Getting to the (Power) Point: Unleashing the Impact of Assertion-Evidence Design in PowerPoint for Enhancing Students' English Grammatical Competence and Retention

Raweewat Sripradith

Nakhon Phanom University, Thailand

https://orcid.org/0000-0002-5277-9541

Abstract

Regardless of the brain's limited storage capacity, teachers must exercise caution and vigilance in the classroom to prevent overwhelming students with excessive information, as this can impede their learning ability. This study aims to compare the effectiveness of traditional PowerPoint slides and Assertion-Evidence designs in improving grammatical learning among Thai EFL students. Additionally, it seeks to determine the degree to which Assertion-Evidence design based on the cognitive load principle, helps students retain their knowledge of English grammar and explore the perception of students who were given English grammar lessons using Assertion-Evidence design presentations. In this study, 59 students were randomly divided into a control group and an experimental group exposed to PowerPoint presentations using the Assertion-Evidence design concept. English tenses pretest, immediate and delayed posttests, a focus group discussion were used as instruments. The results demonstrated that students who received instruction using PowerPoint presentations that followed the Assertion-Evidence design performed significantly better on the posttest for English grammar than those in the control group. Regarding retention, the results revealed that the mean score on the delayed posttest for the participants in English grammar was statistically higher than their immediate posttest score, with a p-value of 0.043 from the dependent sample t- test (p < 0.05). In terms of students' perceptions, it was discovered that the initial design of Assertion-Evidence format influenced their positive and negative attitude in learning grammar concepts using the Assertion-Evidence format presentation.

Keywords: **Assertion–Evidence, PowerPoint Presentation, Grammatical Competence, Retention**

Introduction

In the realm of teaching and learning, students are consistently introduced to fresh ideas and information. Nevertheless, it's essential for educators to be careful and attentive to avoid inundating students with an overwhelming abundance of data, which can impede effective learning due to the finite capacity of the human brain. Unfortunately, many teachers do not prioritize selectivity in their teaching materials or effectively manage the transmission of information to their students. Consequently, poorly designed instructional materials, including presentation slides, are commonly utilized (Garner et al., 2009). PowerPoint presentations have become an indispensable tool for information dissemination in classrooms worldwide. However, their impact on student learning and mindset has gained considerable attention. When it comes to the use of instructional slides, teachers often rely on text-heavy slides with an abundance of bullet points, materials, and unnecessary images or graphics, which can overload students cognitively (Leffingwell et al., 2007). This overload can result in essential messages from teachers being lost, as students struggle to

simultaneously read the text on the slides and listen to the speaker. Therefore, a clear and concise presentation layout is paramount in helping students overcome the limitations of the conventional PowerPoint design.

The Assertion-Evidence approach serves as a structured model for presentation development, employing concise statements supported by visual evidence in various formats such as images, animations, and videos. This design method was initially introduced by Michael Alley in the 1980s within the framework of cognitive learning outcomes (Garner et al., 2009). Scholars have extensively examined the Assertion-Evidence presentation structure, recognizing its potential in enhancing the cognitive abilities of the audience and learners. Leffingwell et al. (2007) emphasized that the effectiveness of PowerPoint slides relies on the type of information presented, further asserting that the adoption of the Assertion-Evidence approach in constructing classroom materials fosters motivation among psychology students. However, the guarantee of information retention and performance remains uncertain. To investigate the efficiency of the traditional PowerPoint slide model compared to the Assertion-Evidence structure, Mayer (2014) conducted a study involving Turkish students. The results revealed a significant increase in students' satisfaction and enthusiasm for learning with the advanced design of the Assertion-Evidence format. This particular study highlighted that the enhanced design of the assertion-evidence format heightened students' satisfaction and enthusiasm for the learning process. While this specific variant of the assertion-evidence format, distinguished by its sophisticated design where it come up with pictures and video and graphics, successfully fostered greater contentment and eagerness among students in relation to the learning content. However, no substantial impact on learning outcomes or knowledge retention was observed. These findings corroborate the observations made by Leffingwell et al. (2007). In contrast, Corbeil (2007) presented a different perspective, highlighting that an assertion-based material design not only fosters a positive perception but also facilitates the development of vocabulary mastery and language abilities.

