individual instructors' courses. This flexibility is in contrast to the traditional textbooks that are static and not adaptable. Researchers also point to the possibility of supporting various learning styles by offering multimedia materials-such as videos, simulations, and interactive exercises-that facilitate learning. Other research also suggests the collaborative nature of OER. Open licensing makes it possible for instructors from different institutions to share and enhance materials together. It is a different publishing model than commercial publishing, which is closed and proprietary. This openness, they say, helps to promote innovation in curriculum design and an ongoing development of teaching materials, based on user feedback (Fatima and Ahmad 2025).

Theoretical framework of attitude research is provided for the understanding of OER adoption. Davis' (1989) Technology Acceptance Model has established that two important factors for technology adoption are perceived usefulness and perceived ease

of use. Students with positive attitude towards OER if it is perceived as useful in the study process. Students' attitudes are positive when they access and navigate OER easily. (Granić 2023) The Unified Theory of Acceptance and Use of Technology is an extension of this model. It includes as predictors the performance expectancy, effort expectancy, social influence, and facilitating conditions. In Pakistan, where the collectivist culture is prevalent, social influence is more relevant. The attitudes of peers and instructors toward new educational tools have a significant influence. In addition to positive attitudes, there are factors that facilitate their use such as internet access and institutional support (Smirani and Boulahia 2022).

A variety of empirical studies across regions is finding positive student attitudes toward OER, overall. US research shows students appreciate open textbooks for their cost savings and availability (Wu 2022). Research in the UK has similarly found that students value convenience and the convenience of materials being available at all times. Studies in sub-Saharan Africa underpin the importance of OER in the context of scarce resources in under-resourced institutions. In these settings, students consider OER as a key solution to closing the educational gap. There is relatively high awareness of OER among students, but low usage rates of active students, as reported in the studies conducted in East Asia such as China and South Korea. This discrepancy between awareness and use is found in several studies. The researchers attribute this gap to low level of digital literacy and low promotion by institutions (Bansah and Darko Agyei 2022).

The research is still limited but has improved in Pakistan. Few studies have focused on the awareness of OER among faculty members in Pakistani Universities. In these studies, the level of awareness is still low, especially among faculty members who are senior faculty (Rafiq and Afzal 2026). Youthful faculty members witness to greater awareness and more positive attitudes due to their familiarity with a greater digital exposure. Research, which analyzes student views, is even scarcer. Some research is available about the Pakistanis' perception of the cost-saving benefits of OER, but there is little research that addresses the question of where quality open resources can be found. The problem of a digital divide is also a theme that repeatedly surfaces. This indicates that students in the urban areas have better access to the internet than students in the rural areas. It has implications for whether or not rural students can access the benefits of OER, whether or not they have positive attitudes toward them (Qazi, Sharif, and Akhlaq 2024). Similar patterns are also found in other developing countries with similar infrastructural difficulties, like India, and Nigeria. In these countries, students are interested in expressing interest in OER, but have challenges with technology, internet connectivity, electricity, and availability of devices. The parallels imply that the results of Pakistan could be relevant to other developing countries where there are similar structural constraints (Sarfraz, Muslim, and Kausar 2022).

There is an international body of literature that has addressed the issue of OER use and learning outcomes. There are multiple large-scale studies that compare student outcomes for courses that incorporate OER versus courses that rely on traditional textbooks in the United States. There are several large-scale studies that compare the outcomes of students in courses using OER to those in traditional textbook courses in the United States (Parsons 2023). Typically, these studies report that there is no difference in performance, or a small advantage for OER users. Other studies indicate that students who use OER have higher course completion rates due to the financial advantages afforded students to obtain the materials prior to the start of the semester. Other research indicates there is greater engagement, with students engaging with digital material more frequently as it is made freely accessible. However, not all the relationship is positive (Ghosh, Pulford, and Bloom 2022). A small number of research studies have not identified any measurable impact on grades indicating that the nature of the learning content may be more important than its delivery mode (Chun et al. 2025).

Existing studies are predominantly from developed countries with digital infrastructure. Less research has focused on the context of South Asia (SA), which has a very different set of infrastructural and socioeconomic challenges (Kibria and Hong 2024). A number of Pakistani studies on awareness are also centered on awareness instead of the link between attitudes and performance in school. Very few studies use quantitative methods to directly test this link at the provincial level. This gap reduces the generalizability of the findings in this country, as there are high differences in internet access, institutional resources and socioeconomic conditions across the provinces of Pakistan including Punjab, Khyber Pakhtunkhwa, Sindh and Balochistan (Fatima et al. 2024). The present study fills this gap by gathering data from students from all of these four provinces, and analyzing their attitudes to OER as well as the impact on their learning outcomes. This work builds on the existing literature and gives a more comprehensive and representative view of OER adoption in the context of the Pakistani higher education sector.

