SCIENTIFIC CULTURE

www.sci-cult.com

SCIENTIFIC CULTURE, Vol. 12, No. 1.1, (2026), pp. 2611-2630
Open Access. Online & Print

DOI: 10.5281/zenodo. 121126185

EXPLORING THE RELATIONSHIP BETWEEN TECHNOLOGY EXPOSURE, LEARNING STYLES, AND ACADEMIC ACHIEVEMENT AMONG GENERATION Z STUDENTS IN THE ANDAMAN AND NICOBAR ISLANDS

N. Roashani[1*] and A. Pio Albina[2]

[1]Ph.D. Scholar, Alagappa University College of Education, Alagappa University Karaikudi, Tamil Nadu, India. Email: roashanin18@gmail.com
[2]Assistant professor in Mathematics, Alagappa University College of Education, Alagappa University, Karaikudi, Tamil Nadu, India

Received: 12/08/2025
Accepted: 12/01/2026

Corresponding Author: N. Roashani (roashanin18@gmail.com)

ABSTRACT

This study explores the relationship between Technology Exposure, Learning Styles, and academic achievement among Generation Z (Gen Z) college students in the Andaman and Nicobar Islands. Recognizing that Gen Z learners often rely on quick online searches and digital platforms for acquiring knowledge, the research also considers the role of individual learning preferences in academic performance. A total of 500 students were selected through simple random sampling, and data were collected via a structured questionnaire. Using SPSS for analysis, the study employed descriptive statistics, Pearson correlation, multiple regression, ANOVA, and t-tests to evaluate the findings. Results indicate a significant and positive relationship between technology exposure and academic achievement. Moreover, students with spatial, kinesthetic, and intrapersonal learning preferences demonstrated notably higher academic performance. The findings highlight the importance of aligning educational strategies with both technological engagement and preferred learning styles to enhance academic success among Generation Z learners.

KEYWORDS: Generation Z Learners, Technology Exposure, Learning Styles, Academic Achievement, Andaman and Nicobar Islands, And Random Sampling.

1. INTRODUCTION

Globally, educational institutions have undergone a significant transformation due to the rapid development of digital technologies (Anderson, 2010; OECD, 2020). Born between the middle of the 1990s and the beginning of the 2010s (Seemiller & Grace, 2016; Turner, 2015), Generation Z students are sometimes referred to as "digital natives" because of their early and ongoing exposure to cell phones, laptops, tablets, and the internet (Prensky, 2001; Seemiller & Grace; 2016). There are positive and negative aspects to integrating technology into education in India (Raja &Nagasubramani, 2018; Sharma & Srivastava, 2020), especially in isolated areas like the Andaman and Nicobar Islands. Even while more people have access to technology, there are still gaps in digital literacy and infrastructure, which affect how learners learn and perform academically(Azim & Islam, 2020; Reddy & Sharma, 2021) Cognitive preferences known as learning styles—including linguistic, auditory, kinesthetic, logical, interpersonal, intrapersonal, and spatial—have an impact on how students take in, process, and remember information (Gardner, 1983; Pashler et al., 2008). Understanding how technology affects these learning processes is crucial. Styles and whether it contributes positively to students' academic performance (Ally, 2008; Kay et al., 2017).

Their learning behaviors, preferences, and academic outcomes are believed to be significantly influenced by this technological exposure (Helsper & Eynon, 2010; Wang et al., 2014). The extent of parental support in their children's education has also been thought to have an impact on student academic achievement, in addition to the caliber of the teachers and schools (Fan & Chen, 2001; Jeynes, 2005). To determine whether parental participation in their children's academic activities and academic success is related (Epstein, 2001; Hill & Tyson, 2009). The specific manner a student tries to learn anything is known as their learning style, and it refers to how they perform better on tasks that correspond to their preferences (Dunn & Dunn, 1993; Kolb, 1984). To enhance student learning, teachers need to be aware of their students' preferred learning styles. But today, it can be challenging to address the different LSs of kids because of the generational divide between teachers and students (Gagné, 1985; Pashler et al., 2009).

1.1. Generation Z Learners

Generation Z, commonly defined as those born between the mid-1990s and early 2010s, is the first generation to grow up with the internet, social media, and mobile technology at their fingertips (Seemiller & Grace, 2016; Turner, 2015). This digital-first approach makes them fundamentally different from their predecessor or in how they interact with information, learn, and work. Gen Z is often characterized by a more grounded, independent, and business-oriented outlook than Millennials (Seemiller & Grace, 2016; Williams, 2020). They are characterized by their ability to process large amounts of information quickly, often multitasking across different digital platforms (Prensky, 2001; Seemiller & Grace, 2016).

Since every individual has a unique learning style that is influenced by their strengths and weaknesses, it is imperative to find ways for Gen Z students to improve their Learning Style and information flow throughout their academic years. Millennials are known for their proficiency with technology, preference for blended learning and a collaborative learning environment, strong interpersonal and online communication skills, idealistic risk-taking, and a strong social media following. Despite exhibiting more millennial-than-traditional style sense, the iGeneration, also known as Gen Z, has always had internet access, iPods, and iPhones (Taylor & Keeter, 2010).

