Genre-based visualization through an online teaching platform: A strategy to engage with academic texts during the Covid-19 outbreak

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Abstract
During the Covid-19 outbreak in 2020, students of all education levels are pushed to study at home via online classes. Schools, universities and other educational institutes have to make sure that their students can keep receiving knowledge and information based on the indicators set by the curriculum. The same thing also occurs at the English Education Department of Syiah Kuala University in Banda Aceh, Indonesia. This article presents the results of a two-cycle action research project conducted in Banda Aceh, Indonesia, through an online learning platform using Zoom meeting. In this study, eight undergraduate students participated in the online intervention class to apply genre-based visualization metacognitive strategy. A total of six academic texts of the explanation genre were taken from TOEFL tests and used in both cycles. In the online intervention class, students generated visual imagery of the academic texts, built up their knowledge of the text genres in the online discussions, and individually drew visual representations of the explanatory texts. The images drawn by the students were taken for the qualitative analysis, and the tests given to the students were analyzed quantitatively. Both data are used to find out their improvement in reading comprehension. The findings of this study revealed a remarkable contribution of genre-based visualization for improving students' comprehension of academic texts of the explanation genre at TOEFL level, particularly through online learning during the pandemic.
Key words: reading comprehension, academic reading, English proficiency tests, visualization, genre approach, online learning

Introduction
The outbreak of the pandemic Covid-19 has changed the procedures of all sectors of life, such as those in the economic sector, health sector, and also education sector. In the education sector, schools, universities, and other educational institutions have to close their buildings, and run the teaching and learning activities through online platforms, for example, Zoom meetings, Google meetings, and Microsoft teams. This is done so to decrease the spread of the virus. At university levels, in particular, lecturers and students need to be literate in technology to be able to open and run the online application, share documents online, and do discussion online. Lecturers have to make sure that the goal and the indicators set for the subject being taught are achieved well during the pandemic. Teaching and learning activities through an online platform surely present benefits and challenges for both teachers/lecturers and students. The use of information technology and internet technology is required to conduct online teaching and learning (Zhou et al., 2020). This quite a novelty way of teaching brings challenges to lecturers and students to adapt with the "technological complexities" (Mishra, Gupta & Shree, 2020). In addition, Huang et al. (2020) maintained three challenges of online education; these include the limitation of time for educators to prepare for the online classes, the isolated feeling experienced by both educators and students during the pandemic, and the emergency of the effective teaching approach to motivate students to keep learning. Nevertheless, the use of online platforms in teaching and learning would benefit students to be independent learners. In relation to the teaching and learning in an online classroom, we investigated the improvement of students' reading comprehension in Reading subject

classroom, who are taught using genre approach visualization through Zoom meeting application. The objective of the subject is to help students comprehend academic texts of the explanation genre at TOEFL level.In some –if not all– universities in Indonesia, achieving a certain score of the Test of English as a Foreign Language (TOEFL) is one of prerequisites for students to graduate from the universities. The required score is varied between one to another university. In Aceh province, Indonesia, for example, students in Syiah Kuala University, where this study was conducted, have to hold a TOEFL certificate with a minimum score of 450. This score is not easy to achieve not only by students studying in the field of science and economic, for example, but also for English Education (EE) students.

TOEFL is one of standardized English proficiency tests to assess students' English competence. The paper-based test, undertaken by students of Syiah Kuala University, usually involves three aspects: listening, structure and reading. Each aspect affects the overall score students will achieve in the test. The improvement of each aspect will enable students to also increase their overall score. To enable undergraduate students at Syiah Kuala University to improve performance in English proficiency, this study focused on the reading skill. TOEFL reading includes the assessment of students' understanding of academic texts; texts written in academic English, a kind of language used at school (Romhild, Kenyon, MacGregor, 2011) as well as scientific level. The competence that students must own in this aspect is to understand meaning in this type of text, so they are able to answer the comprehension questions following the text. However, most students still find difficulties in academic reading comprehension especially at TOEFL level. Students in this university need to learn how to process English language that is syntactically complex, lexically dense and highly technical.

Strategy use in TOEFL reading section has being a familiar topic of research. Previous studies have attempted to investigate which strategy is appropriate to use in processing the academic texts. Most studies have focused on reading and test-taking strategies (see for example Alavi, Bordbar, 2012; Cohen, Upton, 2007; Jia-Ying, 2015; Samad, Jannah, Fitriani, 2017). Generally, among the ways to improve reading comprehension is by using metacognitive strategies. One of well-known strategies in metacognition is visualization (Fitriani, 2015; Fitriani, Erdiana, Samad, 2019; Kigotho, Fitriani, 2018). Studies on visualization have been a topic of investigation in relation to reading comprehension since few decades. J. R. Levin, R. E. Davidson, P. Wolff and M. Citron (1973) conducted research involving second and fifth graders. Pressley (1976) also included eight-year-old children. G. Woolley (2010, 2007, and 2006) proposed a teaching framework involving a visualization strategy to be applied to primary students beyond Year 3. J. R. Levin (1973) involved fourth graders in his research using the visualization strategy. Some other studies introduced the visualization strategy to students of the seventh grade, for example, Hobbs (2001), and of both seventh and eighth grades, such as Park (2012). Moving to a higher level of education, Anderson and Kulhavy (1972) carried on their study with senior high school students.

