INTERPRETING AUTHENTIC ENGLISH AS FOREIGN LANGUAGE TEXT USING VISUAL-ICONICITY'S AND ADVANCE ORGANIZERS IN A HYPERMEDIA LEARNING ENVIRONMENT

BY

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Abstract

The drive of this investigational erudition was to compare the properties of different types of computer-generated iconicity's (static versus motion-graphics) and advance organizers (evocative versus question) in enhancing comprehension and retention of content-based experience for learning English as a Foreign language (EFL). Moreover, the erudition premeditated the interactive effect of learners' existing interpreting proficiency level and the all-mentioned treatments on their interpreting comprehension achievement. Learners from two EFL interpreting sections (N= 115) were tested on their interpreting proficiency and then randomly assigned to one of the four computer-based didactic modules-static iconicity alone, motion-graphic alone, motion-graphics plus evocative advance organizer, and motion-graphics plus question advance organizer. After having interacted with their corresponding instructional resources, Learners then took four criterion tests proximately afterwards and again four weeks late. The results presented that the motion-graphics group outpaced the static iconicity group in one of the four tests, and that motion-graphics engrained with a question advance organizer had a marginal effect among the four treatments in simplifying the acquisition of L2 interpreting comprehension both for the instantaneous and the tardy protests

Keyword: Visualization, Identification, Terminology, Comprehension Tests

Introduction

An education's prime mode of knowledge depends on the technology it embraces. In education's enduring undertaking of meeting the needs of the learners, an apparent shift from orthodoxy of construing skills that may have been appropriate for the medieval clerk, are giving way to skills of correct current approach that are considered desirable in today's modern culture (Ahmed, 2017). Instructional resources designated and developed using hypermedia have provided exciting latent learning opportunities thanks to postmodernist dexterous advancement, making their pedagogical effects on learning and teaching worth appraising. L1 interpreting comprehension take place when a previous acquired schema stored in the long-term memory is retrieved to assist the processing and deciphering of a new unfamiliar information incoming information/statistic (Anderson & Peason, 1984; Otobo, & Bango 2022). The process of transforming incoming information/statistics fundamentals into schematics required considerable cognitive psychological effort. Inherent language chatterers typically encounter difficulties in interpreting when they have gap in their content knowledge. However, the challenges faced by L1 bibliophiles can also be applied to L2 bibliophiles. Insufficient background knowledge hinders top-down processing of the new information, and delimited language competence of second/foreign language (ESL) learners makes the decoding process even more difficult. For ESL/EFL learners with low prior knowledge of a subject matter, instructional tactics need to be integrated into the course material developed using hypermedia are alleged to be able to facilitate learners' information processing, and to augment cognitive encoding due to the manifold representations that gun-trigger both verbal and visual-iconicity's modes of processing in humanoid being.

Theoretical configuration

Dual-coding theory make available theoretical validations for the use of visual iconicity's in the instruction presentation (Paivio, 1991 cited Otobo, 2023). Rendering to dual-coding theory, the humanoid memory is composed of two autonomous but interconnected coding systems. The visual iconicity system, the verbal system, iconic codes, such as images, depictions, tangible objects, or events; the other system, the verbal system, deals with non-iconic codes, such as words, dialect, linguistic, or semantic codes. Basically, each of the system functions autonomously but most information processing requires connections and buttressing between the two systems (Lai, 2000). Generally, visual iconicity's are more predictable to be processed in both verbal and iconicity systems, and henceforth the probability that they are betrothed in working memory and retrieved later from long-term memory is higher than when the presentation contains verbal information alone (Kobayashi, 1986). Mayer (1994) developed a proliferative idea of hypermedia learning to provide design principles of hypermedia instructional materials. The basic-tenet of the proliferative philosophy of hypermedia learning is that learners actively paradigm information and are involved in a reminiscent learning process. A reminiscent process occurs when leaners determinedly select information from presented stimuli, organize information into articulate representation, and then make efforts to integrate new information with other information. The step of integration of information from two discrete systems, that is verbal and visual iconicity, is exclusively critical.

Advance Organizers and Reminiscent Erudition

An advance organizer is defined as a didactic unit that is presented in advance of direct instruction. It is generally presented at a higher level of abstraction and projected to connect learners' prior knowledge to what they will learn (Ausubel, 1996 cited Ahmed, 2005). Rendering to Ausubel, for reminiscent learning to occur, learners must possess a reminiscent learning set and the resource must be evocative to them. The learning set denotes an existing cognitive configuration that contains mechanisms to which the learner can connect substantive and relevant features of new information and thus draw various associations between existing knowledge and newly acquired information. Ahmed (2005) succumbed that advance organizer may promote learning because "…supply a learner with a new cognitive configuration so that new information can be connected to it…"and that advance organizer "…prompt learners to bring together links between new information and more abstract, general, and inclusive information that learners already know…". An advance organizer is designed to give learners a general overview of the new material before the tangible skirmish, and it creates a cognitive connection between established knowledge and new material in term of the relevant philosophies, therefore enhancing the "understanding and learn-ability of new material (Ahmed, 2005, p. 82).

