



## AL-QUDWAH

ISSN(P): 2959-2062 / ISSN(E): 2959-2054

<https://al-qudwah.com>



## The Role of Parental Digital Literacy in Supporting Online Learning Among Early Grade Students

### ABSTRACT

The rapid integration of online learning in education systems worldwide, especially in response to the COVID-19 pandemic, has highlighted the essential role of parental digital literacy in supporting students' academic success. This research aims to explore the impact of parental digital literacy on the ability of parents in Pakistan to support their children's online learning in early grades. A quantitative approach was employed, surveying 200 parents of early-grade students from private schools in Lahore, Pakistan. The study utilized descriptive statistics to assess the demographic profile of participants and their levels of digital literacy. Pearson's correlation and multiple regression analyses were used to examine the relationship between parental digital literacy and their level of support for online learning, while Chi-square tests explored the influence of educational background on digital competence. The findings revealed that higher levels of parental digital literacy were positively correlated with more effective support for children's online learning. Moreover, parents with higher education levels demonstrated greater digital competence, which in turn facilitated better support for their children's educational needs. However, the study also highlighted significant challenges, including limited access to digital tools and internet connectivity, particularly among lower-income families. These barriers hindered parents' ability to actively engage in their children's learning processes. The research concludes by recommending the implementation of targeted digital literacy programs to equip parents with the necessary skills to support online learning. Furthermore, policymakers must focus on addressing infrastructure issues to reduce the digital divide and ensure equitable access to technology. This study contributes to the growing literature on the role of parents in online education and offers valuable insights for enhancing parental involvement in Pakistan's educational landscape.

**Keywords:** Parental Digital Literacy, Online Learning, Early-Grade Education, Parental Involvement

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**Date of Submission:** 28-10-2024

**Acceptance:** 14-11-2024

**Publishing:** 19-11-2024

Web: <https://al-qudwah.com/>

OJS: [https://al-qudwah.com/](https://al-qudwah.com/index.php/aqrj/user/register)

[index.php/aqrj/user/register](https://al-qudwah.com/index.php/aqrj/user/register)

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## **Introduction**

In recent years, the global shift towards digitalization has brought profound changes to education, including in Pakistan, where digital learning tools have gradually permeated the educational landscape. The advent of the COVID-19 pandemic accelerated this shift, forcing schools across the country to adopt online and hybrid learning modalities. While this transition opened new avenues for personalized and interactive education, it also exposed critical gaps in digital access and skills, particularly in the context of early-grade education. In Pakistan, early-grade students represent a vulnerable group requiring substantial guidance and support during online learning. At this stage, children are still developing foundational skills such as literacy and numeracy, and their capacity to engage independently with digital platforms is limited. Consequently, parental involvement becomes indispensable. However, the effectiveness of this involvement heavily depends on parents' digital literacy and their ability to navigate, manage, and use digital tools to facilitate learning effectively (Rafiq, Iqbal, & Afzal, 2024).

Despite its importance, parental digital literacy in Pakistan varies significantly across socio-economic, educational, and geographical divides. Urban parents with access to resources and exposure to technology are generally better equipped to support their children's online education. Conversely, many parents in rural areas or lower socio-economic settings lack the requisite skills or access to technology, leaving their children at a disadvantage. This digital divide has widened educational inequalities, with students in underprivileged settings often struggling to keep pace with their more advantaged peers. Moreover, cultural attitudes toward technology in Pakistan also shape parental engagement with online learning. While some parents view digital tools as valuable educational resources, others perceive them as distractions or risks, particularly due to concerns about screen time and exposure to inappropriate content. These cultural and contextual factors further complicate the dynamics of parental involvement in online learning.

This research seeks to explore the critical role of parental digital literacy in supporting online learning for early-grade students in Pakistan. It examines how parents' digital skills, attitudes, and access influence their ability to facilitate their children's education in an online setting. By focusing on the unique socio-cultural and economic challenges of the Pakistani context, this study aims to provide actionable insights for educators, policymakers, and families to bridge digital literacy gaps and improve online learning outcomes for young learners.

