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A Study on the Interrelationship of Technology Exposure, Learning Styles, and Academic Achievement among Generation Z in Andaman and Nicobar Islands

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Abstract

In the digital era, Generation Z—those born between the mid-1990s and early 2010s—have grown up immersed in technology, fundamentally shaping their learning behaviors and cognitive preferences. This study investigates the relationship between technology exposure, learning styles, and academic achievement among Generation Z students in the Andaman and Nicobar Islands, a geographically isolated region with unique socio-cultural dynamics. Using a descriptive survey method, data were collected from a sample of 500 students selected through simple random sampling. Standardized tools, including the Exposure to Technology Scale and Learning Style Scale, were administered to assess correlations using SPSS. The findings revealed a strong positive correlation between technology exposure and academic achievement, and learning styles such as spatial, verbal, auditory, kinesthetic, interpersonal, and intrapersonal demonstrated significant positive correlations with academic achievement, while logical learning style showed no significant relationship. Additionally, strong correlations were observed between technology exposure and certain learning styles especially spatial, kinesthetic, and intrapersonal while no significant association was found with interpersonal learning style.

Keywords: *Generation Z Learners, Exposure to Technology and Learning Styles.*

1. INTRODUCTION

In the rapidly evolving digital age, Generation Z—individuals born between the mid-1990s and early 2010s—have grown up with pervasive access to technology, shaping their learning behaviors, communication patterns, and cognitive styles **(Prensky, 2001; Seemiller & Grace, 2016)**. As digital natives, they interact with

technology not as a novelty but as an integral part of their everyday life, affecting how they acquire knowledge and engage in educational activities.

Learning styles—categorized into types such as visual-spatial, verbal-linguistic, auditory, logical-mathematical, interpersonal, intrapersonal, and kinesthetic—refer to an individual's preferred method of processing information **(Gardner, 1983; Fleming, 2001)**. When aligned with appropriate technological tools, these styles can be enhanced, potentially leading to better academic outcomes. Several studies have suggested a positive relationship between appropriate technology integration and academic achievement, especially when it complements students' learning preferences **(Cheng et al., 2020; Al-Furaih& Al-Awidi, 2021)**.

However, this relationship remains underexplored in geographically isolated and culturally distinct regions like the Andaman and Nicobar Islands. The unique sociocultural and infrastructural contexts of these islands present both challenges and opportunities for technology-enabled learning. Furthermore, the educational experiences of Generation Z students in these remote territories may differ significantly from their mainland counterparts due to disparities in digital access, teacher training, and curriculum implementation.

Recent studies have suggested that when educational technologies are well-aligned with students' learning preferences, they can lead to higher engagement, deeper understanding, and improved academic achievement **(Al-Furaih& Al-Awidi, 2021)**.

1.1 Generation Z Learners

Gen Z learners are often referred to as "digital natives"—a term coined by **(Prensky 2001)**—to reflect their familiarity with and dependence on digital devices, online platforms, and instant communication from an early age. Their exposure to high-speed internet, social media, and on-demand information has shaped not only their lifestyles but also the way they think, process information, and engage with learning environments.

Gen Z learners tend to prefer interactive, personalized, and technology-driven education. They are known for their short attention spans, multitasking abilities, and preference for visual and hands-on learning methods **(Schwieger & Ladwig, 2018)**. These traits have prompted educators to rethink traditional teaching methods and adopt more flexible, tech-enhanced instructional strategies that cater to their preferences. Furthermore, this generation values autonomy, feedback, and relevance in education—expecting learning experiences that are engaging, collaborative, and aligned with real-world applications **(Seemiller & Grace, 2016)**.

1.2 Exposure to Technology

"Technology is not a panacea. But when used well, it can dramatically enhance student engagement and learning." **Marc Prensky (2005)**. Exposure to technology refers to the extent to which individuals interact with, use, and engage with various technological tools, devices, and digital platforms in their daily lives, especially for learning and communication purposes **(Kara, 2016; West, 2019)**.

1.3 Learning Styles

A person's preferred method of absorbing, remembering, and gaining knowledge during the teaching and learning process is known as their learning style. Numerous learning style categories were identified in this study using responses to a standardized learning style questionnaire, which was based on the VARK model. **(Fleming & Mills, 1992; McLeod, 2019)**.The genetically and cognitively enforced combination of qualities known as learning style is what causes some students to respond well to a given teaching strategy while others do not **(Dunn and Dunn ,1978)**.

1.4 Academic Achievement

Academic success, which is usually assessed using metrics like grades, test scores, and teacher ratings, indicates a student's capacity to meet short- or long-term learning objectives **(Eccles & Wigfield, 2002)**.In the context of modern education, scholars have increasingly emphasized the role of personal learning styles and technological engagement in shaping student outcomes **(Wentzel & Miele, 2016)**. "Students' academic and intellectual performance must be evaluated in order to determine their academic scores."