Learnedness findings have provided proposition of the superior effects of various types advance organizers used to abridge interpreting comprehension. Evans (2003) premeditated the effects of graphic organizers, one type of advance organizers for Japanese interprets on expository texts in English and found that learn-generated graphic organizers help put up different learner styles, lead to meaningful learning, and boost interpreting comprehension. In their erudition looking into how the use of a dynamic iconicity advance organizer can facilitate interpreting comprehension of L2 leaners, Chun and Plass (1996) quantified that a dynamic iconicity advance organizer is effective on the micro-level of processing while interpreting. A comparative erudition on the efficacy of declarative versus interrogative advance organizer in facilitating learners' comprehension of a foreign language cinematic. The results indicated that the learners' listening comprehension of the foreign language cinematic was greatly upgraded when advance organizers were used prior to viewing of the cinematic than not, though there were no significaSSSnt differences in test between the two advance organizer experimental groups. By means of fifth graders as subjects, erudite Hanley, Herron and Cole (1995; Lin & Dwyer, 2010) equated two visual iconicity advance organizers and depictions, plus the teacher's chronicle, in the comprehension and retention of written French passage. The result proposed that the cinematic advance organizer was superior in enhancing the comprehension of the foreign text. Otobo & Bango (2022) steered an experiment to investigate the effectiveness of using a verb and preposition expediency iconicity's advance organizer that outlined scenes from cinematic. The expediency cinematic presented

motional/acoustical using a processor which outlines the verb and preposition activities "…a more natural strategy than, for paradigm providing learners with key lexicon words extracted from the cinematic".

Educational Visualization

Current developments in instructional technology have made it plausible to design instructional material that incorporates varied visualizations. Diagrams and pictures, characteristically presented as static in both print and computer-based environments, can now be animated or premeditated to be dynamic to vividly present abstract concepts or phenomena that are invisible to human eyes (Hegarty, 2004). Though, visualization has a long history in instructional material and previous research has revealed that simply adopting a new technology does not necessarily improve learning (Hegarty, 2004). Generally, animated (motion-graphic dynamic) is more likely than static iconicity's to present effectively motion or movements imperceptible to the human eye or vicissitudes the shapes or motions of object (Wong, 1996; Clark, & Lyons, 2004).

Despite the awe-inspiring excitement for animated visualization, research studies have not been able to conclude that it is any more effective than static iconicity visualization. Eruditions reviewed 20 studies that investigated animation in the CBI (computer-based-instruction) troposphere and found that half of the studies shown an effect in favor of animation (Szabo & Poohkay, 1996; Bleed 2015) while the other half showed no significant differences (Caraballo, 1985, Rieber & Hannafin, 1988; Otobo & Palnam, 2021). Visual iconicity's, such as images/static or cinematic, have gained acceptance in foreign/second teaching for purposes of teaching interpreting comprehension. Rieber (1996), after steering a review of static iconicity versus animated visualization instructions, indicates that animation has been used…" with the resolved to impress rather than teach…". The erudite sturdily proposes animation be used only when its attributes are congruent to learning task. He also conveyed that complex animation may be bewildering for novice learners without prior knowledge in the content area, i.e., they may not know how to attend to critical information transported by animation (Rieber, 1996, Bleed, 2015).

Otobo (2023) appraised the effect of various types of iconicity's as context in the interpreting comprehension of a French text. The results proposed that providing iconicity effectively enhanced the recall of factual knowledge. Learners also demonstrated better performance in interpreting comprehension than their counterparts who acknowledged only the text. ESL/EFL teachers also utilized supplemental material such as news programs, TV programs, or audiovisual. Di Carlo (1994) suggested that iconicity's and specifically audiovisual such TV commercials, movies, and dramas can enhance language acquisition by providing learners various discourse contexts and reducing the anxiety typically experienced in second/foreign language learning. A comparatively large body of similar erudition has also been conducted with innate speakers on different types of erudition in hypermedia learning environment. Since the present erudition draws heavily on Mayer's generative theory of hypermedia learning, a brief review of similar erudition conducted by Mayer and his colleagues is provided here. Mayer, Hegarty, Mayer & Campbell (2005) investigated the effect of annotated illustrations versus narrated animation in hypermedia instruction on learners' retention and transfer test performance. Learners either received a static drawing with explanatory text or animation (iconicity) with narration explaining the process of ocean weaves, and how a car braking system works. The results indicated that learners receiving static drawings (iconicity's) with text scores significantly than those receiving animation with narration on four of the eight tests. The erudition supported the idea that static illustration effectively reduces extraneous cognitive load possibly induced by animation and narration, and on the other hand promotes apropos processing.

Erudition on animation has looked into the effect of animated instruction with various types of maneuvers. Otobo et. al (2022) appraised the comparative efficacy of synchronized narration versus on-screen text when they were used to accompany computer-generated animation. Results indicated that learners acknowledged factual knowledge better when explanations were presented via synchronized narration than by on-screen text. Learners also generated more solution to glitches when animated instruction was accompanied with spoken narration than with on-screen text. Tallying up, previous edifications on visualization have documented the concomitant effectiveness of various

types of maneuvers used to accompanying them either with innate or non-innate speaker of English in different types of learning material and outcomes. Nevertheless, the authors believe that few edifications have compared the learning effect of static and animated iconicity's as well as maneuvers embedded to foster learning from animation in foreign language context.

Challenges of the Erudition

Build on cognitive psychology theories sustaining the use of hypermedia to facilitate L2 learners construing comprehension, this erudition first examines the effect of cognitive strategies on language learners' comprehension of authentic interpreting (reading proficiency) material. The strategies included a combination of advance organizers (queries versus evocative reports) and visualizations (static versus dynamic). Subsequently learners interpreting comprehension level might also affect the strategies that they will employ in the interpreting process, this erudition examined the connotation of the interpreting proficiency level and the proposed cognitive strategies on L2 learners' interpreting comprehension.

Explicitly, this erudition addressed the following research questions

1. What are the comparative effects of diverse cognitive strategies combining advance organizers and conceptions on ESL/EFL learner's interpreting comprehension of a hypermedia-based authentic text?
2. Can cognitive strategies, iconicity's entrenched with advance organizers in a hypermedia-based authentic text, recompense for low interpreting ability?