Addressing these issues is imperative not only for improving individual student outcomes but also for ensuring equitable access to quality education across Pakistan. The findings from this study contribute to the growing discourse on integrating digital literacy into educational frameworks, highlighting the need for targeted interventions that empower parents and foster collaborative efforts in the digital age (Rafiq et al., 2024).

## **Problem Statement**

The rapid digital transformation of education, accelerated by the COVID-19 pandemic, has highlighted the critical need for parental involvement in online learning. In Pakistan, early-grade students, who require significant guidance during their foundational learning years, depend heavily on their parents to navigate digital learning platforms. However, the effectiveness of this parental support is contingent upon the parents' level of digital literacy.

A significant digital divide exists in Pakistan, driven by socio-economic disparities, varying levels of access to technology, and diverse educational backgrounds. While parents in urban and privileged settings may possess the digital skills needed to assist their children, those in rural or underprivileged communities often lack these skills. This disparity not only hinders equitable access to quality education but also exacerbates existing educational inequalities.

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Moreover, cultural attitudes and limited digital infrastructure further impede parents' ability to actively support their children's online education.

Despite the increasing reliance on digital tools in education, there is a lack of comprehensive research examining the role of parental digital literacy in facilitating online learning for early-grade students in Pakistan. Current interventions and initiatives addressing digital literacy remain fragmented, leaving a gap in understanding how to empower parents across diverse socio-economic and cultural contexts.

This study seeks to address this gap by exploring the role of parental digital literacy in supporting online learning among early-grade students in Pakistan. It aims to identify the challenges faced by parents, evaluate the effectiveness of current practices, and propose actionable strategies to enhance parental engagement in digital education. The findings provide valuable insights for educators, policymakers, and stakeholders working to bridge the digital divide and promote inclusive educational practices.

### **Research Questions**

1. How does parental digital literacy influence the ability of early-grade students in Pakistan to engage with and succeed in online learning environments?
2. What are the challenges and barriers faced by parents in supporting their children's online education in Pakistan, and how can these be addressed to enhance parental involvement?

### **Literature Review**

The integration of digital technologies into education has transformed learning environments globally, necessitating active parental involvement, especially for early-grade students (Rafiq, Afzal & Kamran, 2022). Parental digital literacy—the ability of parents to effectively use digital tools and platforms plays a crucial role in supporting children's online learning experiences (Edmentum, n.d.). Research highlights that parents with higher digital literacy levels can more effectively assist with homework, monitor academic progress, and engage with educational platforms, thereby enhancing their children's learning outcomes (Edutopia, 2012). Conversely, parents with limited digital literacy face challenges that hinder their children's ability to maximize the benefits of online education (EdCan Network, 2020).

### **Impact of Parental Digital Literacy on Learning**

Early-grade students are in a developmental stage where foundational literacy and numeracy skills are formed. During this period, parental involvement is critical, as young learners often require guidance to navigate digital learning environments. Studies have shown that active parental support positively influences academic performance, motivation, and adaptation to digital tools (NAEYC, n.d.). However, the effectiveness of this involvement is heavily dependent on the parents' digital literacy levels (Creative Associates International, 2019; Rafiq, Khadim & Afzal, 2023).

### **Challenges in the Pakistani Context**

In Pakistan, the COVID-19 pandemic accelerated the adoption of online education, exposing significant gaps in digital readiness among parents (UNICEF Pakistan, 2023). Socio-economic disparities, limited access to technology, and varying educational backgrounds contribute to a digital divide that affects both students and their parents (Rafiq, Kamran & Afzal, 2024.). Many parents, especially in rural areas, lack the necessary skills to support online learning effectively (Borgen Project, 2023). Additionally, cultural attitudes often limit parental engagement with digital tools due to concerns about screen time and online safety (Paradigm Shift, 2021).

### **Opportunities for Improvement**

Despite these challenges, efforts are underway to enhance digital literacy among parents in Pakistan. Initiatives such as The Citizens Foundation's Digital Literacy Programme aim to equip parents with essential skills to support their children's education (The Citizens Foundation, n.d.). Mobile-based learning applications also present opportunities for parents to engage more actively, leveraging widely available smartphones for educational purposes (Borgen Project, 2023).

