GOMAL UNIVERSITY
JOURNAL OF RESEARCH
Gomal University, Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan
ISSN:1019- 8180 (Print) ISSN: 2708- 1737 (Online)

Website	www.gujr.com.pk	HEC Recognized	Social Sciences	CrossRef	DOI:10.51380

FROM CHALKBOARDS TO DIGITAL PLATFORMS: THE IMPACT OF MEDIA ON MODERN EDUCATION

Komal Mehboob[1], Farrukh Kamran[2] & Qurat-ul-Ain[3]

[1]Regional Academic Lead, The British Academy of Jewelry, London, UNITED KINGDOM
[2]Lecturer, Department of Education, The University of Baltistan Skardu (UOBS), Pakistan
[3]Assistant Professor, Department of Social Sciences, Emerson University Multan, Pakistan

KEYWORDS

Media Integration, Multimedia Learning, O-level and A-level, Student Engagement, Educational Technology

Article History

Date of Submission: 16-11-2024
Date of Acceptance: 21-12-2024
Date of Publication: 31-12-2024

ABSTRACT

This qualitative study investigates the integration of media tools in O-level & A-level classrooms, focusing on perceived impact of multimedia resources such as digital platforms, smartboards, and interactive technologies on the student learning and engagement. Conducted in schools equipped with the modern educational resources, the research involved 50 students and 20 teachers experienced in media-enriched teaching. Data was collected through semi-structured teacher interviews & focus group discussions with students and analyzed using thematic analysis. The findings indicate that multimedia tools boost student engagement and comprehension, leading to improved learning outcomes. However, challenges like limited access to technology, inadequate teacher training, and potential student distractions were identified as barriers to effective implementation. Both teachers and students stressed the need for better technological resources & ongoing professional growth for educators. The study highlights the transformative potential of media integration in enhancing teaching, learning & features the importance of addressing existing limitations to maximize its benefits. By bridging gaps in technology access and educator training, schools can more effectively leverage multimedia tools to create dynamic & engaging learning environments.

Corresponding Author: Komal Mehboob: komal.mehboob@baj.ac.uk

DOI: https://doi.org/10.51380/gujr-40-04-02

INTRODUCTION

Integration of media and digital tools in education has revolutionized traditional pedagogical practices, marking the paradigm shift in how knowledge is imparted and absorbed (Aldhilan, Rafiq & Afzal, 2024). From chalkboards and overhead projectors to smartboards, the interactive panels, and online learning platforms, the journey ultimately reflects dynamic interplay amid technological advancements and educational needs. This shift, particularly evident during the

global pivot to online learning in the COVID-19 pandemic, has reshaped education into a more flexible, interactive, and accessible domain. One of the core transformations lies in the delivery and interaction models. Traditional static methods, like lectures and printed materials, are now complemented or replaced by interactive and multimedia-enriched formats that cater to the diverse learning styles. The digital media enables students to interact with content in engaging ways, like participating in virtual simulations, watching instructional videos, or collaborating in online forums. This has significantly improved cognitive engagement, critical thinking, and creativity among learners (Abboud & Rogalski, 2017; Kennewell, Tanner, Jones & Beauchamp, 2008).

Furthermore, portable devices, wireless connectivity, and real-time communication tools have expanded the scope of learning beyond classroom walls, fostering a continuum of education amid home & school environments (Hinostroza, Hepp & Cox, 2016). In addition to enhancing student engagement, media tools empower educators by enabling them to design the creative lesson plans, use data analytics for personalized instruction and facilitate dynamic assessments (Sharma, Singh & Shernoff, 2009). However, the transition from traditional to digital education also presents challenges, like digital inequity, varying levels of teacher readiness & concerns over screen time's impact on young learners which significantly enhanced student engagement and motivation. Addressing these barriers requires targeted professional development for educators and policies promoting equitable access to technology. This article probes into the complex role of media in education, exploring its evolution, impact on teaching practices, and potential to shape future learning environments (Rafiq, Afzal & Kamran, 2022). It also studies the hurdles in achieving an inclusive and balanced approach towards technology integration, providing insights into best practices and sustainable models for leveraging media in modern education.

