

Perception and Attitude of Tertiary-level Students towards Infographics-embedded Teaching Strategies

MINAKSHI MALIK* AND CHANDAN ADHIKARY**

Abstract

The present study aims to examine the perceptions and attitudes of tertiary-level students towards infographics-embedded teaching strategies. Using a descriptive survey design, data were collected from a sample of 246 tertiary-level students enrolled in B.A. (Education Honours), M.A. in Education, B.Ed., and M.Ed. programmes at government and government-aided institutions in West Bengal, India. A standardised instrument, namely the PAIET (Perception and Attitude towards Infographics-embedded Teaching Strategies) scale was employed to assess the students' responses. The instrument demonstrated high reliability, with a Cronbach's alpha coefficient of 0.97. The study examined core variables such as perception and attitude, along with the contextual variables including gender, habitat, type of institution, nature of study, digital literacy, artistic skills, and graphic design expertise of the respondents. The findings revealed that participants exhibited a positive perception and attitude towards infographics-based instructional strategies. The study underscores significance of integrating visual learning strategies in higher education and emphasises the crucial role of teacher training for the effective implementation of infographics-embedded pedagogy.

Keywords: Perception, Attitude, Infographics-embedded Teaching Strategies, Tertiary-level Students

INTRODUCTION

In the post-COVID era, the global educational landscape has undergone a radical shift in terms of

structure, processes, patterns, and pedagogical modalities (Timotheou *et al.*, 2022). Curricular adaptation, the incorporation of local wisdom,

* Research Scholar, Department of Education, The University of Burdwan, Golapbag, West Bengal

** Associate Professor, Department of Education, The University of Burdwan, Golapbag, West Bengal

and the mainstreaming of innovative pedagogies in the form of online, blended, and digital learning, have revolutionised traditional teaching approaches (Hashim, 2018). Teachers need to remain updated and equipped with the current technological advancements to effectively learn and teach new instructional materials and optimise learning outcomes (Haleem *et al.*, 2022).

In this context, infographics—data-driven design architectures help to communicate complex content in a concise and compact manner, thereby maximising students' learning. Globally, educators are increasingly focusing on designing and developing infographic-based tools and strategies to effectively deliver content to twenty-first-century learners. Infographics facilitate learning by clarifying data, fostering engagement, and accommodating diverse learners through the integration of infographic-based pedagogical strategies (Malik and Adhikary, 2025)

As a powerful pedagogical tool, infographics simplify complex concepts, enhance learners' comprehension through visual and interactive elements, and facilitate the development of visual literacy, thereby significantly influencing students' perceptions and attitudes towards learning (Alyahya, 2019). Learners engage in meaning-making and information processing through infographic-based scaffolds (Vygotsky, 1978), reduce extraneous

cognitive load (Sweller, 1988), and enhance retention by integrating visual and verbal modalities (Paivio, 1986).

As instructional aids, infographics have found wide applications across disciplines, such as science education for designing graphic organisers (Mondal and Adhikary, 2025), preparation of timelines and mnemonics in social sciences, illustration of geometrical figures in mathematics, and explanation of narratives and themes in language and literature. Their use has also expanded into higher education research, innovation, and online learning platforms. Hence, there is a growing demand for research, highlighting the effectiveness of infographics in enhancing students' learning, retention, and critical thinking.

REVIEW OF LITERATURE

Narmatha and Balasubramaniam (2023) reported that infographics, as an effective teaching strategy, enhance students' understanding, retention, and critical thinking. This approach supports active learning, organises information efficiently, and caters to diverse learning preferences, especially in the representation of data and statistics.

Naparin *et al.* (2018) observed that infographics convey information more efficiently than textual formats, emphasising the importance of quality design.

They also stressed the need for creating effective infographic applications for teaching by integrating techniques from various disciplines.

Rastogi and Malhotra (2013) established a strong positive correlation between teachers' ICT proficiency, their attitudes, and their actual use of ICT in classroom pedagogy, thereby highlighting the importance of both skills and attitudes for effective technology integration.

The present status of teaching in West Bengal, India, using digital pedagogy and infographics is still at an early stage. Although the infographic-based instructional strategies are not widely practised, educators are becoming progressively familiar with this innovative approach. Learners gain exposure to these strategies largely through online resources; however, research in this area remains scarce.

Karmakar *et al.* (2025) highlighted that the techno-pedagogical skills enhance teaching efficacy by integrating technology with pedagogy. Their findings emphasise the necessity of teacher training to improve digital proficiency and ensure equitable, high-quality education for all learners. Malik and Adhikary (2025) further demonstrated that infographics serve as effective educational tools that enhance comprehension, engagement, and memory retention.

Visual representation supports diverse learning styles, promotes critical thinking, and improves academic performance across disciplines.

