



## A Comparative Study of Human and Computer Mediators: Ego-Resiliency and Multiple Intelligences

Najmeh Hamzehnejadi<sup>1</sup>

Mehry Haddad Narafshan <sup>2</sup>(Corresponding author)

Valeh Jalali<sup>3</sup>

ARTICLE INFO	ABSTRACT
<p>Received: 23 April 2022  Revised: 25 August 2022  Accepted: 18 November 2022  Online: 30 March 2024</p>	<p>Educational policymakers believe that providing young children access to technology can boost their academic achievement and activate their latent intelligences. Thus, the purpose of this study was to compare the impact of human and technology-based mediators on ego-resiliency and multiple intelligences of young English language learners. Over 6 months, two groups of 30 learners (15 students in each group) were exposed to two forms of mediation: the teacher- and computer-made mediators. Pre-tests and post-tests were used to measure learners' improvements in ego-resiliency and multiple intelligences. The results revealed that the learners involved in computer-mediated instruction proved superior compared to the teacher-mediated group in their ego-resiliency and multiple intelligences. It shows that the learners interacting with a computer mediator surpass those interacting with a human-made mediator, namely the teacher. Our findings suggest that nonhuman mediators (technology) are more effective than humans, possibly due to their enticing features that enhance learners' motivation and interest.</p>
<p>KEYWORDS</p> <p>Ego Resiliency  Multiple Intelligences  Teacher Mediator  Technology Mediator</p>	

<sup>1</sup> PhD Student, Department of Foreign Languages, Kerman Branch, Islamic Azad University, Kerman, Iran, Email: n\_hamzehnejad@yahoo.com

<sup>2</sup> Assistant Professor, Department of Foreign Languages, Kerman Branch, Islamic Azad University, Kerman, Iran, Email: mnarafshan@yahoo.com

<sup>3</sup> Assistant Professor, Department of Foreign Languages, Kerman Branch, Islamic Azad University, Kerman, Iran, Email: massoud\_tajadini@yahoo.com

## **1. Introduction**

There has been a significant disruption in education systems worldwide caused by the Coronavirus pandemic in 2019. Social distancing and restrictive movement policies have significantly affected traditional educational practices. In response to the Coronavirus outbreak, teachers have been able to implement electronic and distance education (Pokhrel & Chhetri, 2021). Since the Coronavirus outbreak, global educational systems have sought alternative methods of teaching (Badrkhani, 2021). This has led educators to apply online education in a way that has never been seen before. With home quarantine, it was essential for governments to recognize which rules and practices can maximize online learning effectiveness. Iranian education lacks a strong background in online education and sufficient infrastructure for e-learning and distance education. Even though they were facing a difficult time, they found an opportunity to experience a revolutionary era and learn new skills. In several countries worldwide, including Iran, the Coronavirus pandemic has impacted educational systems, resulting in the closure of face-to-face classes at schools (Ahmadi et al., 2020). According to Einstein, "in difficulty lies opportunity" (Riker & Fraser, 2018, p. 1881). COVID-19 provided ample opportunities for language educators to integrate online learning technologies into language education, despite its associated difficulties. Thus, researchers must document the valuable lessons learned from this historically unprecedented shift toward using technology to teach languages (Tao & Gao, 2022).

In the field of education, technology offers limitless opportunities to learn, socialize, be counted, and be heard (Garcia-Ruiz et al., 2008; Hatlevik & Christophersen, 2013; Hidalgo et al., 2020; Van Deursen & Van Dijk, 2014). The key to entering the world of children's mind is play, fun, and excitement. These magical elements can be blended with language learning materials to attract and fascinate children in carrying out the difficult task of language learning. To keep the learning process fun, children need creativity, energy, and liveliness in educational interactions (Yam, 2021). Computer-Assisted Language Learning (CALL) systems are the most effective providers of enjoyment and interest in education that children crave.

In previous studies, technology was found to increase learners' motivation and moderate apathy in language learning (Alkhalifah et al., 2012; Finnsson, 2015). The study by Frascini and Tao (2021) found that Korean beginning learners were more likely to be joyful and proud of their online learning experiences than to be anxious. The study also mentioned that students who enjoy language classes do better academically. In the same vein, a survey of 510 European language learners indicated that they experienced more language learning enjoyment and lower anxiety in online classes (Resnik & Dewaele, 2021). Lee (2021) concluded that communicating with

instructors directly, interacting with peers, and designing effective tasks can help enhance learner satisfaction in web-based courses. In addition, Lian et al. (2021) found that authentic language learning opportunities in online classes contributed to students' self-efficacy. In another study, students doing a group presentation and project were found to have created and sustained a virtual communicative space in which they could articulate and negotiate meanings (Junn, 2022). Digital spaces can therefore help language learners develop their communication skills in a second language. However, Hitosugi et al. (2014) showed that the digital environment was not a preferred mode in comparison with explicit instruction helping students learn vocabulary more effectively. Students and teachers at Iranian universities also found online courses to be more boring, according to a study by Pawlak et al. (2022). The students reported having limited strategies to cope with boredom in online learning, including skipping classes as a debilitating strategy. In Yazdanmehr et al. (2021) study, boredom levels varied over the semester, reaching their peak early in the semester.