2. LITERATURE SURVEY

Generation Z, typically defined as those born between the mid-1990s and early 2010s, has grown up in a digitally saturated environment. Their frequent interaction with smartphones, computers, the internet, and digital learning platforms has significantly influenced their cognitive and academic development **(Prensky, 2001)**. **Livingstone & Helsper,(2007)** define technology exposure as the frequency, duration, and context in which individuals engage with digital tools, emphasizing its role in shaping modern learning behavior. Research by **Kara (2016) & West (2019)** indicates that increased digital engagement can lead to improved information access, collaboration, and self-directed learning—elements that can positively impact academic outcomes. However, scholars also caution against overuse or passive consumption, which may hinder deep learning and critical thinking.

Generation Z tends to favor active, visual, and technology-supported learning experiences **(McLeod, 2019)**. The prevalence of gamification, videos, interactive content, and personalized learning apps aligns with their multimodal preferences, supporting the need for adaptive teaching strategies that cater to various styles.

Academic achievement is broadly defined as the level of success a student attains in meeting educational objectives, often measured through grades, test scores, or GPA **(Eccles & Wigfield, 2002)**. A variety of factors contribute to academic performance, including socio-economic background, teacher effectiveness, motivation, learning environment, and technology integration **(Wentzel & Miele, 2016)**.

Studies show that students with strong digital literacy and adaptable learning strategies often perform better academically **(Lei & Zhao, 2007)**. Furthermore, integrating technology in a way that aligns with students' learning styles can enhance engagement and outcomes.

The interplay between technology exposure and learning style significantly affects academic outcomes. Students who engage with technology in a manner consistent with their learning preferences—such as using visual simulations for visual learners or interactive modules for kinesthetic learners—tend to show higher academic performance **(Brown, 2014)**.

Research by **Alharbi (2014)** found that when digital tools align with learners' styles, cognitive load is reduced, and knowledge retention improves. However, mismatches between digital methods and learning styles can create barriers to understanding. Therefore, educators need to consider both the quantity and quality of students' technology use and how it interfaces with personalized learning strategies.

Despite being geographically remote, the Andaman and Nicobar Islands have seen increased digital penetration in recent years. However, studies exploring the intersection of technology use, learning preferences, and academic performance in this unique socio-cultural context are limited. This gap underlines the need for localized research to understand how Generation Z students in the islands navigate digital learning environments and how these factors collectively shape their academic success.

3. NEED OF THE STUDY

The rapid integration of digital technology in education has significantly transformed teaching and learning processes, especially for Generation Z students, who are often referred to as digital natives. Their extensive exposure to smartphones, internet-based learning platforms, and multimedia tools has altered traditional learning environments and introduced new variables influencing academic achievement.

Despite this growing reliance on technology, there remains limited research exploring how technology exposure interacts with individual learning styles and contributes to academic performance, particularly in geographically isolated and under-researched regions like the Andaman and Nicobar Islands. Most existing studies focus on urban or mainland populations, leaving a research gap regarding how learners in remote areas adapt to digital learning environments and how their learning preferences shape their academic experiences.

Moreover, while learning styles have been recognized as important in personalizing education, there is a lack of empirical evidence connecting specific learning styles with the modes of technology use and their combined effect on academic success. Understanding this relationship is essential for educators aiming to create inclusive, adaptive, and effective educational strategies for diverse student populations.

4. STATEMENT OF THE PROBLEM

The 21st-century educational environment is increasingly shaped by technological advancements and individualized learning approaches. Generation Z, being digital natives, is heavily influenced by their exposure to various forms of technology, which has significantly altered the way they learn and process information. At the same time, learning styles which encompass individual preferences in acquiring, processing, and retaining information play a crucial role in shaping educational experiences and academic performance.

While several studies have examined the impact of technology and learning styles independently on academic achievement, few have explored the interrelationship among these three factors. Furthermore, research on this subject is sparse in geographically isolated and culturally diverse regions like the Andaman and Nicobar Islands. Students in this region may face unique challenges and opportunities in accessing and using technology, and their learning experiences may differ from those in more urban or mainland areas. It is essential for understanding how educational strategies can be optimized for students in remote regions. Therefore, the problem addressed in this study is to know what extent are technology exposure, learning styles, and academic achievement interrelated among Generation Z learners in the Andaman and Nicobar Islands.