In view of the above, the present study seeks to explore existing pedagogical practices among the tertiary-level students and teachers in West Bengal with a specific focus on the integration of infographics into the teaching-learning ecosystem.

OBJECTIVES OF THE STUDY

RO₁: To determine the extent of familiarity among tertiary-level students with infographics-embedded strategies.

RO₂: To examine the level of perception of tertiary-level students towards infographics-embedded teaching strategies.

RO₃: To analyse the perception of tertiary-level students towards infographics-embedded teaching strategies on the basis of:

- gender,
- habitat,
- type of institution (government/ government-aided),
- nature of study (academic/ professional),
- digital literacy skills (yes/no),
- skill of art (yes/no), and
- graphic design skill (yes/no).

RO₄: To explore the attitude of tertiary-level students towards infographics-embedded teaching strategies.

RO₅: To analyse the attitude of tertiary-level students towards infographics-embedded teaching strategies on the basis of:

- gender,
- habitat,
- type of institution (government/government-aided),
- nature of study (academic/professional),
- digital literacy skill (yes/no),
- skill of art (yes/no), and
- graphic design skills (yes/no).

RO₆: To determine the relationship between perception and attitude of tertiary-level students towards infographics-embedded teaching strategies.

RO₇: To identify the degree of adoption of infographics-embedded strategies among tertiary-level teachers.

HYPOTHESES OF THE STUDY

H₀₁: There is no significant difference in the perception of tertiary-level students towards the infographics embedded teaching strategies based on:

- gender,
- habitat,
- type of institution (government/government-aided),
- nature of study (academic/professional),
- digital literacy skill (yes/no),
- skill of art (yes/no), and
- graphic design skill (yes/no).

H₀₂: There is no significant difference in the attitude of tertiary-level students towards the infographics-embedded teaching strategies based on:

- gender,
- habitat,
- type of institution (government/government-aided),
- nature of study (academic/professional),
- digital literacy skills (yes/no),
- skill of art (yes/no), and
- graphic designing skills (yes/no).

H₀₃: There is no significant relationship between the perception and attitude of tertiary-level students towards the infographics-embedded teaching strategies.

RESEARCH DESIGN

To fulfil the objectives of the present study, a descriptive survey design (DSD) method was adopted for the data collection and analysis.

Sample for the Study

A total of 246 students were selected as the sample (Fig. 1) from the tertiary level. The participants were enrolled in B.A. (Education Honours), M.A. in Education, B.Ed., and M.Ed. programmes at different government and government-aided colleges and universities in West Bengal.

