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Exploring the Impact of Multimodal Artifact Creation in Canva on the Understanding of Multimodal Texts in EFL Learners



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Abstract

Multimodality is an important component of the English as a Foreign Language (EFL) classroom. Among its myriad elements, one that has not been addressed in recent research is the importance of engaging in the creation of multimodal texts in EFL classes. This study investigates how adding lessons focused on the creation of multimodal texts in EFL classrooms contributes to EFL students' understanding of multimodal texts in English. Employing a quasi-experimental design, the study involved the comparison two groups of students who learned English through a strong approach to multimodality. The control group focused only on viewing skills while the intervention group additionally engaged in artifact multimodal making through Canva in the second language. Our findings suggest that students who participated in this educational experience improved multimodal literacy, which serves as evidence in favor of the use of a strong approach to multimodality in EFL classrooms. We recommend that educational policies and teaching practices should integrate this approach to make EFL lessons a strategic support for the development of multimodal literacy.

Keywords: Artifact making; EFL; ESL; infographics; multimodal literacy.

Introduction

Since the 1990s, there has been a strong movement to understand literacy beyond the processing and understanding of the printed word. Scholars from the New London Group (NLG; 1996) argued for

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a pedagogy that included not only the written text but also other modes of communication, such as images, sounds, and colors. This educational approach was given the name *multiliteracies*. The term *multiliteracies* refers to the multiple ways in which people can make meaning, encompassing two dimensions: the social and the modal (Kalantzis et al., 2019). The social dimension emphasizes the importance of diverse contexts in communication, while the modal dimension pertains to the semi-otic modes available for meaning-making, such as written text, gestures, and sounds. In educational contexts, *multiliteracies* involves the promotion of learning spaces where students can engage in multimodal meaning-making using new media in diverse contexts (Zapata, 2022). When implemented effectively, *multiliteracies* can help students develop critical thinking, comprehend the role of different modes in multimodal artifact creation, understand how social contexts impact literacy practices, and utilize both traditional and new media (Bull & Anstey, 2019).

Multiliteracies in the EFL teaching and learning field has garnered increasing attention due to its potential to facilitate students' access to meaning and to respond to the affordances of digital technologies. Despite the growing body of research, the impact of multimodality on EFL students' language skills development remains contested for at least four reasons. First, research findings have been inconclusive. Some studies have suggested potential benefits of focusing on multimodality in the EFL classroom, including support for translanguageing (Jiang et al., 2024), having positive impacts on affective variables like self-confidence and motivation (Abdelhalim, 2024), developing critical thinking (Carcamo & Pino, 2025), and offering insights into L2 language learning identity and attitudes (Abdulaal et al., 2023; García-Pastor & Piqueres Calatayud, 2023). However, some research suggests that digital multimodal composing does not always lead to improvements in writing skills (Kim & Belcher, 2020) or grammatical accuracy compared to monomodal text-based writing (Alrajhi, 2024). Second, traditional views of language development have often been an obstacle to the use of multimodal approaches to EFL, as teachers used to teaching traditionally often overlook the growing significance of multimodality in the digital age. Such beliefs make it hard for teachers to integrate multimodality in their classrooms and complicate the design of studies adopting a multimodal perspective on language learning. Nonetheless, there have been attempts to incorporate new ideas that reshape traditional views of EFL teaching such as *communicative multimodal competence* (Rubio-López, 2024) and a *strong* version of multimodality (Kessler, 2022), which have the potential to open educators' eyes to new understandings of language competence. Finally, few studies on multimodality have focused on exploring the effects of including multimodal-making activities in EFL contexts (Lim & Kessler, 2022) despite the existence of frameworks such as FAMILY and Learning by Design that encourage the development of multimodal competence (Lim & Tan-Chia, 2023).

To contribute to this ongoing discussion on the importance of making multimodality an essential component of the EFL classroom and address the importance of multimodal artifact making, the present study has two objectives. It first aims to explore if a multimodal literacy unit based on the strong version of multimodality and the FAMILY instructional framework has an impact on EFL students' understanding of multimodal texts. Additionally, it aims to determine the effect of adding a multimodal artifact making experience in a unit focused on multimodality in an EFL course with university students. Our research questions are as follows:

- RQ 1: What is the impact of a multimodal literacy unit, based on a strong version of multimodality and the FAMILY instructional framework, on EFL students' understanding of multimodal texts?
- RQ 2: What are the effects of incorporating a multimodal artifact making experience into a multimodal literacy unit on EFL students?

