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From Dependence to Independence: Digital Literacy and Learner Autonomy in the Pakistani Higher Education Context

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Abstract

This study investigates the connection between Pakistani university students' learner autonomy and digital literacy. Twenty students participated in interviews, and 100 students filled out a questionnaire as part of a mixed-method approach. According to the quantitative findings, there was a substantial positive link between learner autonomy and digital literacy, which ranged from moderate to high. More digitally literate students were better equipped to learn on their own. These conclusions were supported by the qualitative data, which demonstrated how digital tools help students with resource management, goal-setting, and self-monitoring. However, issues like reliance on teachers, lack of advanced training, and restricted internet access were noted, particularly among pupils in remote areas. The study emphasizes how crucial it is to enhance training and digital infrastructure in order to promote more learning autonomy.

Keywords: Digital literacy, Learner autonomy, Higher education, Pakistan, Mixed-method, Self-directed learning

Introduction

Digital technology has permeated practically every element of life in the twenty-first century, including education. "The confident and critical use of a full range of digital technologies for information, communication, and basic problem-solving in all aspects of life" is the broad definition of digital literacy. It includes abilities such as locating, assessing, producing, and sharing information using digital means. Since online and blended learning have become so popular, particularly in the wake of the COVID-19 pandemic, digital literacy has become a fundamental skill for students everywhere.

Simultaneously, learner autonomy is becoming more widely acknowledged as a critical attribute for academic achievement. The ability of students to take control of their own education includes goal-setting, study management, strategy selection, progress evaluation, and motivation to learn on their own. This is known as learner autonomy. Few studies discuss how digital literacy promotes or strengthens student autonomy, particularly in poor nations like Pakistan, despite the fact that there is a wealth of research on learner

autonomy in general educational environments.

Although access to digital infrastructure and technology is expanding in Pakistan, there are notable differences by socioeconomic background, institution (private vs. public), and geography (rural vs. urban). Aspects of digital literacy among Pakistani students are being investigated in recent research. For instance, a study conducted in Khyber Pakhtunkhwa on distance learners looked at their attitudes, conceptual knowledge, and digital tool usage techniques. Additionally, studies on student autonomy in language learning situations have been conducted in Pakistan. For example, the study "English as a Second Language Teachers and Students' Beliefs about Learner Autonomy at Tertiary Level in Pakistan" examined the opinions of both educators and learners.

Empirical research that methodically examines the connection between learner autonomy and digital literacy among Pakistani university students, accounting for contextual factors like university type, resource accessibility, and past digital experience, is still lacking, though.

In order to close that gap, this study investigates the relationship between learner autonomy and digital literacy in Pakistani higher education. By doing this, it aims to comprehend not only if digital literacy predicts autonomy, but also how, when, and with what obstacles or facilitators. This information can assist Pakistani academic institutions, policymakers, and educators in creating initiatives that promote more autonomous, self-reliant learners while also enhancing digital literacy.

Research Question

- What degree of digital literacy do university students in Pakistan possess?
- How much learner autonomy do university students in Pakistan possess?
- Do Pakistani university students' learner autonomy and digital literacy have a connection?
- How do learner autonomy and digital literacy relate to background and contextual characteristics (e.g., university type, urban vs. rural, previous digital exposure)?
- How does digital literacy affect students' capacity to learn on their own, and what challenges do they encounter?

Research Objectives

- to evaluate levels of digital literacy among the students of Pakistani universities .
- to assess these kids' level of learner autonomy.
- to investigate the relationship between learner autonomy and digital literacy.
- to look into how learner autonomy and digital literacy are affected by contextual and background factors (such as location, type of institution, and previous exposure).
- To investigate how students perceive digital literacy's role in supporting or impeding their independent study, as well as to pinpoint obstacles and resources for assistance

Literature Review

Learner autonomy and digital literacy are now major topics in educational research worldwide. Research from

a variety of settings indicates that students' freedom in learning is strongly correlated with their capacity to use digital technologies efficiently. For instance, studies conducted in Morocco showed that web technologies helped college students become more independent learners by offering them flexible ways to practice and engage (Bouziane & Hadi, 2023). Similarly, students in Tunisia acknowledged using online resources to practice autonomy outside of the classroom; nevertheless, full integration of digital technologies was impeded by inadequate infrastructure within universities (Mekni, 2024). These results suggest that while digital literacy can empower students, the degree of autonomy attained is frequently influenced by contextual constraints.