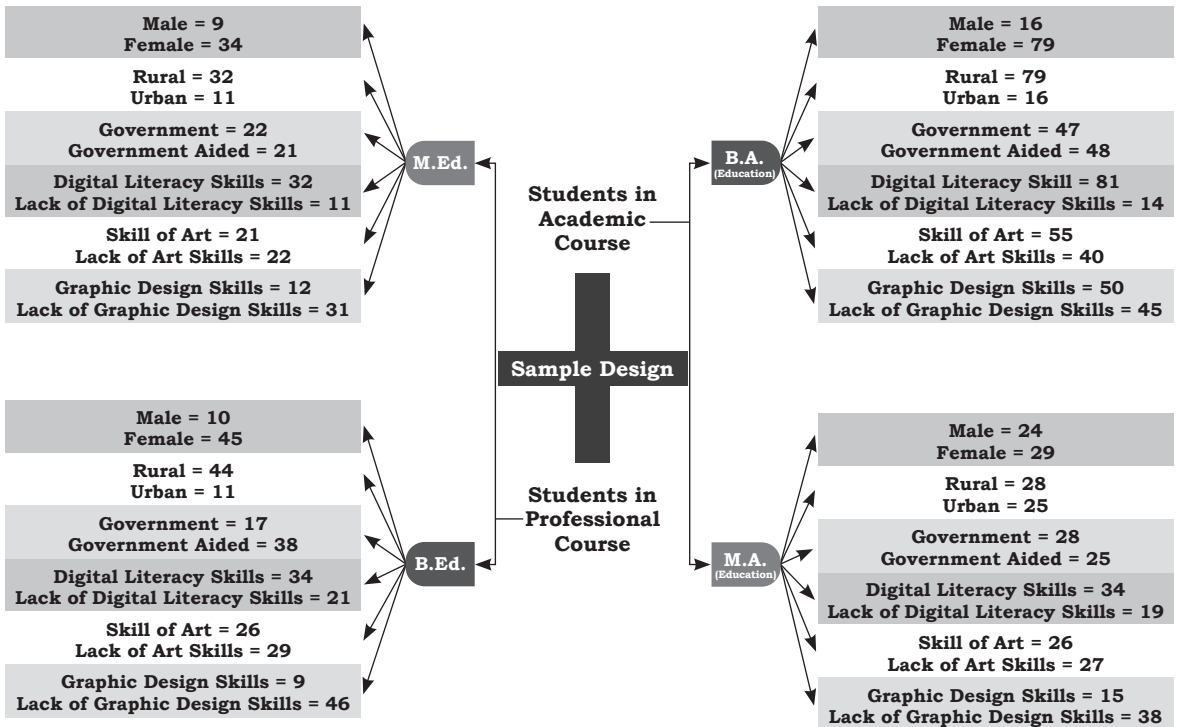


Fig. 1: The Sample Design of the Study

Tools for Data Collection

A survey-based 5-point Likert-type scale titled PAIET (Perception and Attitude towards Infographics-Embedded Teaching Strategies) was designed and developed by the researchers. The PAIET scale consists of three sections:

- Preliminary section for collecting the demographic details of the respondents,
- Perception towards infographics-embedded teaching strategies, and
- Attitude towards infographics-embedded teaching strategies.

The scale was standardised through content validation and reliability testing using Cronbach's alpha method, which yielded a high reliability coefficient of 0.97. The perception and attitude sub-scales comprise 25 items and 40 items, respectively. The maximum possible scores for the perception and attitude scales are 125 and 200, respectively. Responses to each item were recorded on five levels—strongly disagree, disagree, neutral, agree, and strongly agree.

Procedure

Data collection using the PAIET scale involved the dissemination of a Google Form containing explicit instructions for tertiary-level college and university students in West Bengal through e-Mail and WhatsApp. A total of 246 students participated and completed the form accurately within the stipulated time frame. The data collection process was completed over a period of two months.

Statistical Techniques Used

An independent samples t-test and Pearson’s correlation were employed for data analysis and interpretation to test the null hypotheses and examine the relationships among the variables. Descriptive statistics, including mean, standard deviation (SD), and correlation coefficients were computed to provide a comprehensive overview of the data distribution and inter-variable relationships.

Analysis and Interpretation of Data

***Pertaining to Objective 1:
To determine the extent of familiarity among tertiary-level students with infographics-embedded strategies***

The data pertaining to the extent of familiarity among tertiary-level students with infographics-embedded strategies are presented in Table 1.

Table 1 indicates that a high degree of familiarity among tertiary-level students (62.19%) with the infographics-embedded Strategies, with B.A. and B.Ed. students exhibiting the greatest familiarity. Approximately 21.13 per cent are acquainted, signifying a robust awareness across various academic streams. Merely a minor fraction (2.43%) lacks familiarity, indicating minimal knowledge deficiencies. This underscores that infographics are broadly acknowledged as an educational resource, although initiatives could concentrate on

Table 1
Familiarity among the Tertiary-level Students with Infographics-embedded Strategies

Stream	Highly Familiar	Familiar	Moderately Familiar	Somewhat Familiar	Not Familiar	Total Number of Students
B.A.	62	15	9	6	3	95
M.A.	33	12	5	2	1	53
B.Ed.	35	10	6	2	2	55
M.Ed.	23	15	3	2	0	43
Total	153	52	23	12	6	246
Percentage (%)	62.19	21.13	9.34	4.87	2.43	100

enhancing visibility to augment comprehension and utilisation of this approach.

***Pertaining to Objective 2:
To determine the level of perception of tertiary-level students towards infographics-embedded teaching strategies***

To address Objective 2, the mean score of the perception of tertiary-level students was calculated. The results are presented in Table 2 and illustrated in Fig. 2.

***Pertaining to Objective 3:
To analyse the perception of tertiary-level students towards infographics-embedded teaching strategies on the basis of their demographic variables***

To achieve Objective 3, statistical measures including the mean, standard deviation (SD), t-value, and p-value related to the perception of tertiary-level students were calculated. The results are presented in Table 3.

Table 2
Nature of Perception of Tertiary-level Students towards Infographics-embedded Teaching

Variable	Range of Perception Score	Nature of Perception	No of Students (N)	Percentage (%)	Mean (M) of Perception Score	Remarks
Perception towards Infographics-embedded Teaching	106–126	Very High	80	32.52	101.45	High perception
	86–105	High	148	60.16		
	66–85	Moderate	15	6.09		
	46–65	Low	3	1.21		
	25–45	Very Low	0	0		