Literature Review

A Multimodal Approach to Language Studies

The multiliteracies approach has rejuvenated the concept of literacy by advocating for the epistemological assumption that meanings cannot be constructed or understood as the result of interacting with a single semiotic mode. A semiotic mode refers to a system of meaning-making resources developed over time as part of a community's culture, such as writing, speech, gestures, and images (Danielsson, 2016). From this perspective, the writing process involves understanding how different semiotic choices work together to present ideas with a specific purpose, for a particular audience, and within a specific context. This understanding of literacy continues to be fostered nowadays as the multimodal nature of text has been accentuated by an increased access to tools for the consumption and production of digital texts. Digital texts often rely on a combination of various semiotic modes and rarely depend solely on written words (Lim & Tan, 2017). Examples of multimodal texts in the digital age include websites, posters, comic books, social media reels, and videos. In this context, literacy is embedded in the social practices people engage in, which are facilitated by the access to new media and technological tools. Scholars have advocated for placing 'multimodal literacy' at the center of educational agendas, emphasizing the need for learners to develop skills in creating, sharing, interpreting, and redesigning meanings through various representational and communicative modes (Jewitt & Kress, 2003).

From an educational standpoint, it is essential that students develop literacy not only in decoding and comprehending written text, but also in decoding, comprehending, and producing multimodal texts. In this digital age, literacy is not viewed as a static representational system inherited from past generations, but as dynamic and evolving methods of meaning-making facilitated by available tools (Kress, 2010). This new understanding of literacy has influenced both curriculum design and assessment (Unsworth et al., 2019), which requires teachers to act as mediators who help students identify and use tools for creating multimodal texts, thereby becoming designers of meaning. In this approach, multimodal literacy entails developing semiotic awareness, understood as the ability to notice and understand how different semiotic modes can be used to make meaning (Towndrow et al., 2013).

To inform educational practices, researchers have developed pedagogical approaches for the classroom. The NLG (1996) were first to propose a pedagogical approach to multiliteracies, based on the societal and technological changes of the time. In this approach, the concept of 'design' is central, with the focus on engaging in semiotic design processes where people reproduce and transform semiotic conventions. The NLG's proposal includes four flexible pedagogical angles that can occur simultaneously, sequentially, or recurrently. The four pedagogical angles are: 1) *Situated practice*, which involves immersing students in experiences and familiarizing them with designs from their own lifeworlds; 2) *Overt instruction*, where students are introduced to the metalanguage needed to discuss multiliteracies, helping them describe, interpret, and comment on design elements in multimodal texts; 3) *Critical framing*, which encourages students to analyze texts critically within their production contexts; and 4) *Transformed practice*, where students engage in meaning-making practices related to the multimodal texts, considering their application in different contexts. Building on this work, a group of researchers from the NLG postulated The Learning by Design (L-by-D) Framework, in which four knowledge processes based on the NLG's pedagogical angles are proposed: *experiencing*, *conceptualizing*, *analyzing*, and *applying* (Cope & Kalantzis, 2015). More recently, Lim and Tan-Chia (2023) developed their own framework, which echoes but also expands on the L-by-D Framework's processes, highlighting the central position of the student in the learning process. Their four learning processes are *encountering*, *exploring*, *evaluating*, and *expressing*. A key aspect emphasized in these frameworks is the final stage, which promotes the design of multimodal texts. Engaging in meaning-making is advocated as essential for students to actively apply and develop their skills.

Research on multimodality has significantly influenced our understanding of literacy, leading to curricular updates that advocate for a multimodal approach in countries such as Australia, Canada, the US, Chile, Sweden, and Singapore (Carcamo, 2024). An example of this trend is in the English Language Syllabus of Singapore where multiliteracies appears as one of three pedagogical emphases that should be fostered in the classroom, highlighting the multi-dimensional nature of literacy. The syllabus promotes two main skills: viewing (paired with reading and listening) and representing (paired with writing and speaking). The emphasis on representing highlights the importance of designing multimodal artifacts. This aligns with the goal of multimodal literacy, which aims to equip students with the skills to critically consume and produce multimodal texts (Lim & Tan, 2017). This aligns with the understanding that multimodal literacy aims to develop students able to critically consume multimodal texts as well as produce them (Lim & Tan, 2017). Suggested instructional strategies include guided questioning, explicit teaching, inductive learning, and providing students with metalanguage (Lim et al., 2022).

