Digital Competency of Prospective Teachers to Cater the Diversified Learning Styles of Generation Alpha Students

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Abstract- **This study explores the digital competency of prospective teachers in catering to the diversified learning styles of Generation Alpha students. Generation Alpha, often referred to as 'techno-babies', are digital natives who have grown up with constant exposure to technology. Their unique learning needs demand teachers with advanced digital competency. This research examines the competency levels of prospective teachers across five dimensions: information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving. Findings reveal that most prospective teachers possess moderate digital competency, with significant implications for teacher education institutions. The study underscores the urgent need to integrate digital competency training into teacher education programs to ensure future-ready educators.**

Keywords: Digital Competency, Generation Alpha, Learning Styles, Teacher Education, ICT in Education

I. INTRODUCTION

Education in the 21st century is increasingly dynamic, shifting from conventional classroom practices toward technology-driven environments. This shift underscores the importance of digital competency as a crucial skill for prospective teachers. The European Union defines digital competence as the confident, critical, and responsible use of digital technologies for learning, work, and participation in society, encompassing data literacy, media literacy, content creation, digital safety, and problem-solving. Generation Alpha, born between 2010 and 2025, represents the first generation entirely raised in a digital era. Their learning styles are shaped by constant exposure to multimedia, artificial intelligence, and social media. Teachers must therefore be adequately equipped to address these needs.

II. NEED FOR THE STUDY

Generation Alpha learners expect interactive, game-based, multimedia-integrated, and personalized classroom experiences, which traditional teaching approaches often fail to deliver. Many prospective teachers, however, lack sufficient digital skills, creating a gap between student needs and teacher capabilities. Without robust digital competency, teachers risk failing to engage these digitally native learners. Hence, assessing the digital skills of prospective teachers is essential to identify gaps and align teacher preparation programs with the realities of a digital-first learning environment.

III. REVIEW OF RELATED LITERATURE

Studies across various contexts reveal a persistent gap in digital competency among pre-service teachers. Galindo-Domínguez et al. (2021) found that future teachers often have only moderate digital competence, particularly struggling with digital content creation. Naidoo and Dasoo (2024) argued that pre-service teachers feel unprepared to teach Generation Alpha effectively. Doležal et al. (2025) similarly observed that nearly half of pre-service teachers felt inadequately trained to foster digital skills among their students. These

findings highlight an urgent need for systemic improvements in teacher education curricula.

IV. OBJECTIVES

1. To determine the overall level of digital competency among prospective teachers.
2. To examine differences in digital competency with respect to educational qualifications.
3. To compare digital competency across different streams of study.
4. To analyze variations in digital competency across age groups.
5. To explore the impact of marital status on digital competency.
6. To examine differences between first-generation graduates and others.
7. To analyze variations based on teaching experience.

V. HYPOTHESES

H01: There is no significant difference in the digital competency of prospective teachers.
H02: There is no significant difference with respect to teaching experience.
H03: There is no significant difference with respect to stream of study.
H04: There is no significant difference with respect to educational qualifications.
H05: There is no significant difference with respect to marital status.
H06: There is no significant difference with respect to age group.
H07: There is no significant difference with respect to first-generation graduate status.

VI. METHODOLOGY

This study employed a quantitative research design using a normative survey method. The population consisted of B.Ed. prospective teachers, from which 150 students were purposively selected. The instrument, developed under expert guidance, was based on the European Commission's Digital Competence Framework (DigComp). It comprised 29 Likert-scale items spanning five dimensions: information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving. Reliability testing using Cronbach's alpha yielded a coefficient of 0.866, indicating strong internal consistency. Content validity was ensured through expert review.

VII. RESULTS AND DISCUSSION

Table 1: Levels of Digital Competency among Prospective Teachers

Level	N	%
Low	37	24.67
Moderate	79	52.67
High	34	22.66

Interpretation: The distribution indicates that over half of the prospective teachers (52.67%) possess moderate digital competency, while only 22.66% exhibit high levels. This suggests that although most students are moderately prepared, a significant proportion still lack advanced skills to effectively meet the demands of Generation Alpha learners.
Note: Most prospective teachers fall within the moderate competency range.