The evolution of media in education has been a significant area of exploration, driven by the technological advancements and the changing demands of the modern learning environments. Historically, education relied on traditional tools such as chalkboards and printed textbooks, which, while effective, were limited in their ability to cater to diverse learning needs and foster interactive engagement. Over time, the introduction of audio-visual aids, projectors, and early computing technologies marked the initial phase of technological integration in classrooms. By the early 21st century, advancements in information and communication technologies (ICT) enabled introduction of interactive tools like smartboards, digital tablets, and online learning platforms (Rafiq, Iqbal & Afzal, 2024). These innovations facilitated the collaborative learning, personalized instruction, and multimedia content delivery, which significantly enhanced the student engagement and motivation (Abboud & Rogalski, 2017; Kennewell et al., 2008). Thus, the advent of mobile technologies & wireless connectivity further expanded educational access, bridging geographical gaps, enabling remote and hybrid learning models (Hinostroza et al., 2016).

The global COVID-19 pandemic in 2020 accelerated the adoption of digital media in education, highlighting its potential and its challenges. Schools worldwide transitioned to online learning, leveraging tools like video conferencing, virtual classrooms, and digital resources. This period

underscored the importance of media literacy among educators and students, and the need for equitable access to technology (Sharma et al., 2009). Despite these advancements, disparities in access, variations in teacher preparedness & concerns about overuse of screens have persisted as critical challenges. The research on the impact of media in education has revealed both its transformative potential and its limitations. The studies have shown that media integration can foster deeper learning, enhance creativity & improve academic outcomes when used effectively (Shernoff et al., 2017). However, achieving these benefits requires addressing systemic barriers like digital inequity and ensuring that educators are equipped to cross complexities of modern technological tools (Ibieta et al., 2017). This research builds on this foundation to examine the evolving role of media in education, exploring its transformative impact and challenges that lie ahead.

Problem Statement

Despite the widespread integration of media and technology in modern education, significant challenges persist in maximizing its potential while addressing equity, accessibility & efficacy (Rafiq et al., 2024). The Educational media, from interactive whiteboards to digital platforms, has been lauded for enhancing the engagement, fostering creativity and personalizing learning experiences (Abboud & Rogalski, 2017). However, the effective implementation of these tools is often hindered by systemic barriers like unequal access to technology, insufficient teacher training & lack of evidence-based strategies for integrating media into pedagogical frameworks (Hinostroza et al., 2016; Ibieta et al., 2017). Additionally, rapid shift to digital education during the COVID-19 pandemic revealed disparities in the technological readiness among schools and students, exacerbating existing inequalities in education (Sharma et al., 2009; Rafiq, Kamran & Afzal, 2024). Although research has highlighted potential of media to revolutionize education, there remains a critical gap in understanding how to effectively mix these tools across diverse educational contexts. This study seeks to address these issues by exploring the evolution of the media in education, its impact on pedagogy and learning outcomes, and barriers to its effective utilization.

Research Objective

- ✓ To explore the educators' and students' perspectives on the effectiveness of media tools in enhancing engagement and learning outcomes in modern educational settings in the particular context.

Research Question

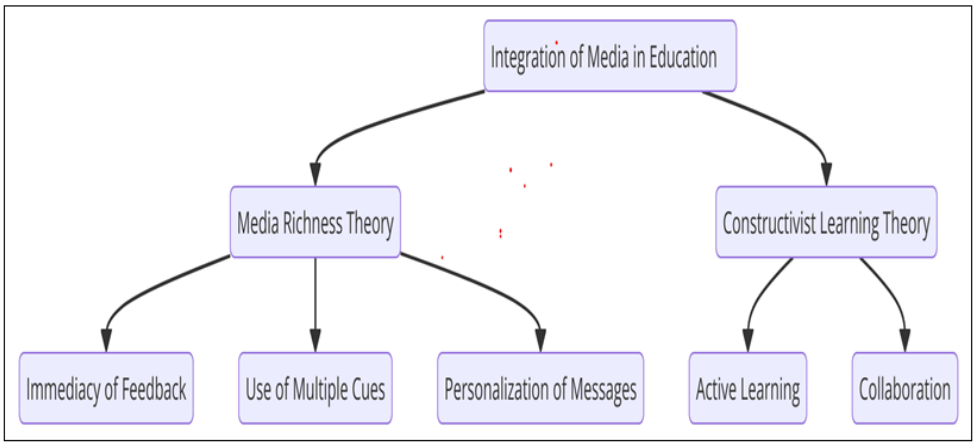
- ✓ How do educators perceive the role of media in transforming the traditional teaching methodologies into interactive and student-centered practices?
- ✓ What are the experiences of students in using digital media for learning, and how does it influence their engagement and academic performance?