Lim and Tan (2017) developed the Systemic Approach for teaching visual texts to Singaporean high school students. This approach is rooted in Systemic Functional Linguistics (SFL) and its applications to multimodal discourse analysis. The Systemic approach heightens the need to explicitly teach the design of visual texts and engage students in this design process rather than focus only on interrogating the text as if the skills necessary for multimodal text design were to develop naturally. In essence, since meaning is a matter of making choices, students must be empowered to make these choices consciously and effectively, considering the features and functions of the genre at hand as well as the context for which it is created. The Systemic Approach proposes three levels for viewing skills: 1) *Encounter*, where students engage with the text to build an emotional connection with multimodality; 2) *Comprehension*, where explicit teaching occurs, and learning is scaffolded using a framework known as FAMILY. This framework guides students in analyzing the Form of a genre, its connection to a specific Audience, and the Message it conveys, aligning with Halliday's metafunctions (textual, interpersonal, and ideational); and 3) *Critical Viewing*, a stage involving higher-order cognitive processes, where teachers encourage students to question and critically evaluate the use of semiotic resources in the text (Lim & Tan, 2017).

The Importance of Multimodal Artifact Making

In ELT, two versions of teaching with multimodality have been identified: a strong and a weak version (Kessler, 2022). The strong version attributes equal importance to all semiotic modes, such as understanding words, charts, and colors (Grapin, 2019). Hence, understanding words may be deemed as important as understanding the meaning of a chart or understanding the use of color. In contrast, the weak version of multimodality views semiotic modes other than words as scaffolds or supplements to linguistic instruction, which remains the predominant focus (Qu, 2017). Proponents of this view may even argue that these scaffolds should be removed once they have served their temporary supporting role in understanding linguistic input (Kessler, 2022). Despite some experts expressing apprehensions about the impact of multimodality on L2 acquisition as well as their compatibility with L2 theories (Manchón, 2017), L2 researchers have put forward a research agenda with the intention of exploring its potential benefits (Lim & Kessler, 2022). One of these interests is the exploration of how engaging in multimodal artifact making impacts foreign language learning.

Engaging students in the design of multimodal artifacts has also gained importance in L2 research, supported by evidence from traditional reading-writing connections in linguistics and advances in Second Language Acquisition (SLA) theory. Regarding the reading-writing connection, some theories coming from the field of linguistics have emphasized the connection between reading and writing. For example, Parodi (2012) asserts that writing works as a proxy for comprehension, therefore, the two

cannot be viewed as separate processes. Sadoski and Paivio (2001) developed Dual Coding Theory, which integrates verbal and non-verbal cognition into both comprehension and production. Similarly, genre-based approaches (Martin & Rose, 2005; Rothery & Stenglin, 1994) combine both skills into pedagogical cycles that promote the acquisition of genres. In these proposals, a genre is not mastered until it can be produced, not just understood. In SLA, pedagogical frameworks such as task-based language teaching (Nunan, 2004) and the interaction approach (Mackey & Goo, 2012) advocate for the integration of different language skills, highlighting their constant interaction during communicative activities in real contexts. In line with these ideas, perspectives focused on multimodality such as those of Critical Viewing and the Systemic Approach assert that multimodal literacy should be viewed as both the critical understanding and the effective design of multimodal texts (Lim & Tan-Chia, 2022). Although there is no consensus on the specific mechanisms that account for comprehension and production transfer, the claim that comprehension and production are connected is widely recognized (Parodi, 2013).

