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# The Impact of Graphics and Visuals Employment on Information Recalling

<sup>(1)</sup>Nashwa Akl, <sup>(2)</sup>Nermine Ibrahim, <sup>(3)</sup>Sally Mohamed Abdelhamid,  
<sup>(4)</sup>Yasmine Yasser Saad

<sup>(1)</sup>Professor of Media, faculty of Mass Communication, Cairo University,  
<sup>(2)</sup> Assistant Professor Faculty of mass communication, Ahram Canadian University,  
<sup>(3-4)</sup>Teaching Assistants, faculty of Mass Communication, Ahram Canadian University

## Abstract:

This research paper aims to examine the effect of graphics and visual employment in digital storytelling and to determine the usage of graphics and visuals to enhance recall levels among youth. The researchers conducted an experiment and in-depth interviews using Information Processing Theory, the experiment was employed on a sample of 50 university students who study at the Faculty of Mass Communication at Ahram Canadian University as the experimental group was 30 students and the control group was 20 students. The in-depth interviews are held with 10 Egyptian experts in digital storytelling. Results showed that there is a positive correlation between visuals and graphics in different types and Egyptian youth recalling rates of information. Also, Different types of visuals and graphics have different functions and usage when used in digital storytelling that content creators must consider.

**Keywords:** Graphics, Visuals, Digital Storytelling (DST), Recalling, Infotainment

## **Introduction**

Graphics and visual always get people's attention, you may also remember the information by its place in the page or in the photo, 90% of information transmitted to the brain is visual, and Visuals are processed 60,000X faster in the brain than text, according to the Visual Teaching Alliance.

Graphics and visuals illustrate and clarify. This helps in people's recalling rates increase. And in this era of social media and home feed scrolling, youth mind and attention are easily saturated; creating visually appealing infotainment content could work on keeping their attention to raise their general knowledge. The variety of graphics and visuals help on that, also, the factor of colour couldn't be neglected.

“Design adds value faster than it adds costs.” – Joel Spolsky.

Despite the fact it may add cost to the content creator, but the effect of it can't be denied, Moreover, there are many tools to be used for small productions. Over 2 million designers are using Canva annually, according to the Visual Teaching Alliance, which is easy and mostly free to all content creators to use.

## **Literature Review**

Reviewing previous studies which are most relevant to this study the dimensions will be categorized as the following:

### **The Usage of Visual Techniques:**

Studies have shown that visual techniques play crucial roles in enhancing the effectiveness of visual communication. For instance, Borkin et al. (2015) identified numerous key factors that enhance recognition and recalling of visualizations which have ability to capture viewer attention, moreover titles and texting within the visuals and using pictograms serve as visual hooks to support in memory recall as people spend more time looking at the text specifically title.

Moreover, Subsequent studies conducted by Strasser et al. (2012), Klein et al. (2015) and investigated the field of health communication. The explorations focused on the impact of using visual techniques, specifically larger graphic health warnings (GHWs), embedded within cigarette advertisements on the attention and recalling among smokers. Amanda et al. (2017) and Klein et al. (2015) focus on three versions of advertisement as size of the graphics and text only, while Strasser et al. (2012) focuses on the time spent looking at text and graphic image. concluded that graphic elements playing a crucial role in enhancing recall in health communication as graphic health warning take more attention than text warning only and the size of the graphic didn't increase the attention.

Additionally, Peter et al. (2001) conducted a study by investigating 4-week recall of 236 pictographic medical instructions on 21 adult clients who had less than fifth grade reading skills demonstrated that 94% recall the instructions after 4 weeks which indicate that people with low literacy skills can recall large amount of information with pictographs.

In a different context, Sandra, Moriarty (1986) conducted a content analysis to analyze the roles of visuals in print media advertising, resulted that visual storytelling had a higher impact in terms of readership scores compared to literal visuals as it increases attention and engagement. Also, Zeiller et al. (2017) Investigate the usage of interactive infographics in online newspaper through an online user survey to understand how reader interact with these graphics resulted that interactive infographics are highly accepted among users of online newspaper, underscoring the role of visuals in engaging audience.

In addition, Michail et al. (2020) conducted an online experiment to investigate how using narrative and visuals in news coverage about growth of genetically modified organisms (GMOs) in agriculture affect people's attitudes. The results showed that narrative and visual have a significant effect on engagement and suggested that narrative news can effectively persuade people on sensitive topics.

