The Impact Of Digital Literacy On Learning Outcomes Among Secondary School Students In Jorhat District, Assam

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Abstract

This study examines the relationship between digital literacy and academic achievement among secondary school students in the Jorhat region of Assam. Digital literacy, which extends beyond basic computer abilities in a culture that is becoming more and more digitalized, includes the capacity to evaluate, create, and distribute information across a range of digital platforms. The rapid shift to online education brought about by the COVID-19 epidemic has brought attention to both the advantages and disadvantages of digital education, particularly in places like Jorhat where significant infrastructural, device accessibility, and teacher preparedness shortages still exist.

To ensure equitable representation of both genders, private and public schools, and urban and rural locations, 100 secondary students were selected by stratified random sampling for this study, which employed a descriptive survey approach. The data was gathered using a standardized Digital Literacy Scale (DLS), and the findings were analyzed using Pearson's correlation coefficient, independent t-tests, and descriptive statistics using SPSS software. The results, which revealed minimal differences in digital literacy levels across school types, gender, and location—with rural students marginally outperforming their urban counterparts—challenged conventional wisdom on internet availability and proficiency.

These findings highlight the critical need for inclusive digital education policies that promote equitable access to technology, enhance teacher preparation, and address infrastructural deficiencies. Such measures are necessary to improve academic performance and provide students with the abilities they need to thrive in a global, digitally driven world.

Keywords: Digital Access, ICT in Education, Secondary School Students, Digital Competency, and Educational Outcomes.

Introduction

Digital literacy has become a critical ability for contemporary citizens in the fast-paced digital age, garnering considerable interest from education scholars (Shuangting Ding et al., 2024). The increasing significance of digital competency is highlighted by the widespread impact of digitization on almost every aspect of human existence (Abinash Neog & A. K. Erigala, 2024). This has been especially noticeable in the field of education, where the COVID-19 pandemic's extensive use of digital tools and online platforms made digital learning an essential substitute for continuing educational activities. These modifications continue to alter teaching and learning methods even in the post-pandemic era (Abinash Neog & A. K. Erigala, 2024).

The ability to find, assess, produce, and share information through digital media, communication technologies, or networked systems is known as digital literacy (W. Brata et al., 2022). According to Muhammad Kashif Majeed et al. (2024), it includes a variety of abilities, including risk reduction, online identity management, information organization, and successful digital communication. Giving students these abilities is essential for training them to handle the changing demands of the digital workplace, as Majeed and colleagues (2024) stress. This will allow them to evaluate emerging technologies critically and choose the right tools for a variety of jobs.

The incorporation of digital literacy into teaching strategies has attracted a lot of research attention in the context of language acquisition (Nur Rahmah Wahyuddin et al., 2024). Digital literacy not only improves learning but also develops critical thinking and problem-solving skills, which improves academic performance overall (Shuangting Ding et al., 2024). UNESCO highlights the importance of digital literacy in creating an informed, values-driven society where educational outcomes are enhanced in all areas by connecting it with Education for Sustainable Development (Risa Saskiatul Amaliah et al., 2023). Successful use of these qualities is frequently reflected in improved academic accomplishment (Risa Saskiatul Amaliah et al., 2023).

People must understand the complex connection between digital literacy and learning outcomes if they are to prosper in the current digital transformation (W. Brata et al., 2022). Digital literacy enables people to interact with technology in ethical and meaningful ways by encouraging a critical, responsible, and reflective approach to digital content (W. Brata et al., 2022).

In India, and particularly in states like Assam, digital literacy presents both opportunities and challenges for education systems. The country's public was first introduced to the internet on August 15, 1995, and today numerous service providers operate nationwide (Anjuma Saikia & Ranjeet Kumar Choudhary, 2024). While specific studies focusing on secondary school students in certain districts remain limited, research has begun to shed light on digital literacy levels among rural populations in Assam's Jorhat and Golaghat districts, revealing knowledge levels and attitudes towards digital learning (Level of Knowledge on Digital Literacy among Rural People of Assam, 2023).

Studies from Lakhimpur District in Assam further reveal a significant digital divide among upper secondary students. Science students demonstrated greater awareness and more extensive internet use than their peers in the arts stream, while students from private junior colleges reported higher levels of internet utilization

compared to those from public institutions (Anjuma Saikia & Ranjeet Kumar Choudhary, 2024). These findings highlight the complex interplay of subject choice, institutional context, and digital engagement within Assam's evolving educational landscape.