Previous studies on visualization included the use of different types of texts. Anderson and Hidde (1971), for example, deployed thirty sentences with transitive verbs, which were all written using the past tense; differently, Pressley (1976) adopted prose to work with his participants in using the strategy. Moreover, there is also a study using visual media (in this case a movie) to visualize the characters of the stories (Hobbs, 2001). Similar to Hobbs (2001), Park (2012) included movies in a form of written stories for the participants to visualize the characters involved in the stories. Meanwhile, Woolley (2007, 2010) and Narkon and Wells (2013) focused on using narrative texts to apply the visualization strategy. Accordingly, it is still little known about the implementation of visualization metacognitive strategy to assist the English

Foreign Language (EFL) undergraduate students in reading the academic texts of the explanation genre found in English proficiency tests like TOEFL, particularly during the pandemic where the learning is conducted online.

In the academic texts, the written genres students must read are often unlike other genres they read, even in English. Explanations, expositions, historical recounts and complex narratives, for example, present particular kinds of difficulties for many students. For tackling academic texts using visualization, students also need to know more about the purpose, structure, and language choices in these less familiar genres and topics in order to get meaning as well as to correctly answer comprehension questions. In this study, the implementation of visualization is accompanied by the teaching of text genre. This study assumes that the ability of students to analyze academic texts based on the genre by using visualization strategy will help them to understand the texts and answer comprehension questions correctly. Thereafter, the research question is formulated as followed: To what extent the use of genre-based visualization through online teaching can improve students' reading comprehension of the English academic texts of the explanation genre?

Hence, this article is expected to be beneficial for English teachers, especially those who teach reading comprehension in EFL classrooms. It is also likely that this article provides new insights for EFL students to tackle English academic texts at TOEFL level.

Literature Review
Reading comprehension

Reading is well known as a process of constructing meaning from a reading text (Pressley, 2002; Snow, Sweet, 2003), which is focused on comprehension (Palincsar, 2003). Specifically, within second and foreign language contexts, reading involves skills and abilities combined by readers when they start to read (Grabe, 2009) to achieve a general understanding of a text. Two of five definitions of reading suggested by W. Grabe (2009, 1991) are considered in this study. The first definition sees reading as an interactive process. Within this definition, second and foreign language readers need to bring skills or strategies to interact with a text. The use of strategies in the reading process involves the activation of cognitive capacity (Randi, Grigorenko, Sternberg, 2005) to engage with a text to construct meaning. Accordingly, reading becomes an interactive process. The second one sees reading as a linguistic process. EFL readers need to develop their understanding of the goal of a text providing information, the generic structures a text uses to organize and develop information, and the language features involved in a text to structure words into sentences and paragraphs. This analysis helps the readers engage closely with the text to construct meaning and hence comprehend it. Consequently, in reading a text of English as a foreign language, especially an academic text, it is necessary that readers use strategies and develop their knowledge of different types of texts to be able to construct meaning and achieve comprehension.

Visualization metacognitive strategies

Certainly, EFL readers face some difficulties in tackling an English text for getting meaning. In literacy learning, the activation of cognitive capacity to interpret and understand a text requires readers' awareness of using metacognitive strategies (Griffith, Ruan, 2005). This awareness needs to be introduced and encouraged when teaching reading in classrooms. Providing access to metacognitive strategies helps EFL readers to minimize the difficulties. Previous studies have reported the benefit of using metacognitive strategies to improve comprehension (see for example, Alsheikh, Mokhtari, 2011; Eilers, Pinkley, 2006; Thomas, Barksdale-Ladd, 2000). More recent studies, for example by S. Raoofi, S. H. Chan, J. Mukundan, and S. M. D. Rashid (2014), have also reported successful learning by using metacognitive strategies

within the context of the second and foreign language. Accordingly, metacognition does benefit not only the English speakers in reading but also the second and foreign language readers.

Hence, among the strategies of metacognition implemented in a reading process is by using visualization. Two types of visualization used in this study include internal and external visualization (Cohen, Hegarty, 2007; Gilbert, Reiner, Nakhleh, 2008). Internal visualization is the visual imagery readers generate in their mind when they are reading a text. This imagery is invisible in nature which cannot be seen by others (Trafton, Trickett, Mintz, 2005). External visualization is a visual representation a reader draws in the form of image, graph, diagram, or chart to represent the meaning in a text (Cohen, Hegarty, 2007). The undergraduate students of this study were encouraged to generate mental imagery when they engaged with the academic text and to draw a visual representation after completing reading each text. Hence, the students applied both internal and external visualization in reading.

The advantages of using visualization in the reading process have been mentioned by previous studies. R. A. Rader (2009) maintained that visualization benefits readers to actively think of and engage more closely to a text in order to construct meaning. Without active engagement, readers are not able to generate mental imagery or to draw a representation because active thinking is the core of metacognition. Accordingly, when applying visualization, at the same time, students also activate their cognitive thinking. In addition to the benefit of visualization, mental imagery helps readers to organize information (Gersten, Fuchs, William, Baker, 2001) in their mind; and visual representation readers draw allows them to monitor comprehension by organizing the information they already understood in a combination of words and images (Van Meter, Aleksic, Schwartz, Garner, 2006). Even though the benefits of using visualization in the area of reading have been widely reported by previous studies, the investigation on the use of visualization combined with the teaching of the genre to improve EFL students' comprehension in reading academic texts at TOEFL level –written in the explanation genre– through online learning is still limited.