The classroom has the potential to be a valuable learning experience when we use the mediators that exist within such a context. This is because they have different roles, and each is enacting that role with different motivations and limitations. Not all students will achieve the same benefits from existing mediators. McGonagle (2012) mentioned that to enrich the learning climate of the classroom, a full range of actors, both human and nonhuman, who interfere – in positive and negative ways – with classroom learning are needed. Different mediators present diverse opportunities to learn. Based on the contextual needs, one mediator in particular merits more detailed consideration (Kamp, 2017). Vygotsky (1978) believed that human cognition is constructed and activated through human beings' interactions with the outer world, and human cognition is the offspring of the relationship between subjects and objects. According to sociocultural theory (Vygotsky, 1978), interaction and community in the context play a significant role in "making meaning". This mediation can be done through people or by signs. Learners transfer knowledge and input from the outside world to the inner world of their minds and cognitions through signs. Along the stimulus-response connection route, signs take the role of mediators in the form of symbolic signs such as schemes or pictures, moderate learning tribulations, and boost cognitive functions of learning and memorization (Vygotsky, 1979). A mediator assists, supports, and guides a person to achieve his or her goals. There are three types of mediation: material tools, psychological tools, and other people (Flavin, 2020). Vygotskian theory of mediation has brought different air to the field of education and teachers can use different mediators in different ways to

connect the learners' present zone of development (what they know) to their ZPD (what they want to know).

Children's social-emotional development is influenced by how they cope with and adjust to various experiences and obstacles. Ego-resiliency is a personality attribute that describes how people cope with stress, uncertainty, conflict, and change (Wehner, 2021). An ego-resilient person can adjust to changing situations, shifting behavior as required, being inventive and persistent, and employing a variety of problem-solving tactics. A non-resilient person, on the other hand, is disturbed by new and changing situations, tends to dwell and fret, breaks down under stress, and has difficulties recovering from traumatic experiences (Chen et al., 2021). According to Luthar et al. (2000), resilience involves positive adaptation to significant adversity. It means accepting risk, coping with trauma, or reacting constructively to adversity that affects a person's psychosocial integrity (Brooks, 2006; Masten, 2001). Despite risk exposure, the resilience of an individual depends on their ability to adapt positively and socially (Luthar, Cicchetti, & Becker, 2000). It stems from the constant interaction with the environment that people develop and socialize in (Vanistendael & Lecomte, 2002). It can vary according to the relationship with the context, requiring a reaction to a series of circumstances specific to each moment and each individual. It is applied when facing an adverse situation that could put personal and social stability at risk (Zolkoski & Bullock, 2012). Resilience increases when a person has to put it into practice.

Academic success is expected to be significantly affected by ego-resilient people's high level of adaptability and flexibility (Kwok et al., 2007). According to Block and Kremen (1996), ego-resiliency correlates with intelligence measures. This is because adaptability partially indicates the functioning of intellectual components such as short-term memory, information, reaction time, and so on. Moreover, ego-resilient students are more likely than their less ego-resilient peers to adapt to unexpected changes/events easily and quickly in their daily school lives (e.g., changing teachers, novel courses, new classmates, etc.), to approach difficulties as challenges, to develop flexible problem-solving strategies, to initiate supportive learning environments, and to persevere in their efforts to meet school requirements (Bursik & Martin, 2006; Kwok et al., 2007). While adjusting for IQ and externalizing difficulties, Kwok et al. (2007) in a longitudinal study of 445 first graders, discovered that resilient personalities were linked to higher grades both simultaneously and 1 year later. Dreke (2009), in a longitudinal study of 784 first graders, found that ego-resilience predicted math scores (but not reading accomplishments). Importantly, empirical research suggests that the link between ego-resiliency and academic achievement extends beyond childhood to adolescence, a developmental phase during which adolescents encounter increasingly difficult scholastic

expectations. Swanson et al. (2011) reported that ego-resiliency strongly influenced the relationship between supportive parenting and academic success in a cross-sectional sample of 240 Mexican American early adolescents. Bursik and Martin (2006) found that ego-resilient characteristics were connected to improved academic achievement despite adjusting for other key variables like verbal IQ and students' learning orientation in a study of 142 middle adolescents. Moreover, Choi et al. (2020) reported that motivation showed positive significant correlations with ego-resilience and linguistic confidence.