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

"Learning style is the biologically and developmentally imposed set of characteristics that make the same teaching method effective for some and ineffective for others."— Dunn & Dunn (1978). Learning Style is a specific preference way

of processing, retaining and acquiring information during teaching and learning process by an individual. In this research various types of learning style adopted based on the VARK model and are identified through various responses with standardized learning style questionnaire. The result shows each learner's particular way of learning (Fleming & Mills, 1992; McLeod, 2019).

1.4. Academic Achievement

Academic achievement refers to the measurable performance of a student in their educational pursuits (Steinmayr et al., 2014). It indicates how well a student has understood, learned, and applied knowledge in academic subjects, often assessed through grades, test scores, exams, projects, and other formal evaluations (Ormrod, 2012). Academic achievement is the result or outcome of what a student has learned in school or college.

2. LITERATURE SURVEY

How individuals acquire and learn information has evolved as an outcome of technological advancements. Conversely, the Internet provides quick access to knowledge and technology in many other fields, which improves efficiency and save time (Selwyn, 2012; Anderson, 2008). The importance of internet technology for modern teaching and learning methodologies is emphasized in specific. This is important for Gen Z as they are used to receiving information quickly and rely on the Internet for their knowledge (Seemiller & Grace, 2016; Prensky, 2001). Created an interactive Virtual Reality (VR) teaching tool for geography instruction (Bakas&Mikropoulos, 2003). Using one of the traditional teaching techniques, expository instruction approaches, the instructor went over the "Shape and Movements of the Earth" slide with the control group of twenty-nineth graders (Ausubel, 1968; Joyce, Weil, & Calhoun, 2014).

In a Senior Secondary School (SSS) in Lagos State, Nigeria, (Bamiro*et al* 2022) examined whether learning preferences affected students' motivation for economics. In the study, a purposeful random sampling method was applied to pick a sample of 250 SSS Economics students. Several recommendations were made in light of the findings, including the need to support highly inquisitive students, classroom instruction that takes into account the variety of learning preferences between students, and the need for classroom discussions that allow students to view and consider economic concerns from various angles. Roashani and Albina (2021) investigated the educational presentation and learning style of Gen Z learners. The Andaman and Nicobar Islands' college students structure the study's population. To control whether there are any notable differences between college students' Learning Style and their components regarding background factors such as mainstream, gender, and region. The findings such as (a) have no discernible impact on academic achievement; (b) pupils' academic recital is not statistically substantially different based on the method of their study. Mr.Sairaj et.al. (2022) has made an effort to investigate the topic of "Use of Technology in Education in Kohlapur." The study sought to determine whether technology use and education were related. This study concentrated on how the internet has changed people's access to knowledge and information, how they interact, how businesses and management are run, and how artificial intelligence is employed in education and other fields. The use of technology in education has advanced learning and given pupils access to the right resources. Students in entry-level IT schools gained strength from an AI-based tutoring system. Ultimately, the results demonstrated that technology may positively impact students' academic achievement as well as their particular diverse learning skills.

Szymkowiak *et al* [2021] examined the types of information acquisition that Gen Z selects to ascertain how equipment and the Internet disturb this generation's process of knowledge acquisition. A study of 498 young individuals who regularly participate in an online community for peer-to-peer knowledge sharing was completed. The results demonstrated that pupils tended to copy their lecturers who utilized contemporary technologies for learning outside of traditional classroom settings. Using Transactional Distance Theory and Bloom's Taxonomy Theory, Abuhassna*et al* [2020] studied aspects that can affect students. This study focused on 243 college students who applied to

online learning environments. A quantitative research methodology was employed for this study. Eleven criteria are illustrated in the research model for using online learning environments to raise students' academic accomplishment and pleasure. There was a strong correlation between students' academic realization and their application, retention, comprehension, analysis, and satisfaction. Exploiting online learning podiums to enhance students' academic victory and satisfaction may assist decision-makers in universities, institutions of advanced education, and colleges in developing, assessing, and implementing online learning platforms inside their organizations (Shiva Shankar Reddy et al.,2022) and PrahbhjotMalhi et.al (2022) has investigated the issues of online teaching in higher education institutions following the COVID-19 pandemic: the experiences and satisfaction of teachers. The benefits and drawbacks of online learning in colleges and universities during the pandemic were the main subjects of the study, along with factors affecting teachers' satisfaction. A sample consisting of 422 teachers was gathered via a Google form. A self-administered questionnaire about teaching experience and satisfaction with the online platform was used in a cross-sectional approach. According to this survey, 36% of respondents are extremely happy and satisfied with their entire online learning experience.

3. NEED OF THE STUDY

There are several reasons why this study is important. It fills the gap in the research on Generation Z learners in remote and culturally distinct areas, such as the Andaman and Nicobar Islands. This study will shed insight on how Generation Z learns in a more distant location, where access to technology may be limited but still has an impact, since most of the research on this generation concentrates on urban and high-tech settings (Smith & Patel, 2021).

Second, the study's conclusions will add to the larger discussion on how well technology-enhanced learning works for a range of demographics. Teachers and legislators may make well-informed decisions on the use of digital technologies in the classroom by knowing how technology exposure and academic achievement are related. The study may provide important new information about how technology use influences learning modes, including kinesthetic, visual, auditory, and a combination of these (Fleming & Mills, 1992; Mayer, 2005).