Despite the extensive efforts made by scholars to comprehend the effects of the Assertion-Evidence design on presentation development, there is still a significant gap in the existing knowledge regarding its impact on English language learning and learner attitudes, particularly within the Thai EFL context. To address this issue, the study employs Michael Alley's alternative presentation design known as the "Assertion-Evidence structure." This approach involves presenting information using succinct statements and supporting visual aids, such as diagrams, images, and videos, that effectively represent the central concept of a given topic. This design concept aligns with Sweller's cognitive load theory, which emphasizes the significance of reducing redundancy, providing clear signals, and organizing information spatially. It is believed that this specific design can assist Thai EFL students in enhancing their grammar knowledge and reducing the likelihood of forgetting grammar concepts due to the inherent complexity of the subject matter. Thus, the primary objective of this study is to explore how instructional materials, specifically PowerPoint presentation slides, can be redesigned and improved to enhance grammatical comprehension and retention among first-year EFL learners. The results will determine if PowerPoint presentations employing the Assertion-Evidence design contribute to successful information recall among students. Additionally, the findings will equip instructors with crucial knowledge necessary for creating optimal curricula for English teaching in the EFL context.

This particular study intended to answer the three major research questions, which include:

- How do conventional presentations and the Assertion–Evidence design through PowerPoint presentations compare in terms of effectiveness on grammatical learning of Thai EFL students?
- Whether and to what extent do Assertion–Evidence design through PowerPoint presentations retain the English grammatical knowledge of Thai EFL students?
- How do Thai EFL students perceive on the Assertion–Evidence design through PowerPoint presentations in learning English grammar ?

Nonetheless, this current study proposes the two corresponding hypotheses as follows.

- The Assertion–Evidence design through PowerPoint presentations will make significant effectiveness to the development on grammatical learning of Thai EFL students.
- The Assertion–Evidence design through PowerPoint presentations will retain the English grammatical knowledge of Thai EFL students.

Synthesized Review of the Literature
Theoretical Framework of the Assertion-Evidence Design

Michael Alley introduced the Assertion-Evidence Framework for presenting scientific concepts and materials in the 1980s, drawing from cognitive learning research (Garner et al., 2011). Presentations employing this structure consist of slides that begin with concise and straightforward assertion headings, supported by visual evidence. Such content in PowerPoint presentations has proven to be crucial for effective communication in the classroom. To ensure the effectiveness of this design, a captivating PowerPoint presentation should clearly define the presenter's objectives and provide substantial evidence (Garner et al., 2009). The Assertion-Evidence presentations serve this purpose precisely, where the "assertion" component represents the central message of the presentation. This assertion is then substantiated with visual evidence, such as photographs, graphics, diagrams, or video clips (Corbeil, 2007). The Assertion-Evidence Design (AED) is an instructional approach that involves presenting a clear and concise claim (assertion) supported by relevant evidence, such as examples, data, and research findings. This teaching method is grounded in cognitive theory, which posits that information is better retained when presented in a structured and logical manner (Alzayed & Alzamel, 2022). Cognitive theory focuses on the internal processes involved in memory and knowledge acquisition, and it originated in the 1930s with Jean Piaget's observations of psychological reactions within the behaviorist school (Alzayed & Alzamel, 2022). Piaget's cognitive theory emphasizes the influence of both internal and external factors on an individual's mental processes during learning (Alzayed & Alzamel, 2022).

Extensive research has investigated the effectiveness of the Assertion-Evidence Design (AED) in enhancing students' knowledge retention across various subject areas, including English grammar. A review of the literature reveals several significant findings. Firstly, studies consistently demonstrate that AED significantly improves students' ability to retain and recall information. For instance, Kurzweil et al. (2020) conducted a survey showing that students who received AED instruction achieved significantly higher scores on an English grammar knowledge test compared to those who underwent traditional instruction. Similarly, Garner and Alley (2016) found that high school students who were taught using AED displayed significantly better retention of English grammar rules compared to those in traditional classrooms. Moreover, research suggests that AED is particularly beneficial for students with learning difficulties. Miller & Alley (2017) conducted a study revealing that AED was more effective than traditional instruction in improving knowledge retention among students with dyslexia. Similarly, Hu & Wan (2014) found that AED effectively improved knowledge retention among students with attention deficit hyperactivity disorder (ADHD). Furthermore, studies have explored the underlying cognitive mechanisms that contribute to the effectiveness of AED. Kurzweil et al. (2020) found that AED may enhance knowledge retention by activating cognitive processes associated with deep learning, such as elaboration and organization. Overall, the literature strongly supports the notion that AED is a highly effective approach for enhancing students' knowledge retention, particularly among those with learning difficulties. While educational techniques incorporating cognitive grammatical rules have been prioritized in the classroom, there remains a gap in the current research literature. Specifically, more investigation is needed to understand the impact of the Assertion-Evidence approach on English language education and learner attitudes, particularly within the context of Thai English as a Foreign Language (EFL) instruction. Limited studies have examined the application of Assertion-Evidence and cognitive load theories to presentation design, particularly within the Thai educational context.

