ISELT 16
Interdisciplinary Studies in English Language Teaching

The Effect of Watching Sustainability-Focused Animations on English Language Learners' Critical Thinking and Reading Comprehension

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Abstract

Promoting environmental awareness and harmony with nature can boost students' empathy and prepare them for a globalized world. Highlighting sustainability in English language classrooms aids in developing students' environmental ethics and sense of personal responsibility. Accordingly, the focus of the present quantitative study was to examine the impact of watching sustainability-focused animations on the reading comprehension and critical thinking of English language learners. The program was implemented in an English language classroom at a private school situated in Kerman City, Iran, with the participants consisting of 30 students (15 students in the control and 15 students in the experimental group) who were 12 years old. Quantitative data were collected and presented using pre- and post-reading tests to track the potential changes in students' reading comprehension. Naeini's (2005) Critical Thinking Questionnaire was used to examine participants' critical thinking at the beginning and end of the project. Post-reading tests showed that the experimental group outperformed the control group participants. Additionally, it was reported that sustainability-focused animations increased learners' critical thinking. Briefly, incorporating environmental components into the educational process directed towards sustainable development enriches the critical thinking skills of students and facilitates the acquisition of language, as there exists an interconnected relationship between thinking, language, and our surrounding environment.

1. INTRODUCTION

Given the increasing global concern for sustainability, the integration of education for sustainability (EfS) into English language programs at schools and universities has become necessary. This approach considers not only the long-term effects of students' actions but also their immediate contributions (Zwickle & Jones, 2018). English language classrooms in Iran can offer more than just language practice; they can also serve as a valuable platform for addressing sustainability issues due to the importance of the English language in the country (Riazi, 2005).

Regardless of their location, whether inside the classroom or outside of it, students are responsible for making decisions regarding sustainability (Edwards, 2012). The aim of Education for Sustainability (EfS) is to involve a larger number of individuals in the decision-making process,

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with the goal of increasing environmental awareness and enabling active participation in the supervision and management of the environment. Therefore, a comprehensive approach to sustainability education necessitates broadening the definition of sustainability, addressing economic and environmental challenges, and progressing towards practical solutions (Veiga Ávila et al., 2018). EfS endeavors to promote knowledge, skills, understanding, values, and actions by advocating for financial and environmental sustainability, environmental preservation, and social equity. It fosters innovative thinking and cultivates creative abilities by integrating and interconnecting social, economic, and ecological development (Talan & Tyagi, 2020).

Moreover, to adequately prepare students for personal and social success, education should prioritize holistic growth encompassing non-academic and personal development in addition to academic progress (Oliveri & Markle, 2017). Furthermore, substantial changes occur over the course of a student's educational journey. Education is widely recognized as a potent tool for fostering intellectual and personal advancement, equipping students—particularly young individuals—to confront and surmount challenges both presently and in the future. Concurrently, notable progress has been made in the realm of second/foreign language education (Chen & Kent, 2020). The World Health Organization (WHO) defines life skills as the competencies that empower individuals to effectively tackle life's challenges and dilemmas, rendering them more adaptable, responsible, and efficient in managing their thoughts, emotions, and actions across diverse contexts and circumstances (WHO, 1997). Consequently, WHO (1997) has outlined ten essential life skills, with critical thinking (CT) being among the most coveted and challenging to cultivate.

The development of critical thinking skills through education enables individuals to analyze and address issues effectively, as well as make well-informed decisions. At times, societal challenges such as crime, poverty, and pollution arise due to decisions made by government and business entities without the application of critical thinking, supported by thorough research and careful implementation. To resolve these problems, it is essential to possess adequate and relevant knowledge, maintain an open mindset, and possess the ability to think critically. By employing critical thinking, decisions can be directed toward positive actions that enhance the overall quality of life for all individuals (Minott et al., 2019). Ruggiero (2012) asserts that critical thinking emphasizes the examination of problems, their resolution, and the process of decision-making.

Various theorists have different interpretations of critical thinking; however, they all agree that it is a cognitive process aimed at making decisions (Bailin et al., 1999). In the realm of education, critical thinking is crucial when discussing sustainability, as education is considered the most potent tool for development (Sunday, 2012, p. 1) and decision-making. Development is also viewed as a key factor in promoting behavioral change, which in turn impacts critical thinking for sustainability, especially in addressing social issues and advancing progress. In the educational sector, learners who acquire critical thinking skills are empowered to learn how to think rather than what to think (Thomas, 2010). This form of critical thinking can be utilized as a tool to equip all learners with the necessary skills to tackle problems and make decisions regarding current sustainability issues or potential future challenges (Rieckmann, 2010).

