



# INFOGRAPHICS-EMBEDDED STRATEGIES IN THE NEW LEARNING ERA

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*Abstract:* The 21<sup>st</sup>-century is the era of information, communication, collaboration, and cooperation. In this fast-growing global world, we have been witnessing a paradigm shift in all fields, including the education sector also. Scientific advancements and technological explorations play a pivotal role in propagating education. With the proliferation of technological devices, the teaching-learning landscape has also been utilizing different technological gadgets for the propagation of education among 21<sup>st</sup>-century learners, making them professionally humane and digitally smart. Infographics are believed to be a useful and effective tool in the educational process, increasing interest among 21<sup>st</sup>-century learners. The landscape of infographics, visually representing information, offers a unique blend of graphics, text, and data, making them an ideal medium for engaging and educating contemporary learners. Infographics in the new learning era play a crucial role in enhancing engagement, comprehension, and retention of information. They serve as potent tools for disseminating information effectively. By employing these embedded strategies, educators can harness the power of infographics to create engaging, interactive, and effective learning materials suited to the demands of the new learning era. The National Education Policy (2020) emphasizes the development of digital literacy among both digitally native students and digitally immigrant teachers. A radical shift from the implications of traditional infographics to digital infographics has been witnessed in teaching-learning sectors. In this article, we report a review of infographics embedded strategies fostering the development of learners in the new learning era.

*Keywords:* Infographics, Visual literacy, Embedded strategies, new learning era, Paradigm shift

## 1. INTRODUCTION

A picture based both on digital and printed media or information graphic that blends data with design to communication or conveying complex information in an appealing and attractive form to the audience is known as infographics. Infographics often prove so effective in educational contexts because they use imagery to highlight, explain or enhance text-based information. Infographics as a learning task the participants also showed positive attitudes based on the results and findings in which the highest trend is the chance of stimulating and improving their creativity in conducting the task. They also demonstrated positive feedback in terms of their learning motivation and learning progress as they see the use of infographics as something new, interesting and beneficial to support their learning process. Therefore, it can be concluded that based on the findings, the use of infographics as learning materials and tasks has enhanced student learning experience indicated by their positive attributes (Bontisesari, 2022). Infographics are believed to be a useful and effective tool in the educational process that would increase interest in learning within different disciplines (Ivy, 2017). The development of computer technology brings forth numerous applications and media for instructors to apply in their teaching session. Most of the instructors realized that they need to be in-line with the fast-changing technology to adapt to the positivism of technology in classroom. The important

aspects of technology in educational context should be emphasizing on the effectiveness of knowledge transfer from the instructors to the learners without abandoning the excitement of learning (Amin, 2017).

## 2. OBJECTIVES

The objectives of the study are as follows:

1. To explore the functions of infographics.
2. To determine the various phases of evolution of infographics over the ages.
3. To understand different types of infographics used in different academic domains.
4. To identify the benefits of infographics.
5. To find out the differences between infographics and graphic organizers.
6. To explore the infographics as a visual learning tool in classroom.
7. To identify infographics embedded strategies for effective teaching.

## 3. METHODOLOGY

A desktop review technique has been used to collect data for this study. These are explained in the following sections.

### 3.1. FUNCTIONS OF INFOGRAPHICS

An effective infographic delivers data and analysis in a way that helps audience digest and understand information easily in a visually pleasing format. "It (infographic) keeps people's interest by lending a storytelling and visual element to what can be sterile research. The Functions of infographics are as follows (Figure 1).

#### 1. Simplicity:

Emphasize simplicity in both design and message to enhance readability and comprehension.

#### 2. Clarity:

Information presented is clear and easy to understand. Use concise language, straightforward visuals, and logical organization to convey the intended message effectively.

#### 3. Relevance:

Focus on presenting information that is relevant and meaningful to the audience. Choose data, facts, and visuals that directly support the main topic.

#### 4. Visual Hierarchy:

Establish a clear visual hierarchy to guide the viewer's attention through the infographic. Use size, colour, contrast.

#### 5. Consistency:

Maintain consistency in design elements such as colours, fonts, icons, and imagery throughout the infographic.