5. OPERATION DEFINITION

- **Exposure:** In this study, exposure refers to the frequency and intensity of interactions Generation Z learners in the Andaman and Nicobar Islands have with technological tools and platforms in their academic activities. It will be measured using a survey instrument that gauges how often students use technology for learning, the type of technology used (e.g., smart phones, tablets, laptops), and the specific purposes for which they engage with it (e.g., research, online classes, assignments).
- **Technology:** In this study, technology refers specifically to digital tools and platforms such as learning management systems (LMS), online resources, e-books, virtual classrooms, and mobile apps that Generation Z learners in the Andaman and Nicobar Islands use in their academic environments. The focus will be on the type of technology utilized for educational purposes, including tools for communication, content delivery, collaboration, and assessment
- **Learning Style:** In this study, learning styles will be understood in terms of the preferred learning modalities of Generation Z learners in the Andaman and Nicobar Islands. Data will be collected using the VARK Learning Style Inventory and Kolb's Learning Style Inventory, which will classify learners into categories such as visual, auditory, reading/writing, and kinesthetic learners.
- **Academic Achievement:** this study, academic achievement will be measured using the cumulative grade point average (CGPA)or percentage scores of Generation Z learners in the Andaman and Nicobar Islands. Academic performance data will be collected through official academic records and self-reported survey responses, focusing on results from major exams over the academic year.
- **Generation Z :** In this study, Generation Z learners will refer to students bornbetween1995 and 2010who are currently enrolled in educational institutions in the Andaman and Nicobar Islands. These learners will be selected based on their age and current academic status in schools or higher education institutions. The study will focus on their exposure to technology, learning preferences, and academic outcomes.

6. OBJECTIVES

- To find out level of exposure to technology of generation Z learners.
- To find out types of learning styles of generation Z learners.
- To find out level of academic achievement of generation Z learners.
- To find out whether there is any significant relationship between the exposure to technology and academic achievement of generation Z learners.
- To find out whether there is significant relationship between leaning styles and

academic achievement of generation Z learners.
- To find out whether there is any significant relationship between exposure to technology and learning styles of generation Z learners.

7. HYPOTHESES OF THE STUDY

- There is no significant relationship between exposure to technology and academic achievement of generation Z learners.
- There is no significant relationship between learning styles and academic achievement of generation Z learners.
- There is no significant relationship between the exposure to technology and learning styles of generation Z learners.

8. TOOLS DESCRIPTION

To collect relevant data for the study titled "Exploring the Relationship between Technology Exposure, Learning Styles, and Academic Achievement among Generation Z Students in the Andaman and Nicobar Islands,"the following research tools will be utilized:

- Exposure to Technology Scale
- Learning Styles Scale
- Achievement Score

8.1. Exposure To Technology Scale

The investigator developed the Exposure to Technology Scale based on **Larry D. Rosen (2010)**. The research tool developed by the investigator to assess learners' level of exposure to technology. The scale comprises 34 items. All 34 items are positive statements and are structured as Likert five point scales. Respondents were instructed to read each statement carefully and select one of the two response options by placing a tick mark. The collected responses were then evaluated using a scoring key established by the investigator.

8.2. Learning Styles Scale

The investigator developed the Learning Styles Scale based on The Modality Questionnaire by **O'Brien (1985)** to assess individuals' unique learning styles. The scale consists of 38 items categorized into seven learning styles:

- Visual (6 items)
- Verbal (5 items)
- Logical (5 items)
- Auditory (5 items)
- Kinesthetic (6 items)
- Interpersonal (6 items)
- Intrapersonal (5 items)

All items are closed-ended and are structured on a five-point Likert scale. Respondents were instructed to carefully read each statement and select one of the five response options: Strongly Agree, Agree, Neutral, Disagree, or Strongly Disagree. The collected responses were then evaluated using a scoring key established by the investigator

Validity is the most important quality of the test. The instructional goals for the content area were taken into consideration when creating the test items. To establish content validity, the tools Exposure to Technology and Learning Style were well scrutinized and checked by the field experts. The agreement of the view of the expert was taken as the index of content validity of the tools. A few modifications were done based on their comments, regarding suitability and relevance. The tool was given to the expert and thus, the content validity of the tool was affirmed. Thus, the validity was established for the tools of the present study and it is observed that the tools have high validity. So, the face validity was established as a result. Additionally, item analysis has been done to pick the most suitable items for the final draft.

The split-half method was used to establish the reliability of the tools. Using this method, the researcher divided the test items as even and odd items, added the test results separately, and then found a correlation between the two sets of values. The Cronbach's Alpha analysis was used to calculate the reliability value after deter-mining the R-value. The reliability value of the Exposure to Technology is 0.939, and Learning Style Scale is 0.947. The tool which was employed in this study is extremely dependable because the reliability rating is more than 0.5.

9. METHODOLOGY

9.1. Research Design

This study adopts a descriptive survey method to explore the relationship between technology exposure, learning styles, and academic achievement among Generation Z students in the Andaman and Nicobar Islands. The survey method is chosen for its effectiveness in

collecting standardized data from a large group of respondents within a natural setting.