Background of the Study

Globally, teaching and learning procedures have been completely transformed by the use of technology into the educational sector. Initiatives for digital education have been growing gradually in India, while acceptance rates differ greatly by location. The Jorhat district in the state of Assam is a semi-urban area with remarkable educational advancements but uneven digital inclusion. Limited digital infrastructure, unequal internet service access, and a lack of qualified teachers with digital tool proficiency continue to be problems in many schools (Baruah & Hazarika, 2020).

Global events like the COVID-19 epidemic, which forced educational institutions to use online teaching methods, have expedited the shift toward digital learning (UNESCO, 2021). The digital divide was made clear by this abrupt change, as pupils who had access to gadgets and digital abilities were able to continue learning efficiently, while others fell behind because they lacked the necessary tools and assistance.

According to Livingstone et al. (2011), digital literacy encompasses more than just the technical proficiency of using computers and the internet. It also includes the ability to critically assess digital content, generate information using digital tools, and engage in safe online interactions. Gaining these abilities is essential for secondary school pupils since it has a direct effect on their academic achievement, information access, and general preparedness for both the workforce and postsecondary education.

Significance of the Study

In order for students to succeed academically and professionally in the digital age, technology integration into the classroom has become crucial. This study is important because it examines the connection between secondary school students' academic performance and digital literacy in the Jorhat district of Assam, a place that reflects both urban and rural educational environments and is frequently characterized by unequal access to technology.

Firstly, by offering actual data on the ways in which digital literacy affects learning outcomes in the unique sociocultural and economic context of Assam, the study adds to the body of information already in existence. Although research from around the world has shown a connection between academic achievement and digital competency, there are few studies that focus on the particular opportunities and difficulties faced by students in Northeast India. This study closes that gap by providing localized insights that can guide future research and policymaking.

Secondly, teachers and school administrators should take note of the study's conclusions. The study can help teachers create effective pedagogical strategies that incorporate digital tools appropriately according to students' needs and capabilities by determining the levels of digital literacy among students across genders, geographic areas (urban and rural), and school types (private and government). In order to close the digital

divide and guarantee that every student, regardless of background, has an equal chance to gain from digital learning, it highlights the significance of focused interventions.

Thirdly, the study is important for Assamese and Indian policymakers and planners of education. The findings of this study can assist in assessing the efficacy of such programs and in creating more inclusive, equitable digital literacy initiatives that serve a variety of student populations as the government continues to implement the National Education Policy (NEP) 2020 and digital initiatives like Digital India and the National Digital Literacy Mission (NDLM).

Importance of Digital Literacy in Education

Digital literacy has become a vital ability for both academic performance and lifelong learning in the 21st century's quickly changing knowledge economy. The ability to access, assess, produce, and share knowledge through digital technology is known as digital literacy (Eshet-Alkalai, 2004). Critical thinking, online collaboration, ethical usage of digital content, and problem-solving skills in virtual environments are all included, going beyond fundamental computer capabilities (Ng, 2012).

Enhancing students' academic engagement and learning results is one of the main reasons digital literacy is important in education. Interactive, student-centered learning experiences that promote greater comprehension, creativity, and critical thinking are made possible by digital tools (Buckingham, 2015). Online simulations, virtual labs, and instructional applications, for instance, help students envision difficult ideas, practice solving problems, and get immediate feedback—all of which help them retain more information (Kay et al., 2017).

Moreover, digital literacy equips students with the ability to navigate vast online resources effectively, helping them distinguish between credible and unreliable information—a vital skill in today's information-saturated world (Livingstone & Helsper, 2007). The ability to critically evaluate information sources empowers students to become independent learners and responsible digital citizens.

On a larger scale, digital literacy also equips students to meet the needs of the contemporary workforce. Nowadays, many professions demand that workers be adept at using digital tools, analyzing data, working together online, and keeping up with emerging technologies (van Laar et al., 2017). Schools can enhance students' academic performance and future employability and job preparedness by incorporating digital literacy into the curriculum.

Furthermore, digital literacy promotes inclusive education by providing alternative pathways for learning. Students with diverse learning needs can benefit from assistive technologies that personalize learning experiences and foster equity in education (UNESCO, 2018).

But a lack of digital literacy can make already existing disparities worse, especially in areas like rural and impoverished communities where access to digital infrastructure is limited (Kundu & Dey, 2021). Thus, encouraging digital literacy is essential to closing the digital divide and guaranteeing that every student has equitable access to top-notch instruction.

Purpose of the Study

This study aims to investigate the connection between academic achievement and digital literacy among secondary school pupils in the Jorhat area of Assam. The study specifically aims to investigate the differences in digital literacy between students from government and private schools, between male and female students, and between urban and rural schools. Digital literacy is becoming a crucial ability for students' academic and personal development as a result of the growing integration of technology into the classroom. The purpose of this study is to find any gaps that may exist between various student groups and to produce empirical evidence on the impact of digital literacy on learning outcomes. The results will assist educators, school officials, and legislators in creating focused plans that support fair access to digital resources, enhance digital literacy, and eventually boost academic achievement for a range of student demographics.