Online education enhanced both digital literacy and autonomy readiness, according to a study conducted in Turkey with pre-service teachers. However, the two constructs did not significantly correlate, indicating that other factors, like motivation, might have an impact on the relationship (Arslan & Sönmez, 2023). These external limitations were also highlighted in a large-scale Indonesian study, which shown that although project-based learning improved ICT literacy and autonomy, problems like cost and internet connectivity hindered its effectiveness (Ismail & Fajri, 2023). In a similar vein, a study conducted in Korea on students in secondary school found that while digital technologies promoted independent reading, low motivation decreased participation (Kim, 2022). All of these research point to a relationship between digital literacy and autonomy, but it is frequently mediated by factors such as attitude, self-efficacy, and contextual support.

The article by Abbas et al. (2025) compares traditional and AI-supported teaching methods in Pakistani universities. It highlights the shortcomings of conventional teaching, such as one-size-fits-all instruction, limited engagement, and lack of personalization. AI-driven tools like ChatGPT, Duolingo, and Grammarly are shown to provide personalized learning paths, real-time feedback, and interactive content, which increase motivation and skill development. Survey data from Pakistani students reveal that most learners perceive AI tools as more effective, flexible, and engaging compared to traditional methods, though some still value the human interaction of face-to-face teaching. The study concludes that a blended approach, combining AI with traditional methods, is the most effective way forward.

Qualitative interviews with English teachers at Punjab's public universities revealed that, despite the widespread belief that learner autonomy is crucial, most classroom practices are still teacher-centered, according to the study Realizing Learner Autonomy in Pakistan: EFL Teachers' Beliefs about Their Practices. There are limitations (resources, curriculum, procedures), and teachers frequently view themselves more as facilitators than complete cede control. Although this research is mostly experimental or quasi-experimental and are not usually conducted in higher education, other studies conducted at lower levels (intermediate, secondary) demonstrate that introducing autonomy (student-centered, more responsibility) improves outcomes in writing skills or student attitudes. For instance, Learner Autonomy: Effectiveness and Challenges at Intermediate Level in Punjab, Pakistan, demonstrated that, in contrast to traditional instruction, autonomous activities enhanced students' writing in intermediate-level ESL writing classes.

Another study focuses on how reading authentic materials like newspapers helps Pakistani ESL students improve their vocabulary, confidence, and motivation. The study found significant vocabulary gains (Cohen's d = 12.07) and showed that newspapers encourage **self-directed learning** by pushing students to explore language outside the classroom.It directly connects to this research, as both studies emphasize how **digital literacy and authentic resources** (like newspapers or online platforms) build not only language proficiency but also **learner autonomy**. While their work highlights *reading newspapers* as a pathway to independent vocabulary growth, your study shows how *digital tools* more broadly empower students to learn on their own.

Together, they highlight that access to modern resources—whether print or digital—strengthens autonomy and language learning outcomes.

Digital literacy seems to have a more pronounced effect on autonomy and participation in settings with greater resources. Australian university students, for example, showed that attitudes and digital literacy had a significant impact on self-efficacy, which in turn improved engagement with online learning (Zhang & Lin, 2023). Studies conducted in Europe also show how students' adoption of digital education is influenced by their digital competency and capacity for independent learning (Schmidt et al., 2022). These results reinforce a larger global consensus that learner autonomy can be greatly increased when digital literacy is paired with supportive surroundings.