Theoretical Framework

This research draws on media richness theory and constructivist learning theory to frame its exploration of the integration of media in education. Media richness theory (MRT) developed by Daft and Lengel (1986), this theory suggests that communication media differ in their ability

to convey rich information. Media richness is determined by factors & immediacy of feedback, the use of multiple cues, and the personalization of messages. In the context of education, MRT helps to analyze suitability of various media tools such as smartboards, online platforms, and interactive apps in fostering effective learning interactions. This theory provides insights into how media can be selected and used to match the complexity of educational content and the communication needs of learners. The constructivist learning theory proposed by theorists like Vygotsky (1978), constructivism emphasizes active, hands-on learning where learners build knowledge through experience and interaction. Media tools in education align with this theory by enabling collaborative & interactive learning environments (Aldhilan, Rafiq & Afzal, 2024). Features like simulations, virtual classrooms, and multimedia resources support constructivist principles by promoting the engagement, critical thinking, and knowledge construction. These theories together provide a lens to examine interplay between media tools and effectiveness in TEP. Whereas, the MRT offers a framework for evaluating the media suitability, constructivism underlines the pedagogical strategies that leverage these tools for desired meaningful learning experiences.

Figure 1
Theoretical Framework



LITERATURE REVIEW

Integration of media technologies into education has significantly transformed how students learn and teachers instruct. Thus, this literature review explores the role of media in modern education, examining theoretical perspectives, empirical studies, and emerging trends related to the use of media tools such as interactive whiteboards, virtual classrooms, and multimedia platforms.

Evolution of Media in Education

Traditional educational practices primarily relied on chalkboards, textbooks, and face-to-face instruction. The rapid advancement of technology in 21st century has shifted the educational paradigm leading to widespread adoption of multimedia tools in classrooms (Anderson, 2019).

Technologies like digital whiteboards, multimedia learning platforms, virtual classrooms have enabled a richer learning environment by supporting a variety of learning styles and fostering interactivity (Baker, 2020; Rafiq, Kamran & Afzal, 2024). This shift is closely related to Media Richness Theory that suggests that richer communication media (offering immediate feedback, multiple cues & personalization) are effective in conveying complex messages (Daft & Lengel, 1986).

Media Richness Theory (MRT) and Education

Media Richness Theory proposes that communication effectiveness is influenced by richness of the medium used. The richer the medium (in terms of number of cues, feedback immediacy, & personalization), better it can support understanding and reduce ambiguity. In education, technologies like video conferencing, interactive media & digital classrooms provide rich media that boost student engagement and learning outcomes in diverse sotiations. In this connection, the recent studies have shown that using rich media tools in education can lead to increased motivation, engagement, effective communication & improved learning outcomes, particularly in the environments that require collaborative and interactive learning (Mayer, 2021; Baker, 2020).

Constructivist Learning Theory and Media

The constructivist Learning Theory, rooted with Vygotsky (1978) and Piaget (1972), emphasizes active learning, knowledge construction, and importance of social interaction in the learning process. According to this theory, learning is most effective when students actively participate in learning process through problem-solving and hands-on activities. Digital media tools, such as virtual classrooms, online simulations and collaborative platforms, ease these constructivist principles by providing interactive environments where students can engage in active learning and build knowledge over collaboration & exploration (Anderson, 2019). The media tools that support student interaction & self-regulation lead to deeper learning experiences (Belland et al., 2020).

Interactive Whiteboards and Digital Classrooms

Interactive whiteboards have become integral part of modern classrooms. These digital tools offer teachers dynamic way to present content, interact with students and boost collaboration. The studies have indicated that IWBs promote engagement by providing immediate feedback, enabling interactive activities, and allowing for multimedia integration (Zhao et al., 2020). They align with the MRT and CLT by facilitating real-time communication and supporting hands-on learning experiences. Thus, in digital classrooms, students are not only passive recipients of knowledge but active participants who can collaborate with peers, access resources and engage in discussions. Similarly, the adoption of digital classrooms has grown significantly, especially post-pandemic, as it offers flexibility and access to diverse learning materials (Hodges et al., 2020).

Media Tools in Hybrid and Remote Learning Environments

COVID-19 pandemic accelerated the adoption of online and hybrid learning environments. Researchers have emphasized potential of media tools to bridge the gap between traditional

face-to-face teaching and remote learning. For instance, platforms like Zoom, Microsoft Teams, and Google Classroom have become essential for maintaining the student-teacher interactions, offering real-time communication, and promoting collaboration (Garrison & Vaughan, 2020). In this linking, these tools provide the immediate feedback and multiple cues, enhancing the richness of communication in a virtual environment, and aligning with MRT. Moreover, the use of digital media in remote learning supports Constructivist Learning Theory by facilitating active learning opportunities. In this drive, the online discussion forums, collaborative group activities, and project-based learning assignments are all examples of how digital media can foster knowledge construction, critical thinking, and collaboration among the students (Baker, 2020).