#### 6. Accuracy:

Ensure that all information presented in the infographic is accurate, reliable, and up-to-date. Verify data sources, fact-check statistics, and avoid misleading or false information.

#### 7. Balance:

Achieve visual balance by distributing elements evenly and harmoniously across the infographics.

#### 8. Engagement:

Capture the audience's interest and engagement through compelling visuals, intriguing storytelling, and interactive features.

#### 9. Accessibility:

Design the infographic with accessibility in mind to ensure that it can be easily understood by all viewers, including those with disability.

#### 10. Whitespace:

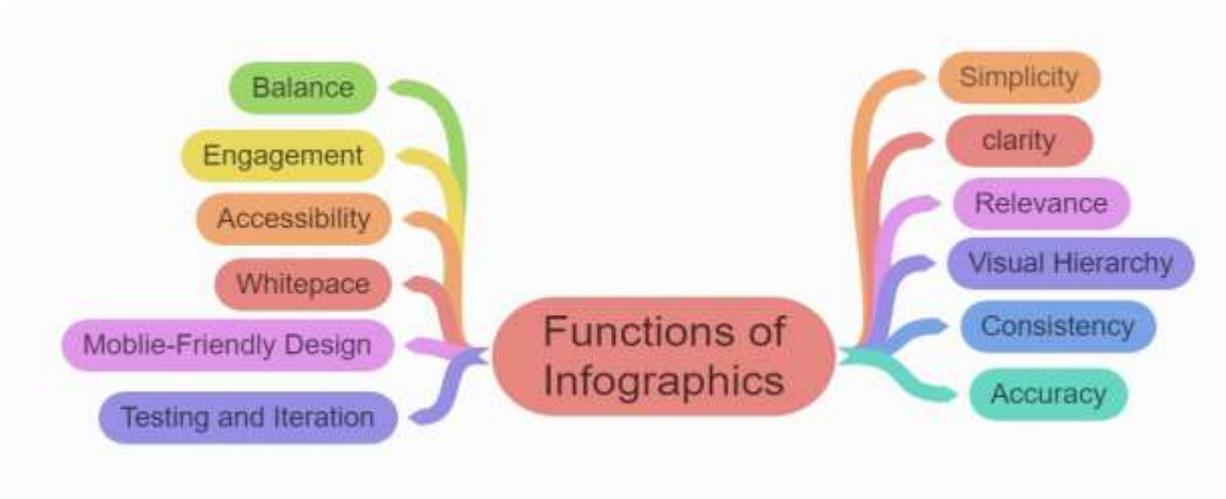
Use whitespace (negative space) strategically to reduce clutter and improve readability.

#### 11. Mobile-Friendly Design:

Optimize the design for viewing on various devices, including smartphones and tablets. Ensure that the infographic remains legible and visually appealing.

#### 12. Testing and Iteration:

Test the infographic with a sample audience to gather feedback and identify areas for improvement.



**Figure 1. Functions of Infographics**

**3.2. EVOLUTION OF INFOGRAPHICS AS A TEACHING TOOL**

First time infographics was used by Christopher Scheine in 1626. He had published a book of Rosa Ursina Siva sol and demonstrated the steps of sun rotation in his book. Table 1 describes the different phases of evolution of infographics.

Table 1. Evolution of Infographics as a Teaching Tool

Year	Evolution of Infographics Tool
1802	Alexander von Humboldt created this on Mt. Chimborazo in Ecuador. This was one of the first examples of unique infographics novel displays of information.
19 <sup>th</sup> century	Pic chart, graphs and even 3-D visuals were popular in newspapers and in political campaigns to represent lots of information
Mid-20 <sup>th</sup> century	More data visuals and infographics were created, but for the first-time using programming software and (gasp) computers
1970	More and more professors, government institutions and Journalist were polling and gathering data turn into infographics for newspapers, publications and public flyers and posters.
1972	Otl Aicher creates pictogram sets for an Olympic sports poster. These See every day for bathroom, phones, gas stations etc.
1982	Published the visual Display of Quantitative information while teaching of Princeton University. He’s considered the “Father of Data Visualization” because he talks extensively about the need to visually represent.
Chart Junk	Tuft’s term for icons, layouts or text that cutlers up the image and distracts from the information.
2000s	(Internet +Infographics) with the use of the internet increasing through the early 2000s more internet companies begin offering unique graphics and more marketers begin to understand the value of visuals on websites and social media.
2012	Easel.ly is launched.
2012-2013	Infographics are used in classrooms, Businesses and online to Educate, entertain and engage

**3.3. TYPES OF INFOGRAPHICS**

Infographics came in various ways, each serving different purposes and presenting information in distinct ways. Here are some common types of infographics (Figure 2).

