



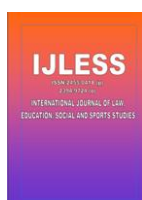
A Study on Digital Literacy and Mental Health Among Preservice Teachers

Sushma¹ and Shruthi²

¹P.G. Student, MBA (IB), University College, Mangalore – 575001, India

²UGC-JRF Research Fellow, St. Ann's PG Studies & Research in Education, St. Ann's College of Education (Autonomous), Mangalore – 575001, India

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Abstract

In today's digital age, preservice teachers must develop strong digital literacy skills to navigate modern classrooms effectively. While this digital shift brings opportunities, it may also affect the mental well-being of individuals undergoing teacher training, especially in diverse and semi-urban settings such as Karnataka's coastal region. This study aimed to investigate the levels of digital literacy and mental health among preservice teachers in Mangalore and Udupi, and the relationship between these two variables. This quantitative, descriptive survey study included 179 preservice teachers specializing in Arts, Science, and Commerce. Digital literacy and mental health were measured using the Digital Literacy Scale (DLS) and the Warwick-Edinburgh Mental Well-being Scale (WEMWBS), respectively. Descriptive and inferential statistics were used to analyze the data. The results indicate that preservice teachers demonstrate moderate levels of both digital literacy and mental health. A significant positive correlation was found between digital literacy and mental health, suggesting that higher digital literacy is associated with better mental well-being. No significant differences were found in digital literacy or mental health across subject specializations. The findings suggest the importance of integrating digital literacy training with mental health support in teacher education programs.

Keywords: Digital Literacy, Mental Health, Preservice Teachers, Online Behavior and Ethics, Digital Competence, Well-being.

Introduction:

In the 21st-century educational landscape, digital literacy has emerged as an essential ability for teachers (Kumari, 2024). Defined as the capability to access, evaluate, create, and communicate information using digital technologies, digital literacy is foundational to effective schooling and learning in increasingly technology-rich surroundings. For preservice teachers—those currently undergoing professional training—the development of digital skills is particularly critical, as it not only

enhances their instructional capabilities but also shapes their readiness to navigate modern educational demands.

The coastal region of Karnataka, characterized by its growing educational infrastructure and socio-cultural diversity, presents a distinctive context for examining the digital preparedness of future educators. As teacher education programs integrate digital tools and platforms into their curricula, preservice teachers are expected to adapt quickly, often with varying levels of prior exposure and support. While digital technology offers opportunities for innovation and engagement, its rapid adoption can also contribute to cognitive overload, stress, and other psychological challenges, especially among individuals still in the process of professional identity formation.

Despite growing attention to both digital literacy and mental health in the academic literature, research exploring the interplay between these two domains within the context of teacher education remains limited, particularly in semi-urban and coastal regions of India. Understanding how digital competencies relate to the mental health of preservice teachers is vital for informing teacher preparation programs and policy interventions.

This study seeks to investigate the level of digital literacy among preservice teachers in Karnataka's coastal region and to examine how these competencies may be associated with their mental well-being. By exploring this relationship, the research aims to contribute to a more holistic approach to teacher education—one that supports both the technological proficiency and psychological resilience of future educators.

Literature review

A growing body of research highlights a significant positive link between digital literacy and mental health across various populations, including students (Bao et al., 2024), older adults (Hong et al., 2023), and working professionals (Lim et al., 2025). Studies show that higher digital literacy is associated with better mental health outcomes, potentially acting as a preventive tool (Bao et al., 2024). In older adults, digital literacy reduces depressive symptoms and improves cognitive function, with depression mediating this relationship (Hong et al., 2023). Among working adults, new media literacy enhances the benefits of social support on mental health (Lim et al., 2025).

In preservice teachers, generally high digital literacy correlates with effective technology use (Nurzhanova et al., 2024; Özden, 2023) and digital instructional material development self-efficacy (Özden, 2023). Gender and academic year influence digital literacy levels, with males and those in later years showing higher proficiency (Nurzhanova et al., 2024). Mental health-specific studies in this group emphasize the importance of emotional regulation and resilience for well-being (Özdemir et al., 2024), suggesting integrated training in psychological and digital competencies is crucial (Gilham et al., 2021; Özdemir et al., 2024). While few digital interventions directly target teacher mental health, existing tools show promise in improving knowledge and confidence in managing mental health (Costardi et al., 2023). Overall, digital literacy is vital for both instructional effectiveness and mental health, underscoring the need for integrated training in teacher education.