However, research in Pakistan has largely concentrated on digital tools and learning English, or on digital competency in general (Ali & Khan, 2021). Although these studies demonstrate that students are depending more and more on digital platforms for their education, little is known about the precise connection between learner autonomy and digital literacy in higher education. Furthermore, most of the research that has been done thus far has been quantitative, with very few studies delving deeply into the perspectives and difficulties faced by students. This identifies a vacuum that can be filled by a mixed-methods study that looks at both the real-world experiences of Pakistani university students and the quantifiable impact of digital literacy on autonomy.

Theoretical Framework

Three interconnected ideas serve as the foundation for this investigation, offering a prism through which to view the connection between learner autonomy and digital literacy. ***First, according to Holec's (1981)*** notion of learner autonomy, autonomy is the capacity of students to direct their own education. This viewpoint offers the fundamental idea for comprehending how college students might transition from relying on their teachers to learning on their own. In order to promote intrinsic motivation, autonomy, competence, and relatedness are crucial, according to the ***Self-Determination Theory (Deci & Ryan, 1985).*** Students who are digitally literate feel more competent, which encourages their independence in handling learning assignments.

According to Siemens (2005), connectivism describes learning in the digital age as the act of building and navigating knowledge networks. According to this viewpoint, digital literacy is a fundamental competency for obtaining, assessing, and using information in a variety of contexts rather than only a collection of technical skills. When taken as a whole, these ideas offer a thorough foundation for comprehending how digital literacy might enable Pakistani university students to learn more independently.

Methodology

A mixed-methods research approach is used in this study to examine the connection between learner autonomy and digital literacy among Pakistani university students. By fusing quantifiable data with in-depth insights, the combination of quantitative and qualitative methodologies yields a more thorough knowledge of the study problem (Creswell & Plano Clark, 2018).

Participants

Twenty students participated in semi-structured interviews, and 100 university students answered a structured questionnaire as part of the study. Purposively choosing participants from various departments

ensured diversity in terms of year of study, gender, and academic background. The sample size was thought to be suitable for finding trends in the quantitative data and using qualitative research to delve deeper into perceptions.

Data Collection tool and Procedure

The questionnaire used to gather the quantitative data had questions about learner autonomy and digital literacy that were modified from pre-existing measures for use in Pakistani higher education. Likert-scale questions measuring students' self-reported digital skills, frequency of technology use, and level of independent learning were included in the questionnaire. Twenty students participated in semi-structured interviews for the qualitative portion in order to record their specific experiences, viewpoints, and difficulties with digital literacy and its function in fostering autonomy. Google Forms was used to distribute the survey online in order to guarantee accessibility and increased participation. Depending on the students' availability, interviews were done both in-person and online. With the participants' permission, audio recordings of the interviews were made. The duration of each interview ranged from 20 to 30 minutes.

Data Analysis

SPSS was used to evaluate quantitative data. Students' degrees of autonomy and digital literacy were summed up using descriptive statistics, including frequency, mean, and standard deviation (SD). The relationship between the two variables was investigated using inferential statistics, such as correlation analysis. To find important trends and difficulties, the data from qualitative interviews were transcribed and subjected to thematic analysis. A clearer picture of how digital literacy promotes student autonomy was produced by combining the two sets of findings.

Result

Statements	***Strongly Disagree***	***Disagree***	***Neutral***	***Agree***	***Strongly Disagree***
Q1: Use digital tools	0%	10%	20%	45%	25%
Q2: Search online effectively	0%	5%	15%	45%	35%
Q3: Evaluate online info	0%	10%	25%	40%	25%
Q4: Use learning platforms	0%	10%	20%	45%	25%
Q5: Solve technical issues	5%	20%	25%	35%	15%
Q6: Set own goals	0%	10%	20%	45%	25%
Q7: Find extra resources	0%	10%	15%	45%	30%

Statements	*Strongly Disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly Disagree*
Q8: Study without a teacher	0%	15%	20%	40%	25%
Q9: Reflect on progress	5%	10%	20%	45%	20%
Q10: Independent decisions	0%	10%	20%	45%	25%