Challenges and Opportunities in Media Integration

Despite the numerous benefits, the integration of media in education also presents challenges. Issues such as digital divide, lack of teacher training, and the over-reliance on technology can hinder effectiveness of media tools in education. Digital divide remains a significant concern, particularly in developing countries, where access to technology is limited. The research has suggested that the lack of training for teachers in using new media tools effectively is another barrier to successful integration (Baker, 2020). Still, media tools offer significant opportunities for enhancing education, especially when implemented thoughtfully. The flexibility of digital tools enables personalized learning, access to diverse resources, and ability to cater to different learning styles (Belland et al., 2020). The challenge, thus, lies in leveraging these opportunities while addressing the barriers to effective media integration. The role of media in education has evolved significantly and its integration into teaching practices is crucial for enhancing student engagement and learning outcomes. By examining Media Richness Theory and Constructivist Learning Theory, this research aims to explore how different media tools can foster the richer communication and active, collaborative learning environments. While challenges such as the digital equity and teacher training remain, potential of media tools to transform education is undeniable.

RESEARCH METHODOLOGY

This study employed a qualitative research approach to explore the role of media in education of O-level and A-level students. The aim was to understand how media tools, including digital platforms, multimedia resources, and smartboards, are integrated into teaching as well as their perceived impact on student learning. The study was conducted in selected schools that are well-equipped with the modern educational resources, focusing specifically on the O-level and A-level students who have experience with the multimedia and interactive technologies in the classroom.

Research Design

A qualitative research design was chosen to provide a deep, context-specific understanding of the experiences and perceptions of both students & teachers about role of media in education. The case study approach was adopted, enabling an in-depth exploration of how multimedia tools were used in O-level & A-level classrooms. This approach allowed researcher to examine

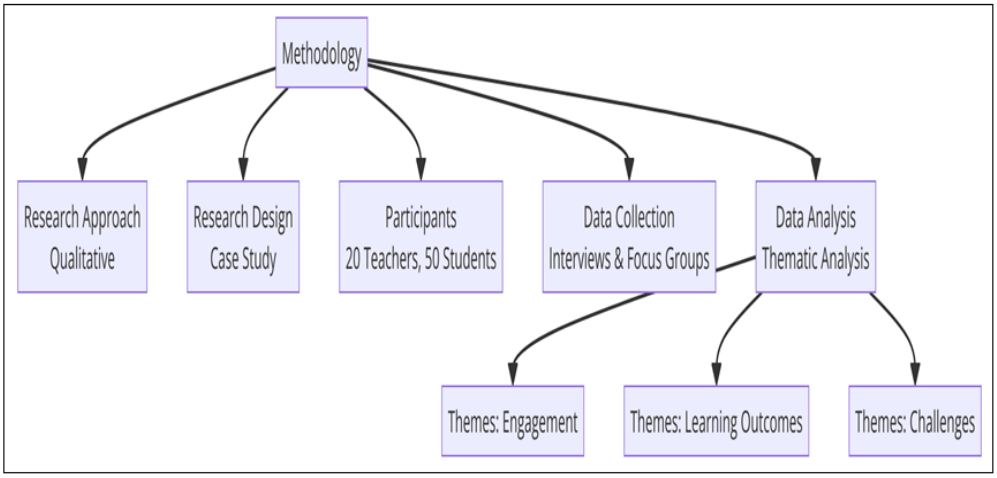
interactions amid students, teachers and media tools in real-world education setting (Creswell, 2014).

Participants

The participants included 20 teachers and 50 students from O-level and A-level classes, who were selected based on their experience with media-enriched teaching methods. O-level and A-level students were specifically chosen because these students generally attend schools that are equipped with advanced educational resources, such as multimedia platforms, interactive whiteboards, and smartboards. These students have also had more frequent interaction with such technologies, making them well-suited for study. A purposive sampling technique was used to select participants who had experience in using digital media tools in classroom. The teachers were selected for their knowledge of using multimedia tools in their teaching, while students were chosen based on exposure to and participation in, lessons involving these media resources. The sample of 50 students was split into 10 focus groups, each consisting of five students.