Conceptual framework

In the context of this study, *digital literacy* is conceptualized as an essential 21st-century competency that enables preservice teachers to effectively engage with digital tools, platforms, and practices necessary for modern teaching and learning environments. This framework is grounded in the 9 C's model proposed by Chen (2015) and operationalized through the Digital Literacy Scale (DLS) developed and validated by Amin, Malik, and Akkaya (2021). Digital literacy, as defined in this study, consists of nine key dimensions: Communication, which involves the ability to read, write, listen, and express ideas clearly in digital formats; Collaboration, referring to engaging in digital teamwork,

sharing resources, and co-creating knowledge; Critical Thinking, which emphasizes evaluating online information and using it to solve academic and professional problems; Creativity, focused on producing original content and solutions using digital tools; Citizenship, which encompasses understanding legal, ethical, and responsible behavior in the digital world; Character, emphasizing respectful and empathetic online interactions; Curation, which involves researching, organizing, and assessing digital content for accuracy and relevance; Copyright, recognizing and respecting intellectual property and digital ownership rights; and Connectedness, which refers to participating actively in online communities and contributing to global digital discourse.

This framework views digital literacy not only as a technical skillset but also as a socio-cultural competence that interacts with the psychological experiences of preservice teachers. The study suggests that higher digital literacy could foster confidence and control in tech-enhanced educational settings, potentially serving as a buffer against stress and anxiety, key elements of mental well-being. Therefore, the study investigates the current levels of digital literacy among preservice teachers in Karnataka's coastal region, explores differences in digital literacy based on subject specialization (Arts, Science, Commerce), and examines the relationship between digital literacy and mental health, recognizing the potential of digital competence in contributing to psychological resilience. By adopting this multi-dimensional model, the study aims to provide insights that could inform more holistic, inclusive, and supportive teacher education programs, promoting both digital capability and mental wellness among future educators.

Objectives

The objective of the study was to

1. To determine the current Digital Literacy and Mental Health status among preservice teachers.
2. To find the difference in the Digital Literacy and Mental health among preservice teachers specializing in different subjects (Arts, Science, and Commerce).
3. To find the relationship between Digital Literacy and Mental Health among pre-service teachers.

Hypotheses

The following null hypotheses were formulated and statistically tested:

H₀1: There is no significant difference in the Digital Literacy mean scores of preservice teachers specializing in different subjects (Arts, Science, and Commerce).

H₀2: There is no significant difference in the Mental Health mean scores of preservice teachers specializing in different subjects (Arts, Science, and Commerce).

H₀3: There is no significant relationship between the Digital Literacy and Mental Health mean scores of preservice teachers.

Methodology

The study employed a quantitative, non-experimental, descriptive survey design. The population comprised preservice teachers enrolled in Bachelor of Education (B.Ed.) programs in Mangalore and Udupi. A stratified random sampling technique was used to ensure adequate representation from each subject specialization. The final sample consisted of 179 preservice teachers, all of whom were currently pursuing their B.Ed. degree with a specialization in Arts, Science, or Commerce.

Data were collected using the Digital Literacy Scale (DLS) (Amin, Malik, & Akkaya, 2021) and Warwick-Edinburgh Mental Well-being Scale (WEMWBS)(2006), which are designed to evaluate the levels of digital literacy and mental health among preservice teachers. The collected data were analyzed using

descriptive statistics, including mean, median, standard deviation, skewness, percentages, and graphical representations. In addition, inferential statistical techniques such as Analysis of Variance (ANOVA) were employed to examine group differences and the relationship between digital literacy and mental health.

Analysis and interpretation

Objective 1: Aimed to assess the levels of digital literacy and mental health among preservice teachers using descriptive statistics (mean, median, standard deviation, and skewness).