Procedure

The participants of the erudition were 115 (20 males and 95 females) drawn from sections of a transitional EFL interpreting course at Collage of education in Borno State. Nigeria. The learners were majors in other pedagogies for practical tenacities with an age range 20-25 (m=20.0; SD=1.25). At the time of the erudition, learners had implicit been learning English for approximately six years since English language is the entry qualification to higher institutions in Nigeria. Participant in this erudition had only ordinary-level English experience.

Hypermedia-Based Instructional Material

The material used in the extant erudition is a paper-based interpreting (reading) material developed by the authors (graphic iconographer/lecturer) that describes the part of the human kidney-organ, the circulation of blood, functions and diseases. This text contains both general physiology knowledge that English innate speakers typically learn in their Senior Secondary School (SSS) as well as more complex concepts in a college freshman biology class. The statistics consisted of 1,820 wards split into 20 pages covering a range of learning tasks in increasing complexity. Each page is accompanied by a concomitant iconicity of simple line drawing (illustrated in colored). The material was further developed into a hypermedia-based instructional format with static or animated iconicity's and advance organizers. To guarantee reliability across all treatments, all instructional web pages were split into five sections with the title of each page on top and an icon of kidney-organ on the right to exemplify the conforming text in the middle. Accompanying review links were placed on the left-hand side of the screen. Next to the bottom was a navigation bar that allowed learners to go back or move forward.

Treatments

Four hypermedia-based modules were developed correspondingly for the erudition. All modules contained undistinguishable instructional content. The account of each treatment material is described in the following.

1. ***Static Iconicity Alone (SI)***

Learners in this group received the instructional material described above accompanied by contextual static iconicity's. The iconicity's contained simple line drawings (illustrated in colure) of parts the human kidney-organ. See Figure 1 for sample screenshot of the treatment.

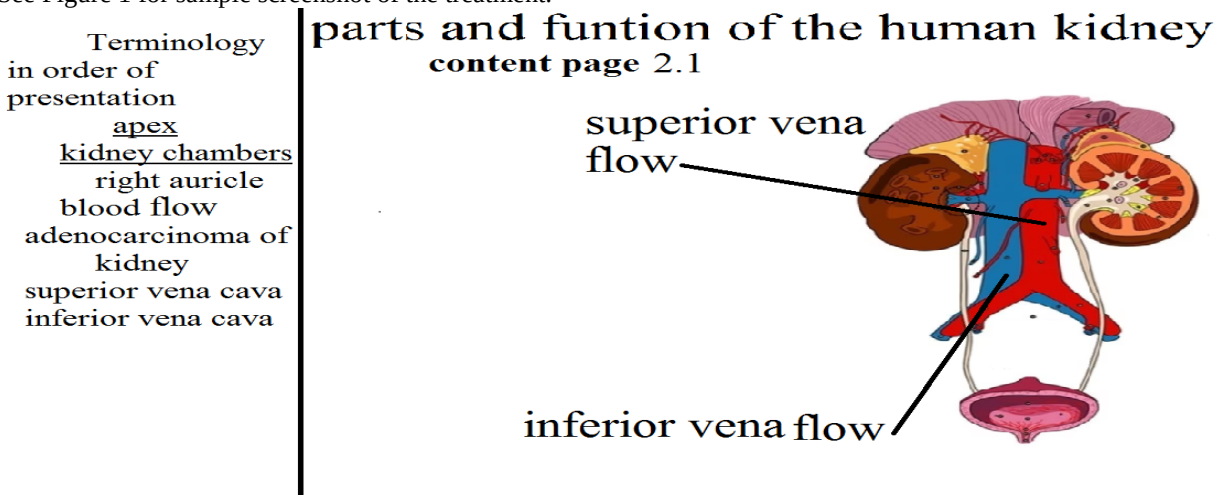

Figure1. Screen shot of a page contain a static iconicity.

2. ***Animation iconicity's Alone (AI)***

Learners in this group received an instructional module that contained animated iconicity's on selected web pages rendering to a preliminary erudition, which was steered to determine the parts the instruction material with which learners had difficulties and where animation could be positioned to fixed these difficulties. Learners in this group were queried to look at the kidney-organ iconicity on right and construe the pertaining text in the middle. Learners were reinvigorated to interact with the animation iconicity's and subordinate them with the text. The animation used in the erudition is of three major sorts: focusing, zoom in/out, and motions. The drive of the animated iconicity's is to exemplify concepts and rules /procedures concomitant to the instructional materials that are inflexible to demonstrate using such static iconicity's. Learners were tolerable to review the animated iconicity's as many times as they wanted by clicking on the animated button. A sample screenshot of the animated instruction is presented in Figure 2

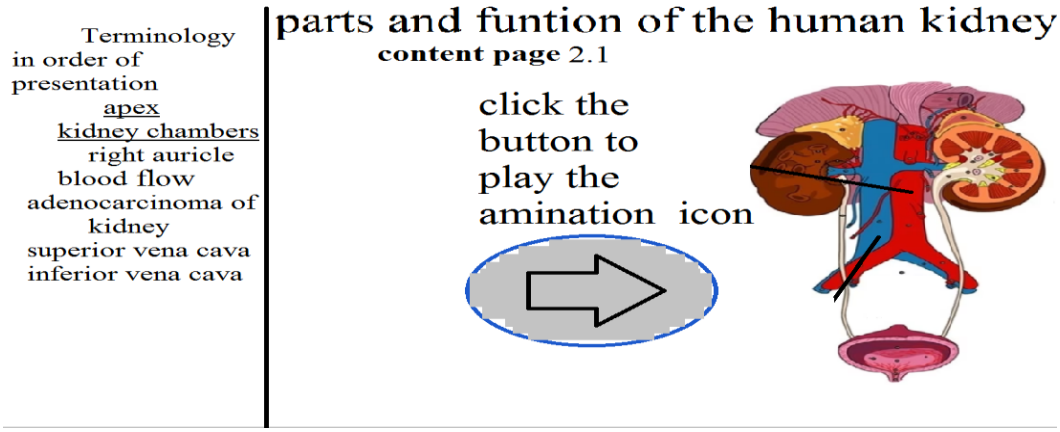

Figure 2. Screen shot of a page containing an animated iconicity.