Table 2: : ANOVA: Digital Competency by Teaching Experience

Experience (years)	N	Mean	F	p
0–1	84	114.93	1.127	0.327
1–3	26	116.92		
3+	40	118.03		
Total	150	116.1		

Interpretation: The ANOVA results show no significant differences in digital competency across teaching experience groups ($p > 0.05$). This implies that prior teaching exposure does not substantially influence the digital competency of prospective teachers.
Note: No significant difference across groups ($p > 0.05$).

Table 3: : t-Test: Digital Competency by Stream of Study

Stream	N	Mean	SD	t	p
Arts	75	117.2	9.795	1.205	0.058†
Science	75	115.0	12.376		

Interpretation: Although Arts students (M = 117.20) scored slightly higher than Science

students (M = 115.00), the difference was only marginally significant at the 6% level. This suggests a potential trend worth further investigation, but not strong enough to establish a clear difference.
Note: † Marginal significance at p < 0.06.

Table 4: t-Test: Digital Competency by Qualification

Qualification	N	Mean	SD	t	p
UG	57	115.61	11.098	0.416	0.886
PG	93	116.39	11.275		

Interpretation: The results reveal no significant difference between UG and PG students (p = 0.886). This indicates that higher educational qualification alone does not ensure improved digital competency.
Note: No significant difference between UG and PG groups (p > 0.05)

Table 5: t-Test: Digital Competency by Marital Status

Status	N	Mean	SD	t	p
Married	90	116.2	11.52	0.134	0.650
Unmarried	60	115.95	10.73		

Interpretation: Married (M = 116.20) and unmarried (M = 115.95) students displayed nearly identical competency levels. The difference was statistically insignificant (p = 0.650), highlighting that marital status has no bearing on digital competency.
Note: No significant difference between groups (p > 0.05).

Table 6: t-Test: Digital Competency by Age Group

Age	N	Mean	SD	t	p
Below 25	104	116.15	11.46	0.088	0.422
25 and above	46	115.97	10.63		

Interpretation: The mean scores for students below 25 years (M = 116.15) and those 25 years and above (M = 115.97) were nearly identical.

The non-significant result (p = 0.422) confirms that age is not a determining factor in digital competency levels.
Note: No significant difference across age groups (p > 0.05).

Table 7: t-Test: Digital Competency by First-Generation Graduate Status

Status	N	Mean	SD	t	p
First-generation	78	115.64	11.69	0.522	0.699
Not first-generation	72	116.6	10.73		

Interpretation: First-generation graduates (M = 115.64) and non-first-generation graduates (M = 116.60) reported similar levels of competency. The difference was not significant (p = 0.699), suggesting that family educational background does not influence digital skills development.
Note: No significant difference based on first-generation status (p > 0.05).

VIII. FINDINGS

- Nearly 75% of prospective teachers demonstrated only average digital competency.
- No significant differences were found across educational qualification, teaching experience, marital status, or age.
- A marginally significant difference was observed between arts and science streams.
- Overall, digital competency among prospective teachers is insufficient to fully cater to Generation Alpha learners.

IX. EDUCATIONAL IMPLICATIONS

The findings emphasize the necessity for teacher education programs to prioritize digital competency. Suggested strategies include:
- Integrating digital literacy, ICT pedagogy, and ethical digital citizenship into curricula.
- Introducing modules on artificial intelligence, multimedia content creation, and emerging technologies.
- Encouraging innovative pedagogies such as blended learning, flipped classrooms, gamification, and adaptive learning.

- Organizing hands-on workshops, innovation labs, and peer-learning sessions to strengthen practical skills.

X. CONCLUSION

This study concludes that prospective teachers currently lack sufficient digital competency to address the unique learning needs of Generation Alpha. Teacher preparation must move beyond basic ICT integration toward cultivating digitally competent, adaptive educators capable of designing innovative, personalized, and engaging learning experiences.

XI. LIMITATIONS AND FURTURE RESEARCH

This study is limited by its purposive sampling method and focus on a single region, which may restrict generalizability. Future research should adopt larger, more diverse samples and explore longitudinal changes in digital competency. Further studies could also investigate the effectiveness of specific digital training interventions in teacher education programs.

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