The functional approach to literacy education

Within a functional model of language, it is necessary to explore several aspects in academic texts, not only the purpose but also the aspects of genre structure and language features relevant to each text genre (Rose, Martin, 2012). Each type of genre differentiates its structure from other genres in terms of purpose and stages because the genre is staged and goal-oriented (Martin, 1985; Samad, Adnan, 2018; Samad, Fitriani, Patak, Weda, 2019). For example, a procedural text aims at telling readers how to do or make something by providing sequent steps, while a recount text is written to document sequential events that happened to a certain participant in the past (Humphrey, Droga, Feez, 2012). To achieve the purpose, each text type follows certain stages to develop and organize the information relevant to the genre. Therefore, the orientation of purpose and stages in a text genre always exists. Moreover, to make the information meaningful, the texts are governed by linguistic resources of English. This is the way language functions to create meanings important to certain fields of life (Derewianka, 2012). Students' understanding of these aspects involving in a text, especially the academic one, is beneficial for them to link one sentence to another and to construct meaning. This study suggests that the application of metacognitive strategies in a reading process could be better done with students' understanding of these aspects. When they actively think of the text using a visualization strategy, they are equipped with their understanding of the aspects of different text genres to understand the information better. In addition, genre approach is a learner-centered approach that helps students be independent learners. Hence, the

combination of metacognition and knowledge of text genres complements in the meaning construction process.

Visual literacy

Visual literacy is defined as the ability that a reader or viewer has in order to read, interpret and make sense of visual images (Vasquez, Comer, & Troutman, 2010; Ananda et al., 2019). It is important for this study to investigate and interpret the information presented by students in their visual representations by analyzing some aspects involved in visual literacy. These aspects were included in the framework of analysis created for this study based on some scholars. This study considered Kress and van Leeuwen's (2006) discussions about the use of vectors or arrows to describe the relationship between participants in a picture or drawing. From the use of arrows, this study found out whether or not students organize information sequentially following the organization in the text they are reading. This study also consulted Chan (2010), Chan and Unsworth (2011), and Unsworth and Chan (2009) to investigate the relationships between image and language in students' visual representation. Some relationships adapted for analyzing students' drawing in this study are given different terms as 'co-referential', 'additive', and 'symbiotic'. Co-referential relation has been used for the images and language that communicate the same meaning. The additive is for the images and language that clarify meaning. Symbiotic is for the images and language that cannot be alone in giving meaning; they have to be together to make the information meaningful.

To identify the quality of image features –or the formation of the image—, this study consulted Callow (2013) and Joyce and Gaudin (2007) and concluded two types of quality: factual and non-factual. The factual quality includes a diagram of processes/steps and event sequence, while non-factual quality includes artwork, problematic event sequence, and character organization. The type of language in the visual representations was also identified. Three types of language were concluded to include in the analysis: lexical, for the language, used to name an image; syntagmatic, in the form of phrase or clause to clarify the meaning of an image; and text organizing language, to link information in a drawing. Furthermore, due to the combination of metacognition and genre approach in the intervention, this study considered additional aspects in the framework of analysis; these are genre- and non-genre specific. Thus, students' drawings were also identified as one of these two categories. In sum, this study concluded four aspects for the analysis of students' visual representation; these are visualization strategy, including the investigation of the organization of information, quality of image features to identify the type of quality, language features to find out the type of language use, and relationships between images and language. This study suggests that the aspects in the framework can be used to analyze visual representations of texts written in different genres. The summary of the analytical framework used to analyze students' visual representations is presented below:

Table 1: The analytical framework

Visualization Strategy									
Order of Information				Organization of information		Characteristics of Image		Type of Image	
Sequent			Not sequent	Static	Dynamic with appropriate text organizing image (+ = → 1 2 3)	General (+Outline)	Specific (+details)	Genre appropriate	Not genre appropriate
Matches text's sequencing	Representation of text								
yes	no	accurate	partially						

Qualities of image features				
Factual (Non-narrative)		Non-Factual (Narrative)		
Diagram of processes/steps	Event sequence	Scenery/Landscape (Artwork)	Problematic event sequence	Character organization

Language Features		
Lexical (Labels)	Syntagmatic (phrase, clause)	Text organizing language (language relates to structure/method of development in text)

Relation between image and language						
Illustrative only (doesn't add to text)	Image dominant	Language dominant	Co-referential	Additive (clarify)	Parallel (different course)	Symbiotic

Each visual representation drawn by the students was analyzed using this framework. This study provides an empty column at the very bottom of each aspect in the analytical framework shown above. The empty column is used for the researchers to put tick (√) sign which is based on the result of the analysis. For example, in terms of the qualities of image features, if a student's visual representation is drawn as a diagram of processes, the researchers then put tick (√) sign as shown in the following example:

Qualities of image features				
Factual (Non-narrative)		Non-Factual (Narrative)		
Diagram of processes/steps	Event sequence	Scenery/Landscape (Artwork)	Problematic event sequence	Character organization
√				