Furthermore, Borkin et al. (2015) explores how visualizations are recognized and remembered through labeling 393 visualizations and analyze the eye movement of 33 participants concluded that making visualizations using helpful symbols and text can be more effective and easy to remember. And a study conducted on students in two teaching sessions one being didactic and the other is virtual learning environment both covered with the same content of radiation therapy to investigate the impact of virtual learning environment on student retention and engagement on teaching radiation therapy through an anonymous questionnaire and then another one after two weeks to assess knowledge retention and results indicated that the use of virtual learning environment have a positive impact on student engagement and retention. (Ryan & Poole, 2019).

### **The impact of storytelling**

Digital storytelling empowers the students to become active creator of multimedia narrative rather than existence passive consumer, as written and spoken storytelling assist as initial elements, improving students to convey their personal experience and insights. (Ohler, Jason 2005) this transitions from passivity to creativity is further reinforced by Robin, Bernard (2006) Highlighted the efficiency of digital storytelling in teaching and learning as students generate their own digital stories and enhancing literacy skills, moreover instructor usage of digital storytelling to participate with students and increase information retention and promote critical thinking. Building upon this, Foelske, Mindy (2014) Demonstrated that digital storytelling has a positive impact on student

motivation, engagement and enhancing literacy skills and overall content knowledge. Furthermore, digital storytelling can offer significant advantage in classroom to develop and enhance student's academic skills. Furthermore, Chang and chun chu (2022) argued that digital storytelling is a powerful educational tool which enhance learning motivation, digital literacy and engagement.

Additionally, the transformative impact of digital storytelling is explained by several studies. Hatice & Yasemin (2015) conducted an experimental study on 59 grade primary school students extend to 13 weeks to explore the impact of digital storytelling on the visual memory capacity and writing skills of students. The finding showed a significant enhancement in visual memory capacity and writing skills for student suggesting digital storytelling has a great impact on improving writing skills. Similarly, Erdogan, Erdi (2021) Conducted an experimental study on 30 students and who focus group on 15 students in 4<sup>th</sup> grade primary school to investigate the impact of digital storytelling on the academic performance of 4<sup>th</sup> grade primary school students. indicated that digital storytelling has a great influence on academic performance and promoting constructivist learning among 4<sup>th</sup> grade primary school students.

In a different context, a study conducted on third grade students in lybia to investigate the impact of storytelling in English classrooms through observation and interviews with educators resulted that storytelling have significantly effect on student English learning as it increases student motivation and quickly picked up new language skills when exposed to storytelling. (Hanan, ELKhimry 2022). Furthermore, Nair & Yunus (2022) conducted an experimental study on 11 years old pupils in rural schools to examine the use of Toontastic 3D (Digital storytelling app) which used to enhance pupils speaking during covid-19 pandemic. The findings showed that digital storytelling has a significant impact on enhancing speaking skills which improve fluency, pronunciation, confidence providing learner engagement, creativity and collaboration.

Research has consistently demonstrated the substantial benefits of digital storytelling in education. Wu, Jing & Chen, victor (2020) conducted a systematic review in the educational digital storytelling field in Asian and European countries among primary, secondary and higher education levels. The study indicated that educational digital storytelling has positive impact on learning outcomes? This impact includes a wide spectrum, encompassing affective, cognitive, linguistics, technological and academic dimensions. This aligns seamlessly with earlier research, such as a Study conducted on primary and secondary school classrooms in an Australian school by Smeda et al. (2014) to explore the effect of digital story telling on learning resulted that digital storytelling has a positive effect on student engagement and enhancing educational outcome.

Moreover, Shishko, Besmir (2022) argued that digital story telling has a great impact on several age group which is used as an instructive tool to increase and enhance learning skills for children and boost problem solving, while also providing a platform for adults to share their life experience. Moreover, it has a significant influence on the gender as it amplifies the voice of marginalized groups mainly women, it provides a space for them to express their experience or

issues free like violence or racism. However, this transformative power of digital storytelling is not without the potential challenges as the study mentioned credibility of the content and democratic discourse.

This consistent pattern of improvement extends to specialized fields as well. Maria, Spiliopoulos & Tsigilis (2022) aimed to explore the usage of audiovisual tools in the educational process of sport journalism higher education courses through a questionnaire and focus groups with the students taking the sports journalism courses and resulted that digital storytelling has a positive impact on sports journalism courses, as participants point that digital storytelling project is inspiring and engaging which allowing them to incorporate their ideas, expressions and experiences. Furthermore, the study mentioned the significant of storytelling essentials such as voice tones, music, transitions and visuals. Together these studies underscore the widespread and multifaceted benefits of digital storytelling in educational excellence.

