Prompting Cognition for Creativity in EFL Context: An Experimental Study on Use of Infographics for Teaching Writing Skill

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Abstract

Creative writing is an imperative prerequisite in EFL contexts with emphasis on developing the cognitive abilities of students for delineating ingenious ideas on paper. Numerous techniques have been introduced for this purpose and one of these influential practices is the use of infographics. Infographics are a potent way to combine visuals with brief descriptions to trigger the cognition of the learners. Keeping in view the efficacy of infographics, the present research intended to explore its practicality within the EFL context of Saudi universities. For the said purpose, an exploratory study was designed with primarily a quantitative approach. In the first phase, an experimental study was conducted with a controlled group of EFL undergraduate students studying in Prince Sattam bin Abdulaziz University; whereas in the second step, students' perceptions were recorded through a questionnaire. The data gathered in the pre-test, post-test, and questionnaire were analyzed using statistical methods. The findings disclosed that infographics have the potential to improve the creative writing skill of the students at large. Moreover, the students also considered the use of infographics as an attention-grabbing way to contemplate new ideas. The study endorses that infographics can be used as an effective strategy in the EFL context.

Keywords: Infographics; creative writing; EFL context; experimental study; visuals; cognition

1. Introduction

Designing learning- teaching material for twenty-first-century youth is a challenging task. In times, when their attention is already gripped by numerous hi-tech gadgets, apps, and consignments, it is difficult to make them concentrate on learning tasks whether through a virtual tutorial room or in customary learning settings. Osterman, Rejo, and Thirunarayanan (2013) opine that contemporary developments in a digitized world have posed new literacy challenges for academia. The students are not just students; they are gamers; they are talkers; they are posers; they are performers; they are spectators; in short, they have to do so many other things and not just studies. For such enigmatic as well as energetic apprentices, the teachers have to develop the right set of stratagems and resources, in order to grasp their attention.

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Visual literacy has acquired the status of one of the effective areas in the education sector to entice learners of the present times. It is based on the theoretical dogma that visualization has a direct connection with a variety of cognition processes. According to Conner and Browne (2013), visual literacy can be commonly stated as a course of developing skills to find images, evaluate them, appraise them, apply them to a purpose, and yield them. Thus, it is a direct channeling of the learning process through cognizance, involving many cognitive processes like perception, evaluation, appraisal, analysis, and invention. As a technique of visual literacy, infographics have emerged out of the notion that it supports understanding of a phenomenon through both illustrations as well as inscribed information. Alrwele (2017) defines infographics as a blend of brief descriptive text along with pertinent imageries that together convey the idea evidently and expediently. This tool has gained widespread importance to teach a variety of concepts and skills including language-related skills like reading, writing, speaking, etc. In the domain of ELT, this technique is also experimented with by some researchers and teachers to assist language learners in the understanding of various ideas and topics, in various contexts.

English is also a popular language in Saudi Arabia and is getting strong roots in the educational institutions with a realization for an upgrade, as also articulated through Saudi Vision 2030. There is a dire need for Saudi students to learn English and become part of a global commerce community in order to promote local business. English as a foreign language is introduced from grade 6 in schools to onwards various educational levels. Higher education is also available in the English language in various prestigious institutions in the Kingdom. Further, the Ministry of Education in the Kingdom has also taken many initiatives to improve the standards of Arab students for using English accurately as well as fluently. However, many pieces of research have referred to low-level skills of the students at various levels, in the English language (Fareh, 2010; Heffernan, 2006; Hinkel, 2004; etc.). In this regard, writing skill is a more challenging task for both learners to learn, as well as for the teachers to teach. Putra (2019) comments that the writing process is more intricate since the learners are needed to pay attention to the wholly inclusive form or organization of the written text. Benahnia (2016) opines that writing in a novice orthographic pattern is a hurdle in the initial stages and it becomes harder at higher levels to think and then write in a different language, for creative and original topics. Creative thinking is in this regard appears to be a significant hurdle as often students feel perplexed to generate ideas first and then give them appropriate linguistic forms later. In this scenario, visual literacy can be supportive as it works with cognition effectively for creativity. It is to be noted that researchers link cognition closely with creative thinking and cogitates creative thinking as a critical cognitive process (Gaut, 2010; Kaufman, 2009; Stillman, 2014).