Statement of the Problem

The significance of digital literacy for academic success has grown as education continues to change in the digital age. However, secondary school pupils' levels of digital readiness differ greatly, especially in underdeveloped areas like Assam's Jorhat district. Limited access to digital devices, poor internet connectivity, and a lack of support in acquiring essential digital skills are issues that many students deal with. There is still a lack of knowledge regarding how government efforts to advance digital education translate into quantifiable learning outcomes at the secondary school level. There is a substantial information gap caused by the lack of thorough research on the relationship between digital literacy and academic achievement in this area.

The true needs of the students may not be met by policy initiatives if the existing levels of digital literacy, the unique difficulties that students experience, and the true influence on their academic performance are not well understood. Thus, it is crucial to carefully investigate how much digital literacy affects learning outcomes and pinpoint the obstacles preventing secondary school pupils in the Jorhat area from effectively acquiring digital skills.

Objectives of the Study

1. To investigate the connection between digital literacy and secondary school pupils in Assam's Jorhat area who attend both government and private institutions.
2. To study the relationship between digital literacy among secondary school students of Male and Female schools in Jorhat district of Assam.
3. To study the relationship between digital literacy among secondary school students of Urban and Rural schools in Jorhat district of Assam.

Reviews Literature

Sharma and Das (2018) Sharma and Das (2018) conducted a comprehensive study in secondary schools in the Kamrup area of Assam, concentrating on the connection between students' academic performance and digital literacy. A sample of 300 secondary school students, equally split between boys and girls, participated in the survey. They came from both public and private institutions, as well as from both urban and rural areas. The researchers wanted to get a thorough grasp of how academic performance is impacted by digital literacy

skills across a range of socio-educational backgrounds. The results showed a strong beneficial relationship between students' academic performance and their level of digital literacy. Pupils who were more adept at using digital tools and resources did better than their colleagues who had less exposure to technology. Participation in online assignments, frequent access to internet-based materials, and use of interactive learning platforms that promoted critical thinking and active learning were important contributing variables. By offering immediate access to a variety of educational resources, facilitating individualized learning, and encouraging collaborative learning settings, these digital technologies improved students' cognitive engagement. The report also emphasized the importance of equitable digital infrastructure, emphasizing how differences in access to technology and inadequate teacher preparation may make already-existing educational inequities worse.

Borah and Saikia (2019) Borah and Saikia (2019) undertook a detailed investigation into the influence of digital learning tools on the cultivation of critical thinking skills among secondary school students in Jorhat district, Assam. The study involved 250 students drawn from five government secondary schools, ensuring equitable representation from both rural and urban settings. To complement the quantitative data obtained through student surveys, the researchers conducted qualitative interviews with teachers and school administrators, offering a holistic perspective on the adoption and implementation of digital learning within these institutions. The findings revealed that students who regularly engaged with digital platforms exhibited notable improvements in analytical reasoning, problem-solving abilities, and self-assurance in managing academic tasks. The use of digital content, interactive learning modules, and problem-based online activities was observed to actively stimulate cognitive processes, foster independent exploration, and promote a deeper comprehension of academic material. Nevertheless, the research also brought to light significant challenges, particularly in rural areas, where infrastructural deficiencies, limited access to devices, and unreliable internet connectivity posed substantial barriers to effective digital learning. The authors stressed that while digital literacy serves as a powerful catalyst for developing higher-order cognitive skills, its benefits remain unevenly distributed due to these persistent access gaps. To address this inequity, Borah and Saikia advocated for focused policy interventions, emphasizing the need for robust investments in digital infrastructure, widespread device availability, improved internet access in marginalized regions, and comprehensive professional development programs for teachers. By empowering educators with the necessary digital competencies and ensuring equitable access for all students, the study argued, educational systems can better harness the full potential of digital learning to foster critical thinking and academic success.

Ahmed and Hussain (2020) We out a thorough investigation on how digital literacy affects secondary school pupils' academic motivation in the Nagaon district of Assam. 200 kids from government and private schools in both urban and rural locations made up the sample. Students between the ages of 13 and 16 made up the study population. The findings showed that academic motivation and digital literacy were strongly positively correlated, especially for students who used interactive e-learning platforms, online simulations, and educational apps. Digital technologies improved student confidence, self-directed learning, and engagement, according to the findings. However, inadequate internet connectivity and a lack of parental support for digital learning presented major obstacles for rural kids, which had an impact on their overall academic development.