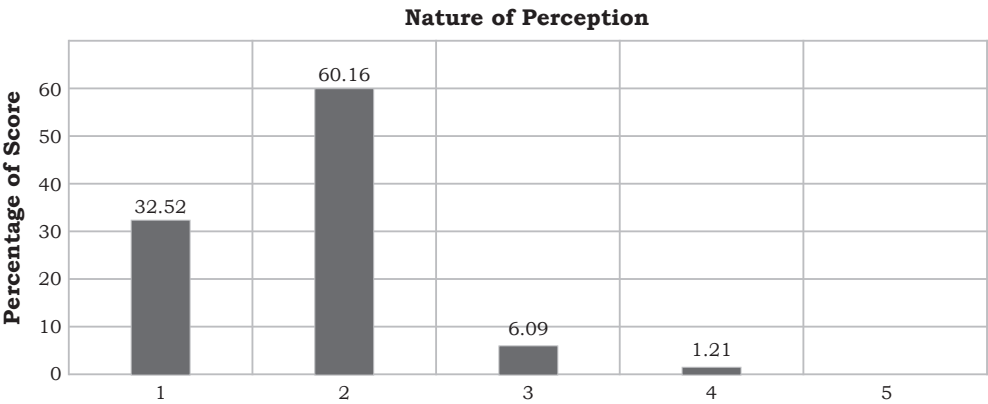


Fig. 2: The Nature of Perception of the Respondents towards Infographics-embedded Teaching

Table 3
Difference in Perception of the Respondents with Reference to their Demographic Variables

Variables			N	Mean (M)	SD	t-value	p-value	Remarks
Background		Dependent						
Gender	Male	Perception towards Infographics- Embedded Teaching	59	101.25	12.99	0.146	0.906	P>0.05*
	Female		187	101.51	11.84			
Habitat	Rural		180	101.39	12.86	0.130	0.076	P>0.05*
	Urban		66	101.62	9.80			
Types of Institution	Govt.		107	100.14	10.81	1.499	0.087	P>0.05*
	Govt.-aided		139	102.46	12.95			
Nature of Study	Academic (B.A. and M.A.)		168	101.21	13.06	0.458	0.015	P<0.05**
	Professional (B.Ed. and M.Ed.)		78	101.97	9.76			
Digital Literacy Skills	Yes		165	102.24	12.53	1.471	0.108	P>0.05*
	No		81	99.83	11.05			
Art Skills	Yes		128	103.52	13.64	2.831	0.001	P<0.05**
	No		118	99.21	9.74			
Graphic Design Skills	Yes		83	104.90	13.91	3.251	0.004	P<0.05**
	No		163	99.69	10.69			
* = Not Significant, ** = Significant								

The findings presented in Table 3 highlight the comparative analysis of students’ perception. The results reveal that gender, habitat, type of institution, and digital literacy skills do not have a significant influence on the perception of tertiary-level students towards infographics-embedded teaching strategies. Hence, the null hypothesis is accepted for these variables.

Specifically, the mean scores for male (M = 101.25, SD = 12.99) and female students (M = 101.51, SD = 11.84) yielded a *t*-value of 0.146

with a *p*-value of 0.906, indicating no significant difference. Similarly, the mean scores for students from rural (M = 101.39, SD = 12.86) and urban areas (M = 101.62, SD = 9.80) yielded a *t*-value of 0.130 with a *p*-value of 0.076. The mean scores based on the type of institution for government (M = 100.14, SD = 12.95) and government-aided institutions (M = 102.46, SD = 12.95) resulted in a *t*-value of 1.499 with a *p*-value of 0.087. Likewise, the comparison based on digital literacy skills between students with the skills

($M = 102.24$, $SD = 11.05$) and those without the skills ($M = 99.83$, $SD = 11.05$) yielded a t -value of 1.471 with a p -value of 0.108. Since all these p -values exceed the 0.05 level of significance, the differences are statistically non-significant.

However, nature of study, art skills, and graphic design skills were found to have a statistically significant impact on students' perception towards infographics-embedded teaching strategies. Therefore, the null hypothesis is rejected for these variables. The mean score of students pursuing an academic stream ($M = 101.21$, $SD = 13.06$) showed a significantly more favourable perception than those in the professional stream ($M = 101.97$, $SD = 9.76$), with a t -value of 0.458 and a p -value of 0.015.

Further, students possessing art skills ($M = 103.52$, $SD = 13.64$) exhibited a significantly higher level of perception compared to

those without this skill ($M = 99.21$, $SD = 9.74$), as indicated by a t -value of 2.831 and a p -value of 0.001. Likewise, students with graphic design skills ($M = 104.90$, $SD = 13.91$) demonstrated a significantly more positive perception than those without such skills ($M = 99.69$, $SD = 10.69$), with a t -value of 3.251 and a p -value of 0.004. Since the p -values for these three variables are below the 0.05 level of significance, the differences are statistically significant.

Pertaining to Objective 4:

To explore the nature of attitude of tertiary-level students towards infographics-embedded teaching strategies

To address Objective 4, the mean score of the attitude of tertiary-level students was calculated. The results are presented in Table 4 and illustrated in Fig. 3.

