Effects of multimodal tasks on
students' critical reading ability and perceptions

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Abstract

This study investigated the effects of multimodal tasks on critical reading ability and perceptions of Thai university students. To compare effects on critical reading ability, students were randomly assigned to experimental and control groups and assessed with pre- and post-critical reading tests. Furthermore, reflective journals and semi-structured interviews were used to gain in-depth information about students' perceptions towards the multimodal tasks. The findings revealed that the experimental group with the treatment of multimodal tasks outperformed the control group in critical reading test scores. Furthermore, evidence from the reflective journals and semi-structured interviews showed that students generally had a positive perception of the multimodal tasks. The multimodal tasks not only assisted them in proposing critical reading ideas and fostered analytical thinking skills, but also enhanced intrinsic motivation and learning autonomy.

Keywords: critical reading, English as a foreign language (EFL) reading, Learning by Design, multiliteracies, multimodality in English language teaching, multimodal tasks

Background of the Study

The ability to read critically is considered necessary in the 21st century since people are now living in a world saturated with digital texts. This makes access to numerous knowledge and information sources easier than it has ever been. With a single mouse click, anyone can simply read anything posted online. In order to empower students to be better learners and to assess what they read, they need to be aware that online information is not always accurate. Thus, learners should be trained how to approach any text critically.

In the education system of many countries, critical reading has been given a prominent role, whether it is for the first language (L1) or the second language (L2) reading. The same is true for Thailand where English is considered a foreign language. For over two decades, the country has

attempted to produce a workforce that can interpret data and make rational decisions in an online environment overly saturated with information (Sompakdee & Pojananon, 2011). As a result, Thai students are required to possess the ability to reason, criticize, and evaluate English reading texts.

Despite this tireless effort, the lack of critical reading skills among Thai students, who learn English as a foreign language (EFL), still prevails. As indicated in several previous studies, the cause of the problem lies in a traditional grammar-translation teaching approach in which teachers take the role of being the translator of the text and the provider of meaning and interpretation while students take the passive role of being recipients of knowledge (Buranapatana, 2006; Chomchaiya, 2014; Sawangsamutchai & Rattanavich, 2016; Tangpinijkarn, 2015). This approach has been vastly criticized as ineffective because it does not provide many opportunities for students to train their critical and analytical thinking and leaves them less motivated in learning. Consequently, most Thai students end up being unable to make use of their critical reading skills and thus develop negative attitudes toward English reading (Punthumasen, 2007).

The same problem also exists in the researchers' classroom. Over years of teaching an English Reading course at the university level, the researchers have observed that the majority of students had difficulties in improving their ability to make inferences and form conclusions, which are the sub-skills of critical reading, to the desired level. Lacking the ability to read critically led to several further problems in their academic life since, at the university level, students are expected to read texts and display their critical reading ideas in their assignments and through their assessment systems. Consequently, the students would become discouraged by the lack of progress, resulting in a constantly reduced motivation to learn.

In light of the problem and its repercussions, this study was conducted to investigate an effective pedagogical approach to enhance the critical reading ability of Thai university students.

To confirm that the problem was not exclusive to the researchers' practices, a preliminary investigation was carried out through interview sessions with other teachers who teach the English Reading course in order to obtain the baseline data on their current practices and concerns about the problem. The results confirmed the existence of the problem. Apart from the traditional grammar-translation teaching method, the data from the preliminary investigation revealed that reading assignments were another issue. The assignments focused more on the ability to summarize ideas and to retell information than to tap into higher-order reading skills. More importantly, the fact that the assignments were restricted by the linguistic ability of the students to write an answer posed another problem. That is, it hindered students from confidently proposing and expressing their critical reading ideas, especially those who had a limited vocabulary range and poor writing skills. This resulted in the students' lack of progress and motivation.

Recent studies have paid increasing attention to multimodality as an instructional approach with the potential to improve the situation. Several researchers have a particular interest in how multimodality could contribute to the learning enhancement and motivation of students. This is exactly the concern of this present study. That is to say, it proposed the incorporation of

multimodal tasks as an alternative teaching method of critical reading and explored its effects on critical reading ability and perceptions of Thai university students.

Motivation for the Study

Extensive reviews of previous research studies on promoting students' critical reading ability, particularly in Thailand, revealed that the use of multimodality was scarce. Indeed, most of those previous studies examined the traditional text-based paradigm in which linguistic intelligence is only what counts. For example, Ueai-Chimplee (2007) adopted the reader response approach in which students were required to write their critical reading responses to a reading passage. Sompakdee and Pojananon (2011) employed the Effective Reading Skills in Content Areas (ERICA) model that directed students through the four critical reading steps of preparing for the topic, thinking through reading, extracting and organizing information, and transferring information through writing. Furthermore, Srisirasasipon (2014) used a research-based learning approach integrated with self-monitoring (RBLSM) and Thonglon and Sroinam (2014) tried out the Know-Want-Learn-How (KWHL) Plus technique.

Even though there have been an increasing number of research studies investigating the implementation of multimodality into English language teaching in EFL contexts, there is far less discussion on pedagogical implications that are specific enough to be useful in the teaching of critical reading. For example, Boshrabadi and Biria (2014) explored the effects of using multimodal texts on reading comprehension and perceptions of Iranian high school students and Lee (2013) investigated students' creation of multimodal responses to a classic work of English literature on reading comprehension.

This study was conducted with the expectation that researching in corporation of multimodal tasks when teaching critical reading would fill in these gaps.

Objectives and Research Questions

This study aimed to investigate the effects of multimodal tasks on critical reading ability and perceptions of Thai university students.

Two research questions include:

1. To what extent do multimodal tasks enhance critical reading ability of Thai university students?
2. What are students' perceptions towards multimodal tasks?

And the hypotheses are:

H_0: The use of multimodal tasks cannot enhance students' critical reading ability.
H_1: The use of multimodal tasks can enhance students' critical reading ability.

Literature Review

Critical Reading

The philosophical root of critical reading can be traced back to the liberal-humanist approach of reading during the 1940s to 1970s. The liberal-humanist scholars highlighted the distinction between truth, also known as facts about the world, and rhetoric, which comprises inferences and judgments that people can make. In their view, no text, regardless of quality and authority, contains its pre-determined meaning. Thus, readers are required to approach a text with skepticism in order to understand an author's intention and decipher the validity of information (Cervetti, Pardales, & Damico, 2001).