Research on multimodality and L2 students' production has shown that multimodality might not significantly impact the quality of students' writing. Cho and Kim (2021) examined the relationship between the quality of multimodal composing and monomodal writing of a group of 31 Korean EFL high school students in reading-to-write tasks. Using an analytic rubric, students' task outcomes were evaluated in terms of content, linguistic features, and depth of reflection. The findings indicated that students' outcomes showed no statistically significant differences regardless of whether the task outcome was monomodal or multimodal. In fact, students expressed the same ideas in both monomodal texts and digital videos they produced with similar levels of complexity and accuracy. Kim and Belcher (2020) compared traditional monomodal argumentative essays to Digital Multimodal Composing (DMC) tasks to explore whether multimodality could promote linguistic development. DMC tasks involve producing a digital genre that integrates linguistic and non-linguistic modes (Kessler, 2024). The 18 university L2 English participants of the study were assigned the tasks of writing an argumentative essay and producing a DMC project as homework over the course of a month. Both tasks were related to job applications. The researchers collected the reflection journals and survey responses regarding the experience. The findings of this study showed that the output of the monomodal task was syntactically more complex than the output of the multimodal product and that both were similar in terms of accuracy.

On the other hand, there are findings that reveal potential benefits from engaging in multimodal artifact making for L2 students. Abdelhalim (2024) recently investigated if collaborative digital multimodal composing (CDMC) impacts self-regulated writing strategies and self-efficacy levels. After a nine-week CDMC project, data was gathered through questionnaires to assess self-regulated writing strategies and self-efficacy while interviews were used to evaluate students' perceptions. The findings of this research suggest that CDMC improves some dimensions of both writing self-efficacy and self-regulated strategies. Moreover, although perceptions were mixed regarding the impact of CDMC on their writing, the project was generally well-received by the students. Overall, this study shows that engaging in multimodal artifact making from a collaborative perspective may benefit cognitive and affective variables that are important to writing in a foreign language. Additional benefits identified by L2 researchers include how multimodality serves as a tool for L2 identity construction (Cimasko & Shin, 2017; Tardy, 2005), enhances motivation (Pyo, 2016), improves fluency and accuracy in oral production (Yang et al., 2020), and develops noticing and audience awareness (Dzekoe, 2017).

In addition, Generative AI (GenAI) DMC in has gained traction in L2 education, as it provides learners with opportunities to enhance engagement, learning outcomes, and agency as multimodal artifact makers (Donley, 2024; Lee, 2024). GenAI has been shown to effectively assist L2 learners with the

integration of both written and visual elements into their digital multimodal compositions, as seen in the recently added Canva's AI-assisted design features (Jiang, 2024; Law, 2024). Tools such as Dall-E, Firefly, and Canva facilitate the development of multimodal literacy by helping students overcome technical barriers. This, in turn, fosters confidence and creativity in designing texts that extend beyond traditional writing assignments (Kim et al., 2024; Law, 2024). Despite these clear benefits, studies on the potential of GenAI to support linguistic development remains limited.

Our study sought to determine whether adding a multimodal artifact creation experience in a unit focused on multimodality had an impact on students' levels of understanding of multimodal texts of the same type. We aimed to determine whether it was sufficient for students to become familiar with multimodal text features by answering questions and analyzing texts or whether engaging in multimodal artifact creation would increase their level of understanding more substantially. To achieve this, we added a DMC component to the students in the treatment group while the control group focused only on the viewing skills related to multimodal literacy traditionally. Our study integrates the intervention into the existing curriculum, as suggested by Lim and Kessler (2022).

Methods

Research Design

The research study followed a quasi-experimental pre-post test design with complete EFL courses in a Chilean university where English is taught as a foreign language. At this university, English is integrated into the curriculum across most study programs. All students in programs that include EFL must complete at least two courses to ensure they achieve an A2 proficiency level of English according to the Common European Framework of Reference. Different sections of the same pre-intermediate course, English 2, were selected for the study, ensuring all participants were matched in proficiency level. Both sections were taught by the same instructor to eliminate differences attributable to teaching style and personality. Students were informed about the study and signed an informed consent approved by the ethics committee of the institution, allowing data collection.

One unit in this course focuses on the development of students' semiotic awareness by reading and analyzing multimodal texts in English, thus concentrating exclusively on viewing skills. This unit follows principles from literature on multimodal approaches to literacy, which emphasize the importance of reading multimodal texts with a critical stance (Lim & Tan, 2017; O'Halloran et al., 2017). Additionally, this approach suggests that the teacher can help the students gain awareness about how different semiotic modes construct meaning by using pedagogic metalanguage (Lim et al., 2022; Lim, 2024). The material used in the course aligns with the FAMILY framework (Lim & Tan, 2017).