Method

This study is action research which is characterized by introducing an intervention, trying it, and then reflecting on it to change and improve classroom academic performance (Burns, 1997, 2000; Cohen, Manion, Morrison, 2000; Kemmis, McTaggart, 1981). In this study, visualization was introduced and encouraged in reading processes to improve reading performance. The teaching was combined with the introduction of text genre, including the aspect of text purpose, generic structures, and language features. This research was conducted in two cycles. Each cycle followed four steps of action research mentioned by Cohen, Manion, and Morrison (2000); these are planning, acting, observing, and reflecting. To achieve more validated answer to the research question posed, this study collected data from the students studying at English Education Department (EED) of Syiah Kuala University. Prior to participating in the action research, the students were given a pre-test. Afterwards, in the online classroom, the students were asked to draw a representation for each text being read. Their reading and drawing processes were guided using a genre-based approach. They also undertook a post-test after each cycle (the first and

the second cycle). Hence, the data collected by this study include students' worksheets from the pre-test, post-test 1 and post-test 2, and students' visual representations. The test results were analyzed quantitatively using repeated measure ANOVA to find out if there is an increase in students' score of reading comprehension after following the intervention, and if there is, to investigate if the increase from pre-test to post-tests is significant or not. Students' representations were analyzed qualitatively using a framework adapted from the literature on visual literacy as discussed previously in this paper.

Participants
The participants in this study were eight students – chosen purposively. The students should have passed Interpretive Reading unit. This criterion is set because by having passed the unit, the students should have been familiar with different text genres and are ready to be introduced to academic texts. In the recruitment phase, this study announced to the EED students about the need to have participants to be treated in the online intervention classroom. After the announcement, eight were chosen because, according to Cohen, Manion, and Morrison (2000), five or six students would be sufficient for a qualitative study unless the population is heterogeneous.

Research instruments
There are two research instruments employed in this study; these are the review of documents and tests. The review of visual representations drawn by the students in the intervention helped this study to identify the improvement of their reading comprehension. The tests were conducted to match the results of qualitative analysis from students' visual representations. The tests include pre-test, post-test 1 and post-test 2. The pre-test was conducted prior to the intervention to see students' reading performance in English academic texts before following the intervention. After the completion of the first cycle of the action research, students undertook post-test 1. This was to investigate whether or not students indicated an improvement in the academic reading performance. To validate and hopefully confirm the results from post-test 1, post-test 2 was also given for students at the end of the second cycle of this action research. In each test, there are two explanation texts given; each is followed by a set of comprehension questions. The texts in each test are academic in nature, which were taken from TOEFL reading sections. The comprehension questions were varied between choosing multiple answers, completing sentences, answering open-ended questions, and briefly paraphrasing a paragraph. There are three types of questions identified in the tests: they are literal, inferential, and interpretive. The literal questions asked students to find for example, synonym or antonym from a certain word. The inferential questions required drawing a conclusion, making an inference, and giving an opinion. The interpretive type asked students to understand and interpret meaning and information from symbols and images. An improvement of comprehension in reading can be demonstrated both from the review of students' drawings and the tests.

Teaching design
The teaching design was implemented in the action step (intervention) of the action research. One of the researchers of this study acted as the online classroom teacher for the intervention. Five online classroom meetings were conducted in each cycle; each meeting lasted for one hour and thirty minutes. Woolley (2010, 2007) suggests three reading phases to apply visualization strategy. Accordingly, the teaching in this study was conducted in three phases: before, during, and after reading. In the before-reading phase of each meeting, the teacher and students discussed about visualization strategy and the advantages of the strategy in reading. The discussions lasted for about fifteen minutes. Thereafter, students were given an academic text in English. In during-

reading phase, students were introduced to the genre of the text being read. The introduction involved a discussion about the purpose, stages, and language features of the text. Using the aspects of text genre to analyze the text, students are encouraged to generate mental imagery to closely think of and try to understand the information communicated in the text. Thus, students began to construct meaning from the text by the activation of cognitive capacity by the use of visualization metacognitive strategy. In the discussions, students talked aloud about their interpretation of the text as a result of visualizing activity and the understanding of text genre. The activities in during-reading phase lasted for about fifty minutes. In the after-reading phase, students were assigned to draw a visual representation of the information they already understood from the reading text. The time given for this task is twenty-five minutes. Students were given the opportunity to monitor their comprehension by looking at their own representations and to confirm their understanding of the meaning in the text.

Results
Pre-test and post-tests

In the pre- and post-tests, students were encouraged to generate mental imagery (internal visualization) and analyze the given texts by focusing on the aspects of the genres of the texts that they have already understood to enable them to engage with and comprehend the texts. Due to the time constraint in the tests, students were encouraged to do external visualization limited to the meaning that was difficult to understand. The results of the pre-test, post-test 1 and post-test 2 were analyzed quantitatively by counting the correct answers and calculating the percentage of correct answers. The statistical significance was calculated by entering pre-test and post-tests scores into a software called 'Repeated Measures ANNOVA'. The following table presents the results.

Table 2: Paired samples statistics.