**1.Statistical Infographics:**

Present data and statistics visually using charts, graphs, and diagrams to illustrate trends, comparisons, distributions, and relationships

**2.Informational Infographics:**

Provide factual information, explanations, or summaries on a particular topic, often using a combination of text and visuals to enhance understanding.

### **3. Timeline Infographics:**

Display chronological sequences of events, processes, or historical developments using a linear timeline format, often including dates, milestones, and descriptions.

### **4. Process Infographics:**

Illustrate step-by-step processes, procedures, workflows, or instructions using diagrams, flowcharts, or sequential visuals to guide viewers through a series of actions.

### **5. Comparison Infographics:**

Compare and contrast two or more concepts, products, options, or variables, highlighting similarities, differences, advantages, and disadvantages.

### **6. Hierarchical Infographics:**

Display hierarchical structures, classifications, or organizational frameworks using tree diagrams, pyramids, or nested visuals to show relationships between different categories.

### **7. Geographical Infographics:**

Present geographical or spatial information, such as maps, charts, diagrams, to illustrate locations, distributions, demographics, or patterns related to a specific area.

### **8. Statistical Process Control (SPC) Infographics:**

Used in quality management and manufacturing industries to monitor and analyse processes over time, displaying data using control charts, histograms, or scatter plots to identify variations and trends.

### **9. Interactive Infographics:**

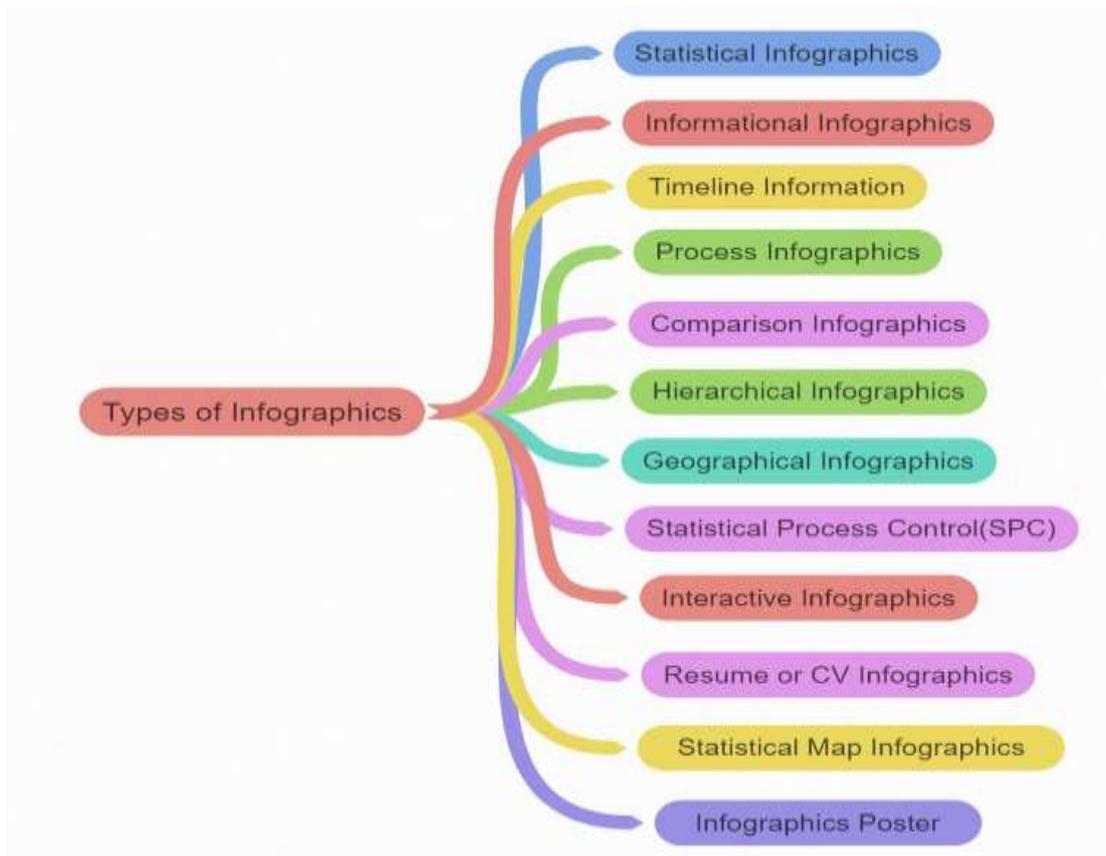
Incorporate interactive elements such as clickable buttons, animations, rollover effects, or embedded multimedia content to engage viewers and allow them to explore information dynamically.