4. STATEMENT OF THE PROBLEM

The rapid advancement of technology has significantly influenced the educational landscape, especially for Generation Z students, who have grown up in a digital era. While numerous studies have explored the relationship between technology use, learning styles, and academic performance in urban and technologically advanced settings, limited research has been conducted in remote regions like the Andaman and Nicobar Islands. The unique geographical isolation, cultural diversity, and potential disparities in technological access make it essential to understand how Generation Z learners in these areas interact with technology and how it impacts their academic success.

Despite the increasing integration of digital tools in education, there remains a lack of empirical data on whether and how such tools support different learning styles—visual, auditory, kinesthetic, or multimodal—and contribute to academic achievement in remote and resource-constrained environments. Therefore, this study seeks to examine the relationship between technology exposure, preferred learning styles, and academic performance among Generation Z students in the Andaman and Nicobar Islands. The findings aim to inform more equitable and effective educational strategies tailored to the needs of learners in geographically marginalized regions.

4.1. 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., smartphones, 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 Zlearnersin 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.

4.2. Objectives

- To find out the level of exposure to technology of generation Z learners.
- To find out the types of learning styles of generation Z learners.
- To find out the level of academic achievement of generation Z learners.
- To find out the influence of exposure to technology and learning styles on academic achievement of generation Z learners.

4.3. Hypotheses of the Study

Relationship among exposure to technology, learning styles and academic achievement

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

Influence of exposure to technology and learning styles of academic achievement

i. To find out whether there is any significant influence of exposure to technology and learning styles on academic achievement of generation Z learners.

5. TOOLS DESCRIPTION

Tocollect 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:

1. Exposure to Technology Scale
2. Learning Style Scale
3. Achievement Score

5.1. 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.

5.2. Learning Style Scale

The investigator developed the Learning Style 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 determining the R-value. The reliability value of the Exposure to Technology is 0.939, and Learning Style Scaleis 0.947. The tool which was employed in this study is extremely dependable because the reliability rating is more than 0.5.

6. METHODOLOGY

6.1. 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.

6.2 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.

6.3. Regression Diagnostics:

Multicollinearity among the independent variables was identified during the regression analysis, indicating substantial intercorrelations among certain predictors. The presence of multicollinearity can inflate the standard errors of regression coefficients and reduce the reliability of individual parameter estimates, thereby limiting the interpretability of predictor-specific effects. However, it does not affect the overall explanatory power of the regression model. Variance Inflation Factor (VIF) and tolerance statistics were examined to assess the severity of multicollinearity. Future studies may address this issue through variable reduction techniques such as factor analysis or principal component analysis, or by constructing composite variables from highly correlated predictors to enhance model stability and interpretability.

7. 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 andquestionnaire 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.

8. 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

9. DATA ANALYSIS

9.1. Percentage Analysis

9.1.1. 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)

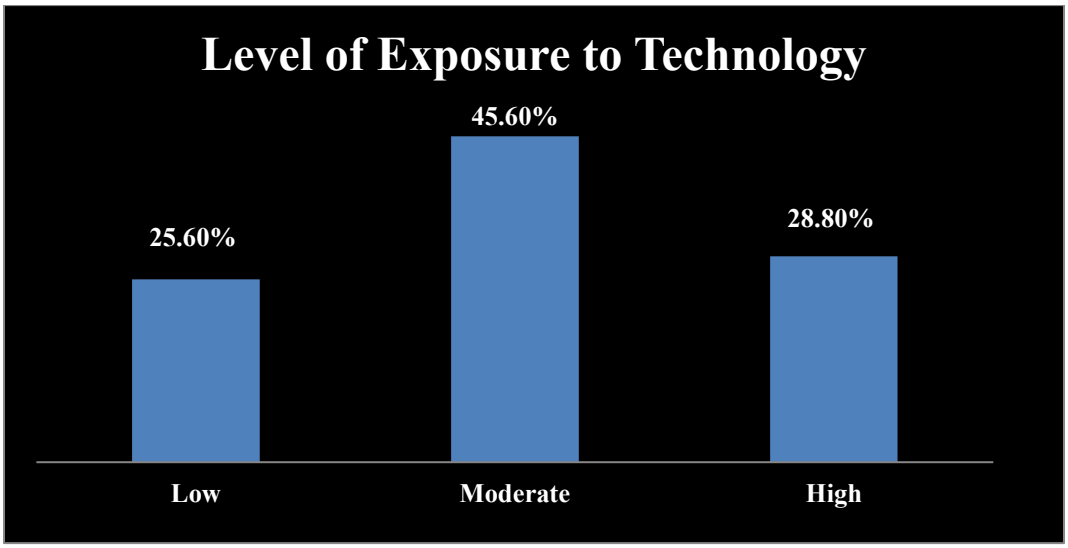

Figure: 4.1: Level of Exposure to Technology of Generation Z Learners.