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pre (%)	47.25	8	10.403	3.678
	post-1 (%)	67.50	8	10.650	3.765
Pair 2	post-1 (%)	67.50	8	10.650	3.765
	post-2 (%)	74.38	8	17.451	6.170
Pair 3	pre (%)	47.25	8	10.403	3.678
	post-2 (%)	74.38	8	17.451	6.170

The above table shows an increase in the mean from the pre-test to post-test 1, then from post-test 1 to post-test 2, and also from the pre-test to post-test 2. The increase in the mean from the pre-test to post-test 1 is 20.25 points, with a standard deviation of 10.403 in the pre-test and 10.650 in post-test 1. From the difference between the means in the pre-test and post-test 1 and from the standard deviations of both tests, the increase in reading performance students made from the pre-test to post-test 1 can be considered statistically significant. This is due to the level of the standard deviation of both tests (10.403 and 10.650), which is smaller than the difference of both tests' means (20.25). Meanwhile, the increase in reading scores from post-test 1 to post-test 2 is only 6.88 points. This indicates that the increase is not significant because the standard deviations of post-test 1 and post-test 2 as shown in the above table, are bigger than the difference between both tests' means (6.88). However, the overall increase from the pre-test to post-test 2 is 27.13, which demonstrates a significant improvement in reading comprehension scores because this amount is larger than the

standard deviations in both pre-test and post-test 2. The results indicate that students' scores improved over time due to the application of genre-based visualization.

Figure 1 below demonstrates a significant improvement in the reading comprehension score from pre-test to post-test 1 and pre-test to post-test 2. It provides compelling evidence of the impact of the intervention on students' scores for reading.
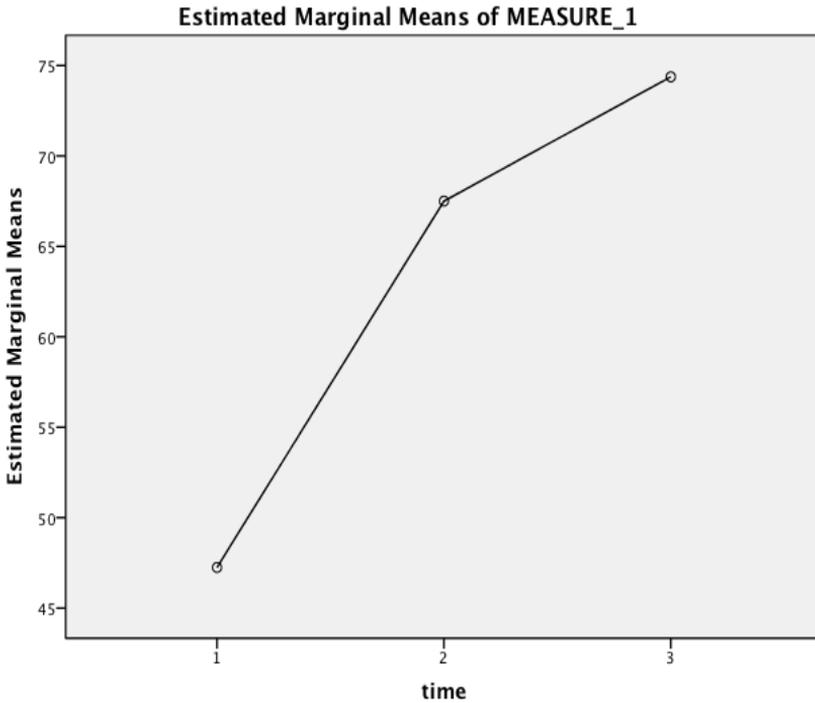
Estimated Marginal Means of MEASURE_1

Figure 1: Estimated marginal means of Measure 1

Visual representations

For this paper, the visual representations of the explanation texts of different topics are presented. Based on the literature on visual literacy discussed previously, this study concludes the characteristics of a genre-specific visualization for an explanation text.

In terms of visualization strategy, a representation of an explanation text includes sequent order of information that matches text sequences, dynamic organization of information, specific characteristics of the image, and genre-specific in nature. In terms of the second aspect, which is the quality of image features, the representation is best drawn as a diagram of processes. According to Macken-Horarik (2002) and Butt, Fahey, Feez, Spinks, and Yallop (2003), the purpose of an explanation text is to account for how and why things occur as they are. Hence, the representation is suggested to include the drawing of sequential processes in the form of a diagram. Moreover, the language features involved the use of labels to name an image, phrase or clause to clarify an image, and text organizing language to lead the development of information in the drawing. The type of relationships between images and language in the representation is suggested to include co-referential or labeling an image based on its term, additive or clarifying information presented by an image, and symbiotic or complementing in giving information. The topic of the explanation text

students read and visualize in the intervention is about the making of chocolate. The aspects of the analysis of this text are discussed based on Image 1.

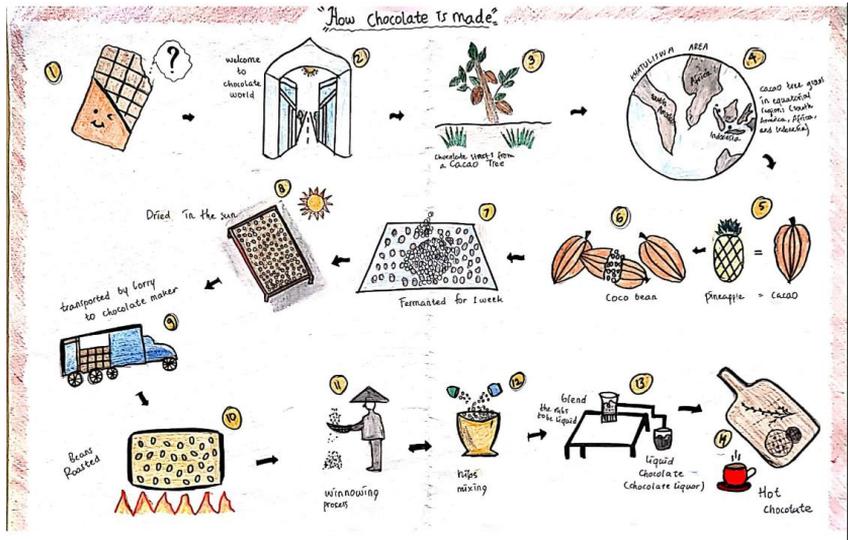**Image 1: ZA's visual representations of an explanation text**