Figure 3

Methodology and Procedure



Data Collection

Data was gathered through semi-structured interviews and focus groups. The semi-structured interviews were conducted with 20 teachers to explore their views on how media tools impact teaching practices and student engagement. The interview questions were designed to capture teachers' experiences with integrating media in classroom and their perceptions of its impact on student learning outcomes. Focus groups with 50 students were conducted to gain insights into their experiences with the media tools in education. In this connection, the focus group discussions explored students' preferences for learning through multimedia, their perceived benefits, challenges and how these tools influenced their engagement as well as retention of information.

Data Analysis

The thematic analysis was employed to analyze the data, following Braun and Clarke's (2006) six-phase process: familiarization with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final report. The analysis was conducted separately for teachers and students, to identify recurring patterns related to the use of media tools in education. In this connection, the research findings focused on three main themes: student engagement with media tools, the impact of media tools on the learning outcomes, and the challenges faced by the teachers and students in using these technologies effectively.

RESULTS OF STUDY

Table 1

Codes, Subthemes, and Themes

Code	Subtheme	Theme
Increased student engagement	Active participation	Media on Student Engagement
Positive feedback from students	Enhanced motivation	
Use of interactive content	Interactive learning	
Visual learning preferences	Multimedia tools' impact	Media on Learning Outcomes
Better sympathetic of hard concepts	Enhanced comprehension	
Use of smartboards	Media tools integration	Integration of Media in Teaching
Classroom accessibility to technology	Availability of multimedia	
Teacher training on multimedia tools	Challenges with technology	Challenges in Applying Media
Limited resources in some schools	Infrastructure limitations	
Lack of focus when distracted	Distraction with media	

Interpretation of Themes

Impact of Media on Student Engagement

The integration of media tools in the classroom was found to significantly enhance the student engagement. Teachers and students both expressed that the interactive nature of media tools, such as the smartboards and multimedia content, promoted active participation and increased motivation. Subtheme: Active Participation One of the key findings was that media tools led to greater student involvement in class activities. Teachers noted that students were more eager to engage when lessons involved multimedia, as one teacher highlighted: “Students seem to participate in class when we use interactive smartboards. They’re excited to answer questions and contribute to discussions when visuals and videos are involved.” (Teacher 1) Students also agreed, with one stating: “I find lessons much interesting when we use videos or animations. It helps me understand better and I feel like I'm more involved in what’s going on in class.” (Student 3)

Subtheme: Enhanced Motivation Teachers observed that students appeared more motivated when multimedia tools were incorporated. This was especially true for O-level and A-level students, who were more accustomed towards digital learning platforms. One teacher shared: “There’s a noticeable difference in how students approach the lesson when we use media tools.

They're more motivated & enthusiasm they bring is reflected in quality of their participation." (Teacher 2). A student also echoed this sentiment: "When we use multimedia like videos or online quizzes, I look forward to class more. It's less boring than just reading from a textbook." (Student 5)

Impact of Media on Learning Outcomes

The use of media tools in education was found to improve students' understanding of complex subjects. The accessibility of the digital resources made learning more engaging and easier to grasp, particularly for the difficult concepts. Subtheme: Improved Understanding of Difficult Concepts Teachers reported that media tools such as videos, diagrams, and digital simulations were particularly useful in explaining complex ideas. One teacher explained: "When I explain abstract concepts using videos or interactive presentations, students tend to grasp them much quicker than with traditional methods. It gives them a visual perspective that makes it easier to comprehend." (Teacher 3). A student commented upon value of multimedia for understanding difficult concepts: "I find it easier to learn things like science or math when we watch videos. It's like seeing process step by step, which makes it clearer than just reading the text." (Student 7). Subtheme: Enhanced Comprehension reported that multimedia tools improved retention of information. The visual nature of media allowed them to remember key points effectively. "I retain information better when there are images, videos involved. It sticks in my mind longer." (Student 9).

Integration of Media in Teaching

The integration of media tools was seen as a valuable teaching method in classrooms that were equipped with digital resources. The teachers reported using a variety of media to supplement traditional teaching methods, creating a richer learning environment. Subtheme: The use of smartboards & interactive content teachers frequently used smartboards to display interactive lessons, allowing students to actively participate in the content being taught. In this linking, a teacher commented: "Smartboards have transformed the way I teach. I can pull up interactive exercises and allow students to take part in the lesson in real-time, which wasn't possible with traditional blackboards." (Teacher 4). The students also enjoyed the interactive nature of these lessons: "Using the smartboard is great source because it feels like you're actively working with the lesson, rather than just watching it happen. It makes learning feel more hands-on." (Student 2).