9.1.2. 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)

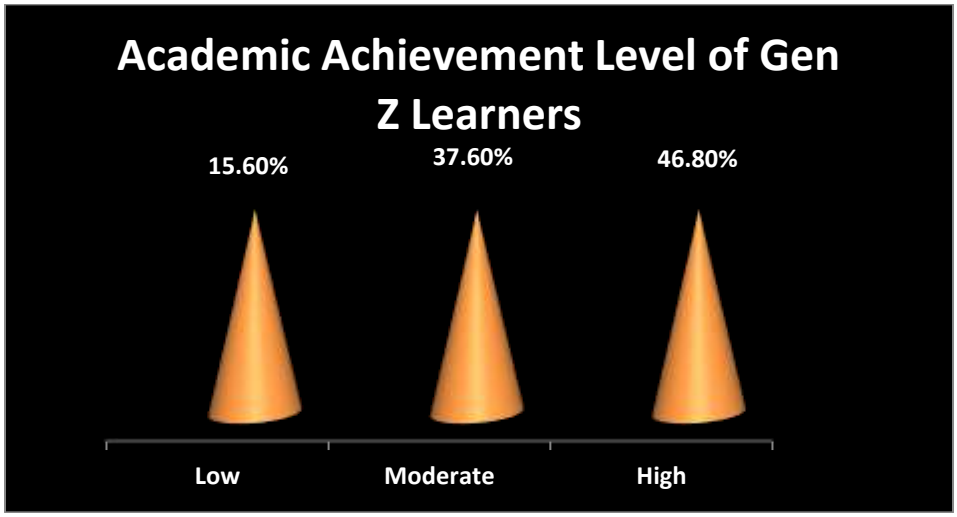

Figure: 4.2. Level Academic Achievement of Generation Z Learners.

9.1.3. Level Of Learning Style

Table: 4.3: Level of Learning Style 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)

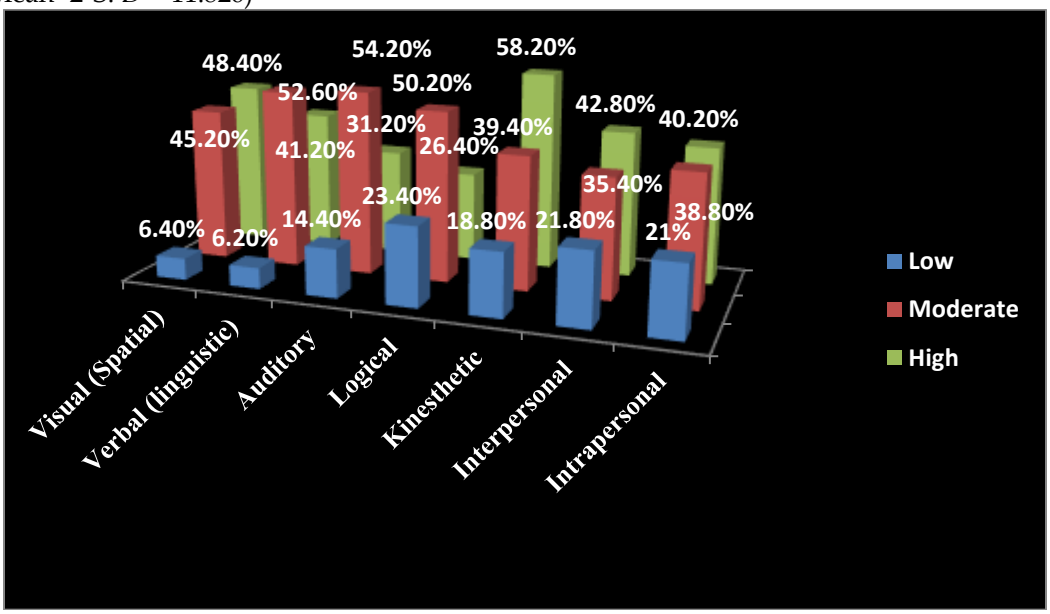

Figure: 4.3: Level of Learning Style with Dimensions.

10. DIFFERENTIAL ANALYSIS

Hypothesis 1:

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

Table. 4.4: Relationship Between Exposure to Technology, Learning Style 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).										

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.

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:

1. **Visual (Spatial)**: 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.
2. **Verbal (Lingusitic)**: 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.
3. **Logical**: The regression coefficient for logical learning style is 0.324 and is statistically significant (p = 0.004), suggesting that logical learning style has a positive and meaningful association with academic achievement.
4. **Auditory:** 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.
5. **Kinesthetics**: The coefficient is 0.980 with a p-value of 0.088, indicating a positive but statistically non-significant relationship between kinesthetic learning style and academic achievement.
6. **Interpersonal**: 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.
7. **Intrapersonal**: The coefficient is 0.919 with a p-value of p < 0.001, indicating a statistically significant strong positive relationship between intrapersonal learning style and academic achievement.

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:

1. **Visual (Spatial)**: 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.

2. **Verbal (Linguistics)**: 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.
3. **Logical**: 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.
4. **Auditory:** 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.
5. **Kinaesthetic**: 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.
6. **Interpersonal**: 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.
7. **Intrapersonal**: 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.

10.1. Influence Of Exposure to Technology and Learning Styles of Academic Achievement

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

11. REGRESSION ANALYSIS

Table 4.5: Regression Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.982[a]	.963	.963	1.122

The above table shows that the R Square of 0.963 indicates that the learning styles included in the model account for 96.3% of the variability in academic achievement scores.

The adjusted R Square of 0.963 suggests that when considering the number of predictors and sample size, the model still explains 3.7% of the variance in academic achievement.