Table 4
Nature of Attitude of Tertiary-level Students
towards Infographics-embedded Teaching

Variable	Range of Attitude Score	Nature of Attitude	No of Students (N)	Percentage (%)	Mean (M) of Attitude Score	Remarks
Attitude towards Infographics-embedded Teaching	169–200	Very High	71	28.86	161.76	High attitude
	137–168	High	156	63.41		
	105–136	Moderate	17	6.91		
	73–104	Low	1	0.40		
	40–72	Very Low	1	0.40		

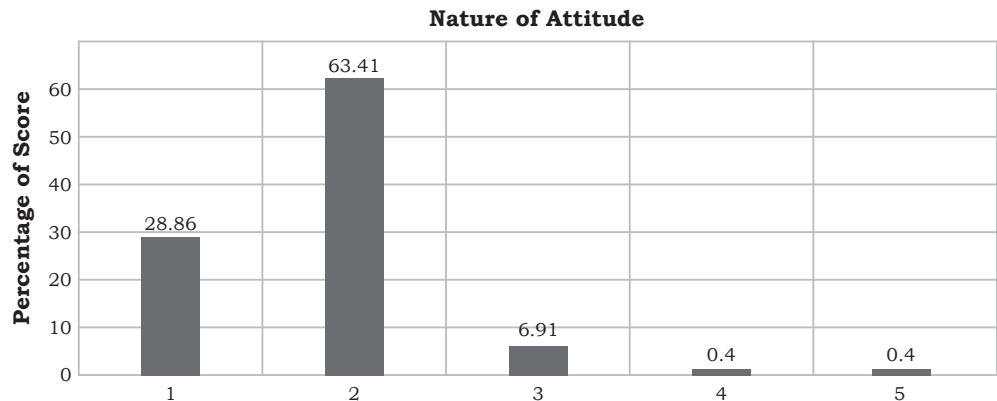


Fig. 3: Nature of Attitude of the Respondents towards Infographics-embedded Teaching

The results presented in Table 4 indicate that 28.86 per cent of tertiary-level students exhibit a very high level of attitude, 63.41 per cent demonstrate a high level of attitude, 6.91 per cent show a moderate level of attitude, while 0.40 per cent each display a low and very low level of attitude towards infographics-embedded teaching strategies. Overall, the findings reveal that tertiary-level students possess a high level of attitude towards infographics-embedded teaching, with a mean score of 161.76.

***Pertaining to Objective 5:
To analyse the attitude of
tertiary-level students towards
infographics-embedded teaching
strategies on the basis of their
demographic variables***

To achieve Objective 5, statistical measures including the mean, standard deviation (SD), t-value, and p-value related to the attitude of tertiary-level students towards

infographics-embedded teaching strategies were computed. The results are presented in Table 5.

The findings presented in Table 5 highlight the comparative analysis of students' attitudes towards infographics-embedded teaching strategies. The results indicate that gender, type of institution, and digital literacy skill do not have a statistically significant influence on the attitude of tertiary-level students towards infographics-embedded teaching. Hence, the null hypothesis is accepted for these variables.

Specifically, the mean scores for male ($M = 160.33$, $SD = 18.93$) and female students ($M = 162.21$, $SD = 19.13$) yielded a t -value of 0.660 with a p -value of 0.701, indicating no significant difference. With regard to the type of institution, the mean scores for students from government ($M = 160.31$, $SD = 16.10$) and government-aided institutions ($M = 162.88$, $SD = 21.05$) yielded a t -value of 1.047 with a p -value of

Table 5

Difference in Attitude of Tertiary-level Students towards Infographics-embedded Teaching Strategies based on Demographic Variables

Variables			N	Mean (M)	SD	t-value	p-value	Remarks
Background		Dependent						
Gender	Male	Attitude towards	59	160.33	18.93	0.660	0.701	P>0.05*
	Female		187	162.21	19.13			
Habitat	Rural	Infographics-embedded Teaching	180	161.42	20.93	0.462	0.008	P<0.05**
	Urban		66	162.69	12.72			
Types of Institution	Govt.		107	160.31	16.10	1.047	0.055	P>0.05*
	Govt.-aided		139	162.88	21.05			
Nature of Study	Academic (B.A and M.A)		168	161.67	20.53	.115	.046	P<0.05**
	Professional (B.Ed. and M.Ed.)		78	161.97	15.56			
Digital Literacy Skill	Yes		165	162.90	20.24	1.334	.151	P>0.05*
	No		81	159.45	16.28			
Skill of Arts	Yes		128	165.28	19.91	3.068	.023	P<0.05**
	No		118	157.94	17.38			
Graphics Design Skill	Yes		83	166.83	23.27	3.021	.003	P<0.05**
			163	159.19	15.99			

* = Not Significant, ** = Significant

0.055, which is also statistically non-significant. Similarly, in terms of digital literacy skills, the mean scores for students with the skills ($M = 162.90$, $SD = 20.24$) and those without the skill ($M = 159.45$, $SD = 16.28$) resulted in a t -value of 1.334 with a p -value of 0.151. Since all three p -values exceed the 0.05 level of significance, these differences are not statistically significant.