9.2. Population and Sample

The target population consists of Generation Z students currently studying in selected college and schools in the Andaman and Nicobar Islands. A sample of 500 students will be selected using simple random sampling, considering accessibility and availability of respondents due to geographic and logistical limitations.

10. ADMINISTRATION OF THE TOOL

After finalizing the tool, the researcher personally visited the selected colleges for data collection. Permission was sought from the head of the institution, and assistance was obtained from the relevant teachers. The Exposure to Technology Scale, Learning Style Scale and questionnaire was administered to a randomly selected group of school and college students. Clear instructions were provided to the students, and their responses were evaluated by the researcher using the scoring key.

11. STATISTICAL METHOD

The collected data will be entered into SPSS for statistical analysis. The following methods will be used:

- Descriptive statistics (mean, frequency, percentage) to summarize student learning styles and technology usage.
- Differential statistics using the Pearson correlation coefficient to determine the strength and direction of relationships between:
  - Technology exposure and academic achievement
  - Learning styles and academic achievement
  - Technology exposure and learning styles

12. DATA ANALYSIS

12.1. Percentage Analysis

❖ Level Of Exposure To Technology

Table-4.1: Level of exposure to technology of generation z learners

Level	Low		Moderate		High	
	N	%	N	%	N	%
Exposure to Technology	128	25.6%	228	45.6%	144	28.8%

According to the above table, 25.6% of Generation Z learners have low level of exposure to technology, 45.6% of Generation Z learners have moderate level of exposure to technology, and 28.8% Generation Z learners have high level of exposure to technology. However, according to the following figure, most of the Generation Z learners exhibit a modest level of exposure to technology. It has been demonstrated that Generation Z learners have a moderate level of exposure to technology.

The investigator has chosen Mean ± 2*S.D for classifying Low, Moderate and High

- **Low:** Scores less than 2*S.D below the Mean (that is Mean -2*S.D = 78.8)
- **Moderate:** Scores less than 2*S.D below the Mean (that is between 75.8 to 99.712)
- **High :** Scores less than 2*S.D below the Mean (that is Mean + 2*S.D = 99.712)

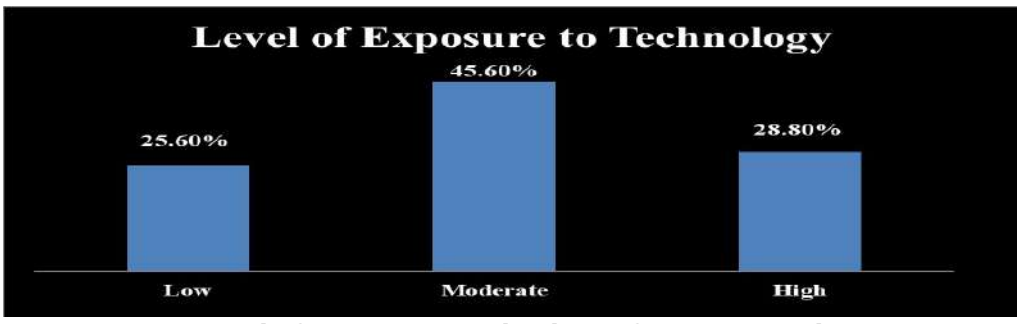

Fig-4.1: Level of exposure to technology of Generation Z learners.

❖ Level Of Academic Achievement

Table-4.2: Level of Academic Achievement of generation z learners

Level	Low		Moderate		High	
	N	%	N	%	N	%
Academic Achievement	78	15.6%	188	37.6%	234	46.8%

According to the above table, 15.6% of Generation Z learners have low level of academic achievement, 37.6% of Generation Z learners have moderate level of academic achievement, and 46.8 Generation Z learners have high academic achievement. However, according to the following figure, most of the Generation Z learners exhibit a modest level of academic achievement. It has been demonstrated that Generation Z learners have a moderate level of academic achievement.

The investigator has chosen Mean ± 2*S.D for classifying Low, Moderate and High

- Low: Scores less than 2*S.D below the Mean (that is Mean -2*S.D = 68.106)
- Moderate: Scores less than 2*S.D below the Mean (that is between 68.106 to 89.394)
- High : Scores less than 2*S.D below the Mean (that is Mean + 2*S.D = 89.394)

Fig-4.2: Level Academic achievement of generation Z learners

❖ Level Of Learning Styles

Table-4.3: Level of Learning Styles of generation z learners

Level	Low		Moderate		High	
	N	%	N	%	N	%
Visual (Spatial)	32	6.4%	226	45.2%	242	48.4%
Verbal (linguistic)	31	6.2%	263	52.6%	206	41.2%
Auditory	72	14.4%	272	54.2%	156	31.2%
Logical	117	23.4%	251	50.25	132	26.4%
Kinesthetic	94	18.8%	197	39.4%	291	58.2%
Interpersonal	109	21.8%	177	35.4%	214	42.8%
Intrapersonal	105	21%	194	38.8%	201	40.2%

According to the above table, 6.4% of Generation Z learners have low level of visual (spatial) Learning Style, 45.2% of Generation Z learners have moderate level of visual (spatial) learning style, and 48.4% Generation Z learners have high level of learning style. However, according to the following figure, most of the Generation Z learners exhibit a modest level of visual (spatial) learning style. It has been demonstrated that Generation Z learners have a moderate visual (spatial) level of learning style.