The research in hand aimed to exploit the use of visual literacy in general and infographics, in particular, to assist EFL learners with creative writing skills, in the selected Arab context. The prime objective was to experiment with the use of infographic techniques with Saudi undergraduate students to determine its efficacy and efficiency for improving the standard of creative essay writing. Moreover, the study also aimed to explore the students' perspectives with regard to the practice and effectiveness of infographics for enhancing creative ideas. For the said purpose, the study was designed and implemented in two phases. The first phase dealt with quasi-experimental research design and the second phase was a survey-based study.

As stated above, the writing skill is a challenging task for Arab learners of English and more importantly to generate either creative ideas or to restate old ideas in creative ways, while writing. Thus, the present study is significant in particular for EFL learners in the Kingdom and ELT scenario, to improve in particular in the writing domain. It tended to test and validate the concept of using infographics with the selected sample of the study in the selected context. It also aimed to examine the ways students perceive its usefulness for triggering creative thinking for writing. In general, the study

strived to scrutinize the possibilities and benefits of usage of infographics in various EFL and ESL domains, worldwide. The educationists and teachers can adapt or adopt the technique in various EFL and ESL domains for better language teaching and learning.

1.1. Literature Review

This section elucidates the different terms and concepts relevant to the study in detail, along with a review of previous researches done in the field.

1.1.1. Infographics as a tool for visual literacy

With progression in technological enterprise and barrage of social media attractions, the global academia is fronting serious complications in engaging pupils in the learning process. One of the outcomes is the emergence of visual literacy which promises to engage students' attention. According to Marabella (2014), the new digital age needs new digitized ways to grab learners' curiosity; and visual representation of data is a pertinent way to this. Roehling, Kooi, Dykema, Quisenberry, & Vandlen (2010) comment that this new generation has been raised in the age of multimedia where the traditional methods are a source of boredom for them. Thus, the visual literacy concept emerged as one of the operative remedies to stimulate students for a better learning process. Kress (2003) defines visual literacy as a new assemblage of "medium of screen and mode of image" which has the ability to captivate new-age learners. The main argument is grounded on the fact that people get bored with listening only whereas screens attract them through both watching and listening. Another important reason is the addiction of pupils to their electronic gadgets along with the internet which can be used effectively for visual literacy purposes. There are various modes of visual literacy and one of them is infographics.

The term infographic is a blended version of two words i.e. information and graphics. As the name suggests, it combines two different modes of data in one format to entrap the spectators and to seize their attention. Kibar and Akkoyunlu (2014) define it as "the visual display of any data or information with the aim of presenting the information in a quick and clear way". Most commonly, an infographic contains three essential elements: firstly, text features like headings and sub-headings, secondly, organized ideas, and thirdly supportive as well as explicit images. The information provided is enough to trigger background knowledge of the students, often along with suitable headings. Images are also supportive and play a crucial role in arousing imagination among learners. Overall, an infographic is very entertaining and successful in grabbing the attention of the learners (Al Hosni, 2016).

The use of infographics has also been experimented with by many academicians as well as researchers in various educational contexts. For example, Fowler (2015) introduced the use of infographics in his science classrooms during the experimental research phase. He reported that infographics were helpful to improve students' levels of comprehension and analysis for teaching various Science concepts. Al Hosni (2016) conducted research on the use of infographics for teaching English grammar lessons and found it valuable and effective. He also suggested using it for the teaching of other linguistic components as well as skills. Alrwele (2017) researched the use of infographics in English language classrooms with 165 candidates. He also gathered the responses of the learners regarding the tool and reported positively about its usage with students' perceptions and performance.