However, habitat, nature of study, art skills, and graphic design skill were found to have a statistically significant impact on students' attitudes towards infographics-

embedded teaching strategies. Therefore, the null hypothesis is rejected for these variables.

The mean scores for students from rural ($M = 161.42$, $SD = 20.93$) and urban areas ($M = 162.69$, $SD = 12.72$) yielded a t -value of 0.462 with a p -value of 0.008, indicating a significant difference. With regard to the nature of the study, students from the academic stream ($M = 161.67$, $SD = 20.53$) demonstrated a significantly more favourable attitude than students from the professional stream ($M = 161.97$, $SD = 15.56$), with a t -value of 0.115 and a p -value of 0.046.

the 0.05 threshold, the differences are statistically significant.

To address Objective 6, the correlation between the perception and attitude scores of tertiary-level students was computed. The results are presented in Table 6.

Table 6

Demographic Variable		N	Major Variables				Co- relation (r)	Remarks
			Perception towards Infographics- embedded Teaching		Attitude towards Infographics- embedded Teaching			
			Mean	SD	Mean	SD		
Gender	Male	59	101.25	12.99	160.33	18.93	0.84	a
	Female	187	101.51	11.84	162.21	19.13	0.84	a
Habitat	Rural	180	101.39	12.86	161.42	20.93	0.87	a
	Urban	66	101.62	9.80	162.69	12.72	0.66	b
Types of Institution	Govt.	107	100.14	10.81	160.31	16.10	0.79	a
	Govt.- aided	139	102.40	12.95	162.88	21.05	0.86	a
Nature of Study	Academic (B.A. and M.A.)	168	101.21	13.06	161.67	20.53	0.85	a
	Professional (B.Ed. and M.Ed.)	78	101.97	9.76	161.97	15.56	0.78	a
Digital Literacy Skills	Yes	165	102.24	12.53	162.90	20.24	0.84	a
	No	81	99.83	11.05	159.45	16.28	0.83	a
Skill of Art	Yes	83	104.90	13.91	165.28	19.91	0.83	a
	No	163	99.69	10.69	157.94	17.38	0.84	a
Graphic Design Skills	Yes	168	101.21	13.06	166.83	23.27	0.88	a
	No	78	13.06	9.76	159.19	15.99	0.78	a

a = High Positive Correlation, b = Moderate Correlation

The findings derived from Table 6 indicate a consistently strong positive correlation between perception and attitude of students towards infographics-embedded teaching strategies across all background variables, including gender, habitat, type of institution, nature of study, digital literacy skills, art skills, and graphic design skills.

With respect to gender, both the male ($r = 0.84$) and female students ($r = 0.84$) exhibit an equally strong positive correlation. This suggests that, irrespective of gender, students who hold favourable perceptions of infographics-embedded instruction, also tend to exhibit a positive attitude towards its application.

Regarding habitat, the relationship between perception and attitude is strong among rural students ($r = 0.87$) and moderate among urban students ($r = 0.66$). This indicates that rural students' attitudes are more strongly influenced by their perceptions of infographics-embedded teaching than those of their urban counterparts.

For the type of institution, students from both the categories demonstrate a significant positive correlation. However, students from government-aided institutions show a stronger association ($r = 0.86$) compared to those from government institutions ($r = 0.79$).

With regard to the nature of study, students from the academic stream (B.A. and M.A.) exhibit a stronger relationship between perception and attitude ($r = 0.85$) than students from the professional stream (B.Ed. and M.Ed.; $r = 0.78$).

In terms of digital literacy skills, both groups show a high positive correlation between perception and attitude. The correlation is marginally higher for students possessing digital literacy skills ($r = 0.84$) than for those lacking such skills ($r = 0.83$).

The existence of art skills also reflect a consistently strong relationship between the two variables, with a correlation of $r = 0.83$ for students with the skills and $r = 0.84$, for those without it. Although the art skills may enhance learning outcomes, the perception-attitude relationship remains strong in both groups.

Similarly, for graphic design skills, both groups demonstrate a strong positive correlation. The association is slightly stronger among students possessing graphic design skills ($r = 0.88$) than among those lacking these skills ($r = 0.78$).