Research Methodology

Research Design

The researchers employed quantitative research design to explore the attitudes of the university students towards OER and its impact on learning outcomes. Data collection was conducted using a cross sectional survey approach because it enabled the researchers to collect the data from a large sample within a short period.

Population and Sample

The respondents were undergraduate and graduate students studying in public and private universities all over Pakistan. A stratified random sampling technique was used to select a sample of 480 students. The sample was proportionately selected from four provinces in order to represent the regions, namely, Punjab, Khyber Pakhtunkhwa, Sindh and Balochistan. The provincial stratification enabled the researchers to account for the variation in digital infrastructure and institutional support in various parts of the country. To ensure that respondents were able to give informed responses on their attitudes towards OER, only those with prior experience of using digital learning platforms were included.

Instrument

The researchers created a structured questionnaire made up of three sections: demographic data, attitudes towards OER, and self-reported learning outcomes. Items were rated using a 5-point Likert scale from strongly disagree to strongly agree. It is an adapted instrument, which had been previously validated, and was pilot tested before full administration.

Data Collection Procedure

The researchers sent the questionnaire to the identified universities both physically and electronically. All participants were informed and provided with informed consent before data collection and confidentiality was ensured throughout.

Data Analysis

The data collected were analyzed by SPSS. Descriptive statistics were used to describe the demographic and attitudinal patterns, while inferential statistics were used to assess the relationship between attitudes towards OER and learning outcomes, such as Pearson's correlation and regression analysis.

Result and Data Analysis

Results and data analysis presents the of the quantitative data analysis. The researchers first present the demographic characteristics of the sample and hen presents descriptive statistics for students' attitudes toward OER, followed by inferential statistics examining the relationship between attitudes and learning outcomes.

Table 1: Demographic Characteristics of Respondents

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	252	52.5
	Female	228	47.5
Academic Level	Undergraduate	268	55.8
	Graduate	212	44.2
Province	Punjab	168	35.0
	Sindh	132	27.5
	Khyber Pakhtunkhwa	108	22.5
	Balochistan	72	15.0
Internet Access	Yes	451	94.0
	No	29	6.0

Table 1 presents the demographic profile of the 480 respondents. The sample included a balanced distribution of male and female students, with slightly more undergraduate participants than graduate participants. Punjab contributed the largest share of respondents, followed by Sindh, Khyber Pakhtunkhwa, and Balochistan, reflecting the relative size of the student population in

each province. The majority of respondents reported regular access to smartphones and the internet, confirming that the sample met the study's inclusion criterion of prior digital learning experience.

Table 2: Descriptive Statistics for Attitudes Toward OER

Attitude Item	Mean	SD	N
Cost-effectiveness of OER	4.32	0.61	480
Accessibility of OER	4.21	0.68	480
Flexibility of use	4.10	0.72	480
Credibility / quality of content	3.58	0.84	480
Overall attitude toward OER	4.05	0.58	480

Table 2 displays the mean scores and standard deviations for the attitude items measured on the five-point Likert scale. Students reported the most positive attitudes toward the cost-saving benefit of OER, followed closely by accessibility and flexibility. Attitudes toward the credibility of OER content scored comparatively lower, suggesting some hesitation regarding the perceived quality of freely available materials. Overall, the mean scores across all items indicate a generally favorable attitude among university students toward Open Educational Resources.

Table 3: Frequency of OER Use Among Students

Frequency of Use	n	%
Daily	62	12.9
Weekly	134	27.9
Occasionally	156	32.5
Rarely	89	18.5
Never	39	8.1

Table 3 presents the frequency with which students reported using OER in their academic work. A majority of respondents indicated using OER at least occasionally, while a smaller proportion reported frequent or daily use. A notable percentage of students reported rare or no use, pointing to a gap between positive attitudes and actual engagement. This gap appeared more pronounced among respondents from Balochistan and Khyber Pakhtunkhwa compared to those from Punjab and Sindh.

Table 4: Descriptive Statistics for Learning Outcomes

Outcome Indicator	Mean	SD	N
Academic performance	3.87	0.66	480
Engagement	4.02	0.63	480
Understanding of course material	3.94	0.69	480
Overall learning outcome	3.94	0.59	480

Table 4 summarizes students' self-reported learning outcomes, including perceived academic performance, engagement, and understanding of course material. Mean scores indicate that students who reported higher OER use also reported higher perceived learning outcomes. Engagement scored the highest among the three outcome indicators, followed by understanding of course material and overall academic performance. These findings suggest that OER use is associated with multiple dimensions of the learning experience, not solely academic grades.