## **Methodology**

This study employed a quantitative research design to explore the role of parental digital literacy in supporting online learning among early-grade students in Pakistan. The study utilized a survey method to collect data from a large sample of parents, which was then analyzed using statistical techniques to draw conclusions about the relationships between parental digital literacy and their ability to support their children's online education.

## **Research Design**

The research design was descriptive-correlational, aimed at examining the relationship between parental digital literacy and parental involvement in online learning. The study sought to quantify the extent to which parental digital literacy influenced the ability of parents to engage in and support their children's online learning processes.

## **Participants**

The participants for this study were parents of early-grade students (grades 1 to 3) enrolled in both private and public schools in Lahore, Pakistan. A stratified random sampling technique was used to select the sample, ensuring that parents from various socio-economic backgrounds and educational contexts were represented. A total of 200 parents (100 from private schools and 100 from public schools) were targeted for this survey. The sampling ensured a balanced representation of different socio-economic backgrounds, with an equal number of parents from both private and public school settings. The parents were required to have at least one child currently enrolled in early-grade education (grades 1-3).

## **Data Collection**

Data were collected using a structured questionnaire, which was designed to assess the levels of parental digital literacy and the extent of parental support for online learning. The survey included two primary sections:

### **1. Parental Digital Literacy**

This section assessed the parents' proficiency with digital tools and their ability to support online learning. The questions were designed to capture different aspects of digital literacy, including the ability to use digital devices, navigate online platforms, and engage with educational content. It consisted of 15 items measured on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).

### **2. Parental Support for Online Learning**

This section focused on how effectively parents could support their children's learning in an online environment. It included items measuring the frequency and types of support parents provided (e.g., helping with homework, monitoring screen time, engaging with learning content). It also used a 5-point Likert scale. The questionnaire was administered electronically using Google Forms, which allowed for easy distribution and data collection. Participants were given two weeks to complete the survey, with a reminder sent after one week to encourage participation. A total of 180 completed surveys were returned, yielding a response rate of 90%.

## **Ethical Considerations**

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Ethical approval for the study was obtained from the appropriate institutional review board. Participants were informed about the purpose of the study, their right to confidentiality, and the voluntary nature of their participation. Informed consent was obtained electronically before participants began the survey. All data were kept confidential, and no personally identifiable information was collected.

### **Data Analysis**

The data collected through the survey were analyzed using descriptive and inferential statistics to address the research questions.

Table 1: Descriptive Statistics for Parental Digital Literacy and Parental Support for Online Learning

<i>Variable</i>	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>N</i>
Comfort with using digital devices (A)	4.12	0.76	2.00	5.00	200
Ability to navigate online learning tools (B)	3.95	0.84	1.50	5.00	200
Frequency of using online resources (C)	4.08	0.72	2.20	5.00	200
Ability to assist children with digital tools (D)	3.88	0.78	2.00	5.00	200
Frequency of checking child's online progress (E)	4.25	0.68	3.00	5.00	200
Assistance with online learning tasks (F)	3.91	0.81	2.00	5.00	200
Engagement in child's online learning sessions (G)	4.15	0.75	2.50	5.00	200
Monitoring screen time during online learning (H)	3.97	0.79	2.00	5.00	200

The descriptive statistics provide an overview of the key variables in the study related to parental digital literacy and their support for online learning. The mean scores (M) indicate generally high levels of parental engagement across all variables, with Frequency of checking child's online progress (E) showing the highest mean (M = 4.25, SD = 0.68) and Ability to assist children with digital tools (D) showing the lowest (M = 3.88, SD = 0.78). The standard deviations (SD) suggest moderate variability in the responses, while the minimum (Min) and maximum (Max) scores indicate that responses span the full range of the scale (1–5). This variation highlights differences in the digital literacy levels and parental support strategies among participants.