Table 1: Descriptive Statistics of the Scores on Digital Literacy and Mental Health among Preservice Teachers

Variable	N	Mean (M)	Median	SD	Skewness (Sk)
Digital Literacy	179	124.5	122	16.84	-0.01
Mental Health	179	51.97	52	8.96	- 0.31

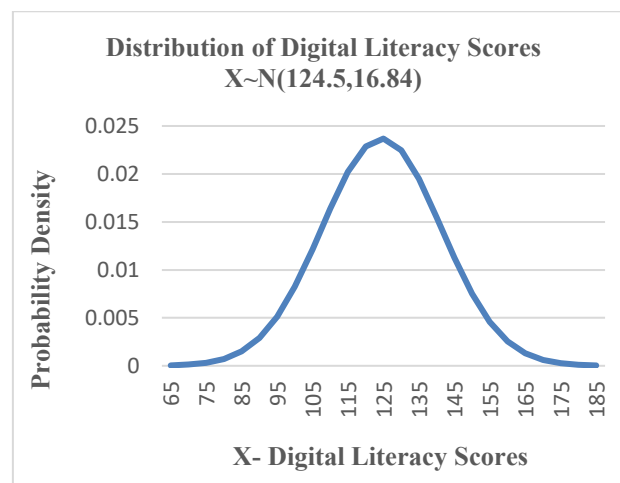


Figure 1: Probability Curve Representing the Scores on Digital Literacy among Preservice Teachers

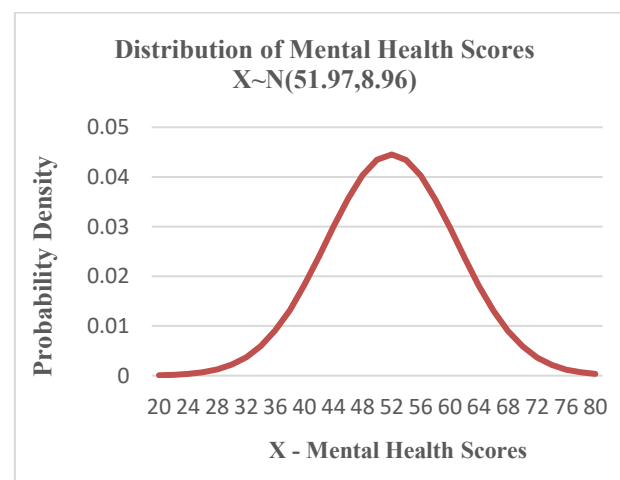


Figure 2: Probability Curve Representing the Scores on Mental Health among Preservice Teachers

Table 1 shows that digital literacy scores are approximately symmetric, with a mean of 124.5, a median of 122, and skewness of -0.01. Mental health scores have a mean of 51.97, a median of 52, and a slightly negative skewness of -0.31, indicating more scores above the mean. Figure 1 supports the near-normal distribution of digital literacy scores. Figure 2 illustrates a slightly negatively skewed distribution of mental health scores, consistent with the descriptive statistics.

Table 2: Percentage of Preservice Teachers at different levels of Digital Literacy and Mental Health (N=179)

Variable		Low (M - 1SD)	Moderate	High (M + 1SD)	Total
Digital Literacy	Total Number	24	123	32	100
	Percentage	13%	69%	18%	100%
Mental Wellbeing	Total Number	33	111	35	100
	Percentage	18%	62%	20%	100%

Table 2 shows that most preservice teachers fall within the moderate range for both digital literacy (69%) and mental health (62%). Smaller, but similar proportions fall into the low and high categories for each variable, indicating generally balanced distributions.

Objective 2: Aimed to examine whether digital literacy and mental health levels differ significantly among preservice teachers specializing in Arts, Commerce, and Science. Descriptive statistics and one-way ANOVA were used to explore both the patterns and significance of variation across groups.

Table 3: Distribution of Levels of Digital Literacy and Mental Health of Preservice Teachers Across Subject Specializations.

