Global Academic Journal of Medical Sciences

Available online at www.gajrc.com
DOI: https://doi.org/10.36348/gajms.2025.v07i05.003

OPEN ACCESS

ISSN: 2706-9036 (P)
ISSN: 2707-2533 (O)

Original Research Article

Student's Perception Regarding Effectiveness of Online Learning Resources in Medical Curriculum

Wasif Ullah Khan[1*], Salman Ahmad[2], Numan Khan[2], Maryam Nisar[2], Muhammad Talha[2], Hina Shams[3], Hassan Altaf Khan[4], Muhammad Hasnain[2], Abbas Khan[2], Suhaib Mesbah[2]

[1]3rd year MBBS, Northwest School of Medicine
[2]2nd year MBBS, Northwest School of Medicine
[3]House Officer at Kuwait Teaching Hospital Peshawar
[4]2nd year MBBS, Bacha Khan Medical College Mardan

***Corresponding Author**
Wasif Ullah Khan
3rd year MBBS, Northwest School of Medicine

Article History
Received: 26.07.2025
Accepted: 22.09.2025
Published: 25.09.2025

Abstract: Medical student perception of online learning resources within the medical curriculum were explored through a cross sectional study involving 384 participants from Peshawar. Results indicated widespread internet access and frequent use of online platforms with YouTube being the most preffered. Students reported positive perceptions regarding improved understanding, memorization and engagement compared to traditional text books and most would recommend these resources to peers. However significant challenges including difficulties in acquiring practical and clinical skills online, lack of motivation unreliable internet, electricity outages and affordability issues while infrastructural and pedagogical limitations hinder their effectiveness in skill based training. These findings highlights the need for balanced and hybrid educational approaches.

Keywords: Medical Education, Online Learning, Medical Curriculum, Student Perception, Peshawar, YouTube.

INTRODUCTION

"Online resources refer to digital materials, tools, or content accessible via the internet, including websites, documents, multimedia files, and other digital information" [1].

The medical curriculum has been effected by the quick adaptation of online resources. Online learning refers to the use of electronic technology to offer students with materials and the traditional theoretical teaching-learning method for health sciences students entails a classroom environment with a faculty presenting face-to-face lectures and students listening and taking notes, asking questions and getting answers [2].

Prior to the covid19 many students moved towards online resources. The emergency of covid19 move from face-to-face to online education has had an extraordinary consequences for teachers and students. During the pandemic, studies found that online flipped classrooms did not result in better learning outcomes [3].

Compared to traditional educational environments, numerous students expressed dissatisfaction with instructor motivation and

Citation: Wasif Ullah Khan, Salman Ahmad, Numan Khan, Maryam Nisar, Muhammad Talha, Hina Shams, Hassan Altaf Khan, Muhammad Hasnain, Abbas Khan, Suhaib Mesbah (2025). Student's Perception Regarding Effectiveness of Online Learning Resources in Medical Curriculum. *Glob Acad J Med Sci*; Vol-7, Iss-5 pp- 217-222.

feedback. While some have stated that students consider online education as more flexible and time-saving [4].

At the moment, different platforms of e-learning are accessible, ranging from independent software solutions to university-owned modules and learning management systems [5].

Online learning insights that can help create a more adaptable, accessible, and student-centered medical curriculum. It enables students to take classes from anywhere, at any time, and typically at a lesser cost than traditional education [6].

Some of the drawbacks of e-learning include limited internet access, insufficient computer skills, and bad internet connections. The flexibility of time may be a constraint of e-learning in circumstances when pupils lack self-discipline [7]. Furthermore, teachers, facilitators, and students reported encountering several organizational, social, and technical problems during online teaching and learning sessions during the pandemic [8].

The purpose of this study is to investigate medical students' impressions of the usefulness of online learning materials, as well as to identify the major challenges they confront while incorporating these tools into their academic experience.

RESEARCH METHADOLOGY

This study was conducted in Peshawar, spanning over a period of 6 months. A cross-sectional study design was employed. The target population consisted of medical students enrolled in different years of their medical curriculum. Sample size for this study was 384 participants, calculated using the standard formula for cross sectional survey with a 95% confidence interval and 5% margin of error. Inclusion criteria were medical students currently enrolled in recognized medical colleges of Peshawar and students who gave informed consent to participate in the study. Exclusion criteria excluded the medical students who were not willing to participate in the study and students absent during data collection.