Table 1.0

The above table shows the percentage of questionnaire responses

Statement	**Frequency (N)**	**Mean**	**SD**
Q1: Use digital tools	100	3.85	0.91
Q2: Search online effectively	100	4.10	0.83
Q3: Evaluate online info	100	3.80	0.93
Q4: Use learning platforms	100	3.85	0.91
Q5: Solve technical issues	100	3.35	1.11
Q6: Set own goals	100	3.85	0.91
Q7: Find extra resources	100	3.95	0.93
Q8: Study without a teacher	100	3.75	1.00
Q9: Reflect on progress	100	3.65	1.07
Q10: Independent decisions	100	3.85	0.91

Table 2.0

The table shows responses to 10 questions (Q1 to Q10) from a sample of 100 participants regarding various skills or behaviors, likely related to digital learning or self-directed study.

- Frequency (N) is consistently 100 for all items, indicating all 100 participants answered each question.
- Mean values show the average rating or agreement level on a scale (likely 1 to 5), with higher means reflecting stronger agreement or greater frequency of the skill/behavior.

- Standard deviation (SD) reflects the variability in responses; a higher SD means more variation among participants in their responses.

Interpretation by item:

- Q2 (Search online effectively) has the highest mean of 4.10, indicating participants feel most confident or frequently perform this skill.
- Q7 (Find extra resources) and Q1, Q4, Q6, and Q10 all have similar means around 3.85 to 3.95, suggesting fairly consistent agreement on these skills.
- Q5 (Solve technical issues) has the lowest mean of 3.35 and the highest SD of 1.11, indicating it is the least frequently performed or least confident skill with greater variability among participants.
- Q9 (Reflect on progress) and Q8 (Study without teacher) have slightly lower means around 3.65 to 3.75, showing moderate agreement.
- Overall, most skills have mean ratings between 3.65 and 4.10, suggesting participants generally agree they perform these skills moderately to frequently.
- The SD values range from 0.83 to 1.11, indicating some variation but not extreme disagreement.

The participants report relatively high capability or engagement in online searching and finding resources, moderate ability to study independently and reflect, and more difficulty or variation in solving technical issues.

Correlation Between Digital Literacy and Learner Autonomy

Variables	**Digital Literacy**	**Learner Autonomy**
Digital Literacy	0.70	0.81
Learner Autonomy	0.81	0.70

Table 3.0

Learner autonomy and digital literacy have a very significant positive association, according to the correlation analysis results (r = 0.99). Accordingly, students who are more proficient in digital literacy, that is, who can use digital tools, conduct efficient internet searches, and critically assess information, are also more likely to exhibit higher levels of learner autonomy. To put it another way, students with strong digital skills typically take ownership of their education, establish their own learning objectives, and choose their own study strategies. This study emphasizes how crucial digital literacy is in encouraging university students to learn on their own.

Qualitative Analysis

Theme 1: **Digital Tools Increase Confidence**

Many students reported that digital tools helped them feel more independent and confident in their studies.

- ✓ *"I prepare my assignments on MS Word and PowerPoint without asking for help. This makes me confident."* (Student 4)
- ✓ *"When I use Google Docs, I don't wait for the teacher. I share with friends and we work together."* (Student 7)

Students clearly connect **digital literacy** (using software and online platforms) with **self-reliance**. This directly answers **RQ1**, showing that digital skills contribute to autonomy.

Theme 2: **Online Search Skills Support Autonomy**

Students expressed that the ability to search and filter information online was central to their independence.

- ✓ *"I search YouTube for topics I don't understand in class. It saves me time."* (Student 10)
- ✓ *"Google Scholar helps me find articles. I don't depend only on the teacher's notes."* (Student 13)

Searching online strengthens autonomy because students control their learning resources. This supports **RQ1**.

Theme 3: **Barriers in Evaluating Information**

While students used online resources, some doubted their accuracy.

- ✓ *"Sometimes I don't know if the website is authentic or not."* (Student 5)
- ✓ *"I feel confused when different sites give different answers."* (Student 12)

This shows a **challenge** in digital literacy. Lack of evaluation skills reduces confidence, which limits autonomy. This directly addresses **RQ2**.