A common problem is how the environment and sustainable development are depicted in many educational programs worldwide, including Iran. Teachers and students are not required to think about how their actions could impact ecosystems, human well-being, or the sustainability of the environment. There is not much effort to connect environmental sustainability with student welfare. Less emphasis is placed on the development of practical skills for practicing sustainability, and the majority of what is taught in these educational settings is theoretical. Therefore, it is crucial to concentrate on sustainable methods of teaching. In Iran, there is a tiny body of research on EfS, much of which concentrates on theoretical issues (Ahmadi et al., 2021;

Bahaee et al., 2014; Bazm, 2021; Torkzadeh et al., 2022). The responsibility of addressing the multifaceted requirements of Iranian society in the realm of sustainability education prominently rests upon educational institutions, particularly schools, which serve as the key operational agents within the broader educational framework. Accordingly, two following research questions are proposed to investigate the effects of sustainability education on English language learning:

1. Is watching sustainability-focused animations significantly effective in enhancing English language learners' reading comprehension?
2. Is watching sustainability-focused animations significantly effective in empowering English language learners with critical thinking?

Theoretical Framework of the Study

The study utilizes transformative learning theory (Mezirow, 1991, 1996) as its theoretical framework. This perspective on education emphasizes the transformation of the student, in contrast to the notion that education solely revolves around the acquisition and accumulation of knowledge (referred to as the banking model of education by Paulo Freire in 1970). Instead, it directs attention toward the goals and outcomes of education rather than the curriculum itself. Transformative learning, therefore, stems from transformational learning and seeks to elucidate the profound personal impact that teaching has on a student. In contrast to imitation, transformational learning employs the terms "transactional" or "transmissive" learning, which involves exchanging information between the student and the teacher.

Taylor (2008) elucidated that the transformative process is influenced by frames of reference, comprising assumptions and expectations that impact perspectives, thoughts, beliefs, and behaviors. These frames consist of two key dimensions: meaning schemes, which are specific knowledge or beliefs that shape interpretation, and meaning perspectives, which represent the personal paradigm. The theories and assessments derived from these frames guide decision-making. A paradigmatic shift occurs when a frame of reference is revised following reflection. Analyzing problematic frames of reference offers advantages as it enables individuals to alter their schemata and develop emotional readiness for change. TLT plays a crucial role in modifying deeply ingrained frames of reference, ultimately leading to a transformation in perception and the process of creating meaning.

In recent years, a significant amount of research has been conducted on TLT, focusing on various aspects such as community and social transformation, intercultural learning, lifestyle, and career change. Interestingly, sustainability has also been included in this new list despite not being originally incorporated into the subject matter of TLT (Sterling, 2011). Research in the field of EfS in Iran is limited, with a predominant emphasis on theoretical key issues, as demonstrated by Ahmadi et al. (2021), Bahaee et al. (2014), Bazm (2021), and Rafie Moghadam et al. (2022). Scholars, including Ryan and Cotton (2013), have proposed that combining TLT and EfS offers valuable opportunities to address the intricate and uncertain nature of social, economic, and ecological challenges. Given the current context of sustainability-related crises in the 21st century, TLT has emerged as a promising form of education that has the potential to facilitate individual, organizational, and societal transformation on a large scale, thereby contributing to the promotion of a more sustainable world.

Review of Literature

In 1987, the World Commission on Environment and Development (WCED), which had been set up in 1983, published a report entitled "Our Common Future". The WCED provided a clear definition of sustainable development, which involves meeting present needs while ensuring that future generations can also meet their own needs. This concept was widely accepted globally, especially after its central role in the 1992 United Nations Conference on Environment and

Development (UNCED). As a result of this conference, Agenda 21 was established as a comprehensive global action plan for sustainable development. Serving as a fundamental framework, Agenda 21 guides the implementation of sustainable development policies, initiatives, and programs at both national and local levels. Additionally, the WCED emphasized the importance of a progressive economy and transformation of society.