Challenges in Implementing Media in Education

Despite the positive impact of media tools, several challenges were identified by both teachers and students about the effective implementation of these resources in classrooms. Subtheme: Lack of Training for Teachers Teachers expressed the need for further training to effectively use media tools in their lessons. One teacher shared: "Although the tools are available, I don't always feel that fully confident in using them. There's definitely a need for more professional development to maximize their potential in classroom." (Teacher 5). In this connection, another teacher echoed the sentiment: "We need more support and training. I know how to use the

smartboard, but I'm not sure how to fully integrate the multimedia into my teaching strategy." (Teacher 6)

Subtheme: Infrastructure Limitations Some schools, though equipped with technology, faced challenges in maintaining & updating their infrastructure. One teacher explained: "Not every class is equipped with projector or functional computer. It can be frustrating when technology is available, but the infrastructure doesn't always support it." (Teacher 7). Subtheme: Student distraction while media tools helped engage students, some teachers & students noted that they could be source of distraction. A teacher observed: "Students can sometimes get distracted by the technology, especially when we have free access to online resources. It's a challenge to keep them focused on task at hand." (Teacher 8). One student admitted: "Sometimes I get diverted when I'm using the smartboard or the tablet. I end up looking at things not related to lesson." (Student 4).

DISCUSSION

This research aimed to explore role of media in modern education, focusing on its integration in O-level and A-level classrooms and how it affects student engagement, learning outcomes, and challenges faced by educators in implementing these technologies. The findings suggest that media tools, mainly smartboards & multimedia resources, have positive impact on student participation, understanding, and academic performance. Challenges like short infrastructure, teacher training, and potential distractions remain barriers to the full utilization of media in education.

Media's Impact on Student Engagement

One of the key findings from the study is enhancement of student engagement through the use of multimedia tools in classroom. Both teachers and students reported increased participation & motivation when media tools were integrated into lessons. The findings align with previous research, which has consistently demonstrated that interactive and visual learning experiences improve student engagement (Schuitema et al., 2021; Gikas & Grant, 2021). Students, especially in the O-level and A-level groups, appear to be more accustomed to digital tools, which fosters a more active and participatory learning environment. This finding underscores the shift in education toward more student-centered approaches, where technology supports engagement and fosters active learning (Meyer et al., 2022). The findings resonate with the study by Lee and Lee (2022), which found when media tools like videos and interactive content are incorporated into lessons, students exhibit greater enthusiasm for subject matter. The interactive nature of multimedia allows students to visualize complex concepts, making learning more relatable & engaging.

Media's Impact on Learning Outcomes

In terms of learning outcomes, the research found that the use of media tools facilitated better understanding and retention of complex concepts. This is consistent with earlier studies that have dyed the role of multimedia in improving comprehension, especially in subjects such as mathematics & science (Mayer, 2021; Noroozi et al., 2022). The teachers reported that students who engaged with digital resources were able to grasp difficult concepts effectively compared

to those who relied on traditional methods. The multimedia tools have been shown to improve students' memory retention by providing varied modes of content delivery, including visual, auditory, and kinesthetic learning chances (Grabe & Grabe, 2021). This aligns with cognitive theory of multimedia learning, which suggests that people learn ffectively when information is presented in multiple formats (Mayer, 2021). The study supports this theory by illustrating how use of videos, animations, smartboards helps students consolidate learning and improve understanding.

Integration of Media in Teaching

The integration of media into teaching practices has proven to be beneficial for both educators and students. Teachers in this study reported a greater sense of satisfaction and efficacy when using digital tools, mainly smartboards and multimedia, as part of their lessons. This finding supports research by Ertmer and Leftwich (2022), which emphasizes importance of technology integration in teaching process. Educators who are proficient in using technology can create dynamic and engaging lessons that enhance the learning experience. However, despite these benefits, study highlighted several challenges. Some schools faced infrastructure issues that hindered the consistent use of media tools in the classroom. This is a common issue reported in developing countries, where access to up-to-date technology, resources remains a significant barrier to effective media integration (Crompton & Burke, 2021). Moreover, the research found that while students were usually engaged with multimedia tools, there was tendency for some to become distracted, especially when technology was not integrated effectively into the lesson plan.