1.1.2. Infographics for writing skill

Language skills and in particular the writing skill is some of the difficult areas in EFL classrooms. Defining writing, Virdyna (2016) states that it is a tool of communication in orthographic format. Thus, it is written symbols that are used to articulate all that can be vocally said, emotionally

expressed, or bodily conveyed. Benahnia (2016) states that it is one of the problematic areas where EFL students often do not perform well. Fareh (2010) opines that writing and in particular, essay writing is the most disliked task for EFL learners. In English language classrooms, infographics can be more helpful as they can explicate the idea in better ways, whether writing an assignment, an essay, a test, or a story. Few previous studies conducted on the usage of infographics in writing skills classrooms suggest that they are effective to improve students' writings in various stages from drafting to presenting (For example see Saadah, 2019; Sukma, 2016; Nygate & Cliver, 2015). Nygate and Cliver (2015) used the technique of infographics to assist students in technical writing. As per the results of the experimental study, learners were able to perform better with the use of infographics. Similarly, Saadah (2019) reports the results of her study with EFL writing skills and approves that students are better able to understand and produce when topics for writing are presented in the form of infographics. However, these studies are limited in number and more accurately no such studies have been conducted (as per researchers' knowledge) to explore the use of infographics for teaching creative writing and in particular in the Arab context.

1.1.3. Writing skill and problems of Arab Learners

As mentioned earlier, among all language skills, writing skill is often more problematic for EFL learners. Sakkir (2018) opines that EFL students face numerous problems in writing such as punctuation, assembly, spelling, organization, ideas, etc. With reference to the present context, Arab learners find it often difficult to deal with a writing system totally different from their mother tongue i.e. Arabic. These problems are attributed to learners' poor competency of a foreign language, their inefficiency to grasp a different orthographic system efficiently, interference of mother tongue, and lack of motivation to learn and master a new language, as reported in various researches (Al-Hazmi and Schofield, 2007; Fitze and Glasgow, 2009; Ezza, 2010; Baka, 2013). According to Baka (2013), besides these, teachers' role is crucial in this regard if they fail to stimulate and persuade students for writing for practice and writing for purpose eventually. If it is the case for common writing practices, creative writing becomes a real threat to learners' ability to perform and excel, as writing can never be restricted to only crammed or traditional writing patterns. Creative writing needs a broader framework of cognitive practices to excel. The present study primarily focuses on the use of infographics for effective creative writing among Arab learners.

1.1.4. Linking cognition with creativity for writing process and Infographics

Creativity is a process to create something, whether a proactive gadget to fulfill a need or a passive solution to resolve a problem. Originated from the Latin word 'creo', it primarily is defined as the ability to make or create. Ohanyan & Ohanyan (2015) define it as "the tendency to generate or recognize ideas, alternatives, or possibilities that may be useful in solving problems, communicating with others, and entertaining ourselves and others" (pg. 8). On the other hand, cognition is a mental process that is defined as an information processing mechanism including thinking, memory, impetus, perception, language, and skillful movements (Rao & Tandon, 2016).

As per Stillman (2014), creativity is primarily a cognitive process that involves various stages of preparation, incubation, illumination, and verification. Preparation includes getting ready for the process through planning and preparation whereas other processes involve the subconscious more frequently. The first stage of preparation is further about directing attention, arousing reasoning, and drafting layout (Stillman, 2014) and this is the stage where students can be assisted while writing. Another key factor to creativity is the use of imagination as claimed by Schiering (2015). Treffinger (2009) also enlists a number of factors that can assist to trigger essential cognition for creative writing. Among these factors, prior knowledge plays a crucial role. Combining the above-mentioned factors (proposed by Stillman, 2014; Schiering, 2015; & Treffinger, 2009), it can be argued that if students are

prompted for these factors, they can be well assisted for the creative process in the general and creative writing process, in particular. Creative writing is a mechanism by which students are supposed to produce new information or the same old information in new original ways.