Several studies underscored the transformative role of technology in storytelling. Lina, Molinas (2018) highlighted the role of technological innovation in creating the visualization and storytelling particularly the integration of artificial intelligence which play a significance role in enhancing storytelling on education, scientific communication and government information through visualizations and multimedia elements.

In a different context, Laer et al. (2019) mentioned that in the digital era storytelling become an effective tool for marketers as it significantly enhancing customer engagement and persuasion by constructing it in commercial domains and tailoring storytelling experiences to individual consumers. This demonstrates the power of storytelling in the business realm.

Moreover, Song, Zihan (2022) Conducted an empirical study focus on data journalism on 125 participants to explore the effectiveness of map-based visual storytelling and its impact on participants' retention. Resulted that map based visual storytelling have a significant impact on retaining participants' attention and facilitate comprehension of narrative content.

Furthermore, the evolving landscape of storytelling extends to emerging technologies. Shoran, Yang (2023) conducted an experiment design that aimed to compare the user experience of engaging with different two methods (traditional AR e-books and innovative AR storytelling) on 368 participants who are likely visitors to cultural spaces. Results showed that the innovative AR storytelling not only enhances enjoyment and education but also significantly boosts engagement. Also it has a great effect on users' cultural experience within metaverse, underscoring its potential in shaping the future of interactive narratives.

The importance of storytelling in the digital age is evident through various studies. Ulrike, Spierling (2002) Explored the significance of storytelling in the digital age in creating engagement, immersive narrative experience, which is visualizing the emotional and social behavior of narrative agents. This interactive narrative experience not only enhances education but also facilitate historical knowledge and provide cultural sharing.

Lambert, Leo (2006) highlighted the transformative potential of storytelling in the digital era. claimed that storytelling in the digital era propose prospects for association and sharing stories through online network and engage with each other. digital media tools have converted storytelling, enabling the creation of short media videos that combine spoken narrative, images and design elements

In the realm of business and branding, Ashton, Natasha (2014) argued that visual story telling is an effective tool for real estate and businesses which enhance engagement, interaction with consumers, improve brand identity. Success in visual storytelling relies on design, personalization, usefulness, personality theme and real time engagement and necessitates a strategic approach that includes clear goals, identify consumer preferences, creativity and engage with consumer and respond their interactions.

In addition, Fish, Carolyn (2019) explore the role of storytelling in cartography design decisions for climate change communication in the united states through semi structured interviews, resulted that the potential of map storytelling has a significant role in remembering and engage with climate change information.

Moreover, Elisa et al. (2021) conducted a research on using storytelling as a tool to raising awareness and detect beliefs and values of stereotypes with children, resulted that digital storytelling is an effective instrument for recognizing stereotypes, creating awareness, engagement and developing analytical tool as it created environment for open dialogues to discuss stereotype.

Additionally, Zhang et al. (2022) emphasized that data storytelling is a significant tool to fill a gap between data analytics and data presentation as it facilitates the delivery of the information through images, graphs, audio and videos. It also provides flexibility for content creator to customize their presentation to adapt different regions and improve communication of data and insight to audiences in an entertaining way and story-like format.

Beheshti et al. (2023) indicated that storytelling with image data had a great influence on enhancing data explaining specifically for non-specialized users who may haven't skills to comprehend complex data analysis techniques and by using the storytelling with images it turns into more understandable and accessible.

Finally, Chen, Min-Ju & Cheng (2023) explored the impact of digital storytelling on students' scientific creativity and teamwork during two days' science invention workshop in Taiwan. Even during this short duration of the workshops the findings indicated that digital storytelling has positive effect on satisfaction level, social skills, expressing point of views and problem solving.

### **Benefits of Literature Review**

In conclusion these studies have illuminated the impact of visual techniques and storytelling through different fields. Visuals and graphics improve visual communication effectiveness, pay attention through elements like graphics and titles. Additionally, storytelling transforms education, enhancing students to create multimedia narrative, improving literacy, critical thinking and problem solving. Building on these insights, this study can investigate specific visuals and graphics impact of digital storytelling especially infotainment shows and the impact on recalling for Egyptian youth.

### **The significance of the Study**

This paper maybe creating a guide for digital content creators and producers to help them use graphics and visuals in infotainment shows on social media among Egyptian youth as that affect the ability of recalling information to develop general knowledge among youth. This guide will be created according to the results of real experiment and in-depth interviews with experts working in social media content creation and production.