For the present study, the control group ($N = 35$) experienced the standard version of the unit, which focuses on reading and analyzing multimodal texts, considering features such as the purpose of the text, the message, and genre features. These students did not experience activities that engaged them in multimodal artifact composing. While the control group was reviewing these skills, the treatment group ($N = 38$) engaged in activities related to the design of multimodal texts. Table 1 summarizes the design.

As can be seen, all groups started with the same lessons, but from lesson six onward, they diverged. Each lesson lasted two hours; therefore, there were 10 hours of different materials being implemented between the groups. Figure 1 and 2 show examples of DMC activities the students in the treatment group did in class. Figure 1 shows an example of an activity designed for lesson 8, including the answers provided by one of the students in the veterinary medicine program. Figure 2 shows an example of the same activity done by a student in the obstetrics program.

Table 1 *Overview of the Intervention*

Lesson	Control groups	Treatment groups
1	Pre-test: Reading comprehension of multimodal texts	Pre-test: Reading comprehension of multimodal texts
2	Introduction of the language of multimodality: semiotic modes, multimodal texts, semiotic awareness, and reading purposes from a multimodal approach.	Introduction of the language of multimodality: semiotic modes, multimodal texts, semiotic awareness, and reading purposes from a multimodal approach.
3	The importance of multimodality and of giving reasons why. Exploration of how reasons can be given through different semiotic modes.	The importance of multimodality and of giving reasons why. Exploration of how reasons can be given through different semiotic modes.
4	Analysis of multimodal texts and answering comprehension questions about these texts, considering persuasive strategies.	Analysis of multimodal texts and answering comprehension questions about these texts, considering persuasive strategies.
5	The role of multimodality in multimodal texts used for advertisement. Analysis of multimodal ads promoting products as to identify the purpose of the decisions made by the author as well as the effectiveness of the text communicating its intended message.	The role of multimodality in multimodal texts used for advertisement. Analysis of multimodal ads promoting products as to identify the purpose of the decisions made by the author as well as the effectiveness of the text communicating its intended message.
6	Review of reading purposes and multimodal texts. Students read multimodal texts and answered questions.	Exploring the importance of multimodality in their undergraduate programs and future professions
7	Grammar and vocabulary practice to explore in further depth multimodal texts. Students answered reading comprehension questions about the content of multimodal texts.	Planning their multimodal text: Identifying the features of multimodal text design that are relevant for their design of a multimodal text relevant to their future professions.
8	Grammar and vocabulary practice to explore in further depth multimodal texts. Students answered reading comprehension questions about the content of multimodal texts.	Design of the multimodal text planned considering the features and strategies selected for its design using Canva.
9	Analysis of multimodal texts.	Present multimodal texts designed in Canva.
10	Post-test: Reading comprehension of multimodal texts	Post-test: Reading comprehension of multimodal texts

Instruments

To measure the impact of the intervention, we used two equivalent versions of a test designed to assess students' ability to understand multimodal texts which had previously been validated by experts and piloted with students (Carcamo & Pino, 2025). The original version of the test included multimodal texts, followed by three questions of different yet complementary nature based on previous literature (Pellicer-Sánchez et al., 2020; Unsworth et al., 2019):

- A) Text question: This type of question requires the reader to pay close attention to the written text to answer correctly.
- B) Image question: This type of question requires the reader to examine the pictures and/or graphs in detail to answer correctly.
- C) Integration question: This type of question requires the reader to integrate information from both text and images to answer correctly.