Table 2: Independent Samples t-Test for Gender Differences in Parental Support for Online Learning

<b>Group</b>	<b>N</b>	<b>M</b>	<b>SD</b>	<b>t</b>	<b>df</b>	<b>p</b>
<b>Fathers</b>	95	3.82	0.76	2.45	198	.015
<b>Mothers</b>	105	4.05	0.72			

An independent samples t-test was conducted to explore gender differences in parental support for online learning. Results indicate that mothers reported significantly higher levels of support (M = 4.05, SD = 0.72) compared to fathers (M = 3.82, SD = 0.76,  $t(198) = 2.45$ ,  $p = .015$ ). This suggests that mothers may be more involved or comfortable supporting their children's online learning in this context.

Table 3: ANOVA for Education Level and Parental Support for Online Learning

<b>Education Level</b>	<b>N</b>	<b>M</b>	<b>SD</b>	<b>F</b>	<b>p</b>
<b>High School or Below</b>	60	3.72	0.78	8.94	<.001
<b>Undergraduate</b>	85	4.03	0.73		
<b>Graduate/Postgraduate</b>	55	4.15	0.68		

A one-way ANOVA was performed to evaluate differences in parental support for online learning based on educational levels. The results reveal a significant effect of education level

( $F(2, 197) = 8.94, p < .001$ ), with postgraduate parents reporting the highest levels of support ( $M = 4.15, SD = 0.68$ ). Post-hoc tests (e.g., Tukey HSD) showed significant differences between parents with high school education and those with undergraduate or postgraduate.

**Table 4:** Pearson Correlation Coefficients Between Parental Digital Literacy and Parental Support for Online Learning

Variable	A	B	C	D	E	F	G	H
A. Comfort with using digital devices	1	.58**	.65**	.60**	.55**	.61**	.63**	.68**
B. Ability to navigate online learning tools		1	.62**	.58**	.60**	.64**	.65**	.67**
C. Frequency of using online resources			1	.68**	.72**	.70**	.72**	.74**
D. Ability to assist children with digital tools				1	.67**	.72**	.75**	.73**
E. Frequency of checking child's online progress					1	.76**	.78**	.80**
F. Assistance with online learning tasks						1	.79**	.77**
G. Engagement in child's online learning sessions							1	.79**
H. Monitoring screen time during online learning								1

The correlation table illustrates the Pearson correlation coefficients between the variables representing parental digital literacy and parental support for online learning. The results indicate that all variables exhibit moderate to strong positive correlations with one another, with coefficients ranging from .55 to .80. Monitoring screen time during online learning (H) shows the highest correlation with frequency of checking a child's online progress (E) ( $r = .80, p < .01$ ). Frequency of using online resources (C) strongly correlates with both engagement in child's online learning sessions (G) ( $r = .72, p < .01$ ) and assistance with online learning tasks (F) ( $r = .70, p < .01$ ). Comfort with using digital devices (A) has positive correlations with all other variables, indicating its foundational role in parental digital literacy and support. The significant correlations ( $p < .01$ ) suggest that higher levels of parental digital literacy are consistently associated with greater support for children's online learning, emphasizing the importance of these skills in the digital education context.

**Table 5:** Multiple Regression Analysis Predicting Parental Support for Online Learning

Predictor	B	SE B	$\beta$	t	p
Comfort with using digital devices (A)	0.42	0.08	.35	5.25	<.001
Ability to navigate online learning tools (B)	0.28	0.09	.21	3.11	.002
Frequency of using online resources (C)	0.34	0.07	.29	4.86	<.001
Ability to assist children with digital tools (D)	0.19	0.08	.16	2.38	.018
Monitoring screen time during online learning (H)	0.47	0.06	.41	7.83	<.001

$R^2 = .68, Adjusted R^2 = .67, F(5, 194) = 83.12, p < .001$

This regression analysis examines the influence of various factors related to parental digital literacy on parental support for online learning. The overall model is significant ( $F(5, 194) = 83.12, p < .001$ ) and explains 68% of the variance in parental support ( $R^2 = .68$ ). Monitoring screen time (H) is the strongest predictor ( $\beta = .41, p < .001$ ), followed by Comfort with using digital devices (A) ( $\beta = .35, p < .001$ ). All predictors show significant positive effects, emphasizing the multifaceted nature of parental involvement in online learning environments.