### **Problem Statement**

The study aims to investigate the effects of using visual techniques in digital storytelling employed in infotainment shows on social media platforms and its impact on information recalling among the Egyptian youth precisely. And to know how these graphics and visuals could be applied in an appealing and effective way. In order to examine this effect a semi experiment and in-depth interviews will be conducted.

### **Objectives**

- To determine to what extent visual techniques may affect the recalling levels of information mentioned in infotainment shows on social media among university students.
- To investigate how could content creators use these graphics and visuals the right way to help the audience not to disrupt them.

### **Theoretical Framework**

This paper aims to conduct Information Processing Theory, a cognitive psychology theory, its founder is George Miller, a cognitive psychologist and computer scientist.



This theory focuses on how human encode information to be learned and relate it to knowledge already existing in memory, to store new knowledge and retrieve it later (Shuell, 1986). It depends on the idea of, humans process the information they are exposed to. Experts believe that the brain’s mechanisms and functions are relatively simple (Wang, et. al, 2003).

Information processing theory proposes that cognitive processes happen in four stages, each stage has a purpose and functionality; they are **A) encoding**, which is receiving information before they can be stored in short-term memory **B) Storage**, which is carrying information in short-term memory while it is processed or transferred into long-term memory **C) Retrieval**, accessing already stored information whether it is in the short term or the long term memory when needed in a task according to (Campos, Barroso, & de Lara Menezes, 2010) **D) Transformation** taking information to a more advanced level using it in problem-solving for instance (Liu et al., 2021)

### Theory model

**Two-Store (Dual) Memory Model:** It is a generic model and it corresponds to the classic model proposed by Atkinson and Shiffrin (1968, 1971)

Information processing begins when an input affects one or more senses (e.g., hearing, sight, touch). The appropriate sensory receives the input and holds it in sensory memory. (Schunk, 2020)

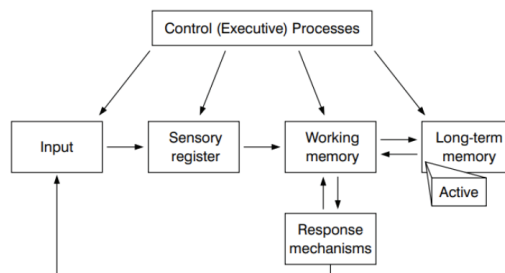


Figure 1 Information processing model of learning and memory  
Source: Educational Learning Theory

The sensory memory transfers information to short-term memory (STM). STM is a working memory (WM). Miller (1956) claimed that Working memory holds seven plus or minus two units of information A unit is a meaningful item: a letter, word, number, or common expression. as it is limited in its capacity.

WM is also limited in duration as it holds information for few seconds only that needs information to be repeated. Researchers agree that information remains in LTM for a long time. (Schunk, 2020)

Schunk (2020) Claims that there is control executive processes to regulate the flow of information. Rehearsal aloud or sub vocally is an important control process that occurs in Working memory. There are other control processes include; putting information into a meaningful and relatable context, imaging (visually representing. information), implementing decision rules, organizing information, and monitoring the level of understanding, and using retrieval, self-regulation, and motivational strategies.

## Theoretical Background

### Graphics and Visuals Usage

According to McKinney, et al (2022) and Cruthers (2021), There are different kinds of graphics and visuals and each has different functions, for example,

**Objects.** If you are describing a fuel-injection system, you will probably need a drawing or diagram of that system. **Photographs, drawings, diagrams,** and **schematics** are the types of graphics that show objects.

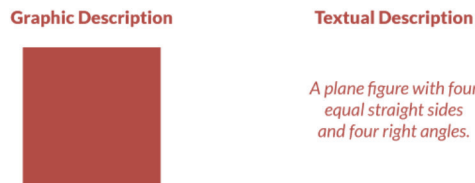


Figure 2 usage of graphics when explaining objects. Image source: Uberflip Blog

**Numbers.** If you are discussing cost or dates for example and you could also show the same data in the form of bar charts, pie charts, or line graphs. Tables, bar charts, pie charts, and line graphs are some of the principal ways to show numerical data.

**Relationships.** If you want to show how country hierarchy for example and how organized in terms of the relationships between different officials, using boxes and circles connected with lines that show how everything is hierarchically arranged and related.

**Words.** Finally, graphics are used to emphasize written text, word-driven graphics include **word clouds**, company or brand **logos**, and **word art**, maybe used for definitions or titles.