The investigator has chosen Mean ± 2*S.D for classifying Low, Moderate and High

- **Low:** Scores less than 2*S.D below the Mean (that is Mean -2*S.D = 9.624)
- **Moderate:** Scores less than 2*S.D below the Mean (that is between 9.62 to 21.216)

- **High:** Scores less than 2*S.D below the Mean (that is Mean + 2*S.D = 21.216)

According to the above table, 6.2% of Generation Z learners have low verbal (linguistic) level of learning style, 52.6% of Generation Z learners have moderate level verbal (linguistic) level of learning style, and 41.2% Generation Z learners have high verbal (linguistic) level of learning style. However, according to the following figure, most of the Generation Z learners exhibit a modest level of verbal (linguistic) level of learning style. It has been demonstrated that Generation Z learners have a moderate level verbal (linguistic) level of learning style.

The investigator has chosen Mean ± 2*S.D for classifying Low, Moderate and High

- **Low:** Scores less than 2*S.D below the Mean (that is Mean -2*S.D = 10.808)
- **Moderate:** Scores less than 2*S.D below the Mean (that is between 10.808 to 23.092)
- **High:** Scores less than 2*S.D below the Mean (that is Mean + 2*S.D = 23.092)

According to the above table, 14.4% of Generation Z learners have low level of auditory of learning style, 54.4% of Generation Z learners have moderate level of auditory learning style, and 31.2% Generation Z learners have high level of auditory learning style. However, according to the following figure, most of the Generation Z learners exhibit a modest level of auditory learning style. It has been demonstrated that Generation Z learners have a moderate level of auditory learning style

The investigator has chosen Mean ± 2*S.D for classifying Low, Moderate and High

- **Low:** Scores less than 2*S.D below the Mean (that is Mean -2*S.D = 12.546)
- **Moderate:** Scores less than 2*S.D below the Mean (that is between 12.546 to 24.092)
- **High:** Scores less than 2*S.D below the Mean (that is Mean + 2*S.D = 24.092)

According to the above table, 18.8% of Generation Z learners have low level of logical learning style, 39.4% of Generation Z learners have moderate level of logical learning style, and 58.2% Generation Z learners have high level of logical learning style. However, according to the following figure, most of the Generation Z learners exhibit a modest level of logical learning style. It has been demonstrated that Generation Z learners have a moderate level of logical learning style.

The investigator has chosen Mean ± 2*S.D for classifying Low, Moderate and High

- **Low:** Scores less than 2*S.D below the Mean (that is Mean -2*S.D = 12.216)
- **Moderate:** Scores less than 2*S.D below the Mean (that is between 12.216 to 24.816)
- **High:** Scores less than 2*S.D below the Mean (that is Mean + 2*S.D = 24.816)

According to the above table, 21.8% of Generation Z learners have low level of kinesthetic learning style, 35.4% of Generation Z learners have moderate level of kinesthetic learning style, and 342.8% Generation Z learners have high level of kinesthetic learning style. However, according to the following figure, most of the Generation Z learners exhibit a modest level of kinesthetic learning style. It has been demonstrated that Generation Z learners have a moderate level of kinesthetic learning style.

The investigator has chosen Mean ± 2*S.D for classifying Low, Moderate and High

- **Low:** Scores less than 2*S.D below the Mean (that is Mean -2*S.D = 12.246)
- **Moderate:** Scores less than 2*S.D below the Mean (that is between 12.246 to 25.086)
- **High:** Scores less than 2*S.D below the Mean (that is Mean + 2*S.D = 25.086)

According to the above table, 21.8% of Generation Z learners have low level of interpersonal learning style, 35.4 % of Generation Z learners have moderate level of interpersonal learning style, and 42.8% Generation Z learners have high level of interpersonal learning style. However, according to the following figure, most of the Generation Z learners exhibit a modest level of interpersonal learning style. It has been demonstrated that Generation Z learners have a moderate level of interpersonal learning style.