3. ***Animated Iconicity's +Evocative Advance Organizer (A+E)***

Participants in this group received treatment that contained animated instructional material that was accurately the same as those received by Animated group (AI), On the other hand, evocative advance organizer were placed preceding to each frame. Each evocative advance organizer entailed of a short assertion and a harmonizing static iconicity. The drive of the embedded evocative advance organizer was to cue learners to crucial concepts that they needed to pay particular attention to in the to-be-encountered material. For a sample screenshot of a frame that contains evocative advance organizer, see Figure 3.

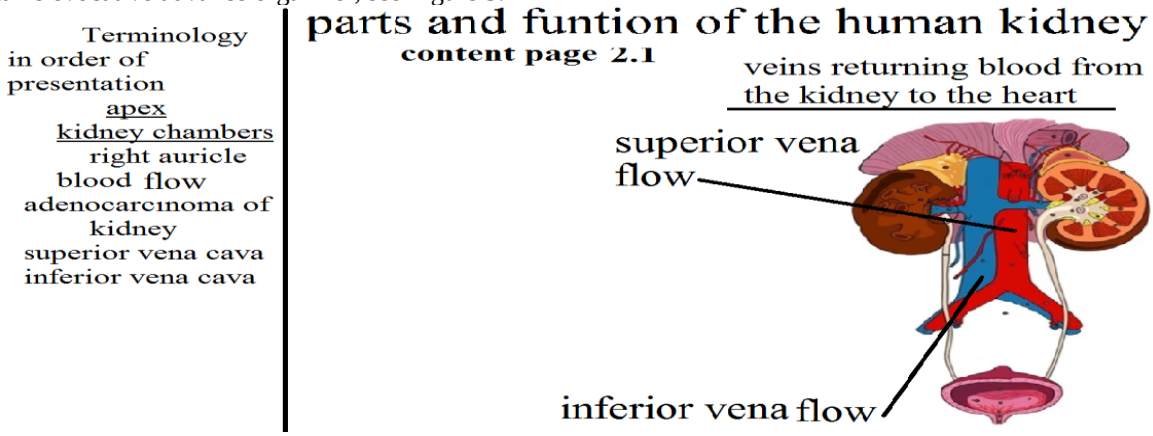

Figure 3. Screen shot of a page containing an evocative advance organizer

4. ***Animated Iconicity's + Question Advance Organizer (A+Q)***

Participants in this treatment received the same animated instructional material as the (AI) group. However, learners in this group received advance organizer in form of questions prior to each frame. The question organizer consisted of a question and a static iconicity, which was exactly the same as that received by the (A+E) group. This type of advance organizer asked a question apropos the main concepts in the impending material, followed by possible answer choices. Annotation as to the right answer of the question was provided in a pop-up window eight seconds after the initiation of the question. The purpose of the question advance organizer was to activate learners' prior knowledge and to hearten elaborate processing of impending material. For a sample screenshot of the frame that contained a question advance organizer, see Figure 4.

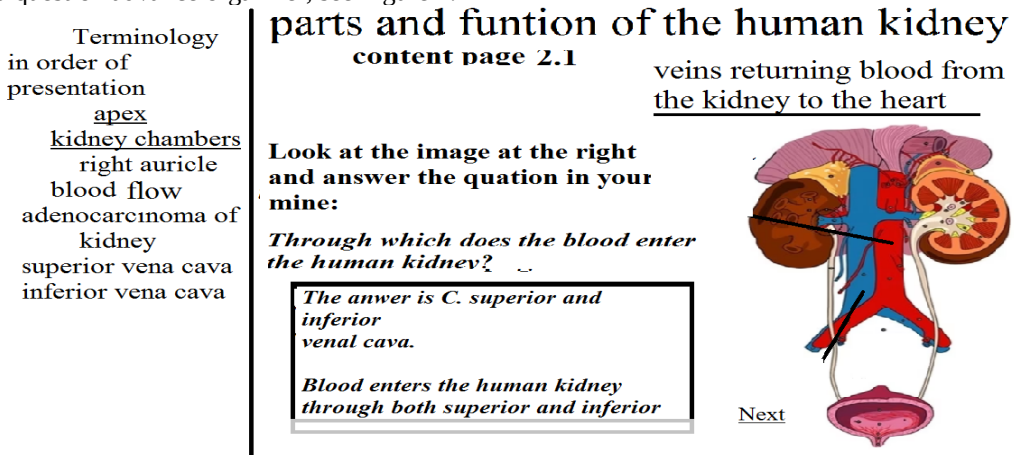

Figure 4. Screen shot of a page containing a question advance organizer

Criterion Procedures

Four criterion procedures were used to assess learners' interpreting and retention of the content-based information. These four criterion tests measured different levels of interpreting comprehension of the instructional material, i.e., simple precise/indicative knowledge, concepts, rules/procedures, and comprehension. Each criterion test is composed of 20 items with each item worth one point. The thoroughgoing scores for each test are 20. Exclusive of for the drawing test, the terminology, identification, and comprehension tests consisted of 20 multiple choice questions each. As for the drawing test, learners were asked to draw a drawing of the human kidney on a piece of paper provided. All the tests, except for the drawing test, were converted to an online format so that after learners received their respective treatments, they could immediately take the tests. A comprehensive description of the criterion procedures is provided below. Refer to the Appendix for the complete test questions.

