Influence of Digital Learning Awareness on the Academic Achievement of Secondary Level Tribal Students in Thiruvananthapuram District

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Abstract

This research paper focuses on the effects of digital learning awareness on the academic achievement of the tribal students in secondary schools in Thiruvananthapuram district. The study adopted a descriptive survey. A sample of 100 tribal students, amongst those studied digitally via a learning awareness tool, had their final exam academic achievement scores gathered. The statistical analysis showed a significant direct correlation between digital learning awareness and academic performance. It was established that more aware and well-informed students who used digital tools effectively had a higher chance of success in their academic outcomes. The differences were minimal by gender and place of residence. This demonstrates that the effects of digital learning awareness were essentially the same across these groups. This study showed that strengthening digital capabilities is needed to improve educational performance and ensure that tribal communities receive inclusive education. Future research may also continue to investigate the qualitative approach to understand the long-term impact of digital learning better, the application of specific digital tools, the effectiveness of the blended learning model, and the experience and impact of digital education on Indigenous students.

Keywords: digital learning awareness, digital competence, tribal students, academic achievement, secondary education

Introduction

Digital technologies have become a vital component of the modern teaching and learning process as educational levels have increased exponentially. Digital learning is the knowledge, skills, and attitudes that students must possess to successfully use digital tools to access information, engage in discussions, and participate in academic activities. Digital learning has become a significant academic skill in the 21st century, as students are expected to act responsibly and intelligently in the digital world (Kallas and Pedaste, 2022; Yang et al., 2021). One aspect is academic performance, which is traditionally quantified by test scores but also depends on students' ability to use digital resources to learn (Hong et al., 2022).

Earlier research has demonstrated that digital learning and academic achievement are positively correlated. Digital learning encourages student engagement, motivation, and self-directed learning. Digital learning enables tribal students to overcome the challenges of geographic distance, insufficient school facilities, and limited access to quality education (Sen, 2025).

However, the association between digital learning and academic success is not always obvious or uniform. Nayak and Alam (2022) explain that the digital learning experience could have a less positive effect on tribal populations due to the absence of proper infrastructure, structured digital learning, and socio-economic status. The challenges are worsened by barriers to the use of digital tools and the absence of an internet connection.

Tribal students are often exposed to unique social, economic, and geographical challenges. This restricts their access to online education materials. This also impacts their education. Most studies on digital learning have been conducted with other students. However, only a few have been conducted with tribal students in higher secondary schools in regions like the Thiruvananthapuram district. Hence, one should take a closer look at the impact of digital learning on the academic performance of tribal students in higher secondary schools. The study's research question was to determine the extent to which digital learning influences the academic performance of tribal students in higher secondary schools in the Thiruvananthapuram district. The results of the current research are likely to contribute to the establishment of educational policies and practices that ensure an appropriate approach to digital learning and enhance educational outcomes among indigenous populations.

Review of the Related Literature

Several recent studies have highlighted the growing importance of digital learning in enhancing academic performance. Song et al. (2025) examined digital competence among undergraduate students. They found that students who demonstrated stronger evaluation and assessment skills in digital learning settings were more likely to achieve higher grades, especially in practical and course-related activities. Secondary research, too, has demonstrated the same trends. According to Gogoi and Bora (2017), digital learning had a positive impact on students' academic performance, and differences among students by gender, school type, and place of residence were minimal. Similarly, Bora and Saikia (2019) reported that the regular use of digital learning tools improved students' critical thinking and problem-solving skills. However, poor rural infrastructure reduced the overall efficiency of these tools.

Choudhury and Paul (2023) conducted comparative gender studies and found that, despite equal access to and training on the digital learning platform, girls and boys performed equally well in academic performance and higher-order thinking skills. In their comparative analysis of government and privatized schools, Khan et al. (2021) have demonstrated that computer-based teaching results in improved academic performance and more positive attitudes among learners compared to conventional teaching methods.