### **10. Resume or CV Infographics:**

Visual representations of a person's resume, curriculum vitae, using graphics, icons, and timelines to showcase skills, experiences, achievements, and qualifications in a creative and concise format.

### **11. Statistical Map Infographics:**

Combine statistical data with geographic information to create thematic maps, choropleth maps, or heat maps, illustrating spatial patterns, distributions, or trends across regions or territories.



**Figure 2. Types of Infographics**

## 12. Infographic Posters:

Large-scale infographics designed for display, often used in educational, promotional, or informational contexts to convey complex information or messages in an eye-catching format.

### 3.4. BENEFITS OF INFOGRAPHICS

Infographics promote the development of essential 21<sup>st</sup>-century skills such as creativity, communication, collaboration, critical thinking, and digital literacy, preparing students for success in a rapidly evolving global society. Infographics offer numerous benefits as a teaching tool (Figure 3).

#### 1. Visual Learning:

Infographics leverage visual elements such as icons, charts, and images, catering to visual learners who grasp information better through pictures and graphics.

#### 2. Simplified Complex Information:

They complex topics into easily understandable visuals, breaking down information into digestible chunks and enhancing comprehension.

#### 3. Engagement:

Infographics captivate students' attention with their visually appealing designs and layouts, promoting active engagement and interest in the subject matter.

#### 4. Retention:

Visual aids, including infographics, improve information retention by providing memorable visual cues that reinforce learning and recall.

#### 5. Accessibility:

Infographics can accommodate diverse learning styles and abilities, including visual, auditory, and kinaesthetic learners, fostering inclusivity in the classroom.

#### 6. Data Visualization:

They excel at presenting data and statistics in a clear and accessible manner, facilitating data interpretation and analysis skills development.