The investigator has chosen Mean ± 2*S.D for classifying Low, Moderate and High

- **Low:** Scores less than 2*S.D below the Mean (that is Mean -2*S.D = 11.826)
- **Moderate:** Scores less than 2*S.D below the Mean (that is between 11.826 to 25.364)
- **High:** Scores less than 2*S.D below the Mean (that is Mean + 2*S.D = 25.364)

According to the above table, 21% of Generation Z learners have low level of intrapersonal learning style, 38.8% of Generation Z learners have moderate level of intrapersonal learning style, and 40.2% Generation Z learners have high level of intrapersonal learning style. However, according to the following figure, most of the Generation Z learners exhibit a modest level of interpersonal learning style. It has been demonstrated that Generation Z learners have a moderate level of intrapersonal learning style.

The investigator has chosen Mean ± 2*S.D for classifying Low, Moderate and High

- **Low:** Scores less than 2*S.D below the Mean (that is Mean -2*S.D = 11.826)
- **Moderate:** Scores less than 2*S.D below the Mean (that is between 11.826 to 25.364)
- **High:** Scores less than 2*S.D below the Mean (that is Mean + 2*S.D = 25.364)

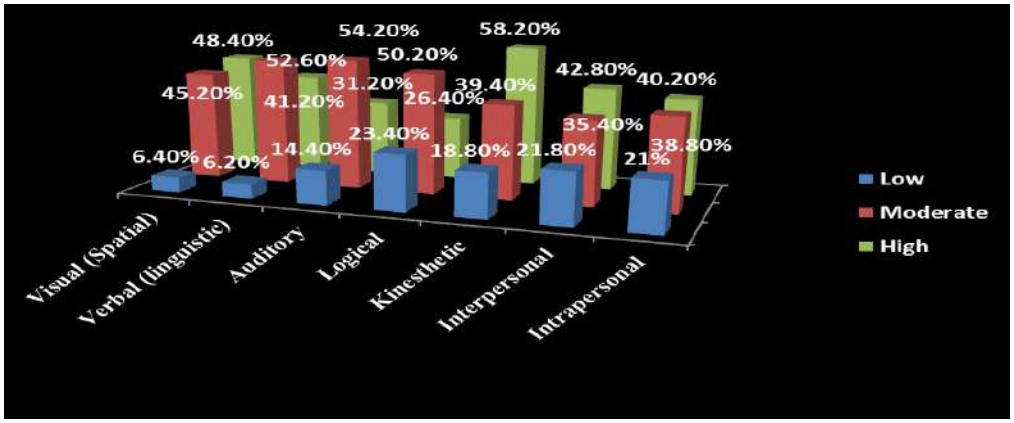

Fig-4.3: Level of learning styles with dimensions

13. CORRELATIONAL ANALYSIS

Table-4.4: Relationship between exposure to technology, learning styles and academic achievement of generation Z learners.

		Exposure total	spatial	verbal	logical	Auditory	Kinesthetic	intrapersonal	interpersonal	Achievement
Exposure total	Pearson Correlation	1	.881**	.777**	.291**	.534**	.886**	.832**	.127**	.891**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.004	.000
	N	500	500	500	500	500	500	500	500	500
spatial	Pearson Correlation	.881**	1	.886**	.314**	.631**	.995**	.944**	.114*	.976**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.011	.000
	N	500	500	500	500	500	500	500	500	500
verbal	Pearson Correlation	.777**	.886**	1	.330**	.651**	.881**	.883**	.046	.868**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.303	.000
	N	500	500	500	500	500	500	500	500	500
logical	Pearson Correlation	.291**	.314**	.330**	1	.382**	.320**	.331**	-.142**	.324**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.001	.000
	N	500	500	500	500	500	500	500	500	500
Auditory	Pearson Correlation	.534**	.631**	.651**	.382**	1	.627**	.657**	-.076	.616**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.089	.000
	N	500	500	500	500	500	500	500	500	500

Kinesthetic	Pearson Correlation	.886**	.995**	.881**	.320**	.627**	1	.939**	.111*	.980**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.013	.000
	N	500	500	500	500	500	500	500	500	500
intrapersonal	Pearson Correlation	.832**	.944**	.883**	.331**	.657**	.939**	1	.066	.919**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.141	.000
	N	500	500	500	500	500	500	500	500	500
interpersonal	Pearson Correlation	.127**	.114*	.046	-.142**	-.076	.111*	.066	1	.129**
	Sig. (2-tailed)	.004	.011	.303	.001	.089	.013	.141		.004
	N	500	500	500	500	500	500	500	500	500
Achievement	Pearson Correlation	.891**	.976**	.868**	.324**	.616**	.980**	.919**	.129**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.004	
	N	500	500	500	500	500	500	500	500	500

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

14. FINDINGS

14.1 Hypothesis 1:

There is no significant relationship between exposure to technology and academic achievement of Generation Z learners

The table shows that the calculated 'r' value is (.891**) of exposure to technology and academic achievement of generation Z learners is significant at 0.01 level. Hence the null hypothesis is accepted. There is a strong positive relationship between exposure to technology and academic achievement of generation Z learners.