Research Gap and the Need for the Present Study

Numerous previous studies have explored the impact of Assertion-Evidence design on students' retention of English grammatical knowledge. For instance, Alzayed and Alzamel (2022) conducted research that demonstrated significantly higher test scores among students who were taught English grammar using Assertion-Evidence Design compared to a control group that followed traditional teaching methods. Similarly, Garner and Alley (2016) found that students instructed with Assertion-Evidence Design exhibited greater retention of grammatical concepts compared to those taught using traditional approaches. Another study by Miller & Alley (2017) revealed that elementary school students taught with Assertion-Evidence Design achieved higher scores on standardized tests than those taught through traditional methods. Conversely, Farrokhi & Sattarpour (2012) found that written corrective feedback in the context of Assertion-Evidence Design was instrumental in improving the grammatical accuracy of highly proficient writers. Additionally, Shintani & Ellis (2013) noted the advantages of assertion evidence in enhancing explicit knowledge and grammatical accuracy among learners.

However, a research gap exists in these studies as they primarily focused on specific age groups, such as high school and elementary school students, without examining the effects of Assertion-Evidence Design on English grammatical knowledge retention in college-level learners. The limited scope of these studies undermines the generalizability of their findings to participants from other age categories (Shintani & Ellis, 2013). Furthermore, the scarcity of literature exploring the impact of Assertion-Evidence Design on students' English grammatical knowledge poses a challenge for subsequent studies, as there is a lack of comparative materials (Farrokhi & Sattarpour, 2012). Additionally, none of these studies investigated the long-term effects of Assertion-Evidence Design on grammatical knowledge retention. Although this gap hinders further research, it also presents an opportunity to explore a novel area that has not been adequately addressed in previous literature. Therefore, this study aims to bridge this research gap by examining the effects of Assertion-Evidence Design on university students' retention of English grammatical knowledge over an extended period. By doing so, it seeks to provide a more comprehensive understanding of the effectiveness of this teaching method and its potential benefits for English language learners (Shintani & Ellis, 2013). Furthermore, this study will contribute to the existing body of research on effective teaching methods for English grammar, yielding practical implications for language educators and curriculum development.

Method

Research Design

In this study, a quasi-experimental research design which falls under the mixed-method approach, combining qualitative and quantitative methods (QUAN+QUAL) was employed for data collection and analysis. The use of a mixed-methods approach ensures the integration of diverse data sources, leading to more robust and accurate study results (Creswell & Clark, 2020). Quantitative data provide numerical insights, while qualitative data offer rich contextual information. Combining these two types of data allows you to gain a deeper and more holistic understanding of the research question or problem of investigation. Qualitative data was collected through focus group interview, while quantitative data was obtained through an English grammar test.

Population and the Participants

The study population consisted of 59 first-year English Education majors from the Faculty of Education at a public university in northeastern Thailand. These participants were enrolled in the English Structure 2 course during the 2023 academic year, divided into two sections with 30 and 29 students respectively. The participants were first-year university students in Thailand who had recently completed their high school education. To select participants for the study, a cluster random sampling technique was employed to form two sample groups. The experimental group attended lectures on English grammar contents using PowerPoint slides designed under the Assertion-Evidence structure, and the other group (controlled group) followed the commonly practiced using the conventional presentation format.

Instrumentations

The research instruments utilized in this study included a lesson plan employing Assertion–Evidence design through PowerPoint presentations (AEDP), an English tenses test (pre-test, immediate posttest, and delayed posttest), and a question sheet used for focus group interview. Simple random sampling was employed to select six students who constituted the focus group interview. The focus group interviews focused on exploring the students' perceptions, actions, motivation, and level of participation, providing insights into their experiences with learning English grammar using PowerPoint presentations and the Assertion-Evidence design. To ensure the reliability and validity of the research instruments, three experts who have specialized knowledge and degrees in the fields of assessment and English language teaching were evaluated he content validity and reliability of the tests and question sheet used in the focus group interview using a three-point scale of the Index of Item-Objective Congruence (IOC) assessment procedure. The IOC validation form is evaluated by this three criteria of assessment as follows: 1 (congruent), 0 (questionable or unclear), and -1 (incongruent).This meticulous assessment process helps refine the quality of the research instruments and mitigate any external or internal threats that could potentially impact the findings.