Critical reading is considered a high-level reading ability. It is different from reading to extract information in that it entails rational thinking for making judgments about a text (Smith, 1963). Tierney and Pearson (1994) added that critical reading is an active process that involves the interplay between a text and readers in the sense that their background knowledge and experiences are the key to the careful evaluation and analysis of the text. It is a process of questioning, analyzing, and evaluating information that a person obtains in order to make a sensible conclusion about a text. Critical reading helps readers manipulate data and analyze information before making a final decision regarding whether what they are reading is true, useful, or reliable (Koehler, Mishra, Kereluik, Shin, & Graham, 2014).

Different scholars have proposed different sets of critical reading sub-skills. However, seven of them are frequently overlapped (Ueai-Chimplee, 2007). These seven sub-skills of critical reading comprise the abilities to (a) distinguish between fact and opinion, (b) identify an author's purpose, (c) recognize an author's tone, (d) recognize an author's attitude, (e) recognize an author's organizational patterns or writing style, (f) draw inferences or logical conclusions, and (g) identify a source of information. These seven sub-skills are all about readers discovering authorial intention as a path to evaluate ideas and to reflect on the presented information for the sake of better understanding. Hence, it is crystal-clear that critical reading is an active reading in which the reader's role is highly stressed.

Multimodality

The term "multimodality" refers to the use of two or more modes in communication and meaning construction (The New London Group, 1996). The modes are linguistic, visual, audio, gestural, and spatial. Described by Jewitt (2008), linguistic mode comprises vocabulary, structure, and the grammar of oral and written language. Visual mode refers to the use of colours, vectors, scenes, perspectives, and viewpoints in both still and moving images. Audio mode is the rhythm of music and sound effects. Gestural mode contains the physical act of signings and a wide range of movements. Spatial mode includes architectural, environmental, and geographical meanings such as direction, position of layout, and organization of objects.
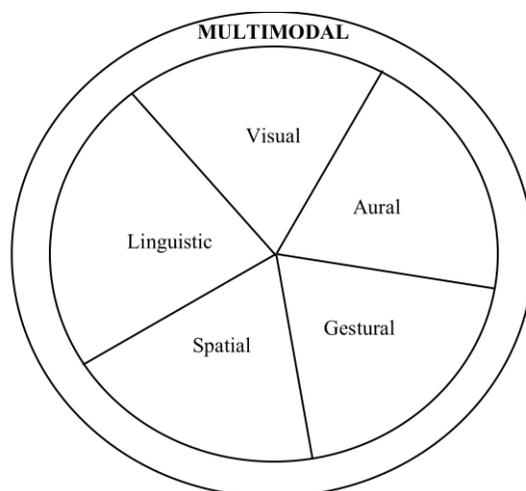
Figure 1. Five multimodal modes.

The foundation of multimodality lies upon the idea that different modes have different affordances for meaning making. Even though social linguists consider speech and writing as the ultimate factor in carrying meanings, social semioticians do not perceive it that way. In a multimodal sense, modes such as audio, visual, or spatial do not only expand, exemplify, or modify the linguistic meaning but work simultaneously in representing meaning in order to empower the way people communicate (Jewitt, 2008). Each mode has its own distinctive feature and it creates specific meaning or different communicative activities for both message senders and recipients (The New London Group, 1996). The interplay between multimodal modes provides unique and endless possibilities in conveying information.

In sum, multimodality describes approaches that understand communication and representation of messages beyond merely language. It considers how individuals make meaning with different kinds of modes (Rowsell & Walsh, 2011). Since communication now encompasses multimodal, multimodality has received growing attention in the field of literacy, especially English language teaching, because it can offer a powerful pedagogy that reflects students' real life knowledge and experiences.

The integration of multimodality into pedagogy highlights the use of multiple modes in learning experiences. Owing to the fact that the multimodal communication platform is now deeply ingrained in the lives of students in the digital age, students today are fundamentally different from previous generations in terms of out-of-classroom practices, which have a great influence on their styles and preferences in learning (Derakhshan & Faribi, 2015). To more effectively engage today's students, a teaching method that merely pays attention to a linguistic strand may no longer be enough. The notion of literacy has been expanded to include the ability to convey and receive meaning via various modes such as images, sound, videos, and gestures (Kress, 2003). Thus, teaching and learning practices need to be reconceptualized to meet the recent requirements of the World Wide Web society. This is why multimodality comes into play.

Advocates of this teaching paradigm, such as Stein and Newfield (2006), have encouraged teachers to integrate multimodality into curriculum, pedagogy, and practices and focused on mode as a defining feature of communication in learning environments. The key principle for doing so is to increase the engagement and improve the learning performance of students by offering a learning mechanism that is interactive in nature, acts as a catalyst to empower their thinking, and that is tailored to students' individual preferences of communication and representation (Lee, 2014).

Multiliteracies

In order to infuse multimodality into teaching, The New London Group proposed the pedagogy of multiliteracies, which embraces the combination of multimodal modes within a wide range of literacy practices. Thus, multiliteracies are considered as an approach to language and literacy development that affords the tools for promoting multimodality. As Rowsell and Walsh (2011) stated, multimodality informs principles of how people make meaning but multiliteracies give a possible pedagogy or a tool for doing so.

The term "multiliteracies" refers to multiple literacies that are stretched beyond the constraints of written and spoken language. The fact that people can incorporate various features like audios, videos, pictures, and animations to communicate a message to the world or among individuals opens up new possibilities for communication (Jewitt, 2008). Based on this view, literacy is no longer a set of linguistic skills one must master, so it needs to be pluralized into literacies.

In line with Jewitt (2008), The New London Group suggested that the pedagogy of multiliteracies matched with the twin goals of literacy education. The first goal is to expose students to multimodality and the second is to equip the students with the necessary tools for active and critical engagement with these new forms of meaning making resources. The key principle of the multiliteracies pedagogy is to ensure that active participation and intellectual engagement of students are scaffolded through a range of tasks such as thinking, discussing, problem-solving, synthesizing, theorizing, or drawing conclusions (Haren, 2010).

Multiliteracies are centered on promoting the acceptance of other forms of literacies, which include linguistic, audio, spatial, visual, and gestural literacies. In order to facilitate it, students need to engage in a process of designing in order to produce a transformed product. The concept of designs for learning emphasizes the notion that knowledge is no longer produced through a single semiotic system but through the combination and integration of a design system (The New London Group, 1996). This does not mean that multiliteracies discredit the conventional form of literacy. It is viewed as an approach that allows students to express their knowledge through different modes. According to Kress (2003), the pedagogy of multiliteracies provides the opportunity for students to make meaning by integrating their languages, cultures, and multiple expressions of knowledge.