Activity Done by Veterinary Medicine Student

a. Preparing your design: Complete BEFORE you design your infographic 1. What is the topic? Indoor cats 2. What is the purpose of the infographic? (inform about..., persuade x about...) inform about indoor cats and their benefits 3. Who is your main audience? for cats owners 4. I will appeal to (Ethos? Pathos? More than one of them?) Pathos	 The infographic is titled "INDOOR CATS" in a purple box. Below the title, there are two main sections. The first section, "01. ¿What is a indoor cat?", explains that indoor cats have a homely lifestyle where they stay at home and are not allowed to go outside. The second section, "02. Benefits", lists several advantages of keeping cats indoors, such as preventing poisoning, infections, and getting lost. The infographic also includes two images of cats: a brown tabby and a grey and white cat. At the bottom, there is a pink box with the text "become aware of your cats' lifestyle with this information!".
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Figure 1 *Activity Done by Veterinary Medicine Student.*

Activity Done by Obstetrics Student

1. What is the topic? = Prevention of breast cancer 2. What is the purpose of the infographic? (inform about..., persuade x about...) = Inform how to prevent breast cancer 3. Who is your main audience? (level of knowledge, age, etc.) = Adult women who want to take care of their health 4. I will appeal to (Ethos? Pathos? More than one of them?) = Ethos since it is attributed to credibility	 The infographic is titled "TIPS TO PREVENT BREAST CANCER" in a red box. It features a central pink ribbon symbol. Surrounding the ribbon are five circular tips: "Maintain a healthy weight", "Avoid cigarettes and alcohol", "Perform breast self-examination", "Eat healthy", and "Perform physical activity". Arrows connect these tips in a circular flow. The background is red with teal and yellow accents. At the bottom, there are several small hand icons.
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Figure 2 *Activity Done by Obstetrics Student.*

In our study, we added a critical thinking question. This type of question requires the reader to analyze and evaluate the use of modes of persuasion—ethos, pathos, and logos—in relation to emotional triggers, credibility indicators, and arguments in the multimodal text. The critical thinking questions were validated by a panel of three experts who held a PhD in linguistics or TESOL.

The final total score for the test was 24 points. While text, image, and critical thinking questions were designed as multiple-choice questions, the integration question was open-ended and scored using a rubric. We conducted *t*-tests to estimate the impact of the intervention by testing the following two hypotheses:

1. Both groups are expected to score statistically significantly higher on the post-test after participating in a multimodal literacy unit based on a strong version of multimodality.
2. The intervention group is expected to show a greater increase in post-test scores compared to the control group due to the inclusion of a multimodal text design component in the intervention.

Results and Discussion

We started by calculating descriptive statistics considering the types of questions as well as the total scores both groups achieved. Table 2 displays the results.

Table 2 shows the means and standard deviations for the different types of questions by group. The control group reached a pre-test average score of 13.11, which increased to 15.71, indicating that the standard unit which included revising aspects of multimodality through reading and standard language practice had an impact on students' understanding of multimodal texts. This increase is shown mainly in the students' understanding of the written text in the multimodal text as well as their capacity to integrate written text with images in the open-ended question. For the experimental group, the pre-test average was 14.68, increasing to 17.32 after the intervention. Similar to the control group, the experimental group showed improvement in multiple-choice written text and integration questions.

The Shapiro-Wilk test of normality confirmed that both groups complied with the assumption of normality. The control group showed a Shapiro-Wilk statistic of 0.975 ($p = 0.058$) while the Experimental group had a statistic of 0.945 ($p = 0.06$) in the pre-test variable. Regarding the post-test variable, the control group had a Shapiro-Wilk statistic of 0.95 ($p = 0.11$) and the experimental group had one of 0.959 ($p = 0.178$). All *p*-values indicate that the data do not deviate from normality. As the data complied with the assumptions, we conducted an independent *t*-test to confirm whether the groups were comparable before the intervention. The independent *t*-test showed that the groups did not differ

Table 2 *Results of the Pre- and Post-Tests*

Group	N		Pre-text	Pre-im	Pre-Int	Pre-CT	Pre-Total	Post-text	Post-Im	Post-Int	Post-CT	Post-Total
Contr	35	Mean	2.54	3.06	5.06	2.46	13.11	2.94	2.66	7.91	2.20	15.71
		SD	0.95	0.76	2.46	1.24	4.17	0.84	0.94	2.69	0.93	3.68
		Min	1	1	1	1	5	1	1	2	0	7
		Max	4	4	11	4	21	4	4	12	4	21
Exp	38	Mean	2.74	2.95	6.11	2.89	14.68	3.32	2.95	8.61	2.45	17.32
		SD	1.06	1.01	2.45	0.95	3.86	0.74	0.77	2.16	0.89	
		Min	0	0	1	1	5	1	1	5	1	11
		Max	4	4	10	4	21	4	4	12	4	22