To minimize bias, participants were elected using random sampling techniques. Data collection was anonymous to reduce social desirability bias. A high cooperation rate was expected as participation was voluntary, and students were encouraged by their institutions to provide honest responses. A structured, self-administered questionnaire was used. It contained sections on demographic details (age, gender, year of study), frequency of online resource usage, perceived effectiveness of online resources, and satisfaction levels. The questionnaire was pre-tested on small groups of students for clarity and reliability before administration.

Data was entered and analyzed using SPSS software. Descriptive statistics (frequencies, percentages, means, and standard deviation) were used to summarize demographic characteristics and perceptions. Chi squares tests were applied to determine associations between demographic factors and perceived effectiveness of online resources. A p-value of <0.05 was considered statically significant.

Definition of Important Variables:

- ***Effectiveness of online learning resources:*** The degree to which students perceive online resources (e.g., recorded lectures, e-books, online tutorials, educational apps) as helpful in understanding and retaining medical knowledge.
- ***Perception:*** Students' attitudes and opinions regarding the usefulness and impact of online learning tool in their academic performance.
- ***Online learning resources:*** Digital platforms and materials used by students to supplement traditional classroom teaching.

Demographic Characteristics of Participants

The mean age of the participants were 20.8 with the SD of 4. The majority of participants were between 21 to 30 years followed by 18 to 20 years. Students were almost evenly distributed across the four main colleges, with each contributing 25% of the sample. Most were in the second year of MBBS. The participants represented a young student population balanced across different colleges with higher proportion of males and concentration in the earlier study years.

Table1: Demographic Characteristics of Participants (N=384)

Characteristic	Value	Frequency (n)	Percentage (%)	Mean (SD)
Age (years)	18-20	150	39.1	
	21-23	189	49.2	
	24-25	45	11.7	
College	NWSM	97	25.3	
	RMC	94	24.5	
	KMC	96	25.0	
	PIMC	97	25.3	20.8 (4.2)

Characteristic	Value	Frequency (n)	Percentage (%)	Mean (SD)
Study Year	1st Year	100	26.0	
	2nd Year	133	34.6	
	3rd Year	78	20.3	
	4th Year	50	13.0	
	5th Year	23	6.0	
Gender	Male	232	60.4	
	Female	152	39.6	

Frequencies and Percentages of Online Learning Resource Usage and Perceptions

A large majority reported having regular internet access and owning a personal device. Most students used online platforms for medical study. Regarding frequency 64.3% used online learning resources daily while only 1.6% never used them. Online learning resources were widely accessible and frequently used among the students reflecting string integration of digital resources into medical education.

Table 2: Frequencies and Percentages of Online Learning Resource Usage and Perceptions (N=384)

Question	Response	Frequency (n)	Valid Percentage (%)
Do you have regular access to the internet for academic use?	Yes	354	92.2
	No	30	7.8
Do you own a personal device for accessing online resources?	Yes	360	93.8
	No	23	6.0
	Other (2.00)	1	0.3
Do you use online platforms for studying medical subjects?	Yes	361	94.0
	No	23	6.0

Platform Used as a Resource

YouTube was far the most used, followed by Ken hub, Osmosis and Lecturio. Scholarly sources such as Google scholar/Research Gate and online PDFs were moderately used. Other resources accounted for only 18.8%. So according to this data provided by students they showed a strong preference for easily accessible and visual platforms like YouTube, while more specialized platforms were less frequently used.

Table 3: Platforms Used as online resource

YouTube	Yes	356	92.7
	No	28	7.3
Lecturio	Yes	31	8.1
	No	353	91.9
Osmosis	Yes	45	11.7
	No	339	88.3
Kenhub	Yes	56	14.6
	No	328	85.4
Google Scholar / Research Gate	Yes	88	22.9
	No	296	77.1
Online PDF / E-books	Yes	85	22.1
	No	299	77.9
Other	Yes	72	18.8
	No	310	80.7
	Other (7.00)	2	0.5

Subject Most Suitable for Online Learning

Nearly half of the respondents considered online learning suitable for all relevant subjects. Anotomy and Physiology were the most individually preferred subjects. Other subjects such as Biochemistry, Pathology and Pharmacology were chosen by smaller percentages while some students felt none or only clinical subjects were suitable.