In this regard, visual education and in particular infographics are promising as they feature all these components (above mentioned). The text can provide and trigger some background knowledge along with images; images are also key to set imagination free; a combination of text and images are attention grabbers; they can ignite the reasoning process, and finally, a layout in the form of an infographic is the first stage to drafting or planning your essay. Based on this theoretical approach, the present research aims to implement the usage of infographics for triggering cognition for creative writing (in particular essay writing) to undergraduate students in a Saudi university. For the said purpose, quasi-experimental research is designed for the present study. It is to be considered that teaching through infographics followed a scaffolding approach thus ensuring that students are step by step steered to succeed. The scaffolding approach is explicated in the next section.

1.1.5. Infographics working as scaffolds in the teaching process

Scaffolding is undertaken as a conceptual metaphor to understand the role of the teacher in the effective learning process. Literally translated as support, it can be comprehended as guidance, supervision, and direction provided by the teachers in the early stages of learning, aiming to lead them to what Vygotsky (1978, cited in Hedegaard, 1992) calls "zone of proximal development". Hammond (2002) purports that it is inconceivable that children can take whole responsibility of learning from beginning till end; rather other people have to actively participate in the process, providing the required support in various stages. However, it should be noted that the ultimate end is making the learners self-responsible. This idea has been implemented in various educational domains including ELT (For example see Hammond, 2002). Donovan and Smolkin (2002) and Kong (2002) reconnoitered various facets of scaffolding in teaching writing skills. The present study also aims to conduct experimental phase activities in accordance with scaffolding perspectives, to teach creative writing essays through infographics. Looking at the features of infographics, they have all possible features like knowledge providing store, graphics containing hub, attention-grabbing elements, imagination arousing features, etc. to provide a necessary scaffold to the learners.

1.2. Research question

Q. How do infographics help EFL learners to improve their writing skills while triggering their creative thinking skills?

2. Method

Considering the objectives of the research, the researchers applied a quantitative research approach primarily to implement the study and collect data. The quantitative method facilitated the researchers in empirical data collection by "eliminating their biases, remaining emotionally detached" (Johnson; Onwuegbuzie & Turner, 2007). The data collected quantitatively were analyzed qualitatively later to generate contextualized in-depth findings. The research consisted of two phases: the quasi-experimental phase, and the survey questionnaire.

During the first phase of the study the relationship between the independent variable, that is employing infographics, and the dependent variable, that is the creative essay writing skills of the learners was studied through quasi-experimental research design including pre-test, treatment period, and post-test (Rogers & Révész, 2020). At the outset of the study, during the pre-test, the participants were given essay topics and were asked to write 3-4 paragraph narrative essays on them. Then,

applying scaffolding strategy, the participants were provided with precise directions, demonstration, and practice on how to use infographics to brainstorm and organize the ideas, prepare the essay outline and develop an essay. At the end of 6 weeks' practice, a post-test was conducted to find out whether or not there was any improvement in the essay writing skill of the participants of the study. The performance of the participants in both pre-test and post-test was measured through an adapted Essay Evaluation Rubric consisting of five categories: creativity and originality, organization, voice, word choice and sentence structure, grammar, mechanics & spelling. The adaption method was used as the original rubric did not measure creativity aspects in general. The results of pre and post-tests were comparatively analyzed to find out any difference(s) in the performance of the learners and efficacy of infographics for teaching creative essay writing.