Drawing Test: (Cronbach's alpha =83)

The drives of the drawing test were to measure learners' overall deciphering of the content-based experience, as well as their aptitude to reproduce the parts of the human kidney in their appropriate context. Each learner was provided with a blank piece of paper on which 10 parts of the human kidney were to drawn and then identified. Learners' drawing aptitude was not an imperative characteristic in the scoring since correct circumstantial of 10 part of the kidney was the criterion of the assessment. The scorers were three doctorial students with a major in curriculum/instruction configuration. The scorers were proficient and giving instruction on scoring procedures. The inter-rater dependability of the drawing test for this erudition was 0.90.

Identification Test: (Cronbach's alpha =0.81)

The drives of the identification test were to appraise learners' aptitude to identify parts of human kidney. In this test, a drawing of the human kidney with 20 numbered arrows was provided to the learners, who had to then choose the conforming letter (typeface) for numbered arrow from four conceivable answer choices

Terminology Test: (Cronbach's alpha =0.82)

Learners were appraised about their knowledge of explicit terms of the human kidney and their connotation with various diseases of the human kidney. For paradigm, learners were assessed whether or not they knew that "urogenital medicine" is the term for the parts of the human kidney through which the urinary tract is diseased and studied.

Comprehension Test: (Cronbach's alpha =0.78)

This test consisted of more difficult comprehension questions that required learners; decipherment of facts, rules/procedures, and simple concepts concomitant to this content-based knowledge. Specifically, the test covered questions that queried about diseases of the urinary tracts of human kidney. In particular, given an explanation of how a part of the human kidney was functioning, learners needed to be able to comprehend a simultaneous functioning of other part(s) of the human kidney. Contextual or status of relative parts while specific parts of the human kidney are operational needed to be fully comprehended by the learners for them to score high on the test.

Total Score: (Cronbach's alpha=0.92)

Scores from above four tests were added up and the outstanding total was attained, the total score was used to appraise learners' overall decipherment of the instructional material.

Procedure

The process was divided into two phases. In the first phase, the instructor or the facilitator provided learners with construing's (readings) in which the content was concomitant to the material used in the erudition. The construing's were simplified in terms of the level of difficulty in terminology (lexicon) and content. The drive was to provide learners with all-purpose anecdotal knowledge related to the human kidney before they were shown to the experimental material initiated and developed for English innate speakers at the college level. The use of material at a reduce difficulty prior to the experiment was also intended to decrease the level of interference for learners because, generally, learners in this EFL context do not possess advance phycology knowledge unless they are specifying in this discipline. A lexicon listing of some important proficient words with their mother tongue translation was provided to learners, and they were reinvigorated to remember the list to facilitate the grasp of the pre-experimental material.

The second phases of the experiment were steered in a hypermedia language workshop during normally scheduled class hours. Erstwhile to receiving respective treatment, learners were tested on their English interpreting comprehension in their intact review class. Upon completion of the interpreting test, learners were settled in a hypermedia language workshop in which each treatment was installed and the introduction page was demonstrated. Learners, randomly allotted to each treatment, then received the corresponding treatment material and completed the four criterion measures. Throughout the four-week period, learners had no accesses to the treatment material or the answers to the tests nor were they informed previously that the same test would be given the second time four weeks later.

Results

Construing (interpreting) Comprehension Test

The construing comprehension test was a subtest of an instructional ordinary level (O-level) English and consisted of 37 multiple choice questions assessing learner's decipherment of five construing passages in different lengths. The determined score for the construing test is 37. Table 1 recapitulates the means and standard deviations of the interpreting comprehension test scores achieved by the four treatment groups.

Table 1. Means and Standard Deviations of Reading Comprehension Test Score

	(SI)	**(AI)**	**(A+E)**	**(A+Q)**
Mean	20.10	19.07	20.31	20.00
SD	1.34	1.22	1.87	1.67
Minimum	11	11	14	10
Maximum	29	30	28	37

Participants were further divided into low and high construing proficiency levels (CPL) based on mean interpreting (construing) score of the sample (m=19.88), SD= 1.39). As a result, 65 learners were classified into low CPL proficiency level is summarized in Table 2.

Table 2. Number (n) of Subjects Based on CPL for Each Treatment Group

Level	**(SI)**	**(AI)**	**(A+E)**	**(A+Q)**	**Total**
LOW	13	18	16	18	65
HIGH	16	11	13	10	50
TOTAL	29	29	29	28	115

Main Effect of Treatments

A two-way analysis of variance (ANOVA) was steered on the four instantaneous criterion tests. The results suggested that there was no interaction between the treatment group and the level of construing comprehension on each of the criterion tests. On the other hand, the main effects of the treatments were pragmatic in each of the criterion tests. Table 3 abridged the means and standard deviation of each immediate criterion test amongst the groups for the main effect treatments on these groups. As designated, the (A+Q) group outpaced the other three groups in all of the tests. The (SI) group scored the lowest in all except the lexicon (terminology) tests. For treatments in which the advance organizers were embedded, the question advance organizer seemed to be more effective than the evocative advance organizer in abridging the learners' performance on the tests.

Table 3. Main Effects of Treatment on Each Immediate Test

Tests	**(SI) (n=29)**	**(AI) (n=29)**	**(A+E) (n=29)**	**(A+Q) (n=29)**	**F value**
Drawing	14.67(1.80)	16.03(.44)	17.09(.62)	18.15(1.69)	6.501***
Identification	17.16(1.15)	18.63(32)	18.34(.03)	19.13(82)	4592**
Terminology	10.31(.79)	10.98.(12)	10.14(.95)	13.02(1.92)	3.481*
Comprehension	8.00(1.37)	8.98(40)	9.57(.19)	11.00(1.63)	4.612**
Total	50.14(5.11)	54.64(64)	55.14(.11)	61.31(6..6)	6.686***

Note: Value in parenthesis indicated standard deviation. *p<.05. **p<.01. ***p<.001.