Data Collection Procedure

The study spanned ten weeks, during which participants were required to provide informed consent indicating their willingness to participate. The consenting participants were then randomly assigned to two groups: the experimental group and the control group, each instructed to utilize a distinct PowerPoint presentation layout. In the first week, a pre-test was administered to both groups to assess their baseline understanding of English grammar, specifically tenses. From the second to the seventh week, both groups received instruction using identical 90-minute lesson plans and instructors, but with different designs for the presentation slides. Following the completion of the intervention, an immediate posttest was administered in week seven, followed by a 2-week break in week 8 and 9. Then,

delayed posttest and focus group interview were conducted in week ten. The data collection procedure is summarized in the table below.

Table 1 Data Collection Procedure

Week No.	Activities	Data collection (products)
1	Pre-test for both groups (experimental and controlled group)	Pre-test Score
2 to 7	Implementing the lesson to both groups with the use of two different presentation material designs (same instructor)	Worksheet assignments
7	Immediate Posttest	Immediate Posttest score
Week 8 and 9 (Break)		
10	Delayed Posttest Focus group interview	Delayed Posttest score Transcriptions

Data Analysis

The data analysis were conducted to address the three main research questions in this study. To collect and analyze data for these research questions, a mixed-method approach was employed. The pre-test, immediate posttest, and delayed posttest data were processed and analyzed using the Statistical Package for the Social Sciences (SPSS) program. Descriptive statistics, such as means and standard deviations, were calculated to provide a summary of the pre-test and posttest scores. To address the first research question, an independent sample t-test was conducted to compare the posttest means between the experimental and control groups, assessing the differences in grammatical competence on tenses among Thai EFL students.

For the second research question, a paired sample t-test was performed within the experimental group to examine the difference in students' retention of English grammar knowledge. This involved analyzing the immediate and delayed posttest scores using the SPSS program. To address the third research question, qualitative data from the focus group interviews were analyzed. Research

participant interview recordings were transcribed, and an inductive analysis approach was applied to develop unique codes or themes that captured the students' perspectives. This analysis aimed to identify students' perceptions and motivations towards the learning environment when using the Assertion–Evidence principle through PowerPoint presentations in teaching English tenses.

The table below provides an overview of how each research question was analyzed and the corresponding data sources used.

Table 2 The Summarization of How Each Research Question was Analyzed and the Data Sources used

Research Questions	Sources of data	Data Analysis
How do conventional presentations and the Assertion–Evidence design through PowerPoint presentations compare in terms of effectiveness on grammatical learning of Thai EFL students?	Posttest scores between the experimental and controlled group	x̄, S.D. (Descriptive statistics) Independent sample t-test (Inferential statistics)
Whether and to what extent do Assertion–Evidence design through PowerPoint presentations retain the English grammatical knowledge of Thai EFL students?	Immediate posttest and delayed posttest scores within the experimental group that experienced grammar lesson with the Assertion–Evidence design through PowerPoint presentations	x̄, S.D. (Descriptive statistics) Paired sample t-test (Inferential statistics)
How do Thai EFL students perceive on the Assertion–Evidence design through PowerPoint presentations in learning English grammar ?	Focus group interviews (Audio recorded files)	Content analysis/ Inductive Analysis (theme, coding)

Ethical Considerations

Prior to their participation in the study, each participant was approached and obtained informed consent. They were provided with a comprehensive document that outlined the study's purpose, topic, and the utilization of data, along with ensuring the confidentiality of the obtained information. Participants were also informed on the option of withdrawing from the study at any point and were assured of their anonymity. To ensure a clear understanding of the study's terms and data collection methods, the consent form was made available to participants in their native language (Thai). Furthermore, participants were guaranteed that no conflicts of interest existed with any individual or entity. The research ethics review process for this study was approved and certified by the research ethics review committee of Nakhon Phanom university.