Learning by Design

Underpinned by the pedagogy of multiliteracies, Kalantzis, Cope, and the Learning by Design Group (2005) developed the Learning by Design framework that provides the four major knowledge processes for teachers to design classroom activities and tasks.
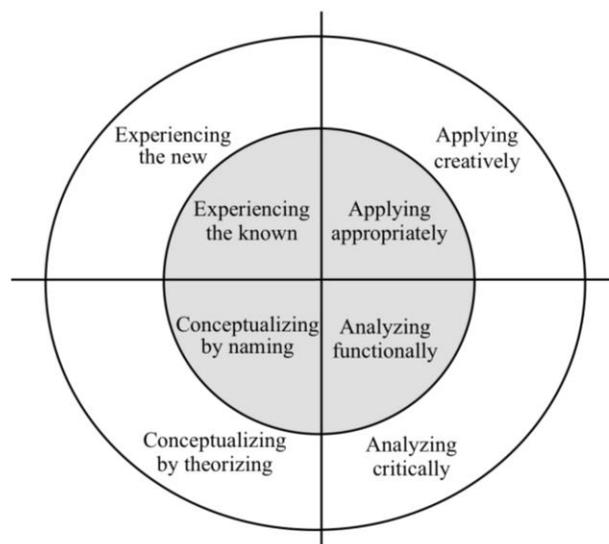

Figure 2. Learning by Design framework. Adapted from *Learning by design* (p.5), by Kalantzis, Cope, and the Learning by Design Group, 2005, Melbourne, Australia: Victorian Schools Innovation Commission.

Shown in Figure 2, the informed knowledge processes include experiencing, conceptualizing, analyzing, and applying and are broadened into eight pedagogical acts; namely, experiencing the known, experiencing the new, conceptualizing by naming, conceptualizing with theory, analyzing functionally, analyzing critically, applying functionally, and applying creatively.

The first knowledge process is experiencing that involves "experiencing the known" and "experiencing the new." The process mainly aims to connect classroom learning to out-of-school experiences. Due to the fact that human cognition is situated and contextual, Kalantzis et al. (2005) believed that effective learning should be grounded on students' experiences, interests, and motivations. As the name suggests, "experiencing the known" is similar to activating students' schemata; whereas, "experiencing the new" entails an immersion in an unfamiliar domain of experiences.

Conceptualizing is another knowledge process. It focuses on developing understanding of subject matter and a shared language for further learning among students. According to Kalantzis et al. (2005), conceptualizing is not merely a matter of teaching or textbook telling but a process where students actively conceptualize and generalize the knowledge. "Conceptualizing by naming" involves grouping things into categories or identifying some similarities and differences, while

"conceptualizing with theory" entails generalizations by connecting concepts and developing theories.

The next knowledge process is analyzing, which includes the examination of causes and effects, structure and function, and elements and their relationships. It requires reasoning in the form of explanation and argumentation. "Analyzing functionally" requires students to examine the function of a piece of knowledge, action, object, or represented meaning. "Analyzing critically," on the other hand, requires students to reason, draw inferential and deductive conclusions, as well as explore human intentions and interests.

Lastly, applying is the knowledge process in which students actively apply experiential, conceptual and critical knowledge. For "applying appropriately," students simply try their knowledge out in real world or simulated situations to see whether it works in a predictable way in a conventional context. For "applying creatively," students make a creative intervention in the world in order to express their own voices or transfer their newly acquired knowledge and ideas into a new setting. This results in imaginative originality, creative divergence, or hybrid recombination and juxtapositions that generate novel meanings and situations (Kalantzis et al., 2005).

In conclusion, the Learning by Design framework provides the four major knowledge processes for teachers to design classroom activities and tasks, not only to engage students with active learning, inquiry, and problem solving, but also to immerse them in an environment where they can use multimodality as a means to interrogate and communicate their ideas and expressions (Kalantzis et al., 2005).

Previous Studies of Multimodality in English Language Teaching

A number of research studies were conducted from different angles in order to understand how multimodality contributed to English language learning achievement. Benson (2008) examined the ways language arts teachers embed multimodality into teaching. By observing, taking field notes and memos, interviewing students, and analyzing students' works, findings showed that multimodality freed students' thinking and encouraged them to think critically about the contents they specifically communicated and the target audiences.

Lee (2014) conducted a case study to explore the effects of using an arts-integrated multimodal approach in which two male Chinese students had to engage in a series of multimodal responses to English literature over two consecutive years. Evidence from the students' writing assignments, their digital stories, their retrospective survey answers, and informal communications with the two students recorded in the teacher journal suggested that the multimodal-integrated learning increased the students' motivation and confidence. Most important of all, the students were found to have improved their ability to use a variety of techniques to make meaning and position themselves as generative and creative authors.

In the same vein, Oldakowski (2014) investigated the implementation of multimodal assignments. Data included observation, student-produced multimodal assignments, student reaction forms, students' rationales for representation, and debriefing sessions with the teacher.

The findings revealed that incorporating multimodal assignments not only provided evidence of students' thinking, but also improved their choices, their thinking, and their understanding of the content.

Furthermore, Darrington and Dousay (2014) examined the use of multimodal works to increase the motivation for struggling students to write. Results indicated that multimodal works could increase students' motivation when compared with traditional, paper-based writing assignments.

Recently, Lirola (2016) investigated the use of multimodal materials such as videos and Facebook in English language and literature subjects on students' development of five language skills; namely, listening, speaking, reading, writing, and interacting. The students were required to write an essay in response to a multimodal text with social content and presented their analysis to classmates orally. The findings showed that multimodal classes facilitated the students' learning process and favored their creativity, motivation, and autonomy. Not only did the students learn the content but they also developed critical thinking skills because they had to take an active role in making decisions about the topic of the oral presentation and its organization using multimodal resources.

Methodology

Research Settings

The present study was carried out at a public university in Bangkok, Thailand. The university provides a wide range of English courses, both compulsory and elective, to meet students' academic and future professional needs.

The course being investigated in this study was Fundamental English Reading. Based on the curriculum, the course is described as intermediate English for academic reading purposes. Its objective is to teach academic English reading skills necessary for students at the university level, such as vocabulary development, reading comprehension, and critical reading skills.