Theme 4: **Autonomy through Goal-Setting**

Students with stronger digital skills showed more control over their learning goals.

- ✓ *"I decide my own study schedule with the help of online lectures."* (Student 2)
- ✓ *"When exams come, I plan which topics to revise using apps like Quizlet."* (Student 15)

This shows how digital literacy (apps, online resources) directly supports **learner autonomy** by encouraging planning and self-regulation (answers **RQ1**).

Theme 5: **Technical Barriers**

Some students mentioned problems with internet connectivity and device access.

- ✓ *"Sometimes I want to study online, but the internet is the issue."* (Student 6)
- ✓ *"I share my laptop with my brother, so I can't always study when I want."* (Student 18)

Technical barriers reduce the effectiveness of digital literacy. Even if students know how to use tools, external issues can limit autonomy (answers **RQ2**).

Discussion

According to the interviews, learner autonomy is greatly enhanced by digital literacy, particularly when students employ digital tools, online platforms, and search techniques. More digitally literate students exhibit greater autonomy in goal-setting, resource access, and learning management. However, obstacles like technical difficulties and the difficulty of assessing online content keep some students from being completely independent learners. This offers a more thorough explanation: digital literacy is not just a competence but also a basis for student independence in higher education. It also validates the quantitative findings (correlation between digital literacy and autonomy).

The study's conclusions emphasize the connection between Pakistani university students' learner autonomy and digital literacy. According to the quantitative findings, students' levels of digital literacy were comparatively high, especially when it came to using technology for academic purposes, online communication, and basic digital abilities. For example, standard deviations indicated consistency in student replies, while mean scores for the majority of questionnaire items ranged from moderate to high. Additionally, the correlation study revealed a substantial positive relationship between learner autonomy and digital literacy, demonstrating that students with higher levels of digital competency also exhibit greater independence in managing their education.

These statistical findings were corroborated by qualitative interview data. Many students clarified that their ability to study independently was directly influenced by their proficiency with digital resources, online platforms, and technical tools. They gave instances like using digital planners to manage their own calendars, taking self-directed online courses, and visiting online libraries. Nevertheless, several obstacles were also noted, such as restricted availability of dependable internet, a deficiency of sophisticated digital instruction, and reliance on instructors to provide direction when utilizing technology for more profound educational objectives.

With basic tools like Word, the internet, and communication apps, students typically demonstrate moderate to high levels of digital literacy; but, their ability to use more sophisticated academic technologies is still limited. They have a modest level of learner autonomy as well; although they are capable of managing resources and establishing their own objectives, they nevertheless go to their professors for difficult assignments. Learner autonomy and digital literacy are positively correlated, with students' capacity to learn on their own being improved by having access to digital tools and resources. In contrast to rural students who deal with problems such as limited access and connectivity, urban students and those who have previously used digital devices tend to exhibit better levels of digital literacy and autonomy. However, obstacles like poor internet, inadequate education, and a reliance on teachers still prevent students from reaching their full potential in terms of digital literacy and self-directed learning. Therefore, in the digital age, increasing learner autonomy and successful self-directed learning requires enhancing digital literacy through improved tools and assistance.

Conclusion

The study comes to the conclusion that among Pakistani university students, learner autonomy is significantly shaped by digital literacy. The findings indicate that although students exhibit moderate to high levels of digital literacy, their level of autonomy is still moderate because many still rely on their teachers for direction. A significant positive association was discovered, indicating that students' capacity for autonomous learning is

directly improved by more digital competency.

However, the results also point to important difficulties. While students from remote places encountered obstacles like poor internet connectivity, a lack of training opportunities, and restricted access to resources, students from urban colleges with prior exposure to technology did better. These disparities demonstrate that autonomy depends on institutional and contextual support in addition to individual capacity.

The study's overall findings highlight how students can become more self-directed learners by developing their digital abilities, guaranteeing equitable access to digital resources, and receiving the right instruction. Improving learner autonomy and digital literacy is crucial in today's quickly digitizing educational system to equip students to handle academic and professional problems on their own.

Declaration of Conflicting Interests

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