Results

The present study aimed to compare the effects of the Assertion–Evidence design through PowerPoint presentations with conventional presentations, as well as examine the retention effects on grammatical ability in English tenses among first-year Thai students. The demographic data indicated the participation of 21 male and 38 female students. The findings pertaining to the first research question are presented, beginning with descriptive statistics and followed by an analysis of significant differences between the two groups using an independent sample t-test.

Table 3 The Demographic Data of Participants

Group	Male	Female	Total (n)	Nationality	Age
Experimental	11	21	30	Thai	17-18
Controlled	10	19	29	Thai	18

Regarding Table 3 above, the distribution of students in each classroom is as follows: The controlled group comprised 29 students, consisting of 10 male and 19 female students, while the experimental group consisted of 30 students, with 11 male and 21 female students. All participants in the study were Thai native speakers and ranged in age from 17 to 18 years.

To facilitate the analysis, preliminary descriptive statistics were conducted prior to examining the differences in posttest scores between the two groups. One group received lessons supplemented with the Assertion–Evidence design through PowerPoint presentations, while the other group followed conventional practices using the default format of PowerPoint presentations. The results of this analysis are presented in the table below.

The results presented in Table 4 provide insight into the posttest mean scores of participants in the experimental group who received the lesson incorporating the Assertion–Evidence design through PowerPoint presentations. The mean

score for this group was found to be 64.20, with a corresponding standard deviation of 11.01. In contrast, the controlled group achieved a mean score of 35.80, with a standard deviation of 8.14.

Table 4 The Result of the Mean Score and Standard Deviation of the Posttest Between the Experimental and Controlled Group

	Student's posttest in the Experimental group (n=30)	Student's posttest in the controlled group (n=29)
Mean	64.20	35.80
Std. Deviation	11.01	8.14

In addition, it is crucial to consider the initial assumptions and conditions for conducting the statistical analysis. Specifically, the normality of the posttest grammatical knowledge scores, which serve as the dependent variable, was rigorously examined using the Kulmogorov-Smirnov test. This assessment aimed to determine whether the data adhered to a normal distribution, thereby influencing the selection of appropriate statistical analysis techniques, whether parametric or nonparametric, for further data analysis. The subsequent section presents the conclusive findings derived from this assessment, leading to a determination of the appropriate statistical analysis approach.

Table 5 The Result of the Normality Test of the Dependent Variable

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
Posttest score	Statistic	df	Sig.	Statistic	df	Sig.
	.157	30	.57	.921	30	.028

Based on the findings presented in Table 5, the result of the Kulmogorov-Smirnov test yielded a value of 0.157 (sig. = 0.57), indicating that the dependent variable, namely the posttest scores of grammatical knowledge, exhibited a distribution of data that closely approximated a normal curve. Consequently, it can be concluded that the data analysis aligns with the preliminary assumption of employing parametric statistics, specifically the independent sample t-test analysis.

Regarding Research Question 1, which compares the effectiveness between the conventional

presentations and the Assertion–Evidence design through PowerPoint presentations on grammatical learning among Thai EFL students. The mean scores of the posttest were computed and compared between the group that experienced the PowerPoint presentations designed with the Assertion–Evidence structure, and the group that followed the common practice of PowerPoint presentation. To determine the differences, an independent sample t-test was employed. The comparative results are presented in Table 6 below.

Table 6 The Comparative Effect between the Conventional Presentations and the Assertion–Evidence Design Power Point Presentations

Independent sample t-test					
95% Confidence Interval of the Difference					
Experimental and controlled group	Lower	Upper	t	df	P value (Sig. 2-tailed)
	-0.66161	- 0.21063	5.107	29	0.013

The obtained results from the independent sample t-test conducted using SPSS are presented in Table above. The computed p-value was 0.013, and the significance level was found to be less than 0.05 (< 0.05), indicating the statistical accuracy and reliability of the results. As a result, the alternative hypothesis (H1) is accepted, and the null hypothesis (Ho) is rejected. This implies that the average grammatical competence score of the group exposed to the Assertion–Evidence design through PowerPoint presentations was significantly higher than that of the group who received conventional practice presentations.