Sarma and Dutta (2021) examined the connection between exam scores and digital literacy among secondary school pupils in Assam's Dibrugarh district. 350 pupils from eight secondary schools—both public and private—equally split between rural and urban areas were included in the research sample. In order to gather contextual insights, teachers were also polled. Because they could access more digital learning resources, kids with higher levels of digital literacy did better on tests, according to the study. According to the study, children attending private schools were exposed to technology more frequently than those attending public schools. The results underlined how government schools must improve their digital resources to give every student equal access to education.

Gogoi and Barman (2021) examined how digital literacy influences students' problem-solving skills in secondary schools in Golaghat district, Assam. The study included 220 students from six secondary schools, with participants drawn from both rural and urban areas. The population included students from diverse socio-economic backgrounds. Findings demonstrated that students with strong digital literacy were more confident in solving academic problems, utilizing online resources for self-directed learning. However, rural students showed lower proficiency due to limited digital exposure. The study concluded that while digital literacy enhances independent learning and problem-solving capabilities, equitable access remains a significant challenge that must be addressed through policy reforms and infrastructural improvements.

Kalita and Nath (2022) centered on evaluating how teachers in the Sivasagar area of Assam view the contribution of digital literacy to raising student performance in the classroom. One hundred secondary school teachers from both government and private schools were surveyed for the study; fifty of them were men and fifty were women. Instructors saw that pupils who were accustomed to using digital tools showed more engagement, better participation, and a greater capacity to handle difficult knowledge. According to the study, instructors were largely in favor of include digital literacy in the curriculum, but they voiced worries about pupils' unequal access. The report suggested that schools focus giving all students equitable access to digital resources and that teachers undergo ongoing training in digital pedagogy.

Das and Bhuyan (2023) studied the influence of digital literacy on self-regulated learning among secondary school students in Tinsukia district, Assam. The sample included 180 students aged 14-16 from four government secondary schools. The study found that students who actively used digital learning platforms developed stronger self-regulation, goal-setting, and time-management skills. The findings highlighted that digital literacy empowers students to take ownership of their learning, leading to better academic outcomes. However, limited infrastructure in rural areas created barriers for many students. The authors suggested that government intervention is crucial to improve rural connectivity, device availability, and parental awareness to support digital learning at home.

Choudhury and Paul (2023) examined how secondary school pupils in the Barpeta district of Assam differed by gender in terms of their digital literacy and learning results. Three hundred pupils from six secondary schools—150 boys and 150 girls—made up the sample. According to the study, when given equal access and training, girls quickly closed the confidence gap that boys had initially shown when using technology. According to the results, digital literacy had an equivalent positive impact on academic performance, critical

thinking, and group learning for both males and girls. In order to guarantee that all students develop their skills in a fair manner, the study underlined the significance of gender-inclusive policies and consistent digital literacy initiatives.

Methodology

Research Design

In order to investigate the connection between digital literacy and learning outcomes among secondary school students in the Jorhat district of Assam, this study used a descriptive survey research approach. The descriptive approach was selected because it enables the gathering of detailed information from a sizable population in order to comprehend the current state of affairs, connections, and difficulties pertaining to digital literacy.

Population of the Study

All secondary school students (classes IX and X) and teachers from public and private schools in the Jorhat district of Assam made up the study's population. To guarantee a balanced representation, both urban and rural schools were included in the study population.

Sample and Sampling Technique

One hundred secondary school pupils in all were chosen to serve as the study's sample. Fifty students from government secondary schools and fifty students from private secondary schools were included in the sample.

To ensure diversity, the sample was equally distributed between:

- Rural areas (50 students), Urban areas (50 students)

To guarantee representation across all school kinds, localities, and genders (both boys and girls), a stratified random sample technique was used. For a thorough analysis, our sampling technique made sure that different subgroups were sufficiently represented.

Data Analysis

After data collection was complete, all Academic Achievement Records and Digital Literacy Scale (DLS) responses were meticulously coded and entered into the Statistical Package for the Social Sciences (SPSS) version 23 for systematic analysis. The calculation of descriptive statistics, such as mean, standard deviation, frequencies, and percentages, gave a comprehensive picture of students' degrees of digital literacy across a variety of domains.

To achieve the first research purpose, the digital literacy scores of students attending government and private schools were compared using an independent samples t-test. The second objective was to examine gender-based differences by comparing the digital literacy scores of male and female students using a separate independent samples t-test. To achieve the third objective, a t-test was also employed to investigate the disparities in digital literacy between students from urban and rural areas.