Incorporating economic, environmental, and social considerations into decision-making processes is crucial for achieving sustainable development (Emas, 2015). The concept of sustainable development encompasses a range of ideas, including the concepts of meeting essential needs, recognizing limitations, and ensuring fairness between generations. According to Holden et al. (2017), sustainable development is guided by three ethical imperatives: fulfilling human needs, promoting social justice, and respecting environmental boundaries. Sachs (2015) contends that although the emphasis on intergenerational fairness persists, there has been a shift towards a more comprehensive approach that acknowledges the interconnectedness of economic development, social inclusivity, environmental sustainability, and effective governance. Sachs defines sustainable development as "a blend of socially inclusive and environmentally sustainable economic growth supported by good governance" (Sachs, 2015, p. 3).

Incorporating sustainability into the curriculum can be achieved through two main methods: diffusion and infusion (Michel et al., 2020; Michel & Pizmony-Levy, 2017). The diffusion approach involves the creation of new programs and courses that offer students more opportunities to learn about sustainability challenges, such as biodiversity and natural resources. On the other hand, the infusion method exposes students to specific learning opportunities that are directly related to sustainability. In this particular project, the infusion method was employed to integrate sustainability-related themes into the existing curriculum. This method can connect environmental and sustainability challenges to broader themes, such as English language acquisition, in this study. This approach not only focuses on the environment and sustainability but also links sustainability-related subject matter to the students' coursework, thereby enhancing their knowledge, attitudes, and behaviors toward sustainability and motivating them to become environmentally engaged citizens. According to Ter Horst and Pearce (2010), combining environmental concerns with foreign language education offers significant opportunities for students to improve their language skills, deepen their understanding of environmental themes, and actively participate in a global society.

In the contemporary era, notable advancements have been witnessed in the realm of Education for Sustainable Development (ESD) due to significant progress made in scientific research and impact evaluations. As indicated by UNESCO, Education Sustainability emerges as a potent instrument that enables individuals to alter their perspectives and actions towards fostering a sustainable future, as posited by Marope et al. (2015). The educational domain assumes a pivotal role in societal transformation by influencing perceptions and nurturing crucial skills such as critical thinking, creativity, and decision-making capacities, as highlighted in the study by Latchem (2017). To advance the cause of ESD, various initiatives that prioritize Global Citizenship Education (GCED) have been introduced globally.

Education, as delineated by Parihar (2017), constitutes a multifaceted process designed to facilitate the comprehensive growth and advancement of individuals and society, thereby ensuring the highest levels of contentment and prosperity within the community. It is a widely accepted notion within scholarly discourse that the role of education is paramount in the advancement of sustainable development, given its pivotal role in nurturing the capabilities of individuals to safeguard the well-being of future generations and effectively tackle an array of developmental hurdles, as highlighted by Tilbury (2002). These hurdles encompass a diverse array of domains including but not limited to environmental conservation, public health, and societal progress. The

attainment of sustainable development is contingent upon the ability of individuals to meet their needs and aspirations in a manner that does not compromise the availability of vital resources for future utilization. Sustainable development aims to harness the collective wisdom, expertise, and value systems of learners at all educational levels to engender a positive transformation in both the natural environment and human society. This necessitates a concerted and deliberate endeavor to bolster and actively contribute to the cause of sustainable development. Reinholz et al. (2019) have highlighted that sustainable change can significantly impact academic and personal perspectives over an extended period. This assertion is supported by other scholars, including Rafiee Rafie Moghadam et al. (2022), Ryan and Cotton (2013), and Sterling (2011).

2. METHODOLOGY

Participants

The study included students who were enrolled in a private primary school situated in Kerman, Iran. Specifically, they were taking English classes during the academic year 2023-2024. The selection criteria required them to be elementary students who could engage in everyday conversations and simply express their opinions on familiar topics. Their primary language was Persian, and they were in the sixth grade at an Iranian primary school. All the participants were female and 12 years old. In both the control and experimental groups, there were a total of 19 students. The initial group included 16 elementary students, and the second group comprised 17 elementary students. To analyze the data, we removed students who were not at the elementary level. Furthermore, any additional students present throughout the study were also excluded from the final data analysis. Consequently, each group had 15 elementary students. It is worth mentioning that their participation in the study was voluntary, ensuring that ethical considerations were met. Additionally, parental consent was obtained for each participant before starting the project. To alleviate any potential anxiety, the participants were given a brief explanation of the study process.