Image 1 is drawn by a student (coded here as ZA) in the intervention. The drawing is a combination of images and language. The language use is English, following the language in the text. Based on visualization strategy aspect, she provided sequent order of processes of how chocolate is made. This is shown by the divisions of image and language she drew. As we can see, there are fourteen images that she has numbered in her visual representation. The first image is accompanied by language; then she drew the second image which is also accompanied by language. She continued drawing the same pattern until the last image. The divisions she made suggest different processes of chocolate making. This is linked to the organization of information appearing in the representation. The organization is shown by the use of arrows and numbers to connect and indicate the processes from the first to the last. Hence, the drawing presents a dynamic organization of information. In addition to the visualization strategy, the images drawn are specific to characterize the participants informed in the text, for example, the images of 'cocoa tree', 'cocoa bean', 'roasted cocoa beans' and 'chocolate liquor'.

ZA drew the representation as a diagram of processes. As mentioned above, this is indicated by the arrangement of images and language connected to each other using arrows and numbers as text organizing images. Furthermore, the language use has two functions: to label or name the images, for example, the image of the cocoa tree is labeled with its term, and to clarify the meaning presented by the images, for example, the image of a container truck is accompanied by a phrase 'transported by lorry to chocolate maker'. The use of language is found to be complementary to the meaning of the images. The last aspect of the analysis is the relation between image and language. Based on the presentation of the images and the language accompanying them, the relation is found to be co-referential where both image and language communicate the same meaning; and additive, where the language clarifies the information. She also presented a symbiotic relationship for example, the drawing of

equal sign (=) accompanied by a phrase 'pineapple = cocoa' to inform that the size of a cocoa is similar to the size of a small pineapple. Accordingly, Image 1 drawn by ZA is considered as a genre-based visual representation because from the characteristics, it clearly presents the purpose of an explanation text, which is to account for the way chocolate is made, and follows the stages of the text by introducing the phenomenon by the title and then sequencing the processes. Now we see another example of visual representations drawn by the students.

Image 2: AL's visual representations of an explanation text
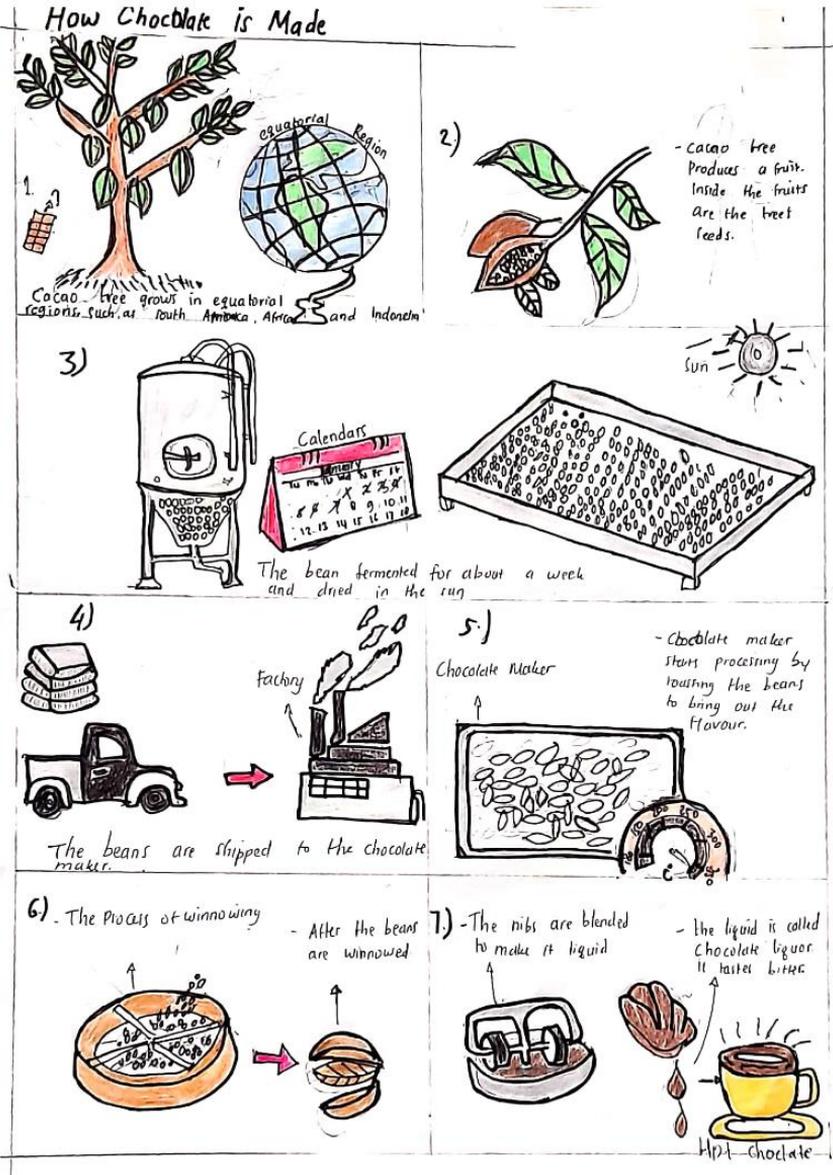
The explanation text represented in AL's drawing tells about the process of how chocolate is made. AL divided her drawing into different frames. The use of frames is meant to separate the procedure of making chocolate. In each frame –from the first to the seventh–, AL drew and wrote each step respectively: cocoa trees grow in equatorial regions, cocoa trees produce fruit that has cocoa beans inside, cocoa beans are fermented and then dried, cocoa beans are transferred to chocolate makers, cocoa beans are roasted, cocoa beans are winnowed, and cocoa beans are blended and made liquid. This indicates that the order of the steps in the frames is sequential. In addition, the organization of the steps presented by the use of the frames is considered dynamic. The use of arrows in each frame was found to help to organize each step of making the chocolate procedure. Readers or viewers can easily follow the development of the steps from the beginning to the end. The images drawn in each frame characterize the cocoa and other participants mentioned in the text. AL drew her visual representation as a framed diagram process indicated from the organization of frames to indicate the order of the steps. The use of language is found to be lexical, for example, the image of the cocoa tree is named with 'cocoa tree' in the second frame; syntagmatic by using a phrase or a sentence, for example, in the fourth frame where a sentence is written as 'the beans are shipped to the cocoa maker' to clarify the image of a pick-up car and a factory; and text organizing language, for example, the writing of number in each frame that help to organize the steps.