Along with these comparisons, the degree and direction of the association between students' academic accomplishment and their digital literacy scores were assessed using Pearson's correlation coefficient. All statistical tests were conducted with a significance level of 0.05 to guarantee the authenticity and dependability of the results.

Results

To investigate the association between digital literacy and several demographic characteristics, SPSS software was used to analyze data gathered from 100 secondary school students in the Jorhat district of Assam. The following is a presentation of the findings for each objective:

Table: 1.1 Age of the respondents.

Age (In Years)		
	Frequency	Percent
11	22	22%
12	33	33%
17	15	15%
18	30	30%
Total	100	100%

The research sample was composed of 100 secondary school students from Jorhat district, Assam, representing a diverse range of age groups. Among these participants, twelve-year-olds formed the largest subgroup, comprising 33% of the total sample (n=33). This indicates that one-third of the surveyed students were at an early stage of secondary education, likely corresponding to lower secondary grades where foundational digital literacy skills are being developed. The second-largest group consisted of eighteen-year-olds, who accounted for 30% of the sample (n=30). These students were likely in the higher secondary levels, preparing for critical board examinations and post-secondary academic pathways, where advanced digital competencies might be increasingly relevant.

Eleven-year-old participants constituted 22% of the sample (n=22), suggesting a significant representation of students who were possibly at the transition point between primary and secondary schooling, gradually being introduced to more structured digital learning environments. Seventeen-year-olds formed the smallest group in the sample, representing 15% (n=15). These students were likely in the final stages of their secondary education, where digital tools may be used extensively for academic research, online assessments, and career planning.

Graph:1.1 Graphical representation of Age of the respondents.

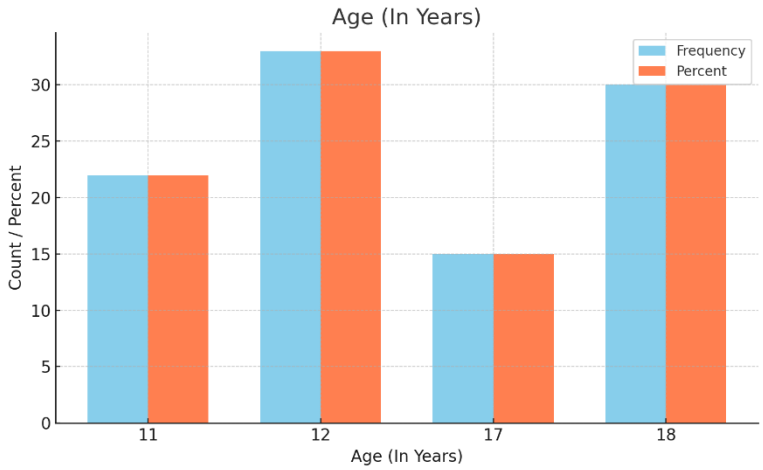
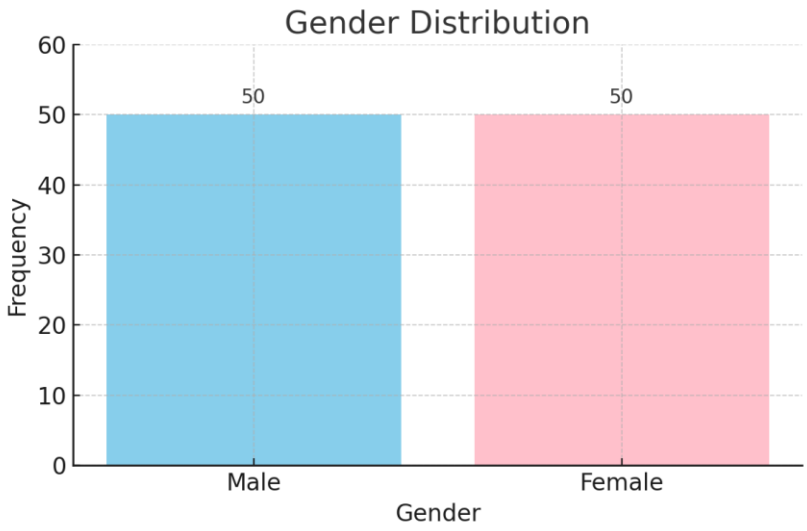


Table 1.2: Gender wise distribution of participants

Gender		
	Frequency	Percent
Male	50	50%
Female	50	50%
Total	100	100.0

Gender wise distribution is discussed in the table above. There are 50 males and 30 females are participated in this study, whose percentage are 50% and 50% respectively.

Graph 1.2: Graphical representation of gender wise distribution of participants



The gender distribution of the research sample was evenly balanced, ensuring equal representation of both male and female secondary school students. Out of the total sample of 100 participants, 50 students were male, accounting for 50% of the total sample. Similarly, 50 students were female, also representing 50% of the total. This equal division between male and female respondents provided a balanced perspective for analysing gender-based differences in digital literacy and academic achievement.