Challenges in Implementing Media in Education

The challenges identified in this research are consistent with those found in previous studies. One of the primary challenges highlighted was the lack of teacher training in the effective use of media tools. Many teachers reported feeling underprepared to fully integrate the technology into their teaching practices. This issue has been widely documented in the literature, with the researchers emphasizing need for ongoing professional development and support for teachers to improve their technological competence (Gurung et al., 2022; Cox & Kay, 2021). These issues echo the findings of previous studies, which highlight that while media tools have potential to enhance learning, their effectiveness is contingent upon the availability of infrastructure and support (Selwyn & Facer, 2021). So, potential for student distraction when using media tools in class was noted by both teachers and students. While technology has the potential to enhance engagement, it can also lead to off-task behavior if not carefully managed. In this connection, the research by Xu and Reynold (2021) also suggests that students can become easily distracted by the technology if teachers do not set clear boundaries and expectations for its use in the classroom.

CONCLUSION

This research explored the integration of media in O-level and A-level classrooms, shedding light on its impact on the student engagement, learning outcomes, and the challenges faced by educators in effectively utilizing multimedia tools. The findings demonstrate that media tools,

like smartboards, videos and multimedia resources, significantly enhance student engagement by providing interactive, visual, and dynamic learning experiences. This aligns with cognitive theory of multimedia learning, which emphasizes the effectiveness of delivering information over multiple sensory channels (Mayer, 2021). Study showed that multimedia tools contribute positively to student kind and retention of complex concepts when integrated effectively. Both students and teachers reported better academic performance and satisfaction, reinforcing the importance of adopting technology in the modern education (Grabe & Grabe, 2021; Lee & Lee, 2022).

However, research also highlighted several barriers to effective media integration, including inadequate infrastructure, limited teacher training and the potential for the student distraction. These challenges echo previous findings in literature, which stress the need for continuous professional development for educators and sufficient technological resources to maximize the benefits of media in education (Gurung et al., 2022; Selwyn & Facer, 2021). In conclusion, while the integration of media in O-level and A-level classrooms presents significant opportunities for enhancing the learning outcomes, its success is contingent upon overcoming infrastructural challenges and ensuring teachers are adequately trained. In this regard, future research should explore strategies for addressing these barriers and examine the long-term effects of the media integration on student performance across different educational contexts (Rafiq, Khadim & Afzal, 2023).

REFERENCES

Abboud, J., & Rogalski, J. (2017). The impact of technology on teaching schedules and lesson planning. *World Journal of Education, 8*(6), 99-102. Retrieved from ERIC database.

Aldhilan, D., Rafiq, S., & Afzal, A. (2024). Enhancing Early Childhood Education in Saudi Arabia: Utilizing Gamification for Engaging and Effective Learning. *Gomal University Journal of Research*, *40*(1), 21-35.

Anderson, C. (2019). *The evolution of technology in the classroom: From chalkboards to digital boards*. Journal of Educational Technology, 34(2), 112-128.

Baker, S. (2020). *Digital education tools and their impact on learning outcomes: A systematic review*. Educational Technology Review, 25(3), 245-262.

Belland, B. R., Kim, C. M., & Hannafin, M. J. (2020). A framework for design and development of constructivist learning environments: Tools for enhancing active learning. *Journal of Educational Computing Research*, 47(4), 443-465.

Braun, V., & Clarke, V. (2006). *Using thematic analysis in psychology*. Qualitative Research in Psychology, 3(2), 77-101.

Cox, S., & Kay, J. (2021). Teacher professional development in the age of digital transformation. *Educational Technology Research and Development*, 69(4), 195-215.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Sage Publications.

Crompton, H., & Burke, D. (2021). The role of technology in education: A global perspective. *Educational Media International*, 58(3), 179-196.

Daft, R. L., & Lengel, R. H. (1986). Organizational information requirements, media richness, and structural design. *Management Science, 32*(5), 554–571.

Ertmer, A., & Ottenbreit-Leftwich, A. T. (2022). Teacher technology change: How knowledge, confidence, beliefs, and culture shape classroom technology use. *Journal of Research on Technology in Education*, 54(1), 46-60.

Garrison, D. R., & Vaughan, N. D. (2020). *Blended learning in higher education: Framework, principles, and guidelines*. Wiley.

Gikas, J., & Grant, M. (2021). Mobile computing devices in education: Student perspectives on learning with tablets. *Journal of Computing in Higher Education*, 33(1), 124-138.

Grabe, M., & Grabe, C. (2021). *Integrating multimedia technology in the classroom: A guide for teachers*. Pearson Education.

Gurung, R. A. R., Prieto, L. R., & Muenks, K. (2022). *Technology in the classroom: How to bridge the gap between theory and practice*. Routledge.

Gurung, R. A. R., Silva, M. A., & Pritchard, M. E. (2022). Technology and education: A critical overview of research and practice. *Journal of Educational Technology*, 13(4), 33-47.