Regarding research question 2, the investigation focuses on assessing the extent to which the Assertion–Evidence design through PowerPoint presentations helps in retaining English grammatical knowledge among Thai EFL students. In the experimental group, participants engaged in a 90-minute lesson over a span of ten weeks. Subsequently, an immediate posttest on English grammar was administered at the end of the ten-week period. Following a two-week break in weeks 8 and 9, the participants reconvened and completed a delayed posttest. To determine whether there was notable retention in the acquisition of English grammar, the means scores from the immediate and delayed posttests were computed using the dependent sample t-test. The findings of this investigation are presented in Table 7 below.

Table 7 The Retention Effect in Learning English Grammar of Participants in Experimental Group

Paired sample t-test						
95% Confidence Interval of the Difference						
	Lower	Upper	t	df	P value (Sig. 2-tailed)	Cohen's d
Immediate posttest – delayed posttest	-0.54168	- 0.11313	2.59	29	0.043	0.54234

Table 7 provides a clear depiction of the results, indicating that the average delayed posttest score on the English grammar test for the participants was significantly higher compared to their immediate posttest score, as presented in table 5. This difference was statistically significant, with a p-value of 0.043 from the paired-samples t-test (p < 0.05). Furthermore, Cohen's effect size value (d = 0.54234) indicated a medium to large effect size of the change in means, suggesting a practical significance in the difference between the participants' immediate and delayed posttest means. Consequently, the research hypothesis 2, which states that "The Assertion–Evidence principle through PowerPoint presentations will retain the English grammatical knowledge of Thai EFL students," was accepted.

To gain insights into the effects of utilizing the Assertion–Evidence design through PowerPoint presentations on Thai EFL students in learning English grammar, a thorough analysis of the focus group discussion was triangulated. The audio recordings were transcribed and coded, with the assistance of the Nvivo program, to extract themes and topics from the discussion. The transcribed content was meticulously compiled into Microsoft Word documents. The outcomes of the thematic analysis revealed a range of motivations expressed by the students, encompassing both positive and negative aspects, in relation to their experience with the Assertion–Evidence design principle through PowerPoint presentations. Various themes emerged, representing factors contributing to internal and external motivation. Remarkably, the participants concurred that affective factors significantly influenced their motivation to engage with the grammar content when it was presented through the instructional session utilizing PowerPoint presentations designed in accordance with the Assertion–Evidence format.

Several positive responses were observed regarding the impact of the Assertion–Evidence through PowerPoint presentations on the motivation and engagement of Thai EFL students in learning English grammar. A notable observation was that the use of visual elements in the slides contributed to creating a relaxed learning environment. For instance, students expressed that when they encountered PowerPoint slides featuring relevant pictures and videos, particularly those associated with popular movies or television series, their familiarity with the subject matter increased. Testimonials from participants further support this notion.

One student (S1) stated, "*I have found that the slides contain some cute and relatable pictures that help me to understand the tenses easily*."

Another student (S4) emphasized, "*I understand the grammar more from one or two pages in the slides contain some interesting video that helps in describing the Grammar which the character in the video help me to remember the rule of using past continuous tense*."

Additionally, a student (S6) expressed, "*Usually, I hate to learn Grammar stuff, but this kind of slide is very pleasant to my eyes and I enjoy learning more*."

Furthermore, participants highlighted their appreciation for the PowerPoint presentations designed under the Assertion–Evidence principle, as they facilitated a deeper comprehension of the intricate grammar content.

Testimonials exemplifying this sentiment include statements such as, "*I like to see the slides that contain less irrelevant information but have only the key information since it helps me stay focused and understand more*" (S1) and "*When learning with the slides that contain pictures and videos, it helps me understand more in-depth*" (S2).

Another student (S4) added, "*Seem like I get into the content deeper when the teacher shows this kind of slides*."

Conversely, negative comments highlighted a preference among some students for written examples over visual aids. Specifically, they indicated a desire for more written content in the slides, which formed a common theme.

Testimonials reflecting this sentiment include statements like, "*I had difficulty relating the topic of the lesson as I found that the example part of how to use the tense is a bit limited*" (S3) and "*I prefer more examples in written rather than in pictures when talking about how to use the tenses because I can take some notes easily*" (S5).

The findings derived from the qualitative data using the thematic analysis suggest that the utilization of PowerPoint presentations structured in accordance with the assertion-evidence format can lead to favorable outcomes. Specifically, students experience a heightened sense of relaxation while learning grammar. Furthermore, concerning cognitive motivation, students articulated that they engage in more profound contemplation when exposed to PowerPoint presentations following the assertion-evidence format. On the downside, students conveyed concerns about the presentations' lack of depth. Some felt the need for more comprehensive content. They also indicated a preference for textual examples over visual representations, as they often encounter a multitude of written examples instead of images.