### **Typography**

Kinder (2015), tells how typography could be used in E-learning, it claims that good typography gets your learner's attention, so, taking it wisely should be considered, starting with selecting the right style for your content set the right mood for your audience, moving to how content creator properly ending with making your content readable all of that will help your audience navigate your content building brand identity for the show. To choose the right style creators must ask "What are you trying to tell your audience something serious? Or something fun?"

"Rule of Three" which states you shouldn't use more than three typefaces in one project or video in case of content creation and If you mix and match too many typefaces, you are going complicate your design and disrupt your audience, Saltz (2014)

When sizing your type, consider who is your target audience, for instance, an older audience will likely prefer larger fonts due to eyesight that often weakens with age. Kinder (2015).

### **Colors**

People love colors as well as your audience will get attracted by a colorful presentation. People love seeing a good combination of color in ways that made them question how people did that, you will recognize that color can also distract and turn off an audience, that what makes color a powerful way to present information. McKinney, et. al (2022)

### **Research Questions**

**RQ1:** How could the content creators use visual techniques to increase the recalling levels for information of the youth in infotainment shows on social media?

**RQ2:** What is the average rate per minute to insert graphics and visuals or text when producing infotainment shows for social media in shows?

**RQ3:** What is the most type of information that needs to be assisted with visual elements? And which type of visuals and preferred to be attached? (Real photo- Animated photo- Text- Real video- Motion graphic- AI generated media).

### **Research Hypotheses**

**H1:** Using Graphics and visuals attached on the screen, increases the recalling levels for information of the youth in infotainment shows on social media.

**Variables and Definitions**

**Table 1: Conceptual and Operation Definitions**

<b>Dependent Variable</b>	<b>Conceptual Definition</b>	<b>Operational Definition</b>
Recalling	Peter and Michael (2001), three-dimensional graphic art, it also involves two-dimensional graphic art and illustration processing.	Recalling of Egyptian Youth of infotainment shows like “El-Da7ee7” which means “The Nerd”, this will be measured by a questionnaire given to the experiment sample to answer about the facts mentioned in the episode.
<b>Independent Variable</b>	<b>Conceptual Definition</b>	<b>Operational Definition</b>
Graphics and Visuals	Images or video displayed on the screen of a .computer or other digital device	Real photo- Animated photo- Text- Real video- Motion graphic- AI generated media.

**Research Methodology**

This paper is based on a semi-experimental technique, an experiment with Egyptian youth sample aging between 18 and 22 years old. In addition to, In-depth interviews with Egyptian experts who are working on content creation for social media platforms content.

**Experiment**

**Sample**

The Experiment population is the Egyptian University whose age range between 18-24, as it is the standard university age.

**Criteria and method of selection of sample study**

The researcher chose some characteristic for the experiment sample and that included the following;

- Egyptians.
- Males and females.
- University students who are in their third of fourth level.
- Students at faculty of Mass Communication in Al-Ahram Canadian University.
- Age range between 18-24

**Sample Size: 50**

## **Design**

First group was exposed to infotainment content supported with graphics, pictures, text and more. The other group was exposed to infotainment content that has no visual elements attached at all. First group was 30 students and the other group was 20 students, Content was filmed and produced all with the same topic.

## **Topic Selection**

After watching tons of social media infotainment shows from the top rated shows by respondents in the pilot study, specifically “El-Da7ee7 - The Nerd” The researcher tried to find a topic that is applicable to be told in all the four DST, and the chosen topic was The American Dollar and impact on the world Economy, it was an episode for “El-Da7ee7 - The Nerd” named “El-Dollar” The researcher chose this topic because it is not something they would be fully aware with but they will be interested in the topic because this experiment was held in the period of the Egyptian pound floating and the worldwide economic crisis and inflation.

## **Experiment Process**

The sample had a pre-test to know their background information level, then they were exposed to one of the episodes in a university hall projector. Then, they had a post-test right after watching the content. The experiment was conducted in three days only.

## **In-depth Interviews**

In-depth interviews are conducted with experts in producing infotainment content for social media, whether they scriptwriters or producers.

## **Sampling Method**

Non-probability, Purposive sampling, As the research had certain criteria, interviewees were chosen consciously to get relative responses.

## **Sample size: 10**

## **Results**

### **Experiment Results**

The Control Group is the group that was exposed to the episodes without graphic designs or visuals or texts, While the experimental group were exposed to episodes supported with various kinds of visuals and graphics.