***Pertaining to Objective 7:
To identify the degree of
adoption of infographics-embedded
strategies among tertiary-level
teachers***

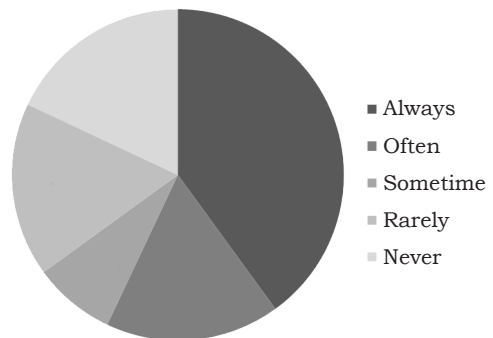


Fig. 4: Familiarity of Teachers with Infographics-embedded Teaching

During the data collection, tertiary-level students were asked to provide their rating to what extent their teachers use infographics in classroom instruction. The respondents mentioned that they attended classroom instructions of 60 teachers. As per their feedback, out of 60 teachers, 24 teachers consistently utilised infographics, 10 used frequently, 5 applied in occasional purpose, 10 claimed infrequent use, and 11 never employed. From Fig. 4, it is evident that 60 per cent teachers are highly familiar with infographic-embedded teaching strategies.

MAJOR FINDINGS

The findings of the study reveal that the majority of tertiary-level students perceive infographics-embedded teaching strategies favourably, as reflected in the high mean scores and the absence of significantly low perceptions among the respondents. Variables such as gender, habitat, type of institution, and digital literacy skill were found to have no significant influence on students' perception, whereas nature of study, art skills, and graphic design proficiency significantly influenced students' perception.

With regard to attitude, a majority of tertiary-level students exhibited a positive disposition towards infographics-embedded teaching strategies, with 28.86 per cent demonstrating a very high level of attitude and an overall mean score of 161.76. Further, habitat, nature of

study, art skills, and graphic design skill were found to significantly influence students' attitudes, whereas the remaining variables did not show any significant effect.

The study also established a strong positive correlation between the perception and attitude across various background variables such as gender, habitat, type of institution, and nature of study, indicating a consistent and meaningful association between the two constructs.

EDUCATIONAL IMPLICATIONS

The highly positive perception and attitude of tertiary-level students towards infographics-integrated teaching strategies indicate significant potential for improving instructional practices in higher education. Infographics serve as powerful visual tools that simplify complex concepts, enhance content accessibility, and increase students' learning propensity. Teachers can effectively utilise infographics to promote active learning by encouraging students to analyse, explain, and create their own visual representations of course content. This approach enhances conceptual understanding while fostering essential twenty-first-century skills such as critical thinking, creativity, and digital literacy.

The interactive nature of infographics increases student motivation and engagement, particularly in subjects that are often perceived as challenging or complex.

Their ability to combine visual and textual information, enhances comprehension, especially for the visual learners, and facilitates better retention of key concepts. The positive perception and attitude of students towards infographics clearly indicate a strong preference for visually enriched instructional content. Therefore, educators should consistently integrate infographics into teaching materials to enrich student engagement, simplify complex topics, and promote deeper understanding and retention.

Educators must also possess essential digital and design competencies to successfully integrate infographics into pedagogy. Hence, structured professional development programmes should be organised to enhance teachers' efficiency in the creation and application of infographics, as well as their understanding of diverse learning preferences. Curriculum design should also incorporate infographic-based assignments, projects, and assessments to strengthen students' ability to process and present information visually. This practice not only improves conceptual clarity but also encourages creativity, critical thinking, and digital literacy.

Infographics cater to multiple learning styles and are particularly beneficial for visual learners. Their application can help reduce educational inequities by making learning more inclusive and accessible to the students from diverse academic backgrounds and abilities.

Infographics-based pedagogical strategies promote active learning by encouraging students to engage more deeply with course content. Educational institutions should promote the use of infographics in classroom instruction and student presentations to encourage learner autonomy and higher levels of cognitive engagement.

In alignment with the national educational priorities, such as NEP 2020, policies should continue to advocate the integration of ICT tools, including infographics, in higher education. Adequate financial resources, infrastructure, and institutional support are essential for the large-scale adoption and sustainable use of these digital tools. Academic institutions must equip faculty with appropriate training and resources to effectively implement infographic-based strategies. Student feedback clearly highlights the value of visually enriched teaching methods in improving academic performance and fostering a more engaging learning environment in higher education.

CONCLUSION

The integration of ICT into education, particularly through the innovative tools such as infographics, reflects a significant transformation in contemporary pedagogical approaches. The present study examined tertiary-level students' perceptions and attitudes towards infographics-embedded teaching

strategies and revealed that students generally respond positively to the visual, organisational, and interactive advantages offered by infographics. The findings indicate that infographics play a significant role in simplifying complex content, enhancing student engagement, fostering critical thinking, and improving knowledge retention.

The study further revealed that students' demographic and educational backgrounds—gender, habitat, type of institution, digital literacy, art skills, and graphic design skills—influence their perceptions and attitudes to varying degrees. A strong positive correlation between the perception and attitude was also established, indicating that favourable perceptions of infographics directly influence students' receptiveness and enthusiasm for learning through such tools.