Table 4: Which subject is most suitable for online learning?

Subject	Frequency	Percentages
Anatomy	86	22.4
Physiology	79	20.6
Biochemistry	9	2.3
Pathology	12	3.1
Community Medicine	2	0.5
Pharmacology	7	1.8
Clinical Subjects	2	0.5
All relevant subjects	185	48.2
None	2	0.5

Perception Statements

Students generally agreed that online learning resources improved understanding and helped in memorization about 70% of the students were agreed or strongly agreed to this statement. A majority found them engaging compared to the text books and a valuable supplement to teaching. Most also recommended them to peers (76.6%). So the overall perceptions were positive with students recognizing online resources as effective, engaging and worth recommending.

Table 4: Perception Statements Responses

Perception Statements (Agreement)	Frequency (%)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Positive Perceptions						
Improved understanding of concepts	n (%)	150 (39.1)	117 (30.5)	49 (12.8)	15 (3.9)	53 (13.8)
Better memorization and recall	n (%)	117 (30.5)	140 (36.5)	51 (13.3)	32 (8.3)	44 (11.5)
More engaging than textbooks	n (%)	112 (29.2)	131 (34.1)	100 (26.0)	35 (9.1)	6 (1.6)
Valuable supplement to teaching	n (%)	110 (28.6)	149 (38.8)	88 (22.9)	23 (6.0)	14 (3.6)
Would recommend to peers	n (%)	117 (30.5)	177 (46.1)	69 (18.0)	13 (3.4)	8 (2.1)

Barriers and Challenges

Key challenges included difficulty acquiring practical or clinical skills online and the in effectiveness of clinical training. Other barriers lack of motivations, inadequate training and affordability of devices. Infrastructure issues such as unreliable internet and electricity outages were also significant.

While online learning resources were well received students highlighted limitations acquiring practical skills, technical barriers and affordability concerns as major obstacles.

Table 5: Barriers and Challenges in the Use of online learning resources

Barriers and Challenges	Frequency (%)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Lack computer skills	n (%)	69 (18.0)	95 (24.7)	79 (20.6)	116 (30.2)	25 (6.5)
Inadequate training	n (%)	61 (15.9)	110 (28.6)	99 (25.8)	93 (24.2)	21 (5.5)
Lack personal motivation	n (%)	83 (21.6)	76 (19.8)	65 (16.9)	125 (32.6)	35 (9.1)
Clinical skills not effective online	n (%)	87 (22.7)	131 (34.1)	96 (25.0)	54 (14.1)	16 (4.2)
Difficulty acquiring practical skills	n (%)	126 (32.8)	119 (31.0)	66 (17.2)	59 (15.4)	14 (3.6)
Online exams are unfair	n (%)	73 (19.0)	86 (22.4)	101 (26.3)	97 (25.3)	27 (7.0)
Slow/unreliable internet	n (%)	60 (15.6)	68 (17.7)	100 (26.0)	150 (39.1)	6 (1.6)
Electricity outages	n (%)	67 (17.4)	109 (28.4)	97 (25.3)	94 (24.5)	17 (4.4)
High internet data costs	n (%)	73 (19.0)	77 (20.1)	96 (25.0)	114 (29.7)	24 (6.3)
Cannot afford proper devices	n (%)	78 (20.3)	58 (15.1)	64 (16.7)	142 (37.0)	42 (10.9)

DISCUSSION

The present study explored medical students' perceptions regarding the effectiveness of online learning resources within the medical curriculum. Our findings indicate widespread accessibility, frequent utilization, and predominantly

positive perceptions of online platforms, particularly YouTube, as supplementary educational tools. These results align with growing global evidence on the integration of digital resources into medical education.