The second data collection tool of the study was a survey questionnaire, developed with an aim to recognize the perceptions and opinions of the participants of the study about the effectiveness of infographics in facilitating and developing creative essay writing skills. The survey method has been used for decades for a number of merits, including but not limited to cost-effectiveness, large-scale access to participants, and fast data processing (Zhang et al., 2017). The survey used a closed-ended questionnaire designed specifically for the current study. It was based on the theories of creative aids, Imagination, and Creativity and Cognition, proposed by Treffinger (2009), Schiering (2015) and Stillman (2014) respectively (explained above). Thus, the main variables of the questionnaire were attention, reasoning, planning, imagination, background knowledge, and overall impression (See questionnaire in Appendix B). Each variable was given Likert scale values of 1-5, from strongly agree to strongly disagree. It is to be noted that the questionnaire was specifically designed to understand how infographics assist learners to think creatively. In total, the survey had two items related to demographic features of the participants i.e. age and level of studies.

The face validity of the questionnaire was approved by three experts in the field. For the reliability purpose, a sample of five students was taken through an initial phase pilot study. As the questionnaire was constructed on 5 values Likert scales, thus the coefficient of reliability was measured using Cronbach's Alpha test. The overall measured value ($\alpha = 0.69$) shows that questionnaire was reliable to use for the purpose.

The target population of the experimental study was all the students studying English essay writing courses in a government sector university in the Kingdom of Saudi Arabia. The sample of the study consisted of 35 females, 3rd Semester Students enrolled in BS English Degree Program. There was only one experimental group of these 35 female students that participated in this experimental research. Moreover, the same group participated in the survey conducted in the second phase as they had a better idea of infographics.

The results in each phase were statistically analyzed and presented in tabular as well as graphical forms.

3. Results and Discussion

The current study primarily aimed at studying the impact of infographics on the essay writing skill of the selected participants and to achieve the said purpose quasi-experimental research design was implemented along with a survey questionnaire. The first stage was to conduct the pre-test to measure the performance and achievement of the participants at the very outset of the study. By the end of 6 weeks experimental reaching period, a post-test was conducted to comparatively analyze the results of both pre and post-tests to assess improvement in the performance of the learners, if any. The following line graph exhibits the results of the pre and post-tests (the actual results are attached in Appendix A).
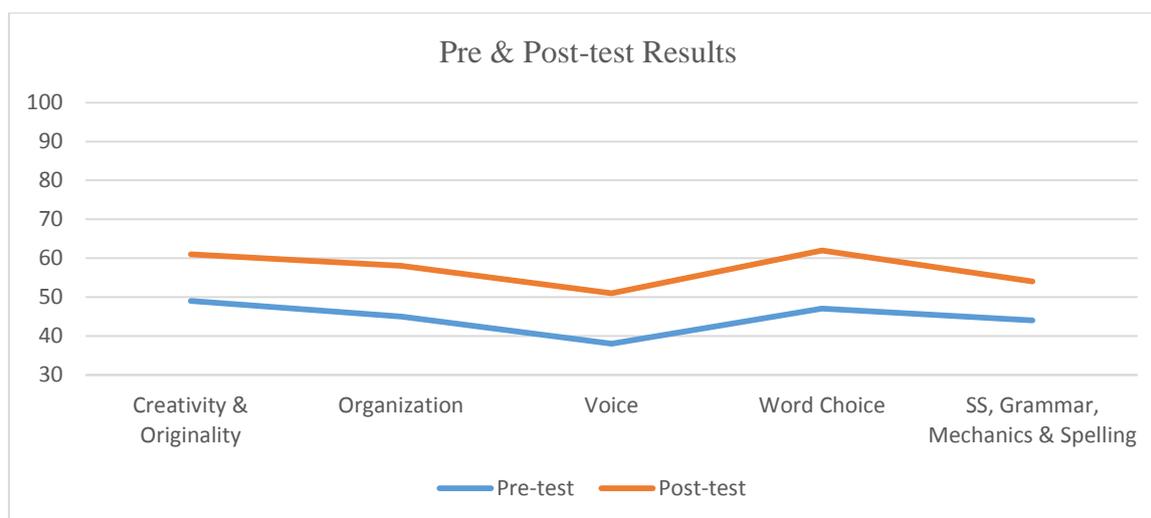
Figure 1. Comparison of Pre and Post-tests Results