LEVELS		LOW	MODERATE	HIGH	TOTAL
Digital Literacy					
ARTS	Total Number	17	63	20	100
	%age	10%	35%	11%	56%
COMMERCE	Total Number	4	33	8	34
	%age	2%	16%	2%	20%
SCIENCE	Total Number	3	28	3	45
	%age	2%	18%	4%	24%
Total %age		14%	69%	17%	100%
Mental Health					
ARTS	Total Number	18	62	20	100
	%age	10%	35%	11%	56%
COMMERCE	Total Number	6	23	5	34
	%age	3%	13%	3%	19%

SCIENCE	Total Number	10	26	11	45
	%age	4%	15%	6%	25%
Total %age		17%	63%	20%	100%

Table 3 shows that the majority of preservice teachers in all specializations fall within the moderate range for both digital literacy and mental health, with smaller proportions in the low and high categories. This suggests generally balanced distributions across all three groups.

Table 4: Summary of Descriptive Statistics of Digital Literacy and Mental Health Scores of Preservice Teachers Across Subject Specializations.

CATEGORY	N	Mean (M)	SD	Skewness (Sk)	Min	Max
Digital Literacy						
Arts	100	123.18	18.52	0.067	71	168
Commerce	34	122.82	13.44	0.752	84	149
Science	45	128.58	14.72	0.327	103	162
Mental Health						
Arts	100	52.12	9.17	0.469	26	20
Commerce	34	50.29	8.43	0.412	31	64
Science	45	52.91	8.87	0.089	36	70

Table 4 reveals slight variations in digital literacy and mental health scores across subject specializations. Science preservice teachers had the highest mean score for digital literacy ($M = 128.58$), followed by Arts ($M = 123.18$), and Commerce ($M = 122.82$). In contrast, for mental health, Science students again reported the highest mean ($M = 52.91$), followed by Arts ($M = 52.12$), and Commerce ($M = 50.29$). The skewness values indicate that the distributions are approximately normal, with slight positive skewness in the Arts and Commerce groups and nearly symmetric distribution in the Science group.

Table 5: Analysis of Variance (ANOVA) for Subject Specialization on Digital Literacy of preservice teachers.

Subject Specializations	Source of variations	SS	Df	MS	F	P-Value	F- crit	Significance ($p < 0.05$)
Digital Literacy	Between-group	1017.902	2	508.951	1.812	0.166	3.047	NS
	Within Group	49438.68	176	280.902				
	Total	50456.58	178					

Table 6: Analysis of Variance (ANOVA) for Subject Specialization on Mental Health of preservice teachers

Subject Specializations	Source of variations	SS	Df	MS	F	P-Value	F- crit	Significance (p < 0.05)
Mental Health	Between-group	137.597	2	68.799	0.857	0.426	3.05	NS
	Within Group	14137.26	176	80.325				
	Total	14274.86	178					

The results of the One-way ANOVA conducted to test hypotheses H_{02} and H_{03} revealed that subject specialization does not significantly affect either Digital Literacy or Mental Health among preservice teachers. In Table 5, the analysis of variance for Digital Literacy showed an F-value of 0.857, with a p-value of 0.426, which is greater than the 0.05 significance level, indicating no statistically significant differences between the groups based on subject specialization. Similarly, Table 6, which analyzed the variance for Mental Health, resulted in an F-value of 1.812 and a p-value of 0.166, again exceeding the threshold for significance. These findings suggest that subject specialization does not play a significant role in shaping preservice teachers' levels of Digital Literacy or their Mental Health. As both p-values were larger than 0.05 and the calculated F-values were smaller than the critical F-values, the null hypotheses (H_{02} and H_{03}) were not rejected, confirming the lack of significant differences in these areas.

Objective 3: Aimed to investigate the relationship between digital literacy and mental health among a sample of pre-service teachers. To examine this relationship, a Pearson product-moment correlation analysis was conducted.

Table 7: Correlation Coefficient Between the Scores of Digital Literacy and Mental Health Among Preservice Teachers

Variables	N	'r' value	'r' table value	Result
Digital Literacy	179	0.423	0.148	Significant at the 0.05 level
Mental Health	179			

Table 7 reveals a statistically significant positive correlation between digital literacy and mental health ($r=0.423$, $p<0.05$). The positive correlation of 0.423 indicates a moderate positive linear relationship, suggesting that as pre-service teachers' levels of digital literacy increase, their reported mental health tends to be better. The finding that this correlation is statistically significant at the 0.05 level implies that the observed relationship is unlikely to have occurred by chance, and a similar positive association likely exists in the broader population of pre-service teachers.