Table 2 Recall levels in Experimental group and Control group

Groups	Scale Experiment	Low		Medium		High	
		N	%	N	%	N	%
Experimental Group (With Graphics)	Before	16	53.3	14	46.7	-	-
	After	4	13.3	11	36.7	15	50
Control Group (Without Graphics)	Before	12	60	7	35	1	5
	After	4	20	9	45	7	35

The previous table shows that of background information of the experimental group was 53.3% participants in the low level before the experiment, while 50% of them were in the high level of the recalling rates after the experiment. Regarding The Control group 60% of the participants had low levels of information background before the experiment while only 35% of them had high level of recalling of information mentioned in the episode.

**Testing Hypothesis 3:** Statistical differences among the study groups regarding the information recalling level according to the storytelling techniques the audience get exposed to, according to mediating variable “Graphics and visuals” and to test that the researcher used Mann-Whitney U test and the results are shown as the following:

Table 3 Results of Mann-Whitney U test

Scale	Methods	N	Mean Rank	Mann-Whitney U	Sig
Recalling	Content with Graphics	30	28.78	201.50	0.04
	Content without Graphics	20	20.58		

The statistical results and analysis showed that there is a correlation relationship between recalling rates in infotainment shows on social media platforms and the usage of graphics and visuals in the episodes or not, and the statistical significance (sig = 0.04) and this was in the sake of the group who were exposed to content with graphics and visuals supported episodes, and those groups had average recalling rates 28.78.

According to the Information Processing Theory there are 3 types of memories and it includes sensory memory when input is affected by one or more senses and the theory assumes that the two sensory memories that have been most extensively explored are iconic (vision) and echoic (hearing) (Neisser, 1967) which explains the previous result.

### **In-depth Interviews Discussion**

Brand Identity and visual identity, the very common advice from experts to create a clear identity for your show on social media, so it is easy for audience to remember who you are, what you present and be loyal to you this can't happen without a certain visual identity and brand identity, Haitham Abo Aqrab explained "Audience love to see the same show style and brand identity without changes, one of our shows at "Vertical Network" is named "Home Economics" had a style of "Fast Food", a fast advice about money "buy this and not that", "gold is a good investment now", etc. When we changed the style into more advanced and high production style that has lots of graphics and acting scenes or sketches and filming it with two cameras instead of only one with a better sound effects and music, people didn't like it and they didn't watch it regularly as in the past, they loved him more in the past and summarized advice. How the graphics and visuals material appear; typography, colors, size and place of graphics and visuals are all aspects of the visual identity of the show that must be unified in all episodes to achieve the equity of the show in audience brains.

Other elements like size, duration, and place of graphics and visuals existing on the screen discussed, first of all, Size of Graphics and visuals depends and vary between the interviewees, "Regarding the size of the material attached whether it is graphics or not, is depending on the audience preferences are, if they are more interested in the storyteller way of presenting, as in our show "El-Sa7la" our audience is more attached to "Ganna Adel", the storyteller, with her look and her different outfits, they like to hear her stories even if it exceeds 40 minutes, so in such case you don't pause the audience focus and attach a visual element in a full-screen." Said Haitham Abo Aqrab. As well as, Medhat Saqr believes "Full-screen or part of the screen is a matter of individual differences, if you ask 10 persons half of them will choose something and the rest will choose the opposite." Despite, most of the experts interviewed said it is better to be in a full screen. Some interviewees considered some aspects such as it depends on the importance level of it, for example, if the story has happened in the 17<sup>th</sup> century and the visual team wrote "The 17<sup>th</sup> century" on the screen, it doesn't have to be huge, but, if the media is an animated video about atom interaction the audience will not be interested in seeing the storytellers' face expressions, in this way the audience will understand that this part is important, the multi-media is full-screen and they should only focus on it. Adding, the complexity level of the material attached, does it have many details to check or not.

The duration of visuals and graphics on the screen is between 5 and 6 seconds for one third of the interviewees. The second third of experts think it is from 2 to 3 seconds are enough, two experts think it should appear on the screen as long as we are explaining it, But, only one expert thinks one second is enough as in second in the case of "El-Da7ee7" that means "The Nerd" for example, the team don't care about recalling of information, but only breaking the boredom for audience and changing the composition of the frame. And one expert was neutral it must stay on

the screen for 3 seconds if it doesn't have a lot of details, but if it full of details it must stay a little longer maybe between 10 to 15 seconds. For text and specially the name and photo of certain public figure, if it has appeared once, "it doesn't have to appear every time we talk about them unless there are a lot of characters we are talking about in the episode." Said Osama Elaskary.

Regarding the place of the material attached should be on the far right or on the far left of the storyteller, the most preferred place is on the axe of his right hand, according to Medhat Sakr. But all experts believe it should be a constant place to maintain a visual identity wherever it will be attached, so audience is familiar to what they watch.