It is important to note that the perspectives and learnings of the focal participants encompass both positive and negative facets, as outlined from the figure below.
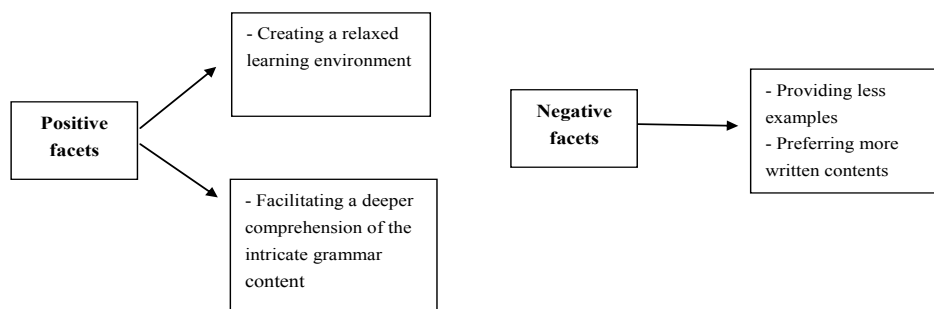

Figure 1 The Themes/Codes Derived from the Qualitative Data on the use of Power Point Presentations Structured in Accordance with the Assertion-Evidence

Discussion

The assertion-evidence format plays vital roles in the process of EFL learning and concept comprehension. The assertion-evidence format, derived from the cognitive theory model, has proven to be an effective instructional method in EFL learning. This effectiveness is evident in the enhancement and retention of grammatical competence observed in this study. Specifically, in response to RQ1, which sought to compare the effectiveness of conventional presentations with the assertion-evidence design through PowerPoint presentations in terms of grammatical learning among Thai EFL students, the results showed that the group supplemented with the assertion-evidence design had significantly higher average grammatical competence scores compared to the group exposed to conventional practice presentations. This finding aligns with students' perception of the intervention's effectiveness.

When examining RQ2, which investigated the extent to which the Assertion-Evidence design through PowerPoint presentations retains English grammatical knowledge among Thai EFL students, the results indicated that this instructional tool was effective in retaining grammatical knowledge. This can be attributed to the established contiguity feature, which has been shown in numerous studies to enhance knowledge retention (Mutlu-Bayraktar et al., 2019). When there is a strong connection between graphics and words, as provided by the tool, the retention of knowledge is significantly improved compared to situations where there is a disconnect between these elements. The significance of this tool extends to its role in designing digital learning experiences. Poorly designed instructional methods often lead to high memory usage as students struggle to grasp and understand the concepts being presented. In contrast, the Assertion-Evidence design in PowerPoint presentations optimizes the learning experience, reducing the cognitive load on students and promoting effective knowledge retention. Overall, the hypothesis stating that "the Assertion-Evidence design through PowerPoint presentations will retain the English grammatical knowledge of Thai EFL students" was supported by the findings. This contradicts the study conducted by Mayer (2014), which reported that the amplified design of the assertion-evidence format, which not only elevated students' satisfaction and enthusiasm for the learning process but also integrated engaging elements such as pictures, videos, and graphics. This distinct iteration of the assertion-evidence format, characterized by its sophisticated visual enhancements, effectively nurtured heightened contentment, and enthusiasm among students regarding the learning material. Despite these positive effects, however, it fell short in terms of generating a significant impact on learning outcomes and knowledge retention. However, the study by Garner and Alley (2016) aligns with our hypothesis, demonstrating that students taught English grammar using the Assertion-Evidence design had a higher retention rate of grammatical concepts compared to those taught using traditional methods.

The results of RQ3, which investigated how the Assertion-Evidence design through PowerPoint presentations motivates Thai EFL students in learning English grammar, revealed that students exhibited both positive and negative motivations when exposed to this instructional approach. The significance of motivation in the learning process cannot be overstated, as learners' motivation influences their acceptance of instructional methods (Ma et al., 2019). Therefore, the choice of instructional methods employed can have a substantial impact on students' learning experience.