The structure of the course is comprised of two modules. The first module is vocabulary skills, which covers the first eight weeks of the semester. Lessons include analyzing word parts and using context clues to guess meaning of words.

The second module, on which this study focused, enforces the application of the reading skills. Lessons, therefore, focus on building reading comprehension and critical reading skills, such as finding the main idea and making inferences and forming conclusions from both fiction and non-fiction texts.

Research Design

This study used a quasi-experimental research design with mixed-methods of collecting and analyzing data. The major objective of this research study was to investigate the effects of multimodal tasks on critical reading ability and perception of the students. Therefore, the

independent variable was the teaching of critical reading through multimodal tasks. The dependent variable was students' critical reading ability and perception.
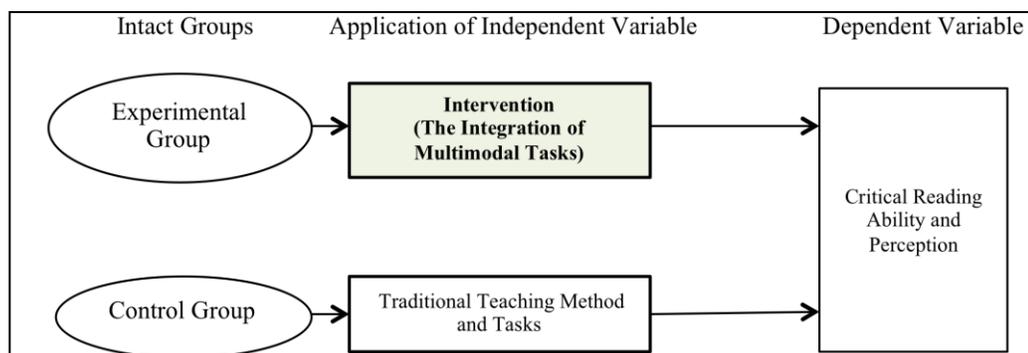

Figure 3. The design of the study.

This study included two groups of intact participants. The participants were randomly assigned to the experimental group and the control group. The two groups studied the same course contents prescribed by the syllabus on the same days (Tuesday and Thursday for 90 minutes each) for nine weeks with the teacher-researcher, the first author.

However, the differences between the two groups were the methods of teaching critical reading. The experimental group received an intervention in which they were taught critical reading through multimodal tasks. The participants in the control group were taught critical reading through a traditional approach in which they wrote answers to express their critical reading ideas.

Population and Sample

In the research context, the population was 600 students of different years of study and faculties who studied in the Fundamental English Reading course in the second semester of academic year 2017. The participants were chosen through convenience sampling method. They were a group of students who enrolled in two sections of the course that the teacher-researcher was assigned to teach. Based on the sampling technique, the participants were considered intact groups. Two intact groups of students were randomly assigned to the experimental and control group for the present study.

To be exact, there were 35 participants in the experimental group and 28 participants in the control group. In order to assure linguistic homogeneity, particularly related to their reading ability, a validated reading test taken from the university's proficiency test was administered to the participants in the two groups at the beginning of the semester.

Table 1. *Result of English reading proficiency test*

Group	N	M	SD	SE	t	Sig. (2-tailed)
Control	28	10.68	4.85	0.90	-0.823	0.414
Experimental	35	11.91	5.28	0.89		

Note. *$p < .05$

As displayed in Table 1, the result of the independent samples *t*-test showed that there was no statistically significant difference between the English reading proficiency scores of the participants in the two groups at 0.05 level (sig. = .414). Thus, it can be claimed that the participants were fairly equal in terms of their English reading proficiency.

Intervention

The intervention of this study was the teaching of critical reading through multimodal tasks. The framework adopted in developing the teaching model was the Learning by Design framework by Kalantzis and Cope (2005). The framework, consisting of eight knowledge processes, was mapped with the learning goals of the second module of the Fundamental English Reading course, which emphasizes reading comprehension and critical reading skills. The derived teaching model is described in Figure 4.

Learning by Design Framework (Kalantzis & Cope, 2005)		The Derived Teaching Model
Experiencing	**the known** Learners reflect on their own familiar experiences, interests and perspectives.	To activate students' schemata about a reading passage and review reading strategies and reading skills they have learned
	the new Learners observe or take part in something that is unfamiliar.	To introduce students critical reading skills
Conceptualizing	**by naming** Learners group things into categories, apply classifying terms, and define these terms.	To familiarize students with the terms and functions of multimodality as a new concept of expression and communication
	with theory Learners combine concepts in order to generalize schemas or develop theories in discipline knowledge.	To have students generalize the concept of multimodality to the reading course by designing a multimodal artifact that represents their understanding through a comprehension reading assignment
Analyzing	**functionally** Learners analyze logical connections, cause and effect, structure and function.	To train students how to approach a reading passage by analyzing the elements such as topic, main idea, supporting details, and key vocabularies for comprehension
	critically Learners evaluate their own and other people's perspectives, interests and motives.	To develop students critical reading skills so they are able to make inferences and form conclusions about a reading passage
Applying	**appropriately** Learners apply knowledge in a typical, expected situation	To have students apply comprehension reading skills via exercises in the coursebook
	creatively Learners transfer their learning to a different context through a creative innovation.	To have students design **a multimodal task** in order to present their critical reading stances to a reading passage in a creative, multimodal way

Figure 4. Derived teaching model.

The derived teaching model was used as a guideline in designing 18 lesson plans. From Experiencing the Known to Analyzing Critically, the lessons were designed to scaffold the students' understanding of critical reading and use of multimodality in order to prepare them for the multimodal tasks which occurred in Applying Creatively. For the nine-week intervention, there were two multimodal critical reading tasks assigned to the participants in the experimental group (See Appendix A for the outline, and Appendix B for lesson plan samples). For example, in multimodal task I, the participants were given a passage about legalizing a casino in Thailand and they were asked to convey their critical reading stances about the writer's standpoint and make inferences based on the passage by creating a piece of work or an artifact that integrated different multimodal modes (i.e., linguistics, audio, visual, gestural, and spatial). A sample of student work is presented in Appendix C.