From south Asia, studies in India and Pakistan have consistently demonstrated mixed but largely favorable perceptions of online learning. Singh *et al*., (2020) found that Indian medical students appreciated the flexibility of online education, though they expressed concerns regarding reduced concentration and interaction [9]. Similarly, Jana *et al*., (2021) reported that while Indian students recognized the value of digital platforms, challenges such as inequity in assessment fairness and limited clinical skill acquisition remained prevalent [10]. In Pakistan, Kamal *et al*., (2021) documented skepticism among undergraduates regarding e-learning as a substitute for traditional teaching, although students acknowledged its supplementary value [11]. A broader review confirmed that Pakistani students accepted online learning for theoretical content but consistently found it inadequate for clinical and practical training [12].

In East Asia, Wang *et al*., (2020) reported that Chinese student's satisfaction with online learning was strongly influenced by prior familiarity with digital tools, yet satisfaction decreased in higher study years where clinical exposure was critical [13]. This mirrors our findings that students valued online platforms for conceptual subjects like anatomy and physiology but recognized limitations in clinical training.

In Southeast Asia, a study from Universitas PalangkaRaya in Indonesia highlighted largely positive perceptions of online learning, with students even reporting improvements in academic performances during the pandemic [14]. This resonates with our participants' agreement that digital tools enhanced understanding and recall.

From the Middle East, Saudi students expressed appreciation for the flexibility and comfort of online platforms but voiced concerns about reduced interaction, isolation, and difficulty adapting content to diverse learning styles [15]. Similarly, Kosasih *et al*., (2023) in Indonesia emphasized that effective online learning depends heavily on instructors' ability to adapt content, provide interaction, and support students beyond content delivery [16].

In Western contexts, Gallagher *et al.,* (2021) demonstrated that medical student's usage of resources varied across campuses on structured learning hours, reinforcing that context strongly shapes resources preferences [17]. More recently, Patel *et al*., (2024) in Canada found that clerkship students preferred a hybrid approach, with case-based and interactive online strategies proving most effective [18]. Likewise, Khoso *et al*., (2024) in Pakistan highlighted persistent infrastructural challenges, particularly internet instability and electricity shortages, echoing barriers noted in our study [19].

Taken together, global evidence confirms that while students value online learning resources for their accessibility, flexibility, and ability to enhance conceptual understanding, consistent challenges remain in clinical applicability, interaction, and infrastructural reliability. Our study corroborates these findings, with YouTube and similar platforms favored for their visual and user-friendly approach, while barriers such as poor internet, affordability, and limited skill-based training persist.

Limitations

This study has certain limitations. First, being cross-sectional, it captures perceptions at a single point in time without accounting for changes across academic years or post pandemic adjustments. Second, reliance on self-reported data may introduce bias, particularly in assessing effectiveness and engagement. Third, while diverse colleges were included, the findings may not be generalizable to all medical institutions, especially those with varying technological infrastructure. Future research should employ longitudinal designs, incorporate objective performance outcomes, and explore blended approaches that balance online flexibility with in-person skill acquisition.

BIBLIOGRAPHY

1. Al-Natour B, Safadi R, Hamasha AA, Karasneh R, Alkandari MA, Hamasha SA. Dental students' perceptions of integrating online learning in the dental curriculum. BMC Med Educ. 2024 Dec 18;24(1):1452. doi: 10.1186/s12909-024-06497-6. PMID: 39696355; PMCID: PMC11654323.
2. Siddiqui AA, ZainUlAbideen M, Fatima S, Talal Khan M, Gillani SW, Alrefai ZA, WaqarHussain M, Rathore HA. Students' Perception of Online Versus Face-to-Face Learning: What Do the Healthcare Teachers Have to Know? Cureus. 2024 Feb 14;16(2):e54217. doi: 10.7759/cureus.54217. PMID: 38500946; PMCID: PMC10948083.
3. Sarfraz M, Hussain G, Shahid M, Riaz A, Muavia M, Fahed YS, Azam F, Abdullah MT. Medical Students' Online Learning Perceptions, Online Learning Readiness, and Learning Outcomes during COVID-19: The Moderating Role of Teacher's Readiness to Teach Online. Int J

Environ Res Public Health. 2022 Mar 16;19(6):3520. doi: 10.3390/ijerph19063520. PMID: 35329204; PMCID: PMC8955236.