There are three types of relation between the images and language identified in AL's drawing. The first one is as co-referential where both image and language convey the same meaning, for example, in the third frame, where the image of a calendar is named 'calendars'. The second one is additive, where the language is used to clarify the meaning communicated by the image; for example, the image of winnowing in the sixth frame is accompanied by a clause 'the process of winnowing'. The last type is symbiotic, where both the image and language cannot stand alone in giving information; for example, in the fifth frame AL drew images of an oven with cocoa beans inside and a temperature button at the bottom right corner of the oven, which is accompanied by a clause' chocolate maker starts processing by roasting the beans to bring out the flavor'. The combination of the images and the clause informs the process of roasting the cocoa beans. Without the clause, the images we see in the fifth frame cannot convey the complete meaning. From the characteristics of AL's visual representation based on the framework of analysis, this study assumes that the drawing can be considered as a genre-specific visual representation of the explanation text.

Discussion

This study aimed at improving students' reading comprehension in reading academic texts at TOEFL level. The quantitative analysis of the tests' results indicated an improvement in students' reading comprehension of academic texts. After following the intervention in the first cycle, the students benefited from the use of genre-based visualization metacognitive strategy, which is shown from the significant improvement in posts-test 1. This benefit is also seen from the results of post-test 2 after the second cycle, even though the analysis of Repeated Measures ANNOVA indicated that the improvement in this second post-test is not considered significant. Nevertheless, the classification of the two post-tests is significant or insignificant, the main purpose of this study to improve students' reading comprehension is achieved, and this purpose is demonstrated in the post-tests' results. In other words, the application of genre-based visualization by students when undertaking the tests helps them to comprehend the text and increase their score in the TOEFL reading section.

The qualitative analysis of students' visual representations indicated similar results regarding the improvement of students' reading comprehension of academic texts at

TOEFL level. Over time, the students were able to show an improvement in reading comprehension indicated from the analysis of the characteristics of students' drawings. The analysis emphasized the changes in the features appearing in the first until the last drawings that each student produced in the intervention. The changes can be discussed based on the aspects of the analysis. In this paper, this study presents a student's (coded here as NZ) visual representations as the examples that indicate the changes.

Image 3: NZ's visual representation of an explanation text

Image 3 is the visual representation drawn by NZ to represent an explanation text about Arctic haze formation as one of the topics given in the intervention. According to visualization strategy, Image 3 shows that NZ was not able to order the phenomena of the Arctic haze sequentially. Even though she tried to present the processes through drawing detailed images such as the images of trees and smog, readers or viewers cannot exactly follow the sequential steps because NZ did not include arrows or numbers to connect the processes. In terms of the quality of image features, NZ drew the image as a panoramic one, not a diagram of processes. Moreover, NZ did not include the use of language to label and clarify the information presented by the images. In conclusion, NZ's very first visual representation does not completely represent the purpose and stages of an explanation text and is not considered genre specific. Nevertheless, after few meetings, NZ indicated positive changes of the features in her drawing that can be discussed based on Image 4.