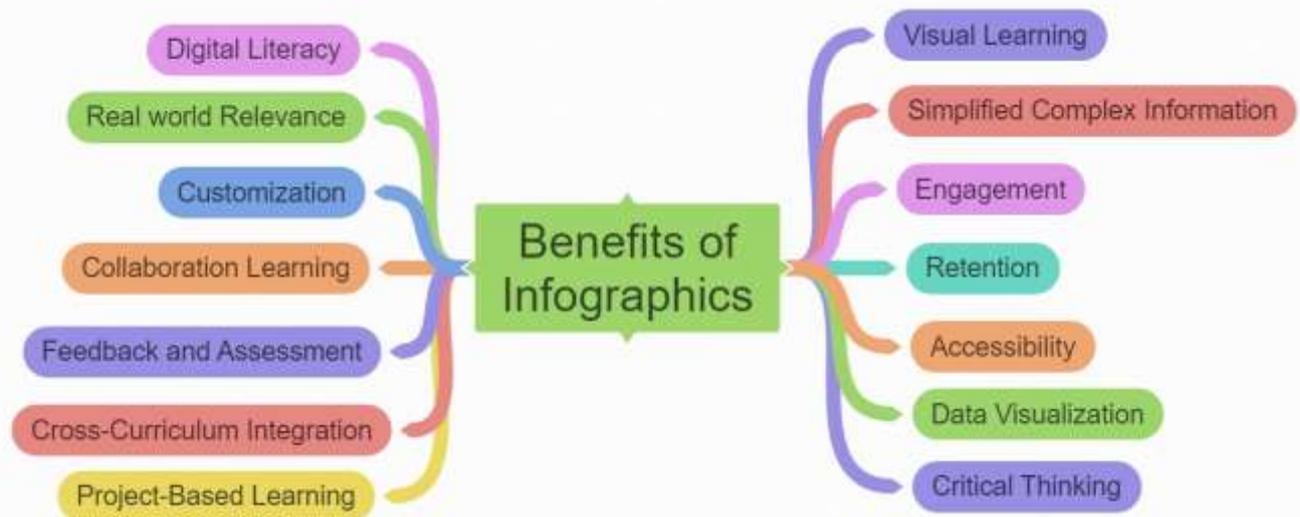


Figure 3. Benefits of Infographics

**7. Critical Thinking:**

Creating or analysing infographics encourages students to think critically about the information presented, evaluate its validity, and draw informed conclusions.

**8. Digital Literacy:**

Using infographics enhances students' digital literacy skills, as they learn to navigate and create visual content using various digital tools and platforms.

**9. Real-World Relevance:**

Infographics mirror real-world communication practices, preparing students for the visual-centric nature of modern information dissemination in fields such as media, marketing, and academia.

**10. Customization:**

Educators can tailor infographics to suit specific learning objectives, adapting content, design, and complexity to meet the needs of diverse student populations.

**11. Collaborative Learning:**

Collaborative infographic projects foster teamwork, communication, and peer learning as students collaborate to research, design, and present information together.

**12. Feedback and Assessment:**

Infographics serve as effective tools for formative assessment, enabling educators to gauge students' understanding, identify misconceptions, and provide targeted feedback.

**13. Cross-Curricular Integration:**

Infographics can be integrated across various subjects and disciplines, facilitating interdisciplinary connections and reinforcing learning across different contexts.

**14. Project-Based Learning:**

Assigning infographic projects promotes project-based learning, where students apply knowledge and skills to real-world tasks, fostering deeper understanding and long-term retention.

**3.5. DIFFERENCES BETWEEN INFOGRAPHICS AND GRAPHICS ORGANIZERS**

Infographics and graphics organizers are visual tools used in education, yet they serve different purposes, contain different types of content, target different audiences. The differences between infographics and graphics organizers are explained in Table 2.

Tables 2. Differences between Infographics and Graphics Organizer

Subject	Infographics	Graphics Organizer
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Purpose	Infographics are Primarily used in a visually appealing and easy to understand manner, used to present research findings, Statistics, informs the audience	Graphics Organizers are tools designed to help students organize and visualize information, used to brainstorm ideas, outline concepts, map out relationship
Content	Infographics typically contain a combination of text, images, icons, charts, graphs and other visual elements. They are often including a mix of qualitative and quantitative data	Graphics Organizer are simply design, diagram, chats, tables. Her may include elements like mind maps, Concepts maps, Venna diagrams, timelines of flowcharts.
Audience	Infographics are often created for communication information effectively to diverse audience, including general public, stakeholders or specific target group.	Graphic Organizers are primarily used by students and educators as instructional tools within the classroom setting
Creation process	Infographics created by specialized graphic design software or online infographics making tools.	Graphic Organizer created by manually using pen and paper, digitally using software tools, presentation software

### 3.6. INFOGRAPHICS AS A VISUAL LEARNING TOOL IN CLASSROOM

Infographics in education is a great way to help students' visual content by effectively engaging them with digitally classroom setting.

- Encourage students to present their research findings through an information.
- Easily explains and clarifies concepts.
- Ask students to highlight similarities and differences with a comparison infographic.
- Use infographics to share data or highlight trends.
- Makes a timeline infographic to explain historical events or evolutionary process.
- Exhibit course curricula/ syllabus in a style look.
- Use infographics for classroom introductions.
- Explain complex topics with an infographic.
- Use infographics to communicate with other educators and staff in school.
- Make classroom posters in an instant with infographics.

### 3.7. ROLE OF INFOGRAPHICS IN AI-BASED TRANSACTION

There are several online tools to help visually build an infographic, some important and common AI based tools have been discussed in Table 3.