It has also been established that motivation is a key factor that connects digital learning and achievement. Lin et al. (2017) noted that a digital learning environment contributed to singular growth in students' motivation and, consequently, led to better learning outcomes. Likewise, Pate (2019) found an increase not only in academic performance but also in motivation, computer skills, and classroom engagement among secondary school students who had their experience with digital learning. Nevertheless, digital learning is usually context-specific in terms of its effectiveness. In a review of higher education, Tiwari (2025) found that both blended and digital learning methods enhance engagement and academic performance, but access and digital skills disparities remain problematic. These barriers have been highlighted in studies of tribal populations. According to Mahto and Mahawar (2025), tribal college students preferred hybrid learning resources, but a lack of digital competence and technological barriers reduced learning effectiveness. Kolpe and Ghodake (2024) also reported similar results: the absence of devices, digital skills, and poor infrastructure adversely impacted online learning among tribal students. Additional data from Samiullah et al. (2021) showed that learners who received instruction through digital approaches had better academic performance than those who received instruction through traditional methods. However, Shakya (2023) noted that a lack of awareness and poor acceptance of online learning among tribal postgraduate students limited the academic benefits of online learning. Kalitha and Baishya (2025) also found that, despite students' best efforts, poor internet connectivity and limited digital learning hindered academic development among Scheduled Tribe learners.

According to the national reports published by the Ministry of School Education and Literacy (2022), the lack of access to digital devices and unstable internet connectivity are major limiting factors for online learning opportunities among rural and tribal students In this perspective, Yesmin and Khan (2021) and Haser et al. (2022) highlighted that the digital divide and infrastructural constraints were devastating to the continuity of learning, especially during the COVID-19 pandemic. Simultaneously, Patil (2024) and Shirke (2024) emphasized that digital awareness may facilitate access to education and skill development in tribal communities, despite existing geographical and socio-cultural barriers. Mukherjee and Rakesh (2025) also noted that digital learning will have dual effects, promoting education and creating livelihood opportunities for tribal women despite structural obstacles. Despite extensive studies on digital learning and academic achievement, few have *examined the impact* of digital learning awareness on the academic performance of tribal students at the secondary level in the Indian context. Specifically, the empirical evidence on the regions is lacking in the Thiruvananthapuram district. Thus, the current research aims to fill this gap by exploring the relationship between digital learning awareness and academic performance in the secondary school tribal students in this region.

Objectives

1. To assess the level of digital learning awareness among higher secondary tribal students in Thiruvananthapuram district.
2. To identify the academic performance of higher secondary tribal students.
3. To find out the relationship between digital learning awareness and academic performance among these students.
4. To identify the effect of digital literacy on the academic performance of higher secondary tribal students.
5. To find out whether digital learning awareness among higher secondary tribal students is based on gender and location.

Hypotheses

1. There is no significant relationship between digital learning awareness and the academic achievement of secondary-level tribal students.

2. There is no significant influence of Digital Learning Awareness on the Academic Achievement of secondary-level tribal students.
3. There is no significant difference in digital learning awareness among secondary-level tribal students by gender or locality.
4. There is no significant difference in Academic Achievement among secondary-level tribal students based on digital learning awareness.

Methodology

Design

The primary research design used in this study was a descriptive survey aimed at examining the effects of knowledge of digital learning on the academic achievement of tribal students in secondary schools in Thiruvananthapuram district. The research investigated current levels of digital learning awareness and their relationship with academic performance, while controlling for other factors. Thus, a descriptive approach would be appropriate.

Participants

The sample comprised 100 tribal students in 9th and 10th grades from government schools in the tribal regions of Thiruvananthapuram district. A simple random sampling method was used in order to represent the target population appropriately. Students were found in the official school records to ensure that the sample of eligible students was randomized to eliminate selection bias.

Tools

Digital Learning Awareness Scale (DLAS)

The Digital Learning Awareness Scale had 30 items on a five-point Likert scale, ranging from strongly agree to disagree strongly. The overall score ranged from 30 to 150, with higher scores indicating greater awareness of digital learning. The scale measures a number of factors, such as digital skills, education with digital tools, knowledge of online learning platforms, and responsible online habits. The subject experts revised and validated the instrument to ensure its validity and general reliability.

Achievement Test

Academic task performance was measured using students' final exam scores. The Academic Achievement Test was used to indicate the marks achieved in the core subjects in one education board. These scores were applied as an academic performance measure.

Procedure

Formal consent of the school authorities was received before data collection. The school administration was consulted before the tools were used. The Digital Learning Awareness Scale was administered during normal school time, and students were provided with clear instructions and enough time to respond. The official school records were used to obtain the academic achievement scores. The information was subsequently gathered, assessed, tabulated, and reviewed.

Limitations of the Study

1. The study was restricted to 100 students from tribal higher secondary schools in the Thiruvananthapuram district.
2. Final examination results were the only variable used to assess academic performance in the current study.