Note. *Pre-text*: Pre-test multiple-choice questions related to text; *Pre-im*: Pre-test multiple-choice question related to image; *Pre-Int*: Pre-test open-ended question integrating text and image; *Pre-CT*: Pre-test critical thinking question; *Pre-total*: Total score in pre-test; *Post-text*: Post-test multiple-choice questions related to text; *Post-im*: Post-test multiple-choice question related to image; *Post-Int*: Post-test open-ended question integrating text and image; *Post-CT*: Post-test critical thinking question; *Post-total*: Total score in post-test)

significantly from each other before the intervention ($t(71) = -1.671, p = 0.099$). Subsequently, we conducted paired-samples t -tests to estimate within-group differences. The results of the paired-samples t -tests revealed that the control group showed a mean increase in multimodal text comprehension of 2.6 ($t(34) = 3.82, p < 0.05$), with Cohen's $d = 0.64$, indicating a moderate effect size. The experimental group also showed positive results, increasing its scores by 2.63 ($t(37) = 3.81, p < 0.05$). The effect size was also moderate (Cohen's $d = 0.63$).

To complement the within-group analyses, an ANCOVA was conducted to compare post-test scores between the experimental and control groups while controlling for pre-test performance as a covariate. The covariate exhibited a significant effect on the post-test scores, $F(1, 70) = 11.01, p = .001$, partial $\eta^2 = .136$, indicating that initial performance significantly predicted post-test outcomes. The effect of group on post-test scores was not statistically significant, $F(1, 70) = 2.33, p = .131$, partial $\eta^2 = .032$, which supports our claim that there is no significant difference between the groups. The power analysis revealed relatively low power (.325), suggesting that future studies might benefit from considering larger samples to detect possible between-group differences.

Overall, the results indicate that the unit itself had a positive impact on students' multimodal reading comprehension. Both the control and experimental groups displayed similar increases in scores, suggesting that the key factor for students to develop their reading comprehension is the opportunity to interact with multimodal texts, understand their design in terms of aspects such as form, audience, and purpose, and gain awareness of the role different semiotic modes play. These results show that active engagement with multimodal text design did not produce significantly different outcomes between the groups. The engagement with multimodal text design may have resulted in other benefits that were not measured in the study, such as the quality of students' multimodal designs or motivation, but they indicate that engaging in multimodal text design does not significantly impact students' ability to critically interpret multimodal texts.

Teaching with multimodality in the EFL classroom may seem intuitive because materials often rely heavily on semiotic resources, such as images and colors to support comprehension. Nonetheless, the effective incorporation of multimodality in the EFL classroom requires instructional frameworks that support its effective implementation, resulting in the development of students' semiotic awareness. The findings of this study, first of all, confirm that a strong version of multimodality has a place in EFL and that it can be successfully implemented through the Systemic Approach and the FAMILY framework. Additionally, it provides evidence that students' engaging with multimodal artifact design in EFL settings does not directly contribute to the improvement in their understanding of multimodal texts.

The findings of the study support the effectiveness of adopting a strong version of multimodality in the EFL classroom, as all students experienced gains in their understanding of multimodal texts. A comparison of pre- and post-test results using paired-samples t -tests revealed that both the control and experimental groups improved their scores. This is particularly related to the students' capacity to integrate images and words to convey the purpose of the multimodal text. The same gain was found in both groups, regardless of their prior experience with multimodality. This shows that a strong version of multimodality implemented through the FAMILY framework may help students gain awareness of how different semiotic modes create meaning. These results align with prior research that focused on the role of multimodality in EFL settings, both in those in which comprehension was measured from students' perceptions and with tests (Carcamo & Carmona, 2025; Lewis III & Lewis, 2020; Yawiloeng, 2022). Although the FAMILY framework supports lesson planning for EFL, it is important for EFL researchers and educators to continue tailoring this framework to directly address linguistic components and offer feedback that concerns not only multimodality, but also language

learning (Ganapathy et al., 2016; Wen, 2023). Research has shown that multimodal text use tends to align with a weak version of multimodality (Grapin, 2019); therefore, it might be useful to study how educators analyze the material they are given and make adaptations to ensure multimodality is not only used as language support but as a significant topic to be addressed, especially considering that research has shown that EFL educators tend to be reluctant to teach multimodality due to practical and philosophical challenges (Yunus et al., 2022).