Data Collection Instruments

The present study made use of both quantitative and qualitative instruments for collecting data. The quantitative data collection instrument was a critical reading test, consisting of 30 items of multiple-choice and open-ended questions. The test domain focused on the ability to draw inferences or logical conclusions, which are aspects related to critical reading ability. Before its actual use, the test was inspected for its content validity through The Index of Item-Objective Congruence protocol (IOC), revised, and piloted (the difficulty index = 0.59 and α coefficient of reliability = 0.83). To collect data, the same test was used as a pretest and a posttest. The pretest was administered to the participants in the experimental and the control groups before the experiment while the posttest was administered after the experiment.

For the qualitative part, the instruments included students' reflective journals and semi-structured interviews. The journals were in a semi-structured open-ended format using Google Docs. The purpose of the journals was to gain a contextual understanding of the participants' experiences in learning critical reading through multimodal tasks. The other qualitative data collection instrument was the semi-structured interview whose purpose was to probe for in-depth information on the participants' perception towards multimodal tasks.

Data Collection Procedure

The data collection procedures were divided into three phases: pre-intervention, intervention, and post-intervention.

For the pre-intervention phase, the participants in both groups were given the pretest to assess their critical reading ability before the implementation of the multimodal tasks.

During the study, the participants in the experimental group received the intervention that required them to perform multimodal tasks after reading a text, while the control group did traditional writing tasks. The experiment covered the period of week 9 to week 17 of the semester or from March to May 2018. The participants in the experimental group were assigned to write a reflective journal on their learning experiences, thoughts, opinions, and feelings after completing each class.

After the intervention, the participants in the experimental group and the control group were provided a posttest to assess their critical reading ability. Moreover, the participants in the experimental group were randomly recruited to attend semi-structured interviews. Each session took approximately 20 to 30 minutes based on a one-on-one discussion. In order to eliminate any language problems that might have affected comprehension, the participants were interviewed in their native language, which was Thai. The data collection of this study is summarized below in Table 2.

Table 2. *Data collection*

Type of Data	Period	Instrument
Quantitative	Before and after the experiment	Critical reading test
Qualitative	During the experiment	Reflective journal
	After the experiment	Semi-structured interview

Data Analysis

This mixed-methods research study employed different measures of data analysis. The data were analyzed separately and were later integrated in the data interpretation for triangulation in order to increase the trustworthiness of the findings.

For the quantitative data, the pre- and post-critical reading tests were rated by two raters. To ensure that the scores between the two raters were consistent and valid, the inter-rater reliability was statistically analyzed using the Pearson correlation. The results indicated high correlation in the scorings of the two raters. Then, the pre- and post-critical reading test scores were analyzed and compared using descriptive means and standard deviation (*SD*) and inferential statistic protocols (independent samples *t* test and paired samples *t* test).

For the qualitative counterparts, the data from the reflective journals and semi-structured interviews were transcribed, coded, and assigned themes.

Results and Discussions

The report on the findings of this study is divided into two parts. The first part presents the quantitative findings that discuss the extent to which multimodal tasks affected critical reading ability. The second part elaborates on the qualitative findings of students' perceptions towards learning with multimodal tasks.

RQ1: To What Extent do Multimodal Tasks Enhance Critical Reading Ability of Thai University Students?

The analysis of pre- and post-critical reading test scores revealed positive effects of multimodal tasks on critical reading ability. From the outset of the experiment, the result from the pretest

showed that the participants were at the same level of critical reading ability. As shown in Table 3, the independent samples *t* test results indicated that there was no significant difference in their pretest scores at 0.05 level (sig.= .499). This implied that the participants in the experimental and the control groups were roughly equivalent in terms of their critical reading ability level before receiving the intervention.

Table 3. *The comparison of critical reading pretest scores*

Group	N	M	SD	SE	t	Sig. (2-tailed)
Control	28	16.76	6.29	1.19	0.68	0.499
Experimental	35	15.80	4.99	0.84		

*Note. *p* < .05*

After the intervention, the posttest was administered. The independent samples *t* test was also run to determine whether there was a statistically significant mean difference between the posttest scores between the two groups. A comparison of gain scores revealed a greater improvement in the experimental group than the control group. In addition, the experimental group also had a significantly higher mean score.

Table 4. *The comparison of critical reading posttest scores*

Group	N	M	SD	SE	t	Sig. (2-tailed)
Control	28	19.59	6.65	1.26	1.476	0.034
Experimental	35	22.57	4.58	0.78		

*Note. *p* < .05*

From Table 4, it can be seen that the experimental group outperformed the control group in the posttest. The results indicated a statistically significant difference between groups at the 0.05 level (sig.= .034).

In addition, the difference of the mean values of the pretest and posttest scores between the two groups was analyzed in order to identify the magnitude of the intervention. By using effect size measures for mean differences of groups with unequal sample size within a pre-post-control, as suggested by Klauer (2001) and Morris (2008), the effect size (*d*) was .682 and .689, respectively. Therefore, the effect size of the intervention in this study was approximately .70, which was considered intermediate. The analysis indicated that the mean of the experimental group was located at .70 standard deviation above the mean of the control group.

In conclusion, this study provided evidence that multimodal tasks could significantly enhance critical reading ability of Thai EFL students. The results from the descriptive and inferential statistical analysis of the pretest and posttest scores suggested that multimodal tasks had significant positive effects on critical reading ability of students. The comparison of the gain scores and posttest scores revealed that the participants in the experimental group showed greater

development at a significant level, with the effect size of .70. Furthermore, the effect size suggested that the intervention yielded desired effects and had a moderate practical significance. Therefore, the null hypothesis that there was no difference in critical reading scores between the two groups was rejected.

RQ2: What Are Students' Perceptions Towards Multimodal Tasks?

The analysis of reflective journals and semi-structured interviews showed that the participants' perceptions towards learning with multimodal tasks were mostly positive, particularly in three main areas; namely, the overall impressions on multimodal tasks, multimodal tasks as reinforcement in learning, and multimodal tasks as reinforcement in critical reading. In contrast, the participants also stated some negative experiences towards the multimodal tasks regarding the workload, time management, and their lack of certain skills necessary for performing the multimodal tasks.

Theme 1: Overall impressions on multimodal tasks. The findings indicated that the participants generally had a good impression of the multimodal tasks. Based on the journal entries and interview sessions, they perceived the multimodal tasks were fun, interesting, and useful. Besides, they were also aware of the usefulness of the multimodal tasks in several aspects.

First, the majority of the participants (18 out of 35 or approximately 52%) asserted that learning critical reading through multimodal tasks accommodated individual differences and met their diverse communication needs and expression of their critical reading ideas. It was found that the multimodal tasks increased higher levels of engagement among the participants, especially those who were not good at writing.