In line with the findings, the use of PowerPoint presentations designed under the assertion-evidence format was found to generate positive motivation among some students by creating a relaxed atmosphere for learning. Particularly, when students were presented with PowerPoint slides containing relevant pictures and videos related to the grammar content, especially if the videos were derived from popular movies or television series, they reported feeling more engaged and familiar with the subject matter. This finding supports the results of Garner and Alley (2016), who discovered that students taught English grammar using the Assertion-Evidence Design displayed a greater preference for this method compared to traditional approaches. This positive motivation can be attributed to the efficacy of the assertion-evidence format in

preventing information overload and facilitating learning. Furthermore, adherence to the cognitive load theory suggests that PowerPoint lessons should be developed with minimal excessive writing and concurrent teacher talking, as these practices can lead to cognitive overload and memory failures (Shibli & West, 2018). Therefore, teachers must carefully design instructional materials to avoid cognitive load and promote effective learning with improved retention among students.

On the other hand, negative motivation was observed among students who preferred the use of more written examples over visual elements, aligning with the findings of Ma et al. (2019). It is essential to recognize that no single instructional method is universally effective for all students, as individual preferences vary. Some instructional methods may be limiting, while others can be exhaustive. Therefore, a combination of instructional methods is often recommended when teaching grammar to ensure that all students are positively motivated while minimizing instances of negative motivation (Ma et al., 2019).

In conclusion, the results highlight the importance of motivation in the learning process and demonstrate the dual nature of student motivation when exposed to the Assertion-Evidence design through PowerPoint presentations. The findings emphasize the need for teachers to carefully consider instructional design, striking a balance between visual and written elements to create a conducive and motivating learning environment. By understanding students' preferences and avoiding cognitive load, teachers can enhance students' motivation and improve their learning outcomes in grammar instruction.

Implications

The findings of this study have significant implications for the promotion of assertion-evidence-based PowerPoint instructional methods in the context of teaching English as a Foreign Language (EFL) to students. However, further research is warranted to explore the effectiveness of these methods specifically in enhancing grammatical competence among EFL students. Grammatical competence encompasses active engagement with grammar through observation, communication, and reasoning. It is evident that assertion-evidence-based PowerPoint instructional methods play a crucial role in motivating students and facilitating their conceptualization of content. Therefore, these techniques can be employed across various aspects of the EFL classroom to enhance the learning process and improve the comprehension of grammar among EFL learners. Particularly within the domain of grammar, this instructional approach proves valuable in teaching grammatical features such as different verb forms, tenses, and grammatical accuracy.

The implication of these findings is that teachers can adopt and integrate assertion-evidence-based PowerPoint instructional methods into their teaching practices to enhance students' grammatical competence. By employing these techniques, teachers can create a dynamic and engaging learning environment that promotes active conceptualization of grammar and fosters students' motivation. Moreover, this instructional approach can contribute to improving students' comprehension and proficiency in using grammatical structures accurately. However, it is important to acknowledge the need for further research to delve deeper into the effectiveness of these methods and their impact on various aspects of grammatical competence.

Recommendation

The study suggests that the implementation of assertion-evidence-based PowerPoint instructional methods has positive impacts for teaching grammar to EFL students. These methods can be instrumental in enhancing students' motivation, conceptualization of content, and development of grammatical accuracy. Educators are encouraged to explore and incorporate these instructional techniques in their EFL classrooms to foster effective language learning and promote grammatical competence among students. Nonetheless, further research is necessary to gain a comprehensive understanding of the benefits and potential limitations of this approach in different contexts and with diverse learner populations.

However, it is important to note that this study may have limitations due to the relatively small sample size of participants. Therefore, future research should replicate the study's results using a larger and more diverse sample, including separate analyses for male and female students. Furthermore,

the content of the assertion-evidence format can be extended to other subject matters beyond English tenses, broadening its applicability.

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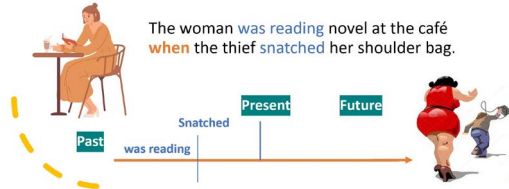
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Appendices

Appendix A: Example of Assertion–Evidence design presentation through Powerpoint

Appendix B: Example of conventional practice presentation through Powerpoint

Author Details

Raweewat Sripradith, *Nakhon Phanom University, Thailand,* **Email ID**: *mr.raweewat.s@gmail.com*