Despite the widespread acceptance of infographics-based learning among tertiary-level students, the study highlights a notable pedagogical gap, as only about 40 per cent of classroom instructors currently employ these innovative strategies. This gap reflects the growing divide

between 'digital native' students and 'digitally immigrant' teachers, who often struggle to adapt to the infographic-based ecosystem due to limited training and exposure. Consequently, there is a growing shift towards self-paced and personalised learning through infographic-rich modules delivered via MOOCs, online lectures, open educational resources, open-access journals, and interactive digital platforms supported by emerging ed-tech ecosystems.

To address this challenge, there is an urgent need for the development of digital infrastructure, curricular reforms, and systematic professional development of teachers. Teacher training institutions such as the Malaviya Mission Teacher Training Centres (MMTTCs) in West Bengal can play a crucial role in equipping and motivating tertiary-level teachers to adopt the digital ecosystem and infographics-embedded teaching strategies. Strengthening teachers' digital competence and pedagogical adaptability will be central to ensuring meaningful and sustainable integration of infographics in higher education.

REFERENCES

- ALYAHYA, D. 2019. Infographics as a Learning Tool in Higher Education: The Design Process and Perception of An Instructional Designer. *International Journal of Learning, Teaching and Educational Research*. Vol. 18, No. 1. pp. 1–15. <https://doi.org/10.26803/ijlter.18.1.1>
- GOVERNMENT OF INDIA, MINISTRY OF HUMAN RESOURCE DEVELOPMENT. 2020. *National Education Policy 2020*. New Delhi. https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf

- HALEEM, A., M. JAVAID, M.A. QADRI, AND R. SUMAN. 2022. Understanding the role of Digital Technologies in Education: A Review. *Sustainable Operations and Computers*. Vol. 3. pp. 275–285. <https://doi.org/10.1016/j.susoc.2022.05.004>
- HASHIM, H. 2018. Application of Technology in the Digital Era Education. *International Journal of Research in Counseling and Education*. Vol. 2. pp. 1–5. <https://doi.org/10.24036/002za0002>
- KARMAKAR, I., S.K. BEHERA, AND R. MOHALIK. 2025. A Study on Techno Pedagogical Skills of College Teachers in West Bengal. *Indian Journal of Educational Technology*. Vol. 7, No. 1. pp. 277–288. <https://journals.ncert.gov.in/IJET/article/view/851>
- MALIK, M. AND C. ADHIKARY. 2025. Infographics-embedded Strategies in the New Learning Era. *Journal of Emerging Technologies and Innovative Research (JETIR)*. Vol. 12, No. 2. <https://www.jetir.org/papers/JETIR2502750.pdf>
- MONDAL, M.H. AND C. ADHIKARY. 2025. The Geometry of Thought: Advance Organiser as the DNA of Comprehension and Visual Spine of Learning. *Journal of Emerging Technologies and Innovative Research (JETIR)*. Vol. 12, Issue 5. <https://www.jetir.org/papers/JETIR2505875.pdf>
- NAPARIN, H., R. A.B. SAAD. 2018. Infographics in Education: Review on Infographics Design. *International Journal of Multimedia & Its Applications*. Vol. 9, pp. 15–24. <https://doi.org/10.5121/ijma.2017.9602>
- NARMATHA, P. AND M. BALASUBRAMANIAN. 2023. The Infographic Method of Learning in Education. *ResearchGate*. <https://www.researchgate.net/publication/371700013>
- PAIVIO, A. 1986. *Mental Representations: A Dual Coding Approach*. Oxford University Press, Oxford.
- RASTOGI, A. AND S. MALHOTRA. 2013. ICT Skills and Attitude as Determinants of ICT Pedagogy Integration. *European Academic Research*. Vol. 1. pp. 301–318.
- SWELLER, J. 1988. Cognitive Load during Problem Solving: Effects on learning. *Cognitive Science*. Vol. 12. pp. 257–285. https://dx.doi.org/10.1207/s15516709cog1202_4
- TIMOTHEOU, S., O. MILIOU, Y. DIMITRIADIS, S.V. SOBRINO, N. GIANNOUTSOU, R. CACHIA, A.M. MONÉS, AND A. IOANNOU. 2023. Impacts of Digital Technologies on Education and Factors Influencing Schools' Digital Capacity and Transformation: A Literature Review. *Education and Information Technologies*. Vol. 28, No. 6. pp. 6695–6726. <https://doi.org/10.1007/s10639-022-11431-8>
- VYGOTSKY, L. S. 1978. *Mind in Society: The Development of Higher Psychological Processes*. Harvard University Press, Cambridge, MA.