Findings of the study

It is found from the study that

Levels of Digital Literacy and Mental Health

- Pre-service teachers, on average, demonstrated a moderate level of digital literacy (Mean = 124.5, SD = 16.84) with a near-symmetric distribution.
- The average level of mental health among pre-service teachers was also moderate (Mean = 51.97, SD = 8.96), with a slightly negative skew, indicating a tendency towards higher mental health scores.
- The majority of pre-service teachers (69%) fell into the moderate digital literacy category, and a similar proportion (62%) were in the moderate mental health category.

Differences Based on Subject Specialization

- Descriptive statistics revealed minor variations in the mean scores for both digital literacy and mental health across Arts, Commerce, and Science specializations. Science students showed the highest mean digital literacy and mental health scores.
- However, the One-way ANOVA results indicated that these differences in digital literacy ($F = 0.857, p = 0.426$) and mental health ($F = 1.812, p = 0.166$) across subject specializations were not statistically significant at the 0.05 level. This suggests that subject specialization does not significantly influence the levels of digital literacy or mental health among these pre-service teachers.

Relationship Between Digital Literacy and Mental Health

- A Pearson correlation analysis revealed a statistically significant positive correlation between digital literacy and mental health ($r=0.423, p<0.05$). This indicates a moderate tendency for higher levels of digital literacy to be associated with better mental health among the pre-service teachers in this sample.

Discussion

This study indicates that preservice teachers, on average, possess a moderate level of digital literacy. This finding aligns with previous research suggesting that preservice teachers generally demonstrate a good grasp of digital tools and technologies (Nurzhanova et al., 2024; Özden, 2023). However, the distribution of digital literacy scores shows that while a majority fall within the moderate range, there are still some preservice teachers with lower levels of digital competence. This highlights the ongoing need to enhance digital literacy skills among all teacher trainees to ensure they are well-prepared for the technology-rich educational environments they will enter.

Similarly, the study found that the average level of mental health among preservice teachers is moderate. This finding is important, as the mental well-being of teachers is crucial for their effectiveness in the classroom and their ability to support students' learning and development. The slightly negative skew in the mental health scores suggests that, overall, a larger proportion of the participants reported scores above the mean, indicating generally positive mental well-being.

Contrary to expectations, this study did not find significant differences in digital literacy or mental health levels among preservice teachers specializing in Arts, Commerce, or Science. Although descriptive statistics showed that Science students had slightly higher mean scores in both areas, the ANOVA results indicated that these differences were not statistically significant. This suggests that subject specialization, at least in this sample, does not play a substantial role in determining preservice teachers' digital literacy or mental health. This finding contrasts with some previous research that has reported differences in digital literacy based on factors such as gender and academic year (Nurzhanova

et al., 2024). However, it's important to note that this study focused on subject specialization, and other factors may still be influential.

A key finding of this study is the statistically significant positive correlation between digital literacy and mental health among preservice teachers. This finding supports the growing body of literature that emphasizes the link between digital competence and psychological well-being (Bao et al., 2024; Lim et al., 2025). The moderate positive correlation suggests that higher levels of digital literacy are associated with better mental health outcomes. This could be because preservice teachers with strong digital skills feel more confident and competent in using technology for teaching and learning, which reduces stress and anxiety and enhances their overall well-being. As the conceptual framework of this study proposes, digital literacy may act as a buffer against stress and anxiety. The ability to effectively navigate and utilize digital tools can empower preservice teachers, leading to a greater sense of control and self-efficacy in technology-enhanced educational settings. This enhanced self-efficacy, in turn, is closely linked to improved mental health.