Instruments

The Oxford Young Learners' Placement test was employed to identify language learners with comparable skills. The Oxford Placement Test for Young Learners consists of two parts - Language Use and Language comprehension. In the Language Use section, students are assessed on their understanding of vocabulary, functions, and grammar through 18 questions. The Comprehension section evaluates students' ability to comprehend details and main ideas through various short and extended listening tasks in 12 questions. The researchers selected elementary students as the participants of this study by utilizing this placement test.

Moreover, to evaluate the levels of critical thinking among the participants at the start and end of the treatment implementation, the researcher employed Honey's (2004) critical thinking questionnaire. This questionnaire, comprising 30 items, was administered to the participants in both the initial and final stages of the study. Naeini (2005) translated the questionnaire into Farsi. The questionnaire's content and construct validity were validated by Honey (2004) and cited in the study conducted by Zare et al. (2021). The questionnaire's reliability was reported to be 0.81. In Iran, Naeini (2005) first employed the questionnaire and reported a Cronbach alpha value of 0.86, indicating high reliability. Additionally, the validity of Honey's questionnaire has been demonstrated in various research studies conducted in Iran, including those by Aghajani and Gholamrezapour (2019), Fakharzadeh and Amini (2021), and Zare et al. (2021). In the present study, the Cronbach alpha value was also calculated, resulting in a value of 0.85, indicating high reliability. However, it is important to note that the researcher, who was also the teacher of the class, was present during the administration of the questionnaire to offer additional explanations

and clarifications, if needed by the students, thereby promoting a more accurate and comprehensive data collection process.

The participants' reading comprehension in this study was assessed by conducting three different reading comprehension tests. These tests included multiple-choice, true/false, and sentence completion questions, which aimed to measure the participants' understanding of the given text. A time limit of twenty minutes was given to the participants to answer the reading questions. In addition, the participants were required to fill in the blanks in sentences based on the provided reading passages as part of the sentence completion task. In the true/false task, the participants were asked to choose the correct statement based on the reading passage, while in the multiple-choice question task, they had to select the correct answer from a set of four options. The tests are designed by Oxford University Press based on the Family and Friends series and are available for teachers' assessment purposes as tests of each unit's progress or the overall achievement of the students' language skills. Based on the readability of the texts employing the Flesch Readability Formula (https://readabilityformulas.com/free-readability-formula-tests.php), the texts were standard for elementary learners. Further, Pearson's correlation coefficient was used to assess the test reliability coefficient value, which was reported as 0.96, which shows that the test was consistent and reliable.

Procedure

During the initial phase of the research, all individuals completed a critical thinking questionnaire and responded to reading comprehension questions within their regular class schedule. The instructor responsible for both classrooms ensured consistency by utilizing identical instructional materials for both groups. The instructional material employed for teaching purposes was the book "Family and Friends (4)" by Naomi Simmons and published by the Oxford University Press. The participants attended English language classes for a duration of 90 minutes, three days per week. The treatment period spanned a total of 24 weeks, equivalent to six months.

Both classes were conducted online under the guidance of the same instructor, ensuring that students in both groups were well-acquainted with technology and its applications. Using instructional films and songs in both classes further solidified the students' familiarity with technology. Consequently, technology did not serve as an intervening variable in either class.

In both groups, the teacher employed three stages: presentation, practice, and production. Initially, the teacher introduced the vocabulary, focusing primarily on pronunciation, meaning, and spelling within the given context. Subsequently, the teacher guided the students in reading the text, explaining the content. Following this, the students engaged in a discussion about the reading, drawing upon their own experiences. Finally, in the application stage, which involved an informal assessment of learning, the students responded to reading comprehension questions.

In the experimental group, sustainability was introduced and integrated into the educational curriculum of the classroom, employing and utilizing sustainability-focused animation as a pedagogical tool to promote a deeper understanding and awareness of sustainability-related concepts and principles among the students. This incorporation and utilization of sustainability-focused animations occurred during the initial twenty minutes of the classroom session, serving as a prelude to the subsequent educational activities and discussions that would take place throughout the remainder of the class period. As it was not feasible to showcase the entire film within the limited duration of the class, a decision was made to extract a total of 210 clips from various parts of the films. During each session, a selection of three clips were carefully chosen to be played, ensuring a well-rounded viewing experience for the students. To maintain a concise and focused session, each clip had a maximum duration of three minutes, allowing for a thorough exploration and analysis of the chosen scenes. By strategically curating these clips, it was possible to provide the students with a comprehensive understanding of the film without compromising on the time

constraints of the class. After viewing the animations, they were given a period of five to ten minutes to talk about what they had just watched. The films chosen for this project were determined by conducting interviews with both students and their parents, which provided reassurance that they had not watched these films.