Image 4: NZ's visual representation of an explanation text
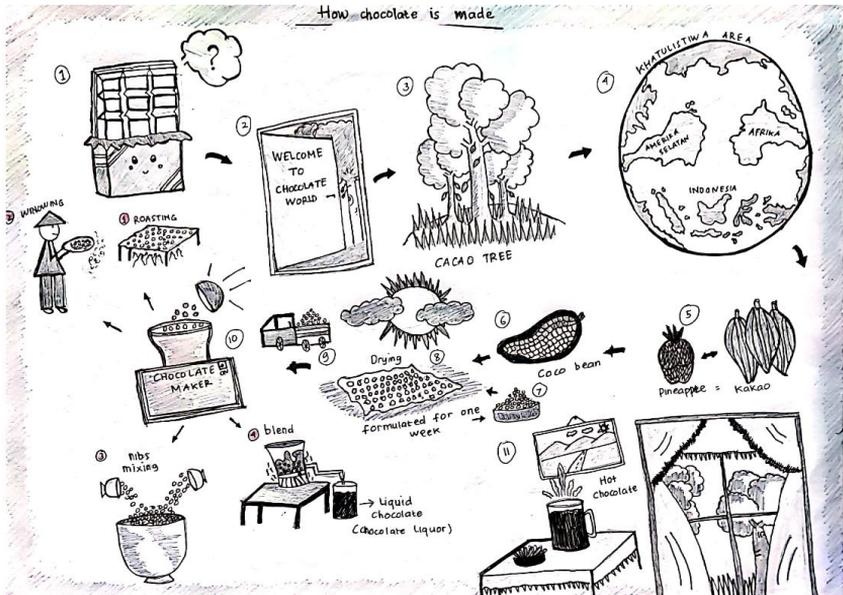
In Image 4, NZ included the use of numbers and arrows to link the processes of making chocolate. The images drawn are more detailed compared to the ones she drew for the Arctic haze text. Drawn in the form of a diagram process, the images present detailed characteristics of the participants involved in the processes. The organization of the processes drawn by NZ indicates a sequential order that matches text sequencing. NZ also has included language in her drawing to give the name to the images as well as to clarify the meaning of the images. The relationships between the images and language are found to be as co-referential and additive. Based on the analysis, the features of NZ's visual representation in Image 4 is better than those found in Image 3, and can be considered a genre-specific visualization.

Based on the analysis, the changes in features found in students' visual representations indicate some important points. Firstly, with regular practice, students can better visualize text's content internally or externally following the correct information of the text in the three reading phases (before, during, and after) as suggested by Woolley (2010, 2007). Secondly, students can be more engaged to the text they are reading to construct meaning (Pressley, 2002; Snow, Sweet, 2003) for comprehension, which is the main aim in a reading process (Palincsar, 2003). Thirdly, students are aware of different text genres important for them to analyze and get the meaning of the text. This includes their awareness of the purpose, stages, and language features of each text genre that helps them in visualizing the texts. As can be seen, students are able to represent the purpose of the text giving information. For example, in a visual representation of the explanation text, students are able to entertain readers or viewers by sequentially ordering the processes of natural phenomena mentioned in the text. When doing this, students are also able to organize the images based on the stages of the text. The features of the language involved in the representation also follow the features found in the text. This has promoted genre-based literacy learning in second and foreign language classrooms, as suggested by Hyland (2007, 2003). Lastly, the positive changes in the features demonstrate students' better comprehension of the text

they read. In other words, students' ability to visualize academic texts supported by their awareness of text genres is beneficial for them to improve comprehension. The benefit of doing visualization by the students of this research in the reading process is in line with the previous studies of the same research area from the earliest to the current ones (e.g. Anderson, Kulhavy, 1972); Levin et al., 1973; Levin, 1973; Pressley, 1976; Hobbs, 2001; Woolley, 2010, 2007, 2006; Park, 2012; Kigotho, Fitriani, 2018; Fitriani, Erdiana, Samad, 2019). In addition, the process of achieving comprehension in academic reading as what the students have done in the intervention of this study is suggested to help them in undertaking TOEFL reading section and obtaining an expected score in order to fulfill one of the university's requirements and thereafter to continue further education.

Pedagogical Implications
The implications of this study are drawn in relation to the teaching of genre-based metacognitive strategies. In preparing students to comprehend academic texts at TOEFL level, it becomes more critical that reading teachers introduce the concept and understanding of metacognitive strategies. Students' awareness of metacognition can be encouraged by involving strategic activities, such as those which include visualization. It is also important for reading teachers to include the teaching of text genre knowledge while introducing metacognitive strategies, especially to those who struggle with academic texts at TOEFL level. This study has indicated that the application of genre-based visualization metacognitive strategy has turned the EFL students to become strategic readers who are likely to think of and engage with academic texts at TOEFL level. The crucial implication of using genre-based visualization for EFL students is their understanding of the importance of active reading for the purpose of comprehension. This strategy helps students to become independent learners, and this skill is crucial for them to solve problems in comprehension in both offline and online learning platforms.

Conclusion
To conclude, firstly, both the qualitative and quantitative data obtained by this study support the application of genre-based visualization to promote reading comprehension of English academic texts at TOEFL level for students in EFL context; and secondly, genre-based visualization is also applicable for an online classroom to help students engage with academic texts. Even though this study has demonstrated positive results by the use of genre-specific visualization, this article is always open for criticism and improvement due to its limitations; for example, there was no introduction of explicit step-by-step procedure of visualization that students can follow to visualize a text based on its genre. Students learned to visualize texts by themselves. Therefore, this study suggests other researchers to conduct a similar study by providing clear steps of how to visualize a text based on its genre, considering that visualizing activity is not an easy one to do, particularly when students need to represent the meaning of a text.

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