4. Shen J, Qi H, Mei R, Sun C. A comparative study on the effectiveness of online and in-class team-based learning on student performance and perceptions in virtual simulation experiments. BMC Med Educ. 2024 Feb 12;24(1):135. doi: 10.1186/s12909-024-05080-3. PMID: 38347571; PMCID: PMC10863100.
5. Maheshwari K, Ladha N, Khapre M, Deol R. Perception of online learning among health sciences' students- A mixed methods study. J Educ Health Promot. 2022 Sep 28;11:286. doi: 10.4103/jehp.jehp_364_22. PMID: 36438998; PMCID: PMC9683464.
6. Saurabh MK, Patel T, Bhabhor P, Patel P, Kumar S. Students' Perception on Online Teaching and Learning during COVID-19 Pandemic in Medical Education. Maedica (Bucur). 2021 Sep;16(3):439-444. doi: 10.26574/maedica.2021.16.3.439. PMID: 34925600; PMCID: PMC8643544.
7. Sheik-Ali A. Online Learning for Surgical Skill in Clinical-year Medical Students: a Rapid Review. Med Sci Educ. 2024 Jun 8;34(5):1239-1247. doi: 10.1007/s40670-024-02093-x. PMID: 39450017; PMCID: PMC11496487.
8. Govindraj L, Santhosh S, Sunish SC, Gopalakrishnan AV, Chandy SJ, Oommen V, ShanthiFx M. Effectiveness of teaching medical ethics to medical students on an online platform: An analysis of students' perceptions and feedback. Indian J Med Ethics. 2023 Jan-Mar;VIII(1):32-38. doi: 10.20529/IJME.2022.034. Epub 2022 May 20. PMID: 35699300.
9. Singh, K. V., Aqeel, K., & Misra, S. (2020). A cross-sectional study of perception among medical students on online learning amid COVID-19 pandemic, at Government Medical College, Agra, India. *International Journal of Community Medicine and Public Health.*
10. Jana, I., Mathur, A., Parmar, D. M., & Dabhi, N. (2021). Perception of medical students for online learning and assessment during the COVID era. *National Journal of Physiology, Pharmacy and Pharmacology.*
11. Kamal, Z., Jamil, A. Z., Waseem, M., Iqbal, M., Aziz, N., & Rafiq, M. (2021). Perception of undergraduate students towards e-learning vs. traditional learning in a public sector medical college. *The Professional Medical Journal, 28*(2), 235–241.
12. Liaquat National Journal of Primary Care. (2022). Medical and dental students' perception of online learning across Pakistan in the COVID pandemic era: A review article. *Liaquat National Journal of Primary Care.*
13. Wang, C., Xie, A., Wang, W., & Wu, H. (2020). Association between medical students' prior experiences and perceptions of formal online education developed in response to COVID-19: A cross-sectional study in China. *BMJ Open, 10*(e041886).
14. Alexandra, F. D., Frethernety, A., & Augustina, I. (2023). The effectiveness of online learning models and their effect on students' learning achievements faculty of medicine Universitas Palangka Raya during the Covid-19 pandemic. *The 5th International Conference on Materials Engineering and Nanotechnology (ICMEN 2021).*
15. International Journal of Multilingualism. (2023). Students' perceptions of online learning in non-L1 environments. *International Journal of Multilingualism, 21,* 2150–2164.
16. Kosasih, F. R., Juhana, J., Ramdani, Z., & Tae, L. F. (2023). English graduate students' perception about the effectiveness of online learning tutor in distance education. *English Review: Journal of English Education, 11*(1).
17. Gallagher, S., Gladman, T., Macfarlane, E., Hallman, S., Hutton, J., & Paterson, H. (2021). Student use of common online resources in a multi-campus medical school. *MedEdPublish.*
18. Patel, R., Bannister, S. L., Degelman, E., Sharma, T., Beran, T. N., Lewis, M., & Novak, C. (2024). Online learning in medical student clerkship: A survey of student perceptions and future directions. *Cureus, 16.*
19. Khoso, Z., Brohi, K., Shereen, A., Panhwar, M. A., Azad, Y., Jafferi, A. A., &Kandhro, R. (2024). Perceptions of medical students concerning online education. *Journal of Health and Rehabilitation Research.*