The statistical representation of the line graph above demonstrates that the essay creative writing teaching applying infographics through scaffolding approach had a positive impact on the essay writing skill of the learners. Creativity and originality, being one of the most important aspects of teaching and learning how to write creatively were given significant consideration during the treatment phase. The participants were provided with the practice of how to think innovatively and productively on given topics and brainstorm the relevant ideas. One main issue faced was that the learners lacked the skill of thinking inventively and focused more on the traditional or online material available. This is the reason that majority of the learners performed low in this skill as 57% of the participants achieved four or fewer marks out of the possible ten. To address the issue, infographics were used to provide the learners with the necessary input to think imaginatively and originally. The infographics helped them look for possible ideas and practice writing on them. The extensive practice resulted in the enhancement of this crucial skill and the post-test results indicate that the overall performance of the learners increased from 48% to 61%.

The second criterion was related to the organization of the whole essay starting with the topic, catchy beginning, thesis statement, logical order, development and relevance of the main and supporting ideas, and effective conclusion. Initially, the learners' performance remained unsatisfactory, as most of the essays produced in the pre-test phase did not have any proper thesis statement or main ideas, logical development of the paragraphs, or well-written, conclusive conclusion. Thus, the overall performance in this particular area remained 45% only. After the learners were exposed to hands-on practice on organizing the whole essay based on the infographic information, the learners were able to develop essays in an effective way. Their performance in the post-test indicates an improvement of 45 to 58 percent.

The most difficult skill for the learners is to manage and develop an essay with clarity and resourcefulness providing the necessary details and description. In most of the essays, the learners were unable to keep clarity and precision. They often lacked in establishing their purpose and audience of writing. This is the reason that the score of the learners remained the lowest in this particular criterion in both the pre and post-tests i.e. 38% and 51% respectively.

It was observed during the study that the infographics facilitated the development of vocabulary and expressions of the learners significantly. The learners were able to learn, retrieve and use the relevant terminology from the materials given. In the post-test attempts, the essays written had appropriate and efficacious use of word choice. The expressions employed seemed natural and

sufficient to convey the ideas of the writers. Therefore, this area of essay writing had the highest value of improvement in all the criteria. For instance, the performance of the learners increased from 47 to 62 percent.

The last criterion referred to the overall mechanics, sentence structure, grammar, and spelling. As highlighted by the writings of the participants, the grammar and spelling errors were in abundance. Similarly, the sentence structure also had problems of accuracy, clarity and often it was difficult to contrive the meanings conveyed. As a result, the overall performance of the learners was recorded to be 44% only during the pre-test. During the experimental teaching, the researchers focused on the improvement of the issues highlighted by providing immediate direct and indirect corrective feedback and practice. The post-test results indicate an increase of 10% in the performance of the learners.

The aforementioned discussion of the results of the pre and post-tests demonstrates that there has been a noticeable improvement in the creative writing skills of the participants. Though this development is not very significant, it is important enough to establish the efficacy of infographics in facilitating the learners to think creatively and innovatively and organize their ideas logically and rationally. It was also observed that the learners appeared to be more confident in the use of appropriate, relevant, and effective voice and word choice. Their language and grammar also improved comparatively though this improvement was not very remarkable.

The pre and posttests results were also statistically analyzed and the output of the descriptive analysis is presented below in table 1. The standard deviation values difference indicates that infographics worked as a simulator for enhancing writing skills in general and creativity in particular.