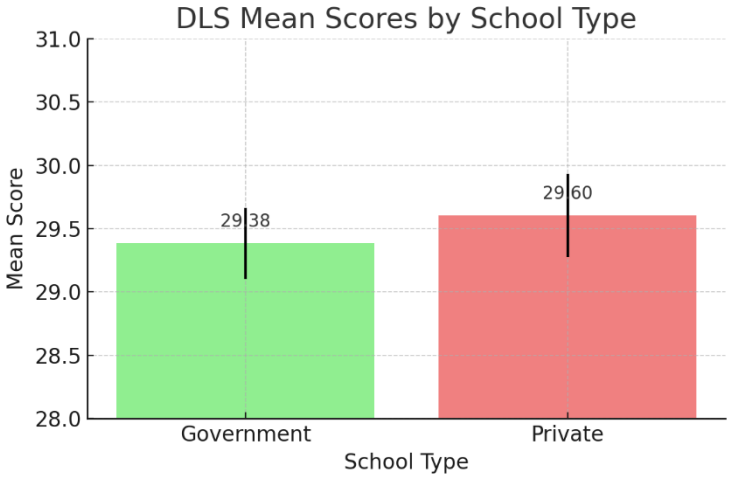
The study benefits from an equal gender distribution since it eliminates the impact of gender bias on sample size and enables a fair comparison of digital literacy levels between male and female pupils. It guarantees that any detected variations or parallels in learning outcomes and digital literacy can be more securely ascribed to real gender-related factors as opposed to sample imbalance. The findings of the study are more accurate and reliable due to this balanced representation, which also makes the findings more applicable to the larger population of secondary school students in the Jorhat district.

Table 1.3 Relationship between digital literacy among secondary school students of private and government schools.

Group Statistics					
	School	N	Mean	Std. Deviation	Std. Error Mean
DLS	Government	52	29.3846	2.03068	.28161
	Private	48	29.6042	2.28538	.32987

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
DLS	Equal variances assumed	1.569	.213	-.509	98	.612	-.21955	.43166	-1.07617	.63707
	Equal variances not assumed			-.506	94.308	.614	-.21955	.43372	-1.08068	.64157

Table 1.3 Graphical representation of private and government schools



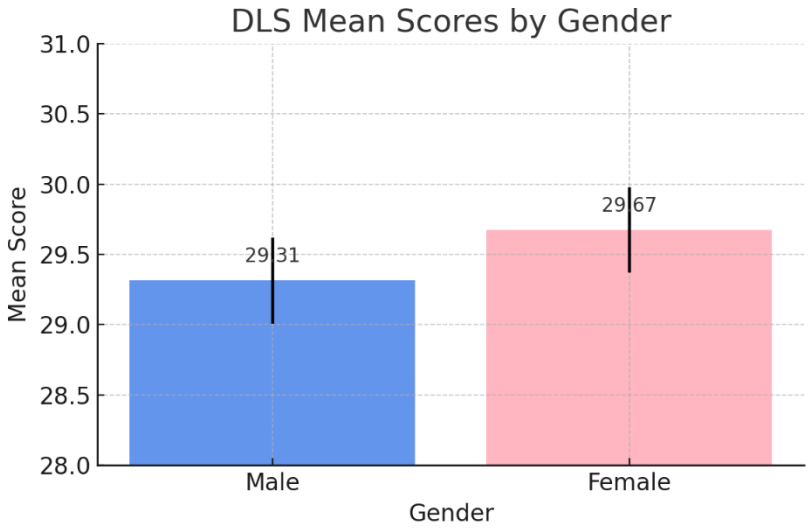
The digital literacy scores (DLS) of secondary school pupils attending government and private schools are contrasted in Table 1.3. The private school group (N=48) had a marginally higher mean score of 29.60 (SD=2.29) than the government school group (N=52), which had a mean score of 29.38 (SD=2.03). To determine if this difference was statistically significant, an independent samples t-test was used. The t-test can assume equal variances because Levene's Test for Equality of Variances showed no significant difference in variances (F=1.569, p=.213). The digital literacy scores of the two groups did not differ significantly, according to the t-test results (t=-.509, df=98, p=.612). The absence of a statistically significant difference is further supported by the mean difference of -.21955, which has a 95% confidence range between -1.07617 and.63707, respectively. According to these findings, pupils from both public and private schools appear to have comparable levels of digital literacy, suggesting that exposure to or instruction in digital competences is consistent across school types.

Table 1.4 Relationship between digital literacy among secondary school students of Male and Female schools in Jorhat district of Assam.