Post-hoc test was used to appraise the differences found in the significant main effect for treatment. The significance level and the mean difference of the treatment groups are shown in Table 4.

Table 4. Post-hoc Test of Treatment Effect on Each Immediate Test

Tests	**Pair-wise comparison**		**Mean difference**	**P value**
	(A)	**(B)**		
Drawing	(SI)	(A+E)	2.31	.028*
		(A+Q)	3.28	.001**
Identification	(SI)	(A+Q)	1.83	.006**
Terminology	(A+E)	(A+Q)	2.68	.039*
Comprehension	(SI)	(A+Q)	2.72	.007*
Total	(SI)	(A+Q)	10.13	.001**
	(AI)	(A+Q)	6.58	.045*

*p<.05. **p<.01. ***p<.001.

Also, two-way analysis of variance was steered on the four deferred criterion posttests. Again, no interaction between the treatment group and CPL was pragmatic on all of the criterion posttests. Hitherto, the main effects of the treatment were observed in three of the criterion tests and the total score as shown in Table 5.

Table 5. Main Effects of Treatment on Each Delayed Criterion Posttest

Tests	**(SI) (n=29)**	**(AI) (n=29)**	**(A+E) (n=29)**	**(A+Q) (n=29)**	**F value**
Drawing	7.20(3.17)	8.65(1.72)	12.18(1.80)	13.57(3.20)	12.039***
Identification	11.75(2.43)	13.91(.27)	14.14(.04)	17.02(2.84)	8.36***
Terminology	7.30(90)	8.04(.16)	7.87(.32)	9.61(1.42)	2.331
Comprehension	6.41(1.17)	7.76(.17	7.51(07)	8.69(1.11)	2.882*
Total	32.68(7.75)	38.76(1.67)	41.71(1.27)	48.88(8.44)	8.565***

Note: value in parenthesis indicated standard deviation. *p<.05. **p<.01. ***p<.001.

Post hoc tests were used to investigate the differences found in a significant main effect for treatment and the results were shown in the Table 6.

Table 6. Post-hoc Tests of Treatment Effect on Each Delayed Posttest

Tests	**Pair-wise comparison**		**Mean difference**	**P value**
	(A)	**(B)**	**(B-A)**	
Drawing	(SI)	(A+E)	4.79	.001**
		(A+Q)	6.01	.000***
	(AI)	(A+E)	3.66	.015*
		(A+Q)	4.88	.001**
Identification	(SI)	(A+Q)	4.86	.000**
		(A+Q)	3.06	.022*
Comprehension	(SI)	(A+Q)	2.16	.030*
Total	(SI)	(A+E)	8.38	.049*
		(A+Q)	14.98	.000***
	(AI)	(A+Q)	9.98	.013

P<.05. **p<.01. ***p<.001

Table 7. provides a summary of the main effects of treatment on both immediate and deferred posttests. As designated, the (A+Q) group performed significantly better than the (SI) group in three of the tests and the total score but not in the terminology (lexicon) test, both for the immediate and deferred test. One major interest of the erudition was to determine the comparative effectiveness of question evocative advance organizers. Table 7 shows that the (A+Q) group only significantly outpaced (A+E) in the immediate terminology test. Apropos the effect of animation compared to static iconicity alone, to our disenchantment, (AI) did not perform significantly better in any of the tests than (SI) group, dependably for immediate and deferred tests. Hitherto, the provision of advance organizers of either type to accompany animation did have a marginal effect compared to not having provided it at all, as learners in (A+E) and (A+Q) groups scored higher in the deferred drawing test than learners in the (AI) group. Evocative types of advance organizers only showed a marginal effect compared to static iconicity's alone as the (A+E) group outpaced the (SI) group only on immediate and deferred drawing tests and scored higher in total score in the deferred test.

Table 7. Summary of Treatment Effect on Immediate/Deferred Criterion posttests

Criterion test	**Immediate**	**Deferred**
Drawing	(AQ)>(SI), (AE)>(SI)	(AQ)>(SI), (AE)>(SI), (AE)>(AI), (AQ)>(AI)
Identification	(AQ)>(SI)	(AQ)>(SI), (AQ)>(AI)
Terminology (lexicon)	(AQ)>(AE)	
Comprehension	(AQ)>(SE)	(AQ)>(SI)
Total	(AQ)>(SI), (AQ)>(AI)	(AQ)>(SI) , (AE)>(SI), (AQ)>(AI)

Main effects of CPL

The main effects of the interpreting (construing) proficiency level were pragmatic in two of the immediate criterion tests, i.e., terminology and comprehension tests, and the total test score. As designated in Table 8, high CPL learners significantly outpaced low CPL learners in terminology and comprehension tests. High CPL learners also have a significantly higher total score. The main effect of CPL was pragmatic in three of the deferred criterion tests, drawing, identification, and terminology tests, and the total score. As indicated in the Table 9, high CPL learners

outpaced low CPL learners at a statistically significant level in all but the comprehension test; in totaling, high CPL learners also had a significantly higher total score

Table 8. Main Effects of Construing Proficiency Level on Each Immediate Criterion Test.