14.2 Hypothesis 2:

There is no significant relationship between learning styles and academic achievement of Generation Z learners.

The above table shows that the learning style and academic achievement of Generation Z learners is

- **H2.1.** The coefficient is .976**(with a p-value of 0.233). This suggests that there is statistically significant very strong relationship between spatial learning style and academic achievement.
- **H2.2.** The coefficient is .868** with a (p-value of 0.018). This indicates a statistically significant strong relationship between verbal learning style and academic achievement.
- **H2.3.** The coefficient is .324 (with a p-value of 0.004). This shows that there is no statistically significant relationship between logical learning style and academic achievement.
- **H2.4.** The coefficient is .616 with a p-value of 0.195. This suggests that there is a statistically positive significant relationship between auditory learning style and academic achievement.
- **H2.5**.The coefficient is .980 with a p-value of 0.088. This indicates that there is statistically very strong positive relationship between kinesthetics learning style and academic achievement.
- **H2.6.** The coefficient is .129 with a p-value of 0.163. This suggests that there is no statistically significant relationship between interpersonal learning style and academic achievement.
- **H2.7.** The coefficient is .919 with a p-value of 0.000. This shows a statistically significant strong positive relationship between intrapersonal learning style and academic achievement.

14.3 Hypothesis 3:

There is no significant relationship between exposure to technology and learning styles of Generation Z learners.

The above table shows that the exposure to technology and learning style of Generation Z learners is:

- **H3.1**. There is statistically significant very strong correlation between exposure to technology and spatial learning style (r =

.881**). This suggests that exposure to technology have positive significantly influence spatial learning preferences or abilities.

- **H3.2.** There is statistically moderately significant correlation between exposure to technology and verbal learning style (r = .777). This implies that technological exposure have positive significantly affect verbal learning preferences or skills.
- **H3.3.** There is statistically significant weak correlation between exposure to technology and logical learning style (r = .291). This indicates that individuals with does not exposure to technology tend to prefer or excel in logical learning methods.
- **H3.4.** There is statistically moderately significant correlation between exposure to technology and auditory learning style (r = .534**). Thus, exposure to technology has appeared to influence auditory learning preferences.
- **H3.5** There is statistically significant very strong correlation between exposure to technology and kinesthetics learning style (r = .886). This suggests that technological exposure has positive significantly impact kinaesthetic learning preferences or abilities.
- **H3.6.** There is no statistically significant correlation between exposure to technology and interpersonal learning style (r = .127). This indicates that individuals with more exposure to technology tend to prefer or excel in interpersonal learning methods.
- **H3.7.** There is statistically significant very strong correlation between exposure to technology and intrapersonal learning style (r=.832**).This implies that technological exposure has positive significantly influence intrapersonal learning preferences or skills.

15. DISCUSSION OF THE STUDY

- Finding No. 1 reveals that there is a strong positive relationship between exposure to technology and academic achievement of generation Z learners. It has been observed from the studies of **Lemay et al., (2022)** and **Raju & Reddy (2024)** which showed that there is a positive approach between technology and their achievement. The findings contradicts the finding of **Choudhary, M. (2024)** which indicated that no correlation between technology usage and students' academic achievement.
- Finding No.2.1.reveals that there is statistically significant very strong relationship between spatial learning style and academic achievement. It has been observed from the studies of **Liu, S., Wei et.al (2021)** and **Porat, R., &Ceobanu, C(2024)** which showed that there is significant relationship with spatial learning style with academic achievement. The findings contradict of A. **Pio Albina, & N. Roashani. (2024)**, which revealed that there is no positive relationship with spatial learning style and academic achievement.
- Finding No. 2.2.revealed that there is a statistically significant strong relationship between verbal learning style and academic achievement.The findings of **Nanawareet .al. (2023)** which showed that there is significant correlation with academic achievement. The findings of **Almigbal, T. H. (2015)** it shows that there is no correlation with verbal learning style.
- Finding No. 2.3revealed that there is no statistically significant relationship between logical learning style and academic achievement. The findings of **Roashani&Albina (2021)** and **Pashler et al. (2008)** which showed that there is no significant relationship between logical learning style and academic achievement. The findings of **Sternberg & Grigorenko (1997)** and **Liu et al. (2020)** which showed that there a strong relationship with logical learning style and academic achievement.
- Finding No.2.4. revealed that there is a statistically positive significant relationship between auditory learning style and academic achievement. The findings of **Moghadam et al. (2021)** and **Pashler, H.et al (2008)** which shows that there is positive relationship with auditory learning style and academic achievement. The findings of **Willingham (2015)** which shows that there is contradict of this study.