Group Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean
DLS	male	51	29.3137	2.18623	.30613
	female	49	29.6735	2.11530	.30219

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
DLS	Equal variances assumed	.084	.772	-.836	98	.405	-.35974	.43044	-1.21394	.49445
	Equal variances not assumed			-.836	97.995	.405	-.35974	.43016	-1.21337	.49389

Table 1.4 Graphical representation of students of Male and Female schools



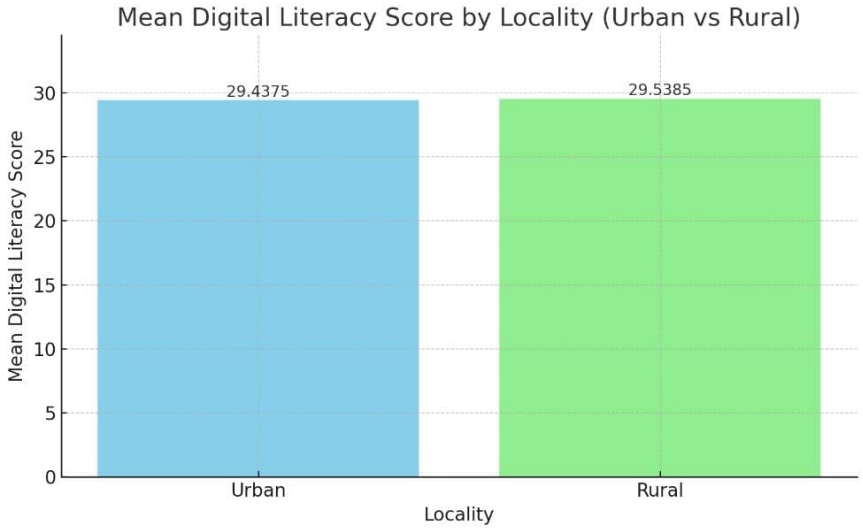
The digital literacy scores (DLS) of male and female secondary school pupils in the Jorhat district of Assam are compared in Table 1.4. The mean DLS score for the male students (N=51) was 29.31 (SD=2.19), whereas the mean score for the female students (N=49) was somewhat higher at 29.67 (SD=2.12). An independent samples t-test was used to assess whether the difference was statistically significant. It was possible to assume equal variances because Levene's Test for Equality of Variances showed no discernible difference in variances (F=.084, p=.772). There was no statistically significant difference between male and female students, according to the t-test results (t=-.836, df=98, p=.405). The 95% CI range of -1.21394 to.49445 and the mean difference of -.35974 further support the lack of a significant gender difference. These results imply that the digital literacy levels of male and female pupils in the Jorhat district are similar.

Table 1.5 Relationship between digital literacy among secondary school students of Urban and Rural schools in Jorhat district of Assam.

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
DLS	Equal variances assumed	.000	.982	-.234	98	.816	-.10096	.43211	-.95848	.75655
	Equal variances not assumed			-.234	97.160	.816	-.10096	.43232	-.95899	.75707

Table 1.5 Graphical representation of students of Urban and Rural schools.

Group Statistics					
	Locality	N	Mean	Std. Deviation	Std. Error Mean
DLS	urban	48	29.4375	2.17242	.31356
	rural	52	29.5385	2.14624	.29763



The digital literacy scores (DLS) of secondary school students in Assam's Jorhat district's urban and rural areas are contrasted in Table 1.5. The mean score for urban students (N=48) was 29.44 (SD=2.17), whereas the mean score for rural students (N=52) was marginally higher at 29.54 (SD=2.15). The significance of this difference was evaluated using an independent samples t-test. The assumption of equal variances was supported by Levene's Test for Equality of Variances, which revealed no significant difference in variances (F=0.000, p=.982). There is no statistically significant difference in digital literacy between urban and rural students, according to the t-test results (t=-.234, df=98, p=.816). With a 95% CI between -.95848 and.75655, the mean difference was only -.10096, indicating little variation across the groups. These results imply that the urban or rural location of the school has no discernible effect on the digital literacy levels of Jorhat district secondary school pupils.

Conclusion

This study emphasizes how important digital literacy is in determining secondary school pupils' academic performance in the Jorhat area of Assam. Students' ability to efficiently acquire, assess, and use digital information has become crucial for improving their academic performance as education increasingly incorporates digital technologies. Strong digital literacy abilities are associated with increased capacity for critical thinking, self-directed learning, and flexibility across a variety of digital platforms and resources. On the other hand, students who lack these competencies frequently face major challenges that impair their overall performance and learning opportunities. Comprehensive and focused actions are needed to close the digital divide in the area. Priority must be given to guaranteeing fair access to digital devices, dependable internet connectivity, and top-notch digital educational resources. Furthermore, to promote the successful use of digital tools in teaching and learning, teachers must receive continual professional development, and students must have ongoing support. Educational institutions may improve students' academic performance and give them the tools they need to succeed in an increasingly digitalized society by fostering a supportive digital learning environment. To create an inclusive educational system where digital literacy is a fundamental skill for all students, sustained dedication and careful preparation are essential.