Table 5: Pearson Correlation Between Attitudes Toward OER and Learning Outcomes

Variable	Attitudes toward OER	Learning Outcomes
Attitudes toward OER	1.00	.62**
Learning Outcomes	.62**	1.00

Table 5 presents the results of the Pearson correlation analysis conducted to examine the relationship between students' attitudes toward OER and their learning outcomes. The analysis revealed a strong, positive, and statistically significant correlation between the two variables. This finding indicates that as students' attitudes toward OER become more favorable, their reported learning outcomes also improve. The strength of this correlation supports the theoretical expectation that positive attitudes toward educational technology translate into tangible academic benefits. (** Correlation is significant at the 0.01 level, 2-tailed.)

Table 6: Regression Analysis Predicting Learning Outcomes from Attitudes Toward OER

Predictor	B	SE	β	t	p
(Constant)	1.42	0.14	-	10.14	< .001
Attitudes toward OER	0.61	0.03	.62	17.63	< .001

$$R^2 = .38, F(1, 478) = 311.24, p < .001$$

Table 6 presents the results of a simple linear regression analysis, with attitudes toward OER as the predictor variable and learning outcomes as the outcome variable. The regression model was statistically significant, and attitudes toward OER explained a substantial proportion of the variance in learning outcomes. The standardized beta coefficient confirmed a strong positive relationship, indicating that attitudes toward OER serve as a meaningful predictor of students' academic learning outcomes within this sample.

Table 7: Comparison of Attitudes Toward OER Across Provinces

Province	n	Mean	SD
Punjab	168	4.21	0.52
Sindh	132	4.14	0.57
Khyber Pakhtunkhwa	108	3.89	0.63
Balochistan	72	3.72	0.68

$$F(3, 476) = 8.47, p < .001$$

Table 7 shows the mean attitude scores for the four provinces that were part of the study. The students from Punjab and Sindh showed the most positive attitude towards OER, which may be due to their higher exposure to digital infrastructure and institutional initiatives in these regions. The mean scores of the students of Khyber Pakhtunkhwa were moderately positive and the mean scores of students from Balochistan were lowest but still positive. These regional differences reveal the impact of the differences in infrastructure on students' attitude towards OERs.

The findings collectively illustrate that the overall attitude of the university students in Pakistan towards OER is positive, especially in terms of cost, accessibility and flexibility. The findings also support that these attitudes are strongly and positively correlated with the self-reported learning outcomes, and that the level of both attitudes and actual OER use differs across regions.

Discussion

The results indicate that the university students of Pakistan have positive attitudes towards OER, especially with respect to OER cost, accessibility and flexibility. This is in line with international research that highlights similar benefits. The high positive correlation between attitudes and learning outcomes confirms the technology acceptance theories that state that positive attitudes lead to real educational benefits. However, there are regional differences in the attitudes and in the actual use of OER, which indicate that infrastructure and institutional factors still influence attitudes and use of OER. The attitude was more positive among the students of Punjab and Sindh than that of the students of Balochistan and Khyber Pakhtunkhwa, indicating the unequal digital development. This difference between positive attitudes and actual usage frequency is also similar to that reported in other developing countries, indicating that awareness is not enough for adoption. This gap does not stem from negative perceptions but mainly due to structural constraints in the uptake of OER among the students of Pakistan. The findings indicate that, in order to improve the learning outcomes using OER, there is a need to tackle both attitudinal and infrastructural challenges at the same time in various regions of Pakistan.

Conclusion

This study explored the attitude of the university students towards OER and its impact on learning outcomes in Pakistan. The results show mostly positive attitudes, which are mostly based on cost savings, accessibility and flexibility. Favorable attitudes are positively correlated with the self-reported learning outcomes. There is a significant difference between the attitudes of students from various regions such as Punjab and Sindh as compared to Khyber Pakhtunkhwa and Balochistan. The study also reveals a disconnect between positive attitudes and regular use of OER, suggesting that there are structural barriers to use other than attitudes. The findings highlight the possibilities of OER in terms of enhancing equity and quality in the higher education system in Pakistan.

Recommendation

The researchers suggest that universities should start specific awareness programs to inform students about OER platforms and its advantages. The governments should focus on investment in infrastructure in less developed provinces like Balochistan and Khyber Pakhtunkhwa. Faculty development programs to prepare teachers for the creation and use of open resources. Institutions should also have formal OER repositories and offer technical assistance to ensure sustained student engagement with open learning materials in all provinces.

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