Table 3. Different AI Tools of Infographics

Sl. No.	Tools	Uses
1	Canva	Free graphic design platform. Editing photo without editing Knowledge and Experience. Used for making invitation cards, Instagram posts, business.
2	Vennngage	Online application for producing infographics, reports, data visualization.
3	Piktochart	Online audience to make slides, Presentations, Posters, and reports.
4	Easel.ly	Enable to visualize any kind of information.

		Easily infographic maker.
5	Visme	Visual content creation tool. Video create and presentation online mode.
6	Infogram	Infogram is a free visual tool. Helps people intuitively visualize content.
7	Visualize.me.	Web service visualizes. User's Linkin profile information
8	Snappa	Non designers but create graphics for social media. Display ads, Blog poster.

### 3.8. CHANGING FACE OF IMPLICATIONS OF INFOGRAPHICS FROM TRADITIONAL TO DIGITAL MODE

The implications of changing face of infographics from traditional to digital serve the purpose of visually presenting information, digital infographics offer more flexibility, interactivity, accessibility in today's digital age. Table 4 explains the shift of infographics from traditional to digital mode.

Table 4. Changing of Infographics from Traditional to Digital mode

Subject	Traditional Infographics (TI)	Digital Infographics (DI)
Format	TI is a typically printed may involve manual design techniques, such as poster, flyers, drawing, printing etc.	DI is a designed to be viewed on electronic devices such as computer, smartphone, using digital graphics, such as hyperlinks, animations, embedded video
Creation process	Reproduced manual such as selecting colours & fonts, sketching concepts, arranging visual elements	Creation process may also web based, such as Adobe Illustrator, Canva, Piktochart
Distribution Channels	Distributed through physically, such as printed posters, newspaper, displayed at events, Conference, public spaces	Distributed primarily through online channels, such as - websites, blogs, social media platforms, email newsletters etc.
Interactivity And Dynamic Content	Dynamic elements instead of traditional infographics are static and non-interactive	Digital infographics more dynamic, engagement and interactive process, such as Animation, clickable buttons, rollover effects, embedded multimedia content

### 3.9. INFOGRAPHICS EMBEDDED STRATEGIES FOR EFFECTIVE TEACHING

Infographics embedded strategies refer to techniques and approaches used to effectively incorporate infographics into teaching and learning experiences. Here are several strategies for embedding infographics into educational settings:

#### 1. Preparation and Selection:

Carefully select or create infographics that align with learning objectives, curriculum standards, and student interests, clarity of visual design, and relevance to the topic being taught.

#### 2. Introduction and Contextualization:

Introduce the infographic by providing context and explaining its purpose, relevance, and key concepts, help to students understand.

#### 3. Guided Exploration:

Guide students through the infographic by directing their attention to specific elements, highlighting key information, encouraging active exploration, discussion about the content.

#### 4. Interactive Activities:

Design interactive activities that include analyzing data, interpreting visual representations, making predictions, or drawing connections to real-world examples.

**5. Collaborative Learning:**

Foster collaborative learning by having students work together to analyze and interpret infographics, encourage peer discussions, group projects.

**6. Integration with Multimedia:**

Enhance infographics by integrating multimedia elements such as videos, audio clips, or interactive features.

**7. Scaffolded Support:**

Provide scaffolded support to help students navigate and understand infographics effectively, offer additional resources as needed to support comprehension.

**8. Differentiation and Personalization:**

Provide options for students to explore infographics at their own pace, choose topics of interest, or engage with supplementary materials tailored to their individual needs.

**9. Reflection and Synthesis:** Encourage students to reflect on their learning experiences with infographics and synthesize key takeaways. Such as summarize main ideas, draw conclusions.

**10. Assessment Integration:** Integrate infographics into assessment could include quizzes, discussions, presentations, or projects where students demonstrate work.

**4. CONCLUSION**

In conclusion, this study highlighted the significant role of infographics embedded strategies. Infographics enhance data visualization and promote effective classroom communication in educational contexts by providing a visual representation of complex information. Infographics is data visualizations that present complex information quickly and clearly which includes signs, photos, maps, graphics and charts. Infographics embedded strategies refer to techniques and approaches used to effectively incorporate infographics into teaching and learning experiences.

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