Hinostroza, J. E., Hepp, P., & Cox, C. (2016). Technology in schools: Education, ICT, and the knowledge society. *International Journal of Educational Technology*, 3(2), 45-52.

Hodges, C. B., Moore, S., Lockee, B. B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. *Educause Review*, 47(2), 1-10.

Ibieta, A., Hinostroza, J. E., Labbé, C., & Claro, M. (2017). Teachers' and students' attitudes towards technology integration in schools. *Education and Information Technologies, 22*(3), 1235-1246.

Kennewell, S., Tanner, H., Jones, S., & Beauchamp, G. (2008). The Interactive whiteboards: Technology and pedagogy. *Technology, Pedagogy, and Education, 17*(1), 7–26.

Lee, J., & Lee, S. (2022). Impact of multimedia learning on academic achievement: A comprehensive review. *Educational Research Review*, 17(3), 71-85.

Lee, Y., & Lee, M. (2022). The impact of multimedia-based teaching on student engagement and learning outcomes in higher education. *Computers & Education*, 161, 104043.

Mayer, R. E. (2005). *The Cambridge Handbook of Multimedia Learning*. Cambridge University Press. Mayer, R. E. (2021). *Multimedia learning* (3rd ed.). Cambridge University Press.

Meyer, M., Tofade, T., & Miller, M. (2022). Using multimedia to engage learners: Evidence from instructional settings. *Journal of Educational Technology Systems*, 50(2), 145-160.

Noroozi, O., & Biemans, H. J. A. (2022). The effects of multimedia learning on students' cognitive and affective outcomes. *Computers in Human Behavior*, 118, 106704.

Piaget, J. (1952). *The Origins of Intelligence in Children.* International Universities Press. Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, 9(5), 1-6.

Rafiq, S., Afzal, A., & Kamran, F. (2022). Impact of School Environment on Students' Academic Achievements at the University Level. *VFAST Transactions on Education and Social Sciences*, *10*(4), 19-30.

Rafiq, S., Iqbal, S., & Afzal, A. (2024). The Impact of Digital Tools and Online Learning Platforms on Higher Education Learning Outcomes. *Al-Mahdi Research Journal (MRJ)*, *5*(4), 359-369.

Rafiq, S., Kamran, F., & Afzal, A. (2024). Assessing Environmental Awareness Integration in the Curriculum: A Case Study of Lahore's Private Schools. *Al-Qudwah*, *02*(04), 86-100.

Rafiq, S., Kamran, F., & Afzal, A. (2024). Investigating the Benefits and Challenges of Interdisciplinary Education in Higher Education Settings. *Journal of Social Research Development*, *5*(1), 87-100.

Rafiq, S., Kamran, F., Zia, F., Munir, I., & Afzal, A. (2024). The Challenges and Opportunities of Female Leadership in Educational Institutions in Punjab Pakistan. *Remittances Review*, *9*(2), 4245-4262.

Rafiq, S., Khadim, M., & Afzal, A. (2023). The Assessment and Impact of 360-Degree Leadership Performance Appraisal at University Level. *Journal of Social Sciences Development*, *2*(2), 189-203.

Schuitema, J., Kriekemans, S., & De Maeyer, S. (2021). Multimedia-based education: An investigation into the impact on student engagement and academic performance. *International Journal of Educational Technology in Higher Education*, 18(1), 23.

Selwyn, N., & Facer, K. (2021). The digital education agenda: What does the future hold for educational technology? *Journal of Educational Technology & Society*, 24(2), 12-28.

Selwyn, N., & Facer, K. (2021). *The politics of education and technology: A critical analysis of the role of media in classrooms*. Learning, Media and Technology, 46(3), 296-309.

Sharma, R., Singh, N., & Shernoff, D. J. (2009). Web-based learning and its motivational impact. *Journal of Educational Research and Practice*, 14(4), 72-89.

Shernoff, J., Csikszentmihalyi, M., Schneider, B., & Shernoff, E. S. (2017). Student engagement in high school classrooms from the perspective of flow theory. *Social Psychology of Education*, 10(1), 105-123.

UNESCO. (2020). *The global education race: Taking the measure of PISA and international testing*. Cambridge University Press.

Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Harvard University Press.

Xu, B., & Reynolds, R. (2021). *Student distraction and engagement in technology-enhanced learning environments: An empirical study*. Journal of Educational Computing Research, 59(5), 915-937.

Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. L. (2020). Conditions for classroom technology innovations. *Educational Technology Research and Development*, 68(3), 113-131.