- Finding No.2.5.reveals that there is a significant relationship between kinesthetic learning styles and academic achievement of Generation Z learners. It has been observed from the studies of Felder, **R.M et. al (1988)** which showed that there is a significant positive relationship between kinesthetic learning style and academic achievement. The findings contradict of **A. Pio Albina, & N. Roashani. (2024)**, which revealed that there is no positive relationship with learning style and academic achievement.
- Finding No.2.6.revealed that there is a statistically positive significant relationship between interpersonal learning style and academic achievement. The findings of **Dass, S.et al (2021)** which shows that there is positive relationship with auditory learning style and academic achievement. The findings of **Willingham (2015)** which shows that there is contradict of this study.
- Finding No. 2.7.revealed that there is a statistically significant strong positive relationship between intrapersonal learning style and academic achievement. This result of this research of **Mohr, K. et.al (2017)** and **Kharb, P.et. al (2013)**, which showed that there is positive relationship between learning style and achievement. The finding contradicts results by **Abd Aziz, et.al (2019)** which indicates no significant relationship with students' academic performance.
- Finding No. 3.1.revealed thatthere is statistically significant very strong correlation between exposure to technology and spatiallearning style. The finding of **Fowler et al(2022)**, which indicating that technology can play a role in developing these abilities. The finding contradict the finding of **Betts, K.,et al (2023)** which indicates that VR's impact on spatial can vary due to technology.
- Finding No.3.2.revealed that there is statistically moderately significant correlation between exposure to technology and verbal learning style. The finding of **Al-Momani, M. M. (2022)**, which indicates that digital content having a beneficial relationship between technology and verbal learning styles. The result contradict to the result of **Moussa, N. (2018)**, correlation analysis showed that there was no significant correlation between students' learning styles and their perception of modern technology.
- Finding No.3.3.revealed that there is statistically significant weak correlation between exposure to technology and logical learning style The finding of Dr. **PioAlbina and N.Roashani(2024)**, study found a statistically significant yet weak correlation between technology exposure and the logical learning style. The finding oppose the findings of **Onjewu, et.al (2025)**, which indicates that the type of technology exposure plays a crucial role in influencing learning styles.
- Finding No.3.4.revealed that there is statistically moderately significant correlation between exposure to technology and auditory learning style. The result of **Shorey, S. et. al (2021)**, showed that the technology statistically moderately related with auditory learning style. The result of **Atabek, O. (2019)** is contradicting to the present study, which recognizes major barriers to the successful incorporation of technology into learning and teaching.
- Finding No.3.5 revealed that there is statistically significant very strong correlation between exposure to technology and kinesthetics learning style. The results of this research are consistent with those of **Ishak, N. et al(2022)**. The findings are in contrast to those of **Ateş, A., & Altun, E. (2008)**.
- Finding No.3.6 revealed that there is no statistically significant correlation between exposure to technology and interpersonal learning style. The findings of **Alruthaya, A.et al(2021)**, support the results of the present study, indicating that there is in sufficient evidence to suggest a statistically significant and there is insufficient significant impact of technology exposure on specific learning styles, such as the interpersonal learning style. The finding of **Vizcaya-Moreno, M. F. et. al (2020)**, which align with the present study indicating that that social media correlated with interpersonal skill.

- Finding No.3.7.revealed that there is statistically significant very strong correlation between exposure to technology and intrapersonal learning style. The findings of **Albina and Roashani (2024)** align with the present study, reinforcing the conclusion that exposure to technology influences learning styles, particularly intrapersonal learning styles. The findings of **Onjewu, A.-K.,et. al(2024)**, suggests that increased exposure to certain technologies may not necessarily enhance intrapersonal learning skills.

16. CONCLUSION

The present study explored the interrelationship between technology exposure, diverse learning styles, and academic achievement among Generation Z learners. The findings reveal several key insights that contribute to the existing body of knowledge in the field of educational psychology and pedagogy. Exposure to technology shows a strong positive relationship with academic achievement of Generation Z learners, who are digital natives—benefit significantly from technological integration in their learning processes. Secondly, among the various learning styles examined, spatial, verbal, auditory, kinesthetic, and interpersonal learning styles were found to have statistically significant positive relationships with academic achievement. The findings underscore that exposure to technology positively influences most learning styles, particularly spatial, kinesthetic, and intrapersonal. The strength of correlation varies, emphasizing that not all technologies affect all learning styles equally. While some existing literature supports these findings, others highlight contrasting results, pointing to the importance of the type, context, and purpose of technology use in shaping learners' cognitive preferences. Overall, the study underscores the importance of understanding individual learning preferences and leveraging technology meaningfully to support academic success among Generation Z students.

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