> Participant 2: ... *People have different strengths and preferences. Some are good at drawing while some are good at explaining. The task gives us an equal chance to show our critical ideas about reading texts.*

> Participant 1: *(Learning with) multimodality gives students equal chance to acquire knowledge and to learn something. It's the fact that using language cannot entirely convey what is on our mind. Some people may have trouble with receiving and manipulating messages via language channel. Using photos or videos can help.*

Second, the analysis revealed that it was the participants' first time doing a multimodal task. The multimodal tasks opened up a new learning experience to the students.

> Participant 6: *Multimodality and doing multimodal tasks are definitely something new to me. Even when I realize that using multi modes is what I usually do in my everyday life, it is still a surprising and new experience in a reading course.*

> Participant 5: *I never experienced this in my university years. The closest would be in the previous course, which the teacher gave to choose the topic we wanted to do but the answer was still in writing.*

Furthermore, 42% of the participants (16 out of 35) expressed that the multimodal tasks were relevant to their lives and interests. They also claimed that doing the multimodal tasks was advantageous for them, not only because it was applicable to their experiences outside the classroom, but it also was a good preparation for future professional lives.

> Participant 8: *… doing the multimodal task gives me fun time and lots of useful experience that I can use in real life.*

> Participant 7: *I think multimodality is a skill that people in my generation should have because it is useful to future and real lives. Everything is multimodal. Who knows one day we may have to utilize the skill to achieve something like career success.*

Theme 2: Multimodal tasks as reinforcement in learning. The findings suggested that the multimodal tasks mainly had positive effects on students' learning behaviours in several aspects.

Fourteen percent of the participants explained and justified their choices of modes and mediums used while performing the multimodal tasks. This suggested that doing the multimodal tasks promoted metacognition, as the students were encouraged to think more and become aware of their strengths and weaknesses so that they could plan to complete the multimodal tasks accordingly.

> Participant 1: *… I asked myself what is the main idea and what does the author want to tell the reader. I used the critical reading questions that teacher told to find some inferences and hidden messages. Then, I thought about the way to transfer my answers by considering the audience and what I can do. After that, I decided which modes I wanted to use.*

Moreover, multimodal tasks increased intrinsic motivation. 32% of the participants (11 out of 35) thought that doing the multimodal tasks were fun, interesting, and stress-free. Also, they developed positive attitudes towards the subject, as well as became more motivated learners.

> Participant 3: *I normally didn't like studying English, mostly I was afraid of giving wrong answers but with multimodal method, I felt more relaxed and want to learn more.*

> Participant 9: *… It made me feel comfortable in learning and doing the work. It's really enjoyable and much more interesting than writing. It was in fact useful and made me want to learn more.*

In addition, the findings revealed that multimodal tasks fostered autonomous learning. The participants stated that when preparing for the multimodal tasks, they surfed the Internet to obtain more information about the tools and techniques they could use to complete the tasks. By themselves, they learned how to use movie-making software and how to collect and organize digital media, for example:

Participant 16: *When I don't know about how to use a program in working multimodal tasks, I watched YouTube and went on Google for how to.*

Participant 14: *Personally, I tried learning Photoshop by myself.*

Theme 3: Multimodal tasks as reinforcement in critical reading. The multimodal tasks helped the participants (18 of them) gain more confidence in reading and proposing ideas. They expressed appreciation over the alternative ways to respond to reading and asserted that the multimodal tasks could solve their vocabulary problems, so they felt more encouraged to read and were able to convey ideas derived from the texts effectively.

Participant 4: *... doing multimodal tasks helps raise my confidence in telling teacher of what I think and what I gain from the text.*

Participant 8: *I use multi modes in expressing what I think about a passage more effective than when I do with writing. I think using multimodality in reading course is good for me as I feel I can express ideas as I want. Reading course will be about read for ideas not read for write.*

A great number (20 out of 35 or 57%) of participants reflected that they were able to make inferences and draw conclusions about a reading passage more confidently and effectively. The findings demonstrated that multimodal tasks strengthened the participants' critical reading skills. The tasks required thorough analysis and reasoning, which means the participants could not have completed the multimodal tasks unless they had understood the passages well. Unlike the traditional written assignment in which the text could be imitated, the multimodal tasks required the participants to produce original works. This encouraged them to exercise their critical reading ability so that they could generate logical inferences, as well as promote their thinking and reasoning since they had to convey their critical ideas in a multimodal form.

Participant 1: *There were many things I had to think critically to get my work finished… If you don't understand and think deeper, you can't infer. Then, you can't do the task because you can't copy from friends like when you write answers.*

Participant 20: *… it is another challenge since I have to pass on my understanding of the text and analysis to other people. This requires a lot of thinking and analyzing the contents, whether the main idea of the passage or the characters in the story, and planning… so I feel I am more thorough in thinking and improve a lot.*

Theme 4: Negative experiences towards the multimodal tasks. Apart from positive experiences, the participants also had some negative experiences towards the multimodal tasks.

There were seven (or approximately 20%) of the participants who considered the lack of artistic ability as their weakness. Interestingly, their perceptions towards the multimodal tasks remained

positive. When they encountered such difficulties related to art, they tried to find alternatives they could deal with comfortably, such as using Photoshop or other design programs in order to carry on the multimodal tasks.

> Participant 1: *I am not good at arts and design. So I decided to use geometric shapes that are equipped with Microsoft Word and find some more photos from Google.*

In addition, there were two participants (or approximately 5%) who expressed their concerns over the workload and time constraint of doing the multimodal tasks. Since they enrolled for a maximum course load of 21 credits in the semester, the participants had to undertake a number of assignments, presentations, and other requirements in each course.

> Participant 5: *I took many courses in this semester, each contained a lot of homework and assignments... To be honest, this subject has a lot more workloads than other subjects I took... editing video is a time-consuming process.*

To sum up, the key findings from the analysis of reflective journals and semi-structured interviews suggested that the multimodal tasks had several advantages and merits on their critical reading ability and learning behaviours in several aspects.

First, the multimodal tasks catered to individual preferences. Similar to Lee's (2014), this study found that the multimodal tasks open a new learning experience and allow the students to participate in the classroom discourse in new ways after they had been discouraged by conventional English learning instruction. Consequently, the students developed positive attitudes and opened their minds to learn. This corroborates Lee (2014) whose studies yielded the beneficial effects of multimodal assignments. They emphasized that multimodality met students' needs as it constituted the freedom of choices of communication and representation. The students, thus, could choose ones that helped them achieve their maximum potential in learning and perceived that learning was fun and motivating.