The films included:

-The Ice Age franchise, consisting of movies such as Ice Age (2002), The Meltdown (2006), Dawn of the Dinosaurs (2009), Continental Drift (2012), and Collision Course (2016), is produced by Blue Sky Studios and 20th Century Fox Animation. Set in the Paleolithic era, these films follow the misadventures of the animal protagonists, including Manfred the mammoth, Diego the saber-toothed lion, Sid the sloth, and their ever-growing herd.

The Ice Age movies delve into global warming, emphasizing the need to discuss climate change. Natural disasters that shaped Earth over the years are showcased, including floods, earthquakes, volcanic eruptions, and asteroid impact. The films also address extinction, focusing on the current crisis and human impacts. By weaving these themes into their narratives, the films encourage audiences, particularly children, to reflect on the impact of human actions on the environment and the need for conservation efforts.

-The Madagascar film series, consisting of Madagascar (2005), Escape to Africa (2008), and Europe's Most Wanted (2012), was produced by DreamWorks Animation. The storyline revolves around the Central Park Zoo animals - Alex the Lion, Marty the Zebra, Gloria the Hippo, and Melman the Giraffe - who find themselves shipwrecked on an island, leading to a series of wild adventures. The films discuss themes like poaching, game hunting, animals in captivity, and depletion of natural resources. Poaching and game hunting are shown as significant threats to wildlife. In "Escape to Africa," Alex is captured by poachers and saved, while Chantel DuBois represents the dangers of game hunting. The films also highlight the mistreatment of circus animals in captivity. Different opinions exist on keeping animals in zoos, stressing the need for proper care. Natural resource depletion is emphasized, urging responsible sharing with other creatures. A dam construction in the movie causes water scarcity for reserve animals, emphasizing responsible resource usage.

-The films "Rio" (2011) and "Rio 2" (2014) were produced by Blue Sky Studios and 20th Century Fox Animation. The storyline revolves around Blu, a Spix's macaw, the last known surviving male of his species. Blu, who exhibits more human-like characteristics than bird-like ones, embarks on a journey back to Brazil to save his species from extinction. Along the way, he encounters Jewel, a wild macaw with a thirst for adventure, and their love story unfolds amidst various escapades.

The films highlight environmental issues like habitat destruction, exotic pet demand, and extinction threats. Despite stricter laws, the desire for exotic pets is increasing globally. Poachers in Brazil capture millions of animals annually for smuggling, mainly birds. In "Rio," Blu is a victim of this trade but finds a new home in Minnesota. "Rio 2" shows the destruction of the Amazon due to illegal logging, with Blu and his friends fighting to protect their habitat. The Amazon lost about 7,900 sq km in a year, endangering its diverse wildlife. Blu's near-extinction stresses the need for conservation efforts. The film, with only 60-80 birds left in captivity, reminds us of human impact on nature, urging the preservation of biodiversity for the future.

-The films 'Finding Nemo' (2003) and 'Finding Dory' (2016) were produced by Walt Disney Pictures and Pixar Animation Studio. The central theme of both movies revolves around the concept of 'finding family'. In the first film, Marlin, a clownfish, embarks on a journey to find his son Nemo, whom a reef diver has captured. In the sequel, Dory, a royal blue tang, sets out to search for her family from whom she has become separated.

The films display the beauty of coral reefs, leading to discussions on reef destruction caused by climate change and pollution. The popularity of exotic fish pets like clownfish and royal blue tangs rose due to the movies. However, these tropical fish need specific care and cannot thrive in any aquarium. Despite the film's message, the demand for these pets negatively affects their wild populations. Characters like Destiny and Bailey in 'Finding Dory' aid Dory, sparking ethical concerns about marine animal captivity for entertainment. Global movements advocate for releasing marine creatures from captivity, emphasizing their right to live freely in the ocean.

3. RESULTS

Table 1 presents the descriptive statistics of research variables in control and experimental groups in pretest and posttest.