Table 1. Descriptive Statistics of Experimental Study Results

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-test experimental class	35	15	40	27.5	4.56
Post-test experimental class	35	19	45	32	5.32

Another important dimension of the study was to determine learners' perceptions regarding infographics and their efficacy in developing creative writing skills. For this purpose, a questionnaire was distributed among the participants of the experimental study. The results are presented in the table below:

Table 2. Results of Students' Perceptions Questionnaire

No.	Variables/ Factors	N	Agreed	Neutral	Disagreed	Rank
1	Attention	35	72.5%	20.5%	7%	4
2	Reasoning	35	79.1%	15.2%	5.7%	3
3	Panning	35	85.2%	10.5%	4.3%	1
4	Imagination	35	70%	20.9%	9.1%	6
5	Knowledge	35	70.8%	17.3%	11.9%	5
	Overall impact	35	80.5%	12.3%	7.2%	2

Average %	35	76.4%	16.1%	7.5%

The results overall (76.4%) disclose that students are fairly satisfied with infographics as a tool to develop and improve their creative writing skills. According to ranks, infographics are the most helpful in the planning factor (85.2%) which according to Stillman (2014) is an important stage in preparation to activate creative cognition. 79.1% of students acknowledged that infographics provided them enough grounds for reasoning which is crucial for creativity. Imagination is another important dimension of creative thinking as per Schiering (2015) which is supported by infographics as per students (70%). 80.5 % of students testified that infographics were overall helpful in improving their creative writing skills.

As per the results, the students approved the efficacy of infographic as an overall technique to assist in essay writing skills as it is attention-grabbing, knowledge starter, etc. as reported by previous studies (for example Matrix & Hodson, 2014; Yildirim, 2016; Alrwele, 2017). However, there is no such study conducted before regarding the usefulness of infographics for activating creative writing skills through cognitive activities. Further, research is needed in this regard with a variety of populations and contexts.

4. Conclusion

Creative writing is an important prerequisite in EFL classrooms to encourage students for better information processing both mentally as well as textually. In this regard, many techniques are practiced around the globe. The present study was addressed the needs of Arab learners in general and EFL learners in a local Saudi university, through the use of infographics for an original and creative writing process. The study was, in the initial phase an experimental group design used to teach a group of 35 female Saudi students enrolled in English as a major program. The pre-test and post-test activities were used to gather data, whereas a 6 weeks' experimental program was initiated to engage them in creative essay writing mechanisms through the use of infographics. The second phase was designed to gather the responses of the participants on how effective infographics were to trigger their creative cognition. The results of pre and post-tests clearly demonstrated that students had a better score average in the later phase than the beginning phase. The majority of the students were able to get good scores in various aspects of essay writing skills, particularly in originality and creativity dimensions. Later, the questionnaire's results also verified that infographics were helpful in various aspects of creative thinking like seeking attention, providing background knowledge, initiating imagination, and planning the draft.

The results verify that infographics can be used as a helpful technique to promote better writing skills among Arab learners. It assist them in putting ideas as combinations of texts and images at the pre-writing stage that actually triggers their cognition. However, the present study was delimited to a single group at a single institution; thus, it recommends further in-depth research with various groups and at various levels.

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Appendices
Appendix A- Pre and Post- Test Results

Essay Evaluation Rubric (Pre-test)

No. of Respondents	Focus & Details				Organization				Voice				Word Choice				SS, Grammar, Mechanics & Spelling				Total
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
1			4				4					2			4				4		18
2			5				5				5			6					5		26
3				3				3				2				3				3	14
4			5			6					4				5				5		25
5		7				6					5			7				6			31
6	8					7				6			8					7			36
7			4				5				4				5				5		23
8	9					7			8				9					7			40
9			5				4				4			6					5		24
10			5				5				5				5				4		24
11			5			6					4				5				5		25
12			4				4					3			4				4		19
13			5				5				4				5				5		24
14			4				4					2			4				4		18
15	8				8						7		8					7			38
16		6					5				5			6				6			28
17			5				4				4				5				4		22
18			4				4					3			4				4		19
19			4				4					3			5				4		20
20			4				4					2			4				4		18
21				3				3				3				3				3	15
22				3				3				3				3				3	15
23			4				4					3			5				4		20
24		6					4					3			5				4		22
25		6				6					4				5				4		25
26			4					3				3			5					3	18
27			5				4				4				5				4		22
28			4				4					3				3				3	17
29				3				3				3				3				3	15
30			4				4					3			5				4		20
31			5				4				4				5				4		22
32			4				4					2			4				4		18
33			4				4					3			4				4		19
34			4				4					3			4				4		19
35			5				4				4				5				4		22