The model's R value of 0.982 indicates a very strong positive correlation between the predictor variables (learning styles) and the outcome variable (academic achievement).

Overall, while the model suggests a statistically significant relationship between learning styles and academic achievement (as indicated by the adjusted R Square and the individual coefficients with their p-values), it also shows that other factors not included in the model may also influence academic achievement. This suggests that technology exposure and learning styles play a crucial role in determining academic success among Generation Z learners.

Table 4.6: ANOVA of Regression Model.

Model	Sum of Square	Df	Mean Square	f	Sig
Regression	16294.051	8	2036.756	**1617.685**	**.000[b]**
Residual	618.197	491	1.259		
Total	16912.248	499			

The regression model with learning styles as predictors significantly explains a portion of the variation in academic achievement scores (as indicated by the F-statistic and its associated p-

value).

The regression equation found likely includes coefficients for each learning style variable, allowing for the prediction of academic achievement based on these variables.

This ANOVA table provides statistical evidence that the model including learning styles is useful for predicting academic achievement scores, as opposed to relying on a model with no predictors.

A significant regression equation was found (F (8,491) =1617.685, p=0.000)

Table 4.15: Coefficients of Regression Model.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	65.411	1.331		49.131	.000		
	Exposure to Technology	.098	.018	.101	5.394	.000	.212	4.711
	spatial	.113	.076	.139	1.498	.135	.009	115.920
	verbal	.021	.016	.025	1.259	.209	.187	5.356
	logical	.012	.008	.014	1.475	.141	.816	1.225
	Auditory	.005	.010	.006	.489	.625	.509	1.966
	Kinesthetic	.613	.074	.752	8.306	.000	.009	110.214
	intrapersonal	-.029	.023	-.035	-1.262	.207	.095	10.471
	interpersonal	.017	.007	.021	2.280	.023	.918	1.089
a. Dependent Variable: Achievement								

The intercept indicates that when all predictors are zero, the dependent variable's value is 65.411.

Kinesthetic abilities are a significant strong positive predictor indicating that it has the largest impact value.

Interpersonal ability is significant positive predictors as its p-value is .023

Spatial, verbal, logical, auditory and intrapersonal predictors are does not significantly predict the dependent variable.

The Final Predictive model was

Achievement=65.411+0.098(Technology Expo sure) +0.613(Kinesthetic)+0.017(Interpersonal)

Collinearity Statistics (Tolerance & VIF)

Tolerance: It indicates the Spatial and kinaesthetic has strong multicollinearity, it shows that these variables are highly correlated with others in the model

Variance Inflation Factor (VIF):

- Kinaesthetic (VIF = 110.214) and Spatial (VIF = 115.920) show extremely high multicollinearity.
- VIF values above 10 are concerning; this suggests that these predictors are highly correlated with other predictors in the model, which could distort regression estimates and reduce reliability.
- Ideally, these predictors should be checked for redundancy, and multicollinearity should be addressed (e.g., through variable reduction or dimensionality techniques).

12. FINDINGS AND INTERPRETATION

Null hypotheses	Statement	Findings	Remarks
Hypothesis 1	There is no significant relationship between exposure to technology and academic achievement of Generation Z learners	There is a strong positive relationship between exposure to technology and academic achievement of generation Z learners	Significant
Hypothesis 2	There is no significant relationship between learning styles and academic achievement of Generation Z learners	There is statistically significant very strong relationship between **spatial** learning style and academic achievement.	significant
Hypothesis 2		There is a statistically significant strong relationship between **verbal** learning style and academic achievement.	significant
Hypothesis 2		There is no statistically significant relationship between **logical** learning style and academic achievement.	Not Significant
Hypothesis 2		There is a statistically positive significant relationship between **auditory** learning style and academic achievement.	Significant
Hypothesis 2		There is statistically very strong positive relationship between **kinesthetics** learning style and academic achievement.	Significant
Hypothesis 2		There is no statistically significant relationship between **interpersonal** learning style and academic achievement.	Not Significant
Hypothesis 2		There is a statistically significant strong positive relationship between **intrapersonal** learning style and academic achievement.	Significant
Hypothesis 3	There is no significant relationship between exposure to technology and learning styles of Generation Z learners	There is statistically significant very strong correlation between exposure to technology and **spatial** learning style	Significant
Hypothesis 3		There is statistically moderately significant correlation between exposure to technology and **verbal** learning style	Significant
Hypothesis 3		There is statistically significant weak correlation between exposure to technology and **logical** learning style	Not significant
Hypothesis 3		There is statistically moderately significant correlation between exposure to technology and **auditory** learning style.	Significant
Hypothesis 3		There is statistically significant very strong correlation between exposure to technology and **kinesthetics** learning style	Significant
Hypothesis 3		There is no statistically significant correlation between exposure to technology and **interpersonal** learning style	Not significant
Hypothesis 3		There is statistically significant very strong correlation between exposure to technology and **intrapersonal** learning style	Significant

13. 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 contradict the finding of Choudhary, M**.** (2024) which indicated that no correlation between technology usage and students' academic achievement.

Finding No.2. 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 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 revealed 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 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 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.Met. 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 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 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 revealed that there is statistically significant very strong correlation between exposure to technology and spatial learning style. The finding of Fowler et al (2022), which indicating that technology can play a role in developing these abilities. The finding contradicts the finding of Betts, K., et al (2023) which indicates that VR's impact on spatial can vary due to technology.