**And that answers the research question number 1 that questioned the elements of visual presentation in digital storytelling "How could the content creators use visuals and graphics to increase the recalling levels for information of the youth in infotainment shows on social media?"**

Graphics and visuals and their suitable rate, some of the interviewees believe that content creators should not exceed 20 or 30 seconds maximum without attaching some graphics and visuals that help explaining the story, Medhat Sakr explained "Each 20 seconds in the show content creator or his team should create a minor hook and each 40 seconds you must create a major hook and this includes the graphics and visuals this is because the human brain can't focus with someone talking and standing still for a long time without any change in their moves, laugh, or change in the photo composition and so on and this can be applied by creating many different techniques to break the rhythm starting from body language and going through frame size and adding the visual elements, to keep the audience entertained which is the main aim in infotainment shows, they are not focused on raising awareness or knowledge."

The rest of the them agreed that there is no specific rate for attaching graphics in your show on social media but there are few elements to keep in mind and those are including the rhythm of the episode and the vision of the director in case of high production storytelling is an art, and art has no rules, some rules may not be applicable at sometimes.

Also, most of them ensured that it depends of the information need to be supported with visuals and the nature of the topic, for instance, if the storyteller is talking about a certain book, the audience need to see the book cover and the book author with no specific rate The majority agreed that the more you attach graphics and visuals the more the information will stick in human brains, for example hearing number 12 with seeing it on the screen will be more effective because two senses are already used, so as much as the storyteller use media is better. On the other hand, "Don't confuse your audience with many graphics or visuals at same screen frame that they get disrupted" was Soha Tarek's advice to content creators.



One of the interviewees put a focus on the script sequence and how it should be written in a balanced way so the graphics and visuals are not all loaded in a short period of time, So, the visual representation of the information must be considered from writing the script, Added Mohamed Abdel-Rahman. In digital storytelling there should be a balance between what you see and what you hear, not showing any graphics and visuals at all is not right and it may cause boredom, this generation can't just focus with the storyteller talking for 15-20 minutes, while loading your audience with many visuals may be disrupting. But I guess every 20-25 seconds is a good rate but the scriptwriter should bare that in mind while writing, information that will have graphics and visuals should not all be stacked in the same part.

Last but not least, one of the interviews considers that visuals and graphics rate depends on the hero of the episode, for example, "El-Morag3a El-Neha2eya" that means "Final Revision" a show that discusses and criticizes movies and series must be assisted by the projects' scenes to discuss because obviously they are the hero, However "El-Da7ee7" that means "The Nerd" is a type of shows that depend on the talent of the storyteller "Ahmed El-Ghandour" the storyteller is the hero of the show, his audience want to see his facial expressions and body language, so he only uses graphics and visuals if needed for explanation.

All were approving that in digital storytelling there should be a balance between what you see and what you hear, not showing any graphics and visuals at all is not right and it may cause boredom, this generation can't just focus with the storyteller talking for 15-20 minutes.

**And that is considered an answer for the research question number 2 that asks "What is the average rate per minute to insert graphics and visuals or text when producing infotainment shows for social media in shows?"**

The interviewees opinions on the topics that needs to be supported with visuals and graphics are; **A) Natural science** such as physics, biology, and chemistry, it is the top category that needs to be supported with graphics, for example, if you are talking about the Electrical circuit it is not something the human brain could imagine so the storyteller should show the audience what they are talking about. On the other hand, if the storyteller is talking about a historical phase, the audience probably saw it in a TV series, If the story is about a dog, the audience don't have to see the dog because they have a photo of it in their brains and that the main concept, if the audience can't imagine it, attach it! **B) History and politics** are fields that need graphics and visuals to be explained, also cultural topics and public figures, if the storyteller is telling a country story with its governments and presidents or kings, all of that must be seen to let the audience live the story with you, Ahmed Elansary added "people's faces are important because regarding to Physiognomy people can understand and expect the character better", **C) Numbers and Coordinates**, they are more understandable in charts and graphs specially if there is a relation between many numbers **D) Technology**, Technological field is complicated and it is not easy to understand for general audience who are not specialized in it.