CPL	Low	High	F value	P value
Drawing	16.00 (.47)	17.08 (.61)	4.233	.072
Identification	18.00 (.31)	18.70 (.40)	4.121	.075
Terminology	10.18 (.91)	12.28 (1.19)	8.642	.004**
Comprehension	8.75 (.63)	10.19 (.82)	5.996	.016*
Total	52.93 (2.31)	58.25 (3.01)	8.686	.004**

Note: Value in parenthesis indicates standard deviation; * p<.05; ** p<.01

Table 9. Main Effects of Reading Proficiency Level on Each Deferred Criterion Test

CPL	Low	High	F value	P value
Drawing	9.58 (.79)	11.40 (1.30)	4.411	.038*
Identification	13.26 (.92)	15.38 (1.20)	7.918	.006**
Terminology	7.37 (.82)	9.26 (1.07)	8.406	.005**
Comprehension	7.33 (.25)	7.91 (.33)	1.116	.293
Total	37.72 (2.72)	43.97 (3.53)	7.285	.008**

Note: Value in parenthesis indicates standard deviation; * p<.05; ** p<.01

Discussion

The main drive of the present erudition was to appraise the effectiveness of diverse cognitive strategies employing a combination of visual iconicity's and advance organizers in simplifying EFL/ESL learners' interpreting comprehension of authentic material. The basic theoretical assumption was that comprehension may be simplified by insertion of varied types of visual iconicity's that assist in the selection, organization, and integration of information, and that advance organizers provide a cognitive configuration that enables current schematics to be connected and integrated with new ones. The present learning also appraised the role that learners' interpreting proficiency may play in learning from authentic material presented in a hypermedia learning environment and its interactive effect with the proposed cognitive strategies on learners' education. A dialogue of findings pertaining to each research question is described in the following.

Research Question 1. What are the comparative effects of different cognitive strategies combing advance organizers and visualizations on ESL/EFL learners' interpreting comprehension of a hypermedia-based authentic text?

The results of this learning regarding the treatment effect can be summarized as (1) *Animation iconicity's entrenched with a question advance organizer (A+Q) is more effective than static iconicity's alone (SI*). Learners assigned to (A+Q) performed better on all immediate terminology test for which (SI) is superior to (A+E*). (2) Animated iconicity's were found to be equally effective as static iconicity's*. This erudition did not support the use of animation in facilitating interpreting comprehension of authentic material. Learners receiving (AI) treatment, did not perform significantly better in any of the criterion posttests than those who received (SI) treatment, representative that animation alone did not have an effect in supporting with the understanding of the material as expected. This finding was treasured. While advances in technology have made dynamic presentations of iconicity's easy and conceivable, the cost associated with the development of animation must be appraised against its effectiveness. (3*) A question advance organizer is only slightly more than an evocative advance organizer*. Learners assigned to (A+Q) outpaced those in immediate terminology test, designated the qualitative features of the learning that these two types of advance organizer can induce may be of diminutive difference and hence failed in the resulting in significant

improvement of comprehension. (4) *Providing of advance organizers of either type to accompany animation did have a marginal effect concomitant to not providing them at all. The* results indicated that learners in (A+E) and (A+Q) groups both scored higher on the deferred drawing test than learners in the (AI). Learners in (A+Q) groups both scored higher on the deferred identification test than (AI) group.

In summary, this erudition found no superior effect of animated iconicity's in supporting with the comprehension of authentic interpreting material. Static iconicity's/cinemas are equally effective in supporting learners' comprehension of the material. Hitherto, the most imperative finding of this erudition was that, with the addition of a question advance organizer, animation iconicity was a more effective cognitive tactic to enhance interpreting comprehension of authentic material. The finding submits that animation iconicity alone is not better than static cinemas; however, when perfecting the animation with a question advance organizer, or in the case of deferred drawing test an evocative advance organizer, its effect was perceptible. Learners in receipt of animation plus question advance organizer suggestively outperformed the static iconicity alone (SI) group in all of the immediate criterion posttests (but lexicon test) and all the three deferred criterion posttests. It was credible that the question advance organizer rooted in the animation abetted the learners in convergency on critical information represented by the animation. Previous researchers indicated that learners, when presented with the animation instruction, were not able "to efficaciously attend to the animation" or were" …sidetracked by the combination of iconicity cum verbal statistics presented to them" (Rieber, 1999 cited Otobo, 2023, p. 195). Erudite Owens & Dwyer (2005) harangued that learners to exceptionally network with the animation and fully benefit from it. Wilson & Dwyer (2001); Otobo & Wilson (2021) orated in their erudition that learners be giving representative and appropriate prompts that help them focus on essential and critical aspects of information.

The present erudition echoes previous instructions in that certain pedagogical strategies needed to be used to complement animation for learners to benefit from its hearty representation. Different types of question or questioning approaches can be used to engage learners in deeper cognitive information processing and hence augment their learning. The effects questions or questioning strategies lie in the fact that the "…explicitness of the questions and relationship to instruction…focus the learner process on question-specific information" (Osman & Hannafin, 1994, p.8).

Research Question 2. Can cognitive strategies, i.e., iconicity's with advance organizers embedded in a hypermedia-based authentic text compensate for low construing ability?

The drive of this erudition was to investigate the relationship between ESL/EFL learners' construing comprehension level and different cognitive strategies used to enhance their construing comprehension of authentic material. Unambiguously, the researchers anticipated to explore whether the employment of the cognitive strategies would close the gap in comprehension between the two groups. The researchers theorized that the learners' construing comprehension level would have an effect on how they make use of the cognitive strategies and accordingly affect interpreting comprehension of the authentic material. The results did not support the above cited hypothesis. Learners with different level of construing comprehension did not score differently depending on the cognitive strategies employed in the authentic material. Learners with a higher CPL, regardless of what cognitive strategy they received, scored reliably higher in criterion test than those with lower CPL, except on the drawing test and identification immediate posttests and on the deferred comprehension posttest. As cited earlier, the finding that higher CPL learners scored higher in the more difficult and complex immediate criterion posttests than their lower CPL counterparts is not surprising. Hitherto, its thought-provoking that lower CPL learners performed equally well as those with a higher CPL on a lower level of immediate construing comprehension questions. Nonetheless, the learning also found that there were no substantial differences on the deferred comprehension posttest between the two groups. Learning investigating the effects of different types of organizers on learners' learning from textuality designated those advance organizers "…influence qualitative features of learning…" (Kloster & Winne 1989, p.12). Studies also showed that advance organizers are more effective in facilitating retention of conceptual knowledge rather than factual details and may actually impede of recall of specific details (Mayer & Bromage, 2006).