Finding No.3.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 contradicts 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 revealed that there is statistically significant weak correlation between exposure to technology and logical learning style The finding of Dr. Pio Albina and N. Roashani (2024), study found a statistically significant yet weak correlation between technology exposure and the logical learning style. The finding opposes 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.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 contradicted to the present study, which recognizes major barriers to the successful incorporation of technology into learning and teaching.

Finding No. 3 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 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.

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. 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.

14. RECOMMENDATION OF THE PRESENT STUDY

- Based on the findings of the study, the investigator suggested the following recommendations.
- Use technology to support learning styles like integrate digital tools and platforms that cater to different learning styles, especially spatial, auditory, and kinesthetic.
- Encourage hands-On learning through practical activities and visual aids to help spatial and kinesthetic learners.
- Provide audio resources such as, offer podcasts, audio books, and online lectures to support auditory learners.
- Foster self-reflection which **c**reates opportunities for intrapersonal learners to engage in independent, self-paced learning.
- Incorporate problem-solving tasks include logical reasoning and coding exercises for logical learners.
- Promote collaboration learning such as use online platforms to encourage group work and discussions for interpersonal learners.
- Train Teachers for offer professional development to help educators use technology effectively for different learning styles.
- Conduct more research for further study how technology impacts logical and interpersonal learning styles.
- Raise awareness among students which help students understand their learning styles and how technology can enhance their learning.

15. CONCLUSION

The study explored the relationship between technology exposure, learning styles, and academic performance among Generation Z students in the Andaman and Nicobar Islands. The findings reveal that technology exposure has a strong positive impact on students' academic achievement. Additionally, learning styles play a

significant role, with spatial, kinesthetic, and intrapersonal learners showing the highest levels of performance. The statistical analysis showed variation in academic achievement could be explained by the factors, indicating a highly reliable model. Overall, the study highlights the importance of integrating technology and recognizing individual learning preferences to enhance educational outcomes for Gen Z learners in the region.

Compliance with Ethical Standards

Conflict of Interest: The authors declare that they have no conflict of interest.

Human and Animal Rights: This study involved the collection of primary data from college students using a structured questionnaire. Participation was voluntary, and informed consent was obtained from all participants prior to data collection. Anonymity and confidentiality were strictly maintained, and no personally identifiable information was collected. The study followed standard ethical guidelines for social science research and did not involve any physical, psychological, or legal risk to the participants.

Informed Consent: Informed consent was obtained from all individual participants included in the study.

Funding: Not applicable.

Conflicts of Interest Statement: The authors declare no conflicts of interest.

Consent to Participate: Informed consent was obtained from all participants.

Consent for Publication: Not applicable.

Availability of Data and Materials: The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

Code Availability: Not applicable.

REFERENCES

A. Pio Albina, & N. Roashani. (2024). Correlational Study on Exposure to Technology, Learning Styles and Academic Achievement of Generation Z Learners in Andaman and Nicobar Islands. *Educational Administration: Theory and Practice*, *30*(5), 13048–13062. https://doi.org/10.53555/kuey.v30i5.3267

Abd Aziz, A. I., Tuan Mat, T. Z., & Hashim, M. R. (2019). The relationship between learning styles and performance: a study on Generation Z accounting students.

Albina, A. P., & Roashani, N. (2024). Correlational study on exposure to technology, learning styles, and academic achievement of Generation Z learners in Andaman and Nicobar Islands. *Educational Administration: Theory and Practice*, 30(5), 13048–13062. https://doi.org/10.53555/kuey.v30i5.3267

Ally, M. (2008). Foundations of educational theory for online learning. In T. Anderson (Ed.), *The theory and practice of online learning* (2nd ed., pp. 15–44). Athabasca University Press.

Almigbal, T. H. (2015). Relationship between the learning style preferences of medical students and academic achievement. *Saudi medical journal*, *36*(3), 349.

Al-Momani, M. M. (2022). *The Effect of Digital Content Designed Based on Learning Styles on Academic Achievement and Motivation*. International Journal of Instruction, 15(1), 1–16.

Alruthaya, A., Nguyen, T. T., &Lokuge, S. (2021). The application of digital technology and the learning characteristics of Generation Z in higher education. *arXiv preprint arXiv:2111.05991*.

Anderson, T. (2010). *The theory and practice of online learning* (2nd ed.). Athabasca University Press.

Atabek, O. (2019). Challenges in integrating technology into education. *arXiv preprint arXiv:1904.06518*.

Ateş, A., & Altun, E. (2008). Learning styles and preferences for students of computer education and instructional technologies. *Eurasian Journal of Educational Research*, *30*, 1-16.

Ausubel, D. P. (1968). *Educational psychology: A cognitive view*. Holt, Rinehart, and Winston.