Next, findings also suggested that the multimodal tasks were useful for out-of-school practice and future use, which are consistent with Siegal's (2012) work stating that multimodal skills were applicable to the future job skills the students might need. As the students learned to design using text, visuals, audio, and video, they felt like they were developing the skills they really needed to communicate in a modern world. Such relatedness made the students feel like they had value within the context of the class and school, so they became more motivated to learn.

In terms of their learning motivation, the multimodal tasks increased intrinsic motivation and promoted metacognition. These findings are relevant to the studies by Darrington and Dousay (2014) and Oldakowski (2014), wherein multimodal assignments were used to motivate struggling students and enrich literacy learning. When the students created the multimodal artifacts, they had to constantly consider the content and how to present the information. The students also had to be aware of their strengths and weaknesses in order to plan their strategies to complete the assignments. This reflection encouraged self-analysis of their mode choices and their understanding of the passages. Besides, since multimodality is related to students' lives

outside school, the students could feel that what they were doing had value and that they had developed competence necessary to their real lives. They were motivated to learn.

The finding that the students developed their learning autonomy is directly in line with what was found in Lee's (2014) and Lirola's (2016) studies, wherein students developed learning autonomy after being exposed to multimodal reading responses. The sharing of ideas through multimodality deepened students' understandings of the texts and led them go beyond the language aspect a conventional reading course could offer. Such an active role in making their own decisions on the topic and organization through the use of multimodal resources, thus, created learning autonomy for the students.

The most important finding of this study is that the multimodal tasks fostered analytical thinking and critical reading skills. This is consistent with Benson (2008) and Lee (2014), who found that multimodal activities sharpened students' generative and critical thinking skills. The students saw the multimodal activities as pushing their thinking in new directions with more focus on the design of multiple elements and purposes in producing the work in an unconventional form.

Conclusion and Implications

The present study discovered the positive effects of multimodal tasks on critical reading ability and perceptions of Thai university students. The findings suggested that the students who performed multimodal tasks significantly improved their critical reading ability and also generally had positive perceptions towards multimodal tasks. In addition to fostering analytical thinking and critical reading skills, the students perceived multimodal tasks as useful for enhancing their motivation towards reading, as well as for preparing them for out-of-school experiences.

Based on the results of this research study, multimodal tasks can be incorporated into the development of an English reading curriculum, as it is evidenced that the multimodality can empower the students to develop their critical reading ability to their potential. For teachers who plan to integrate multimodality into practice, the following are some guidelines for pedagogical implications of multimodality in EFL reading.

First, teachers need to provide students with knowledge about multimodality and semiotic modes. They should discuss how multimodality could work across subjects in order to enhance students' learning and prepare them for the types of meaning making and communication they will perform across their lifetimes. This can also raise students' awareness towards the importance of multimodality.

Second, teachers should pave the way for students to be ready for multimodal tasks. By adopting the Learning by Design framework, teachers gradually scaffold students onto each knowledge process so that students know how they can create and achieve a multimodal task.

Finally, teachers need to reexamine their assessment practices to be sure that they do not reinforce monomodal assessments as the ultimate method. A written-essay examination, for

instance, should not be the only determination of grades. Instead, a multimodal task or assignment can serve as an assessment for learning method.

Limitations of the Study and Recommendations for Future Studies

The present study was conducted with a small number of participants who were university students within a short period of time. Thus, future studies could be conducted with a larger number of participants over a longer period. The results may provide more in-depth understanding of the merits that multimodality could offer. Equally interesting, collecting data from participants of different age groups and proficiency levels may yield different findings. In terms of data collection tools, future studies may also consider using other approaches, such as a researcher's log and observations to yield other relevant data.

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Appendix A

Outline of Lesson Plans (Second Module of the Course)

Week	Day	Knowledge Processes	Multimodal Tasks and Related Assignments
9	Tues.	Pretest	
	Thurs.	Experiencing the known	Introduction to critical reading
		Experiencing the new	(Lecture-based)
10	Tues.	Conceptualizing by naming	Introduction to multimodality
	Thurs.		(Lecture-based)
11	Tues.	Conceptualizing by theorizing	Generalization of multimodality into reading comprehension by creating a multimodal summary to a passage
	Thurs.		
Type of text: information			
12	Tues.	Analyzing functionally	-
	Thurs.	Analyzing critically	-
13	Tues.	Analyzing critically	Integration of multimodality into critical reading and practice how to make inferences from pictures

	Thurs.	Applying appropriately	-
14	Tues.	Applying creatively	**Multimodal task I** - Create a multimodal artifact that portraits the author's viewpoint and what the country would be like if gambling is legalized in Thailand.
	Thurs.		

Type of text: short story

15	Tues.	Analyzing functionally	-
	Thurs.	Analyzing critically	-
16	Tues.	Analyzing critically	Integration of multimodality into critical reading and practice how to make inferences from pictures
	Thurs.	Applying appropriately	-
		Applying creatively	**Multimodal task II** - Create a multimodal
17	Tues.	Applying creatively	artifact that represents the setting of the story and personalities of the characters.
	Thurs.	Posttest	

Appendix B

Sample of Lesson Plans

Lesson Plan for Week 10 (Tues.)
Total time: 75 minutes
Objectives: By the end of this period, students will be able to
    1. familiarize themselves with the key principles and concepts of multimodality
    2. explain what multimodality is and what the five modes of communication are
    3. describe the meaning of glossary of multimodality terms
Required Course Materials:
    • Handouts/ PowerPoint slides on the topic of multimodality
    • Glossary of multimodality adapted from https://multimodalityglossary.wordpress.com
    • Examples of multimodal artifacts/ products/ responses to reading texts

Knowledge Processes	Teaching Procedures	Time	Assessment
Conceptualizing by Naming	• T introduces the concept of multimodality, the key principles and the five modes of communication, and teach glossary of multimodality.	35 mins	• Teacher's monitoring • Teacher's elicitation
	• Ss do worksheets.	10 mins	
	• T shows examples of multimodal artifacts/ products/ responses to reading texts.	10 mins	
	• Ss brainstorm how multimodality affects the communication landscape in the 21st century and discuss the answers with classmates and teacher.	20 mins	