Unreliable findings also existed vis-à-vis the effects of advance organizers for lower and higher aptitude learners. Mayer's studies (1980) found positive effects of advance organizers for in experienced learners while Evans (2003) found that higher-ability learners benefit from advance organizers. Kloster & Winne (1989) in essence specified in their erudition that how learners relate the new information in a text to an advance organizer regulates the effectiveness of an advance organizer. Learners' consciousness improves if they were able to link the information in text to the advance organizers. Their erudition suggested that previous scholarlily that found on effect of advance organizers might be due to learners'" …ineffective use of the advance organizers rather than the physical characteristics of the organizers themselves" (p.14). The current erudition has failed to provide proposition that dynamic iconicity's and advance organizer can be used to scaffold learners with lower CPL in grasping more complex authentic material although these strategies might be effective on their realization in the basic construing measures or on a long-term omprehension measure.

Conclusion

The key findings of the erudition can be abridged as follows. First, dynamic visualization used for the enhancement verbal statistics contained in the authentic material was no more effective than static iconicity's. Rieber (1996 cited Otobo, 2023) anticipated that animation iconicity could be used to provide the misapprehension of movement (motion-graphic) and the path of travel (trajectory). Thus, the learning tasks or content should depend on the deciphering of changes of an object over time or the direction towards which the object is moving. Greater learning gains would be expected if the learning task involved the understanding of concepts that concern motion-graphic and trajectory and if the animated iconicity's are integrated to enhance learning (Otobo, 2023). The didactical material in this learning was selected deliberately to provide justification for the use of animated iconicity's. Nonetheless, learners assigned to the (AI) group did not suggestively outpace those not receiving animation iconicity.

Erudition so far conducted to compare the effects of static and dynamic/visualization on learners' learning has been mixed and mostly dispiriting. In spite of the overwhelming enthusiasm about animation visualization, Scholarly studies have not been able to conclude that it is any more effect than static visualization. The present erudition buttresses previous scholarly findings and provides evidence that static iconicity's and dynamic iconicity's as characterized via animation are equally effective in facilitating construing comprehension in an ESL/EFL context. Secondly, for animation to be effective, a question advance organizer may be used to prepare learners cognitive structure for new and unfamiliar schematic. It is principally decided that learners have in their possession various degrees of meta-cognitive resources that enable them to engage in the lesson content with varying degrees of depth (Osman & Hannafin, 1994). Educations has indicated that questions help to activate prior knowledge and integrate it with new knowledge and application of that knowledge (Anderson & Pearson, 1984; Mayer, 1984; Osman & Hannafin, 1994; McFarlane; 2011; McMahon, et al. 2004). This erudition further reinforces the instructional effect of using questions as an advance organizer in facilitating learners' learning.

Third, when the drive is to encomium animation, the question advance organizer is only marginally more effective than the evocative advance organizer. This finding was based on the evidence that the (A+Q) group only outperformed the (A+E) group in the criterion posttests, i. e., the terminology test. It is plausible that the level/depth of the information processing induced by both kinds of advance organizers is approximately similar. In this learning, the question advance organizer is used as a cue to activate learners' existing schema; however, since no unambiguous responses were required of learners to the questions, learners may be rendered as passive learners as were those who received an evocative advance organizer. Both types of advance organizers cued learners to important information but were not suggestively different with regard to increasing the depth of information that they called upon.

Recommendation

There has been very diminutive empirical erudition on the instructional value of various kinds of visualization with congruent strategies in enhancing the understanding of focus material knowledge in an ESL/EFL context. We recommend further erudition replicating our treatments with different learning materials, participants, and conceivably in different learning atmospheres. The quasi-experimental instructions consisted of a general make-up instructions concomitant to the human kidney convoyed by simple static, animated iconicity's, and animations plus different advance organizers. It is conceivable that due to the nature of the learning tasks, the duration of time that is requisite for the learners to complete the treatment instructions were not comparable. In other words, as one of the annotators has enquired, time-on-task might have been an issue in this erudition. Learners assigned to the more interactive instruction, i.e., animation plus question advance organizer had more exposure to the material as compared to the less interactive instruction, i. e., static iconicity's only condition. Hence, the authors were cautious in making the conclusion that the obtained results were due to the advance organizers and visualizations used but not the differences in the duration of time spent by learners in learning the instruction. It was contentious that the time-on-task might have been a confounding variable that would interrelate with the major treatment effect to affect learning achievement.

However, some media require more time to deliver/present instructional material by their nature. Ahmed (1990) orated that learner-engaged learning time was a "mandatory" but not satisfactory mediating process in pedagogical research on learning. He claimed that while assigned time was useful in rendering learning result, it was the time during which a learner was dynamically engaged with the subject matter that was most crucial and that directly contributed to learning. Erudite Hill (2004) likewise accentuated that "in most instructional circumstances, what learned depends largely on the activities of the learner…" (p. 85). Canning-Wilson (2001) also noted that "…the actives that the learner engages in when challenged with instructional tasks are of crucial importance in determining what he will learn…" (p.335). Whether the added amount of time needed to learn the designated material would warrant additional learning gains is open to question, to mention the cost required to develop augmented learning materials such as the animated iconicity's used in this erudition. The authors suggest that more erudition is needed to explore the relationship between effectiveness and efficiency in a technology-enhanced learning environment.

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