Azim, M. T., & Islam, M. M. (2020). Digital divide and education: Challenges in the post-COVID era. *Journal of Educational Technology Systems*, 49(1), 5–22. https://doi.org/10.1177/0047239520934010

Bakas, C., &Mikropoulos, T. A. (2003). Design of virtual environments for the comprehension of planetary phenomena based on students' ideas. *International Journal of Science Education*, 25(8), 949–967. https://doi.org/10.1080/09500690305026

Bamiro, F. A., Oladipo, S. E., & Olanrewaju, A. A. (2022). Learning preferences as predictors of students' motivation in economics in Lagos State senior secondary schools. *Journal of Education and Practice*, 13(5), 87–95

Betts, K., Reddy, P., Galoyan, T., Delaney, B., McEachron, D. L., Izzetoglu, K., &Shewokis, P. A. (2023). An examination of the effects of virtual reality training on spatial visualization and transfer of learning. *Brain sciences*, *13*(6), 890.

Dass, S., Ramananda, H. S., Jagadeesha, B., Kumar, R. P. C., & Cherian, R. K. K. (2021). Effectiveness of Collaborative Learning Among Gen Z Engineering Students. *Journal of Engineering Education Transformations*, *34*(3), 70-78.

Dunn, R., & Dunn, K. (1993). *Teaching elementary students through their individual learning styles*. Allyn & Bacon.

Epstein, J. L. (2001). *School, family, and community partnerships: Preparing educators and improving schools*. Westview Press.

Fan, X., & Chen, M. (2001). Parental involvement and students' academic achievement: A meta-analysis. *Educational Psychology Review*, 13(1), 1–22. https://doi.org/10.1023/A:1009048817385

Felder, R. M., & Silverman, L. K. (1988). *Learning and Teaching Styles in Engineering Education*

Fleming, N. D., & Mills, C. (1992). Not another inventory, rather a catalyst for reflection. *To Improve the Academy*, 11, 137–155.

Fleming, N. D., & Mills, C. (1992). Not another inventory, rather a catalyst for reflection. *To Improve the Academy*, 11, 137–155.

Fowler, S., Cutting, C., Kennedy, J. P., Leonard, S. N., Gabriel, F., & Jaeschke, W. (2022). Technology enhanced learning environments and the potential for enhancing spatial reasoning: A mixed methods study. *Mathematics Education Research Journal,* *34*(4), 887–910. https://doi.org/10.1007/s13394-021-00368-9

Gagné, R. M. (1985). *The conditions of learning and theory of instruction* (4th ed.). Holt, Rinehart, and Winston.

Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences*. Basic Books.

Hanawi, S. A., Saat, N. Z. M., Hanafiah, H., Taufik, M. F. A. M., Nor, A. C. M., Hendra, A. K., ...& Azlan, T. N. A. I. (2022). Relationship between learning style and academic performance among the generation Z students in Kuala Lumpur. *International Journal Of Pharmaceutical Research And Allied Sciences*, *11*(3-2022), 40-48.

Helsper, E. J., & Eynon, R. (2010). Digital natives: Where is the evidence? *British Educational Research Journal*, 36(3), 503–520. https://doi.org/10.1080/01411920902989227

Hill, N. E., & Tyson, D. F. (2009). Parental involvement in middle school: A meta-analytic assessment of the strategies that promote academic achievement. *Developmental Psychology*, 45(3), 740–763. https://doi.org/10.1037/a0015362

Ishak, N. M., Ranganathan, H., & Harikrishnan, K. (2022). Learning preferences of generation Z undergraduates at the University of Cyberjaya. *Journal of Learning for Development*, *9*(2), 331-339.

Jeynes, W. H. (2005). Parental involvement and student achievement: A meta-analysis. *Harvard Family Research Project*, 1–10.

Joyce, B., Weil, M., & Calhoun, E. (2014). *Models of teaching* (9th ed.). Pearson.

Kara, S. (2016). The impact of technology on learning: A review of research. *Educational Technology & Society*, 19(4), 234–245.

Kay, R. H., Leung, S., & Tang, H. (2017). Technology use and academic performance: A meta-analysis. *Journal of Research on Technology in Education*, 49(3–4), 213–228. https://doi.org/10.1080/15391523.2017.1322857

Kharb, P., Samanta, P. P., Jindal, M., & Singh, V. (2013). *The learning styles and the preferred teaching–learning strategies of first year medical students*. Journal of Clinical and Diagnostic Research, 7(6), 1089–1092https://doi.org/10.7860/JCDR/2013/5809.3090

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice-Hall.

Lemay, D. J., Bazelais, P., &Doleck, T. (2022). The Impact of Technology Use on Academic Achievement in Higher Education: A Meta-Analysis. *Frontiers in Education*, 7, 1–13. https://doi.org/10.3389/feduc.2022.829317

Liu, S., Wei, W., Chen, Y., Hugo, P., & Zhao, J. (2021). Visual–spatial ability predicts academic achievement through arithmetic and reading abilities. *Frontiers in Psychology*, *11*, 591308.

Mayer, R. E. (2005). *The Cambridge Handbook of Multimedia Learning*. Cambridge University Press.

McLeod, S. (2019). *Learning styles and theories*. Simply Psychology. https://www.simplypsychology.org/learning-theories.html

Mohr, K. A. J., & Mohr, E. S. (2017). *Understanding Generation Z Students to Promote a Contemporary Learning Environment*. Journal of Empowering Teaching Excellence, 1(1), Article 5. https://digitalcommons.usu.edu/jete/vol1/iss1/5

Moussa, N. (2018). Learning styles and the adoption of modern technology among adult learners. *Institute for Learning Styles Journal*, *1*, 11-21.