The results showed that the increase in comprehension scores of the experimental group was not significantly different from that of the control group. The similarity in scores highlights two points. First, the experimental group was able to increase comprehension scores despite engaging in significantly less reading than the control group. This suggests that there is a representing-viewing connection that may parallel the reading-writing connection in traditional literature. In addition, it is possible that students obtained other benefits. Carcamo and Carmona's (2025) study revealed additional benefits as their findings showed that through a strong multimodal approach, students learned to value their future professions and recognize the role that multimodality plays in everyday life. Other studies show that engaging with multimodal text design positively influences students' self-perception as multimodal artifact creators and their abilities to produce such texts (Abdelhalim, 2024).

Considering the multiple benefits of including multimodal artifact making in the curriculum, we believe that DMC deserves further investigation, as previous studies have done with the reading-writing connection in L1 and L2 contexts (Graham & Hebert, 2011; Graham et al., 2017; Yang et al., 2020). Lim and Kessler (2022) argue that a clear view of whether multimodal artifact making can impact L2 writing requires a definition of writing that goes beyond the written word, allowing us to move beyond a monomodal understanding of text. In this line, Polio (2017) has stated that L2 writing development should be understood as the changes over time in any of the following areas related to text production: language, genre knowledge, text production processes, metacognitive knowledge, strategy use, and writing goals. Lim and Kessler (2022) suggest that, unlike a monomodal perspective focused mostly on the linguistic aspects of writing, a multimodal perspective embraces the same linguistic aspects along with the dimensions mentioned by Polio (2017). Consequently, future studies should continue exploring the potential benefits of EFL students' design of multimodal texts considering this view of writing as multidimensional and multimodal. For instance, researchers might be interested in exploring the impact of engaging in multimodal artifact making on students' engagement with multimodal literacy or how it influences students' sense of self-efficacy. Additionally, designing longer interventions might shed light on finer nuances of students' multimodal literacy development.

Conclusion

Some theories from a logocentric view of language, as opposed to a multimodal perspective, have historically suggested that reading and writing are mutually beneficial, as both skills are recursive, social, meaning-making processes that share cognitive and linguistic knowledge (Graham & Hebert, 2011; Graham et al., 2017; Yang et al., 2020). Empirical research supports the claim that writing can be improved by reading and vice versa. The strength of this relation varies based on its interaction with other variables such as language proficiency and instructional context (Lee & Schallert, 2016). However, this claim has been far less explored from a multimodal perspective. Among the different approaches to developing multimodal literacy, a common thread is the emphasis on promoting not only the development of receptive skills (e.g., viewing) but also productive skills (e.g., representing). Engaging students in multimodal text design is considered crucial as it reflects the reading-writing connection found in the traditional monomodal literacy literature. The present research aimed to determine whether incorporating a DMC component in a multimodal literacy unit had an impact on students' overall understanding of multimodal texts.

The findings of this study suggest that teaching multimodality through a strong version approach may have a positive impact on students' ability to understand and analyze multimodal texts. Furthermore, the results of our study indicate that having students engage in multimodal text design may strengthen their critical understanding of multimodal texts, suggesting a possible viewing-representing connection. The integration of GenAI assisted tools into L2 contexts may facilitate the composition of multimodal texts, fostering creativity and critical thinking, without neglecting the improvement of the understanding of multimodal texts. Although not conclusive, our findings provide evidence in favor of a strong approach to multimodality in L2 educational contexts.

The evolving nature of literacy cannot be overlooked, as the digital age demands a more radical approach towards its understanding through multimodal lenses. Literacy is no longer solely about written words, and it is important that EFL teachers as well as students understand this. Considering that a strong approach to multimodality has the potential to foster students' multimodal literacy for EFL students, it is important for educational practices and policies to integrate this approach into effective teaching strategies or propose modifications that tailor it to EFL concerns and needs. This will ensure that students develop the foreign language in ways that align with our current and future multimodal world.

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