Note. T = teacher; Ss = students

Lesson Plan for Week 12 (Tues.)
Total time: 75 minutes
Objectives: By the end of this period, students will be able to
   1. define the meanings of unknown words using context clues
   2. summarize the main ideas
Required Course Materials:
   • Coursebook

Knowledge Processes	Teaching Procedures	Time	Assessment
Analyzing Functionally	• T assigns Ss to preview a text using skimming and scanning techniques from the coursebook and asks Ss what predictions they can make based on what they already know about the topic.	10 mins	
	• Using the same text, T asks Ss about the meaning of some key vocabulary words in the text and demonstrates how Ss can guess the meaning of the unknown words using context clues.	10 mins	
	• Ss read other texts in the coursebook and practice guessing the meaning from context clues.	10 mins	
	• T selects one text and demonstrates how to find the main idea.	10 mins	
	• Ss read other texts in the coursebook and practice finding the main idea.	20 mins	
	• T elicits Ss comprehension and checks their understandings using the following comprehension monitoring questions: 1. What are the important ideas or events that occurred in the text? 2. What is the main idea and supporting details?	15 mins	

Note. T = teacher; Ss = students

Lesson Plan for Week 12 (Tues.)
Total time: 75 minutes
Objectives: By the end of this period, students will be able to
      1. define the meanings of unknown words using context clues
   2. summarize the main ideas
Required Course Materials:
      • Coursebook

Knowledge Processes	Teaching Procedures	Time	Assessment
Analyzing Functionally	• T assigns Ss to preview a text using skimming and scanning techniques from the coursebook and asks Ss what predictions they can make based on what they already know about the topic.	10 mins	• Teacher's monitoring • Teacher's elicitation
	• Using the same text, T asks Ss about the meaning of some key vocabulary words in the text and demonstrates how Ss can guess the meaning of the unknown words using context clues.	10 mins	
	• Ss read other texts in the coursebook and practice guessing the meaning from context clues.	10 mins	
	• T selects one text and demonstrates how to find the main idea.	10 mins	
	• Ss read other texts in the coursebook and practice finding the main idea.	20 mins	
	• T elicits Ss comprehension and checks their understandings.	15 mins	

Note. T = teacher; Ss = students

Appendix C

Examples of Students' Multimodal Tasks
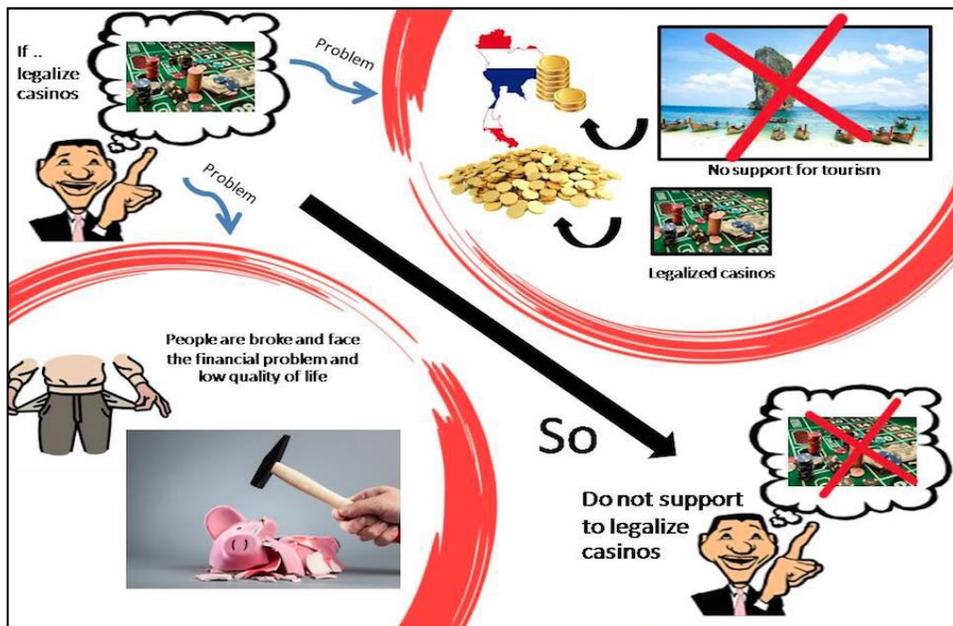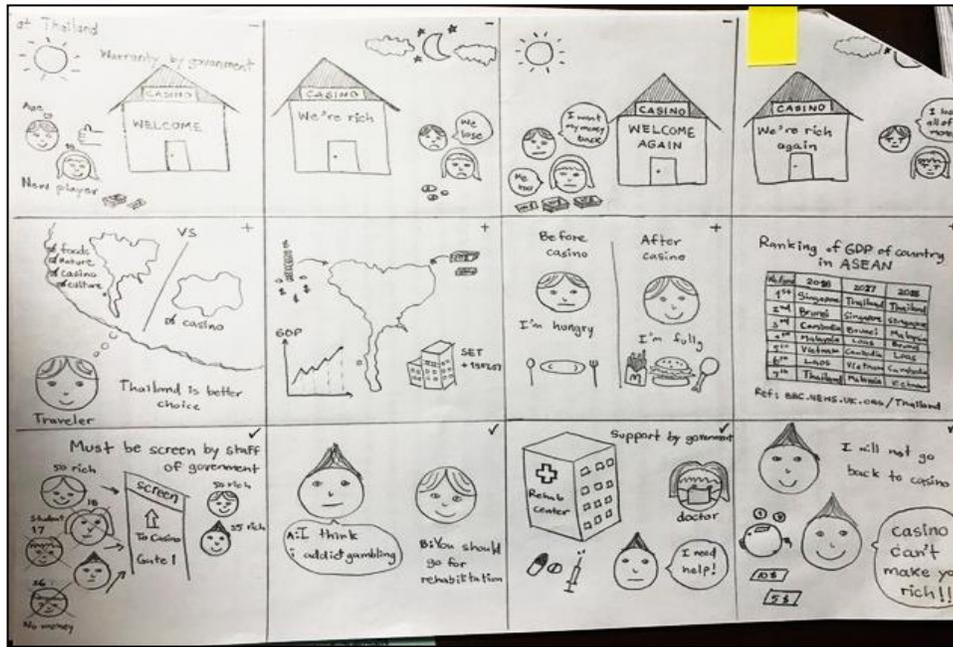
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