Nanaware, R. B., &Baviskar, C. (2023). A Study on Academic Achievement in Relation to Learning Styles of Senior Secondary School Students. *MIER Journal of Educational Studies Trends and Practices*, 180-192.

Onjewu, A. K. E., Godwin, E. S., Azizsafaei, F., & Appiah, D. (2025). The influence of technology use on learning skills among generation Z: A gender and cross-country analysis. *Industry and Higher Education*, *39*(2), 139-157.

Organisation for Economic Co-operation and Development (OECD). (2020). *The impact of digital technology on education: Insights from PISA 2018*. https://www.oecd.org/education/the-impact-of-digital-technology-on-education.htm

Ormrod, J. E. (2012). *Educational psychology: Developing learners* (7th ed.). Pearson Education.

Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2008). Learning styles: Concepts and evidence. *Psychological Science in the Public Interest*, 9(3), 105–119. https://doi.org/10.1111/j.1539-6053.2009.01038.x

Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2009). Learning styles: Concepts and evidence. *Psychological Science in the Public Interest*, 9(3), 105–119. https://doi.org/10.1111/j.1539-6053.2009.01038.x

Porat, R., &Ceobanu, C. (2024). The Role of Spatial Ability in Academic Success: The Impact of the Integrated Hybrid Training Program in Architecture and Engineering Higher Education. *Education Sciences*, *14*(11).

Prensky, M. (2001). *Digital natives, digital immigrants*. On the Horizon, 9(5), 1–6. https://doi.org/10.1108/10748120110424816

Raja, R., &Nagasubramani, P. C. (2018). Impact of modern technology in education. *Journal of Applied and Advanced Research*, 3(S1), 33–35. https://doi.org/10.21839/jaar.2018.v3iS1.165

Raju, R., & Reddy, S. S. (2024). Generation Z learners' engagement with technology and its impact on academic performance: Evidence from Indian high schools. *Journal of Education and Human Development*, 13(1), 59–70. https://jehd.thebrpi.org/journals/jehd/Vol_13_No_1_June_2024/6.pdf

Reddy, P., & Sharma, B. (2021). Digital literacy and the challenges of online learning in India. *Asian Journal of Distance Education*, 16(2), 45–54.

Roashani, N. and Albina, A.P. (2021). A Correlational Study Regarding learning style and Academic Achievement of Generation Z Learners. *Elementary Education Online*, *20*(1), 2992-2992.

Roashani, N., & Albina, A. P. (2021). A correlational study on learning style and academic achievement of Generation Z learners. *Elementary Education Online*, 20(1), 2992–2998.

Seemiller, C., & Grace, M. (2016). *Generation Z goes to college*. Jossey-Bass.

Selwyn, N. (2012). *Education and technology: Key issues and debates*. Bloomsbury Publishing.

Sharma, A., & Srivastava, M. (2020). Digital learning in India: Challenges and opportunities. *International Journal of Creative Research Thoughts*, 8(6), 232–239.

Shiva Shankar Reddy, T., Kumar, R. P., & Lakshmi, M. R. (2022). Impact of learning styles on academic performance among high school students. *International Journal of Education and Psychological Research*, 11(2), 56–61.

Shorey, S., Chan, V., Rajendran, P., & Ang, E. (2021). Learning styles, preferences and needs of generation Z healthcare students: Scoping review. *Nurse education in practice*, *57*, 103247.

Smith, J., & Patel, R. (2021). Exploring Generation Z's learning behaviors in remote areas with limited technology access. *Journal of Educational Research*, 50(4), 345–356.

Steinmayr, R., Meißner, A., Weidinger, A. F., & Wirthwein, L. (2014). Academic achievement. In R. J. Levesque (Ed.), *Encyclopedia of adolescence* (pp. 1–6). Springer. https://doi.org/10.1007/978-3-319-32132-5_4-1

Sternberg, R. J., & Grigorenko, E. L. (1997). Are cognitive styles still in style? *American Psychologist, 52*(7), 700–712.

Taylor, P., & Keeter, S. (2010, February). *Millennials: Confident. Connected. Open to change*. Pew Research Center. https://www.pewresearch.org/millennials

Turner, A. (2015). Generation Z: Technology and social interest. *The Journal of Individual Psychology*, 71(2), 103–113

Turner, A. (2015). Generation Z: Technology and social interest. *The Journal of Individual Psychology*, 71(2), 103–113.

Vizcaya-Moreno, M. F., & Pérez-Cañaveras, R. M. (2020). Social media used and teaching methods preferred by generation z students in the nursing clinical learning environment: A cross-sectional research study. *International journal of environmental research and public health*, *17*(21), 8267.

Wang, Q., Woo, H. L., Quek, C. L., Yang, Y., & Liu, M. (2014). Using the Facebook group as a learning management system: An exploratory study. *British Journal of Educational Technology*, 43(3), 428–438. https://doi.org/10.1111/j.1467-8535.2011.01195.x

West, D. M. (2019). *The future of work: Robots, AI, and automation*. Brookings Institution Press.

Williams, A. (2020). *Generation Z: The rise of the entrepreneurial generation*. Routledge.

Willingham, D. T., Hughes, E. M., &Dobolyi, D. G. (2015). *Teaching of Psychology, 42*(3), 266-271.