Results

The primary analysis sought to determine the relationship between digital learning awareness and academic achievement. As shown in Table 1, the Pearson product-moment correlation coefficient indicated a strong positive association between the two variables ($r = 0.68$, $p < .01$). This indicates that students with higher levels of digital learning awareness tend to achieve significantly higher academic scores. In other words, as awareness of digital learning increases, academic performance improves in a predictable manner.

Table 1
Relationship between Digital Learning Awareness and Academic Achievement

Variables	M	SD	r	df	p
Digital learning awareness	113.20	11.90	0.68	98	< .01
Academic achievement	64.50	8.30			

Note. N = 100.

Table 2
Influence of Digital Learning Awareness on Academic Achievement

Predictor	M	SD	t	df	p
Digital Learning Awareness	113.20	11.90	8.52	98	< .01
Academic Achievement	64.50	8.30			

Note. N = 100.

Table 3
Difference in Digital Learning Awareness by Gender

Gender	M	SD	t	df	p
Boys	112.40	12.30	1.05	98	> .05
Girls	114.20	11.70			

Note. N = 50.

Table 4
Comparison of Digital Learning Awareness between Rural and Urban Students

Locality	M	SD	t	df	p
Rural	111.80	12.10	1.78	98	>.05
Urban	114.80	11.50			

Note. N = 50.

Table 5
Comparison of Academic Achievement with Respect to Levels of Digital Learning Awareness

Levels	n	M	SD	F	df	p
Low	33	56.30	8.50	32.45	2, 97	< .01
Medium	34	64.70	7.90			
High	33	72.10	6.80			

Note. N = 100.

With respect to demographic variables, independent samples *t*-tests revealed no significant differences in digital learning awareness based on gender [t 98] = 1.05, p > .05] or locality [t 98] = 1.78, p > .05]. This suggests that male and female students, as well as those from rural and urban areas, possess comparable levels of digital learning awareness. Furthermore, because the influence of digital learning awareness on achievement was consistent across these subgroups, it can be concluded that the positive effect of digital awareness on academic performance is broadly applicable and not limited by gender or geographic location.An analysis of variance was conducted to compare academic achievement across different levels of digital learning awareness. Students were categorized into low, moderate, and high awareness groups based on their DLAS scores. The analysis revealed a statistically significant difference among the groups (F(2, 97) = 32.45, p < .01). As shown in Table 5, post-hoc comparisons indicated that students with high digital learning awareness (M = 72.10, SD = 6.80) performed significantly better than those with moderate awareness (M = 64.70, SD = 7.90), who in turn performed significantly better than those with low awareness (M = 56.30, SD = 8.50). This graded pattern of results provides strong evidence that the level of digital learning awareness is directly associated with the level of academic achievement.

Discussion

The study has found that awareness of digital learning has a major impact on the academic achievement of indigenous learners in higher secondary schools. The correlation coefficient obtained (r = 0.68) suggests a strong positive correlation. In other words, students with a better conception of digital learning perform better. This relationship underscores the need for digital learning in comprehensive student academic growth. Digital learning awareness among indigenous students goes beyond traditional textbooks and classroom learning, thereby improving their learning. It not only allows access to a range of educational materials but also promotes independent and self-regulated learning. Digital learning can alleviate some learning barriers and improve academic performance in settings that lack proper infrastructure. Though there were some insignificant differences in the digital learning awareness between gender and region, they were not significant. This implies that these groups have a similar positive effect of digital learning. These discoveries align with current research. They also note the significance of using digital engagement to build self-directed learning and improve academic performance (Bora and Saikia, 2019; Khan et al., 2021). Thus, the research highlights the importance of digital learning courses, current technological facilities, and inclusive educational programs that serve tribal students. Enhancing digital learning awareness can be a pragmatic and viable intervention strategy to improve the educational performance of marginalized students.

Conclusion

The study's results indicate that digital learning has a significant effect on the academic performance of tribal students in secondary schools. High digital students were those who scored better academically. The researchers also found that gender and geographic differences were minimized. This implies that the beneficial effects of the digital learning were effective across all groups. Such findings imply a need to promote digital learning to offer opportunities for equality to tribal communities and to foster their academic attainment. More studies are needed to gather qualitative data on the long-term outcomes of digital learning, the efficacy of the blended learning method, and how tribal students embrace and use digital learning.

AI Use Statement

The authors used Grammarly and ChatGPT for grammar checking, improving sentence clarity, and language improvement. The author reviewed and edited the output and takes full responsibility for the final content.

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