Interviewees expressed preference between real visuals or animated ones, the majority agreed that it depends on the topic nature, if the photo is about an animal, it must be real photo, but if the content creator is talking about quantum physics it should be an animated photo or video, so no role here it just depends on what type of information you are giving. Regarding text, foreign definitions with its translation in the mother language of your audience are very important to be seen on the screen so the audience could copy it to search and read more about it if they have interest, in addition, if the story is about a public figure and there is a quote he said and it was remarkable, having this quote written on the screen might be very important. Videos are more suitable for explaining continuous process and more specially for documenting events for example if we are talking about a crime it would support the content more if you have security cameras footage, overall one third of the interviewees prefer using real photos and videos.

Mohamed Gamal spotted the light on historical material and commented, “If I am talking about a historical character like Muhammad Ali for example, his photos and its quality maybe unclear to people, animated photos here will be a better option, Also, in this case a photo generated by artificial intelligent will be a very good alternative.” As well as, half of the interviews see that AI generated content provides a high quality media and this will help storytellers out.

“3D motion graphics are used in specific cases for example, my episode about superstring theory, physical topic about the world because it was extremely complicated.” said Ahmed Elansary.

All of the interviewees agreed the content creator or the team must follow the brand identity guidelines when using visuals and graphics, Soha Tarek added, “the whole episode must all have the same style, you can’t attach animated graph, then a real video, followed by an AI generated photo, create a harmony between all the content elements”. Also, Mahmoud Habib mentioned “you must work on making your show something artistic and visually appealing to your audience to watch” **This is considering the research question number 3 “What is the most type of information that needs to be assisted with visual elements? And which type of visuals and preferred to be attached? (Real photo- Animated photo- Text- Real video- Motion graphic- AI generated media)”**.

### **Conclusion and discussion**

The experiment approved the hypothesis that Graphics and visuals employment in digital storytelling do enhance and increase the recalling levels among youth, and according to the Information Processing Theory there are three types of memories and it includes sensory memory when input is affected by one or more senses and the theory assumes that the two sensory memories that have been most extensively explored are iconic (vision) and echoic (hearing) (Neisser, 1967) which explains the previous conclusion. On the other hand, some few experts think graphics and visuals are only used to break audience boredom. Also, the digital storytelling techniques are effective as the result of Shishko, Besmir (2022) who argued that digital storytelling has a great impact on increasing and enhancing learning skills.

Graphics and visuals in digital storytelling must be employed every 20 and 30 seconds maximum, and it should stay on the screen from 2 to 6 seconds, Natural science, history, politics, numbers and coordinates, and technology are fields that need graphics and visuals to support them in digital storytelling, Content creators must create a brand and visual identity for their show. The place of graphics and visuals is not certain. If the graphics and visuals have details and they are really important content creators must let the audience watch them in a full-screen. Each type of graphics has its own usage, text for definitions, animation for scientific and technological information, real photos and videos are for documenting events, and creatures.

### Limitations

During the experiment, students were not able to focus without automatically holding their phones and checking their social media accounts, and that's because the target audience usually watch infotainment shows on their mobile phones not on a screen in a hall, that may lead to them using their phone, and the experiment was held in a university lectures hall which may give them the lectures atmosphere that helps their attention and recalling.

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**Appendix**

**Interviewees List**

No.	Expert Name	Expert Title and Experience
1.	Haytham Abo-Akrab	Founder of Vertical Network
2.	Medhat Saqr	Senior scriptwriter and content creator
3.	Ahmed Abd-Elhamid El-Ansary	Scriptwriter, content creator and presenter at
4.	Soha Tarek	.Educational consultant, lecturer and former journalist
5.	Mahmoud Habib	Scriptwriter, content creator and presenter at Studio meem entertainment, El-teeta program.
6.	Ahmed Magdy Ragab	Editor-in-chief of El-Da7ee7 program.
7.	Osama El-Askary	Scriptwriter at El-Da7ee7 program.
8.	Mohamed Gamal	Storyteller and Scriptwriter.
9.	Mohamed Abd-Elrahman	Journalist and Scriptwriter.
10.	Nourhan Ezz	Storyteller and Scriptwriter and founder of El-A3da.

**In-depth Interviews Questions**

- 1- What is the average rate per minute to insert visual elements or text when producing infotainment shows for social media in the long type of shows that has a storyteller already?
- 2- What are the most suitable kind of visual elements that is preferred to be attached?  
(Real photo- Animated photo- Text- Real video- Motion graphic- AI generated media)
- 3- What is the most type of information that needs to be assisted with visual elements?
- 4- How do you prefer the visual elements; part of the same frame that shows the storyteller of as a full-screen?
- 5- In case the visual element is next to the storyteller, where it should be attached at the left or at right, in the upper part or in the lower part of the frame?
- 6- For how long should a photo stay on the screen?