Table 1: Descriptive Statistic of Research Variables

Time	Variable	Control (N=15)		Experimental (N=15)	
		Mean	Std. Deviation	Mean	Std. Deviation
Pre-Test	Reading Comprehension	11.89	2.42	12.19	2.24
	Critical Thinking	47.54	4.19	48.67	3.69
Post-Test	Reading Comprehension	12.72	2.24	15.26	1.94
	Critical Thinking	47.67	3.83	75.17	4.03

To examine the research hypotheses, the normality of the data distribution was first examined. One way to do this is to test the Shapiro-Wilk test. The significance level was higher than 0.05 for all variables. This suggested that the distribution of variables in this study was normal, and so parametric tests were used to test the research questions.

To answer the first research question and examine the first null hypothesis, H01. Watching sustainability-focused animations is not statistically effective in increasing English language learners' reading comprehension. Levene's test and normality checks were performed, and the assumptions were met. The homogeneity of variance, the linear relationship between the dependent variable and covariate (pretest scores), and the homogeneity of regression slopes were met (Tables 2 & 3). Since the p-value is more than .05 in the current study, the researcher has met the assumption of homogeneity of variance and can conduct a one-way ANCOVA. Therefore, the ANCOVA test was run for the reading comprehension variable.

Table 2: Test of Homogeneity of Variances (Reading Comprehension)

F	df1	df2	P-Value
1.31	1	28	0.26

Table 3: Test of homogeneity of regression slopes (Reading Comprehension)

Source	Sum of Squares	df	Mean Square	F	P-Value
Group	4.714	1	4.714	16.558	0.00
Pretest	185.71	1	185.71	652.333	0.00
Pretest× Group	0.516	1	0.516	1.814	0.19
Error	12.526	26	0.285		

According to Table 4, there is a meaningful difference between the mean scores of the experimental group and the control group regarding the reading comprehension post-test. Therefore, watching sustainability-focused animations improved participants' reading comprehension ($p<0.01$). The estimated partial Eta Squared is (partial $\eta^2 =0.83$) which shows a large effect. Therefore, the null hypothesis is rejected.

Table 4: The Result of Covariance Analysis (Reading Comprehension)

Source	Sum of Squares	df	Mean Square	F	P-Value	partial η^2
Pretest	188.307	1	188.307	649.710	0.00	
Group	62.078	1	62.078	214.187	0.00	0.826
Error	13.042	27	0.290	-	-	
Corrected Total	278.870	29	-	-	-	

According to the estimated marginal means, the experimental group performed better in reading comprehension compared to the control group (Table 5).

Table 5: Estimated Marginal Means (Reading Comprehension)

Group	Estimated Marginal Mean	Std. Error
Control	12.85	0.11
Experimental	15.13	0.11

To answer the second research question and examine the second null hypothesis, H02. Watching sustainability-focused animations is not statistically effective in empowering English language learners with critical thinking; Levene's test and normality checks were performed, but the homogeneity of variance was not met (Table 6). Since, in the current study, the p-value is less than .05, then the researcher has not met the assumption of homogeneity of variance and cannot conduct a one-way ANCOVA. Therefore, ANCOVA was not appropriate to analyze the data.

Table 6: Test of Homogeneity of Variances (CT)

F	df1	df2	P-Value
13.33	1	28	0.001

Therefore, the pre-test scores of this variable (CT) were controlled, and then the post-test scores of the two groups (EG & CG) were compared using an independent sample t-test. The experimental group and control group showed a statistically significant difference ($p<0.01$). Comparing EG participants to CG participants, CT improved in EG. Accordingly, the null hypothesis is rejected (Table 7). In other words, watching sustainability-focused animations increased participants' critical thinking ($p<0.01$). The effect size for CT was estimated at 6.62 (ES=6.62) and r=0.96, which is statistically significant.

Table 7: Independent Sample T-Test of CT (Post-test)

Group	N	Mean	St. Deviation	T-Test	df	P-Value
Control	15	0.13	1.51	-22.93	28	0.000
Experimental	15	26.50	5.43			

In conclusion, it can be deduced that the experimental group outperformed the control group in the post-test. The experimental group exhibited progress from the pretest to the post-test, whereas the control group displayed moderate variability from the initial testing phase to the final one. It is apparent that the learners' comprehension of reading underwent significant transformations, with the participants' reading comprehension scores escalating from the pretest to the post-test in the experimental group. Additionally, critical thinking in the experimental group saw an increase from the pretest to the post-test; however, the rise in mean scores was not accompanied by a substantial change from the pretest to the post-test in the control group. To put it differently, the control group did not experience a significant shift in critical thinking levels. The findings suggested that overall exposure to sustainability-focused animations positively influenced the learners' reading comprehension and critical thinking level.