Suggestions for Future Research

1. Longitudinal Studies

Longitudinal designs may be used in future studies to examine how digital literacy develops over time and how it affects students' academic achievement, personal growth, and preparedness for the workforce. These kinds of investigations can yield important information about long-term effects and developmental paths.

2. Experimental Studies

Experimental research designs may be utilized to evaluate the effectiveness of targeted digital literacy intervention programs within schools. By assessing the direct impact of these interventions on students' learning outcomes, educators and policymakers can identify best practices for digital literacy instruction.

3. Inclusion of Teachers and Parents

Future studies should incorporate the perspectives and roles of teachers and parents in fostering students' digital literacy. Understanding how educators and caregivers support digital skills acquisition can inform more holistic and collaborative approaches to digital education.

4. Comparative Studies Across Districts and Regions

Expanding research to include multiple districts, states, or regions can enable comparative analyses of digital literacy levels and the various socio-economic, cultural, and infrastructural factors that influence them. Such comparative studies can help identify context-specific challenges and scalable solutions.

5. Relationship Between Digital Literacy and Mental Health

There is a growing need to explore the intersection between digital literacy and students' mental health. Future research should examine how digital literacy competencies may mitigate or exacerbate issues such as digital fatigue, cyberbullying, screen addiction, and overall psychological well-being.

6. Focus on Specific Digital Literacy Components

Further research can delve into particular aspects of digital literacy, such as online safety, information evaluation, media literacy, and critical thinking in digital environments. This targeted focus can help refine instructional strategies and curricula to address specific competency gaps.

7. Impact of Emerging Technologies

Given how quickly technology is developing, future research should look into how new technologies like artificial intelligence (AI), virtual reality (VR), and augmented reality (AR) affect the development of digital literacy and improve learning and academic engagement.

8. Inclusive Education and Digital Literacy

Additional research is needed to explore digital literacy development among students with special needs, disabilities, or those from marginalized and underrepresented groups. Ensuring equitable access to digital education resources is critical for fostering inclusive digital literacy for all learners.

Recommendations for Practice and Policy

1. Integrating Digital Literacy into the Curriculum: Educational authorities should embed comprehensive digital literacy modules into the secondary school curriculum. These modules must encompass not only basic computer skills but also advanced competencies such as information evaluation, online collaboration, digital ethics, cybersecurity, and critical problem-solving (Eshet-Alkalai, 2004; Ng, 2012). Institutionalizing digital literacy within the syllabus ensures that all students systematically develop essential 21st-century skills.

2. Teacher Professional Development: Ongoing professional development programs are essential to enhance teachers' digital competence. Educators should be equipped with both technical expertise and pedagogical strategies to effectively incorporate digital tools into classroom teaching (Hatlevik et al., 2015). Specialized workshops, certification courses, mentorship opportunities, and collaborative training sessions can keep teachers updated with the latest technological advancements and instructional methodologies.

3. Infrastructure Development: Strong investments in internet infrastructure should be a top priority for policymakers, especially in underserved and rural communities like Jorhat, Assam. Smart classrooms, well-equipped computer labs, dependable internet connectivity, and access to a variety of digital learning tools are all necessary (Gogoi & Dutta, 2022). The goals of initiatives to advance digital literacy might not be met in the absence of adequate infrastructure.

4. Equitable Access to Digital Resources: To bridge the digital divide, government bodies and private organizations should collaborate to provide subsidized or free digital devices to students from economically weaker backgrounds. Initiatives like "One Student One Device" can ensure equitable access to digital learning tools, enabling every student to fully participate in the digital learning environment (Kundu & Dey, 2021).

5. Parent and Community Engagement: Fostering students' digital literacy requires the active participation of parents and the larger community. Parents can be empowered to establish supportive home environments for digital learning by participating in awareness campaigns, informational sessions, and community workshops that highlight the importance of digital skills.

6. Monitoring and Evaluation Mechanisms: Frameworks for systematic monitoring and assessment should be put in place to gauge pupils' progress in digital literacy. Schools will be able to precisely monitor students' progress, pinpoint areas for development, and guide future teaching tactics by utilizing standardized evaluation tools (Siddiq et al., 2016).

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