Implications for teacher education

This research underscores a crucial intersection in preparing future educators: the integration of robust digital literacy training with comprehensive mental health support within teacher education programs. By equipping preservice teachers with enhanced digital skills, these programs can foster greater confidence and resilience, empowering them to navigate the increasingly technology-driven educational landscape. Simultaneously, incorporating mental health support is vital to help these future educators effectively manage the unique stressors that can arise from technology integration. Consequently, policymakers bear the responsibility of prioritizing resources directed towards both strengthening digital infrastructure within educational institutions and implementing proactive well-being initiatives for educators. Ultimately, adopting this holistic approach promises to better equip future teachers not only with the technical proficiency but also the mental fortitude necessary to thrive in the face of modern educational challenges.

Limitations and future studies

The study's primary limitations include its focus on preservice teachers from only two B.Ed. colleges in Mangalore and Udupi, which restricts the generalizability of the findings. Additionally, the cross-sectional design does not allow for understanding causal or longitudinal effects of digital literacy on mental health. The reliance on self-reported data may also introduce biases, and the study did not account for other influencing factors such as teaching experience or institutional support. Future research should address these limitations by including a more diverse sample, employing longitudinal methods, and exploring additional variables for a more comprehensive understanding of the relationship between digital literacy and mental health among preservice teachers.

Conclusion

In conclusion, this study highlights that preservice teachers in the coastal region of Karnataka generally demonstrate moderate levels of digital literacy and mental health. The findings reveal a significant positive correlation between digital literacy and mental health, suggesting that higher digital competence is associated with better psychological well-being. However, the absence of significant differences across subject specializations indicates that digital literacy and mental health levels are relatively consistent among different groups. Despite these insights, the study's limitations, such as its restricted sample and cross-sectional design, suggest the need for further research to explore causal relationships and additional influencing factors. Overall, integrating digital literacy enhancement and mental health support into teacher education programs could contribute to more resilient and competent future educators, better equipped to navigate the evolving demands of modern education.

Reference

- [1]. Bao, K., Hu, J., Leung, C. K., & Yao, J. (2024). A correlation analysis method between students' digital literacy and mental health. *Journal of Mechanics in Medicine and Biology*, 24(09). <https://doi.org/10.1142/s0219519424400815>
- [2]. Costardi, C. G., D'agostini, A. C. C., Pan, P. M., & Bressan, R. A. (2023). Digital mental health interventions for school teachers – A narrative review. *Early Intervention in Psychiatry*, 17(8), 749–758. <https://doi.org/10.1111/eip.13431>
- [3]. Gilham, C., Neville-MacLean, S., & Atkinson, E. (2021). Effect of Online Modules on Pre-Service Teacher Mental Health Literacy and Efficacy toward Inclusive Practices. *Canadian Journal of Education / Revue Canadienne De L Éducation*, 44(2), 559–599. <https://doi.org/10.53967/cje-rce.v44i2.4601>
- [4]. Hong, J. W., Nam, Y. J., Hong, S., & Roh, H. W. (2023). Mediating effect of depressive symptoms on the relationship between digital literacy and cognitive function in older adults. *Frontiers in Psychiatry*, 14. <https://doi.org/10.3389/fpsyt.2023.1248347>
- [5]. Kumari, K. (2024). Digital literacy and its role in 21st-century education. *International Journal of Research Publication and Reviews*, 5(6), 5464–5467.
- [6]. Lim, J. H., Prihadi, K. D., & Tan, C. Y. T. (2025). Mental health of working adults: their work and their digital literacy. *International Journal of Public Health Science (IJPHS)*, 14(2), 594. <https://doi.org/10.11591/ijphs.v14i2.25066>
- [7]. Özdemir, A., Mutlu, A. K., & Tönbül, Ö. (2024). The Mediating Role of Resilience between Emotion Regulation and Subjective Well-Being in Pre-service Teachers. *Shanlax International Journal of Education*, 12(S1-June), 126–136. <https://doi.org/10.34293/education.v12is1-june.7393>
- [8]. Özden, Ş. Y. (2023). Investigating the relationship between digital instructional material development self-efficacy, digital literacy and critical thinking disposition. *Journal of Educational Technology and Online Learning*, 6(4), 911–924. <https://doi.org/10.31681/jetol.1360830>