4. DISCUSSION

Using an experimental research study with two groups of English language learners, the statistical analysis revealed that the experimental group outperformed the control group in reading comprehension. Therefore, sustainability-focused animations significantly affected EFL learners' reading comprehension. Sustainability is a multifaceted issue that necessitates researchers to consider cultural, environmental, and academic aspects. Reinholz et al. (2019) study suggested that sustainable change has enduring effects on academic and personal viewpoints. Consequently, language instruction can be conducted within a sustainable learning environment. Some other scholars have also noted this (e.g., Ryan & Cotton, 2013; Sterling, 2011).

Education for sustainability aims to enhance students' understanding, perspectives, and behaviors related to sustainability, as indicated by various researchers (Chalkley, 2006; Sipos et al., 2008). The present research endeavored to introduce environmental awareness and knowledge into the English language classroom by incorporating sustainability-themed animations. Education

for sustainability operates as an educational methodology that cultivates English language learners who are actively involved and possess the ability to think in sustainable ways. Although it may appear idealistic and theoretical initially, the current research provides empirical proof of the impact of Education for Sustainability on enhancing English language learners' comprehension and critical thinking. Bokova (2016) emphasized the transformative nature of sustainability education, highlighting its potential to reshape individuals' perspectives on education and its role in enhancing individual's character development.

Integrating sustainability and intercultural communication in English language classrooms equips students with the necessary skills and mindset for sustainable development. Extensive research shows the potential of foreign language education in promoting sustainable development principles. This is accomplished by thoroughly examining the educational content and learning environment in the context of English as a second language education. Hence, incorporating sustainability into foreign language education can generate a transformative educational encounter that equips students with language proficiency and fosters a sense of responsibility toward sustainable development (Xiao & Pan, 2022).

Moreover, the statistical analysis revealed that the EG group outperformed the CG in critical thinking. Therefore, sustainability-focused animations significantly affected EFL learners' critical thinking. This study affirms the claim made by Kelly (2009) that to teach sustainability, it is necessary for students to perceive themselves as an integral part of a larger whole and to jointly uphold a shared commitment to ensuring a high quality of life for other creatures. When individuals begin to observe and acknowledge the presence of other living beings apart from themselves, this act can be described as a profound and meaningful form of perception. It signifies the initiation of a process where one begins to evaluate and analyze situations with a discerning and analytical mindset. The foundation of engaging in critical thinking is established at this juncture. In line with the current study findings, several studies have focused on gathering valid empirical evidence of the impact of environmental and sustainability teaching and learning on components of action competence in terms of cognitive, affective, and/or behavioral outcomes among students (e.g., Johnson & Manoli, 2010; Liefländer & Bogner, 2018; Negev et al., 2008; Zhan et al., 2019).

5. CONCLUSION

Designing a rich curriculum and creating a conducive learning environment can effectively promote English language learning, contributing to sustainable development goals. Integrating materials and tasks focusing on the natural environment, social interactions, and intercultural communication enhances learners' critical awareness of sustainability principles. Students develop tolerance towards other creatures and are better prepared for a globalized world. Creating a teaching approach for pluralism remains a challenge for teachers and developers. Education for sustainability aims to transform students' understanding, opinions, and actions towards sustainability. Prioritizing sustainability in English language classrooms promotes environmental values and individual responsibility in addition to language learning. The outcomes of this study contribute positively to society, benefiting English language educators, students, and textbook designers. This is because promoting sustainability within English language classrooms guides learners towards transforming into a microcosm of a critical society. In this setting, environmental values are not only promoted and acknowledged but also incentivized, fostering a culture of accountability where learners are mindful of their actions and behaviors towards the surrounding world.

Despite the limitations inherent in the present study, its findings have the potential to make a valuable contribution to research in this field. However, it is important to consider these limitations when interpreting the results. The first limitation of this study pertains to the relatively small sample size. To validate and establish generalizable patterns, future studies could benefit from

using larger sample sizes. Secondly, the participants in this study were recruited from elementary EFL classes, resulting in a considerable variation in the length of their English study. Lastly, the study process was thoroughly explained to the participants prior to the project to ensure their full cooperation. This may have influenced the performance of the experimental group participants, as they were aware of being studied.

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