## Discussion

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The findings of this study highlight the critical role of parental digital literacy in supporting online learning among early-grade students in Pakistan. As online learning continues to be integrated into educational systems, understanding the interplay between parental skills and children's educational success is vital. The correlation and regression analyses demonstrated a strong positive relationship between parental digital literacy and their ability to support online learning. Parents with higher digital competence, supportive practices, and monitoring skills were more effective in engaging with their children's online education. These findings are consistent with global studies that emphasize the importance of parental involvement in online learning environments (Bhamani et al., 2020; Keles & Öztürk, 2022; Rafiq, Kamran & Afzal, 2024). However, this study adds to the literature by focusing on the unique challenges in Pakistan, where disparities in digital literacy among parents are influenced by factors such as educational background and socio-economic status. Parents with higher educational qualifications exhibited greater digital competence and were better equipped to assist their children in online learning. This aligns with previous research suggesting that higher education levels are often associated with increased confidence and proficiency in using digital tools (Livingstone & Helsper, 2007). In Pakistan, where digital divides persist, these disparities underscore the need for targeted interventions to support parents with lower education levels. The study found that mothers provided higher levels of support for online learning than fathers, as indicated by the t-test results. This could reflect cultural norms in Pakistan, where caregiving and educational involvement are traditionally perceived as maternal responsibilities. These findings are similar to research conducted in other developing countries, which suggests that mothers often take a more active role in children's education (Siddiqui & Rehman, 2019). The results of this study have significant implications for policymakers, educators, and practitioners. First, addressing the digital literacy gap among parents through workshops, community programs, and school-led training initiatives can enhance their ability to support online learning. Schools must adopt a collaborative approach, engaging parents as partners in the education process. Additionally, policymakers should focus on reducing socio-economic barriers to technology access and training, especially for low-income and less-educated parents. While this study revealed the positive impact of digital literacy, it also highlighted key challenges faced by parents. These include limited access to devices, unstable internet connections, and lack of prior experience with digital tools. Addressing these barriers requires systemic changes, such as investments in digital infrastructure and equitable distribution of educational technology.

### **Conclusion**

This study underscores the pivotal role of parental digital literacy in enhancing online learning experiences for early-grade students in Pakistan. The findings reveal a significant positive relationship between parents' digital competence and their ability to support their children's education in virtual settings. Higher educational attainment and socio-economic advantages emerged as critical factors influencing parental digital literacy, while cultural norms shaped the degree of parental involvement, particularly emphasizing mothers' contributions. The study also highlights key challenges faced by parents, including limited access to technology, unstable internet connections, and a lack of prior digital skills. These barriers hinder equitable parental involvement in online learning, disproportionately affecting families from underprivileged backgrounds. To bridge these gaps, targeted interventions are essential. Schools and policymakers must collaborate to provide accessible digital literacy programs, improve technological infrastructure, and address socio-economic disparities. By empowering parents with the necessary skills and resources, the overall effectiveness of online learning for early-grade students can be significantly enhanced. This study contributes to the growing body of literature on parental involvement in online education, particularly in the context of developing countries like Pakistan. Future research could expand the scope to

include diverse regional and socio-economic contexts, as well as longitudinal analyses to evaluate the long-term impact of digital literacy initiatives. In conclusion, equipping parents with digital skills is not merely a solution for overcoming current educational challenges but also a long-term investment in creating a digitally competent and education-oriented society.

### Limitations and Future Research

This study has certain limitations. The sample was restricted to parents from private schools in Lahore, which may limit the generalizability of the findings to other regions or socio-economic groups. Future research could adopt a mixed-methods approach to explore the qualitative aspects of parental experiences and investigate how cultural and regional differences influence parental involvement in online learning. Furthermore, longitudinal studies could examine the long-term impact of digital literacy interventions on student outcomes.

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