Key: 1= 8-10 points Excellent   2= 6-7 points Good   3=4-5 points Fair   4= 0-3 points Poor

Total Points=50

Essay Evaluation Rubric (Post-test)

No. of Respondents	Focus & Details				Organization				Voice				Word Choice				SS, Grammar, Mechanics & Spelling				Total
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
1		6					5				5				4				4		24
2		7				6					5			7				7			32
3			5				5				4				4				4		22
4			5			6					4				5				5		25
5		7					7			6				7				7			34
6	9				8					7			9					7			40
7		6				6					5			6				6			30
8	9				9				9				9				9				45
9		6				6					5			7				6			30
10		6					5				5			6					5		27
11		7				7					5			6				6			31
12			5				4					4			5				5		24
13		7				7				6				6					5		30
14			5				4					3			5				4		23
15	8				8				8				9				8				41
16	8					6				6				7				7			34
17		6				6				7				7					5		34
18			5				5			5					5				5		19
19			4				4					3			5				4		25
20		6				6					4			6					5		27
21			4				4			5					5				5		23
22			5				5					4				4			4		23
23			4				4					3			5				4		20
24	8					7				5				6					5		31
25	8					7				6				7				6			34
26		6					5			5				5					5		32
27		7				7				7			8					7			36
28			5			6				5					5				4		25
29			4				4			4				4					4	3	19
30			4				4					3			5				4		20
31		7				6				5				7				7			32
32		6				7				5				7				6			31
33			5				5			5				6				6			27
34		7				6				5					5				4		27
35	8					7				6			8					6			35

Key: 1= 8-10 points   Excellent   2= 6-7 points   Good   3=4-5 points   Fair   4= 0-3 points   Poor

Total Points=50

Formula used to measure standard deviation for Descriptive test
sigmaPhat = sqrt((pi(1-pi)/n) where,
sigmaPhat = the sample size standard deviation
pi = the mean of the sample size
n = the number of samples

Appendix B
Creativity through Cognition: Students' Perceptions Questionnaire
Dear Students
As per your experience with teaching through infographics, the present questionnaire is designed to determine your perceptions regarding this technique as effective or not to trigger creative writing skills. Each question is given five options from strongly disagree- disagree- neutral- agree- strongly agree. You have to choose one of the options as per your experience and feelings.
It is to be noted that the questionnaire does not require any name option to respect your private perceptions.

No.	Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I believe Infographics are attention-grabbing.					
2	I believe Infographics make me focus on the topic.					
3	I believe Images and texts both help me to focus my attention.					
4	I believe Infographics provide me with basic ideas to reason.					

5	I believe Infographics help me to reason the main argument/ incident.					
6	I believe Images and texts are helpful to begin reasoning about the main topic to write.					
7	I believe Infographics help me to prepare the basic structure of my essay.					
8	I believe Infographics provide a start to the planning phase of my essay.					
9	I believe Text and images support me to draft my essay outline.					
10	I believe Infographics set my imagination free.					
11	I believe Infographics help me to imagine further beyond the given ideas.					
12	I believe Text and images are enough to imagine inside and outside the main argument/ incident.					
13	I believe Infographics provide me with valuable knowledge to start.					
14	I believe images text and images help to recall my previous knowledge.					
15	I believe Infographics are enough to start your essay and move freely further.					
16	I believe Infographics help me to think creatively.					
17	I believe Infographics are helpful ways to think, plan and write creative essays.					
Thank you!						