According to Gardner's theory, the mental capability of every human being is an assembly composed of all types of intelligence involved in its construction, but the remarkable point is that the share of each type of intelligence in each person's cognitive competence is different from others (Kirkgoz, 2010; Taaseh et al., 2014). Gardner (1999) in his theory of multiple intelligences changed the concept of intelligence from a general indivisible whole, accepted by mankind for many years as a criterion, into seven intelligences, to which he later added the eighth one. Multiple intelligences are linguistic-verbal, mathematical-logical, visual-spatial, kinetic-physical, intrapersonal, interpersonal, naturalistic, and musical. Traditional methods of teaching and curriculum are primarily designed to activate students' logical-mathematical and verbal-linguistic intelligence. Only students with high logical-mathematical and verbal-linguistic intelligences are pleased and satisfied and have acceptable educational attainment and progress. By designing activities that incorporate multiple intelligences, it is possible to help other students see their academic progress and be pleased and satisfied with educational programs.

Entering this theory into the field of education, students find more progress and integration in their academic achievement. It has given teachers freedom and opportunity to design lesson plans and tasks that are in line and suitable with each student's intelligence profile to bring them closer to their goal of enhancing the learning experience based on the unique abilities and characteristics of the learners (Motejlek & Alpay, 2021). Many educational centers and schools treat linguistic and logical-mathematical intelligence as forerunners of intelligence types and pass students under this discriminatory lens. These schools are indifferent to other intelligence types and rely heavily on repetition and rote teaching (Anderson, 2022). Even though Gardner claimed that MIT can be applied through different methods, he suggested some specific means to exercise and develop our intelligences (Lotfi-Khajouei et al., 2022). Multiple Intelligences theory has brought engagement and motivation into educational environments by giving assurance to individuals that you can do things in the most effective way; the only difference is that you do it in your way and style.

The primary importance of the implementation of the theory of multiple intelligences is that it is possible to give students a chance to use their predominant strengths and capabilities. This will foster learning. Currie (2003) emphasized that if teachers are acquainted with the intelligence profiles in a class, they can adapt or develop a variety of activities that can use students' intelligence to enrich the learning environment. According to Arnold and Fonseca (2004), with MIT applied in the language classroom, teachers are better able to tap into the areas of personal meaningfulness of their students since they are recognizing the differences inherent in the students and putting individuals with their different ways of learning where they belong, back at the center of the learning process. In terms of teaching English as a foreign language, there is a wide range of activities that might be designed to cater to the different types of intelligences. These activities might be applied in EFL/ESL classrooms. Snider (2001) noted that MI theory-related materials have the potential to improve the foreign language (FL) instruction because theory engages learners' innate abilities. Roohani et al. (2015) reported that the learners' reading comprehension scores increased more significantly in the multiple intelligences-based group in comparison to the traditional one. Soleimani et al. (2012)' study indicated that students taught based on MI theory exceeded traditionally instructed students both in general and in each sub-skill of learning English (vocabulary, reading comprehension, and structure). The results also indicated that the attitude of students towards learning English in the experimental group improved significantly. In another study, Sahebkhair (2019) revealed that female learners have higher multiple intelligences. Furthermore, there is a positive correlation between MI and writing skill. In the same line, Zeraatpishe (2019) reported that using multiple intelligences-based instruction helped learners in accuracy, fluency, and organization of English writing skill. Ghaznavi et al. (2021) indicated that the use of the MI-based teaching approach contributed to a significant improvement in physically disabled learners' ego-resiliency. Despite these established links to healthy development and emotional adjustment, few studies have investigated the origins of ego-resiliency and multiple intelligences development. A deeper knowledge of the factors that lead to the development of ego-resiliency and multiple intelligences in children might help intervention attempts to encourage this construct. The present study adds to the semi-void container of studies in this field by using a quantitative inquiry to examine the effects of a teacher-mediated English lesson versus a computer-mediated English lesson on ego-resiliency and multiple intelligences outcomes among 8-year-old children. Accordingly, the present study sought to answer the following research questions.

- Among the teacher and computer mediators, which one is more effective at developing ego-resiliency in young children?

- Among the teacher and computer mediators, which one is more effective at developing multiple intelligences in young children?

## **2. Research Method**

In the current quasi-experimental quantitative study, two intact classes were assigned to a teacher-mediated and computer-mediated condition. The independent variable was the computer-mediated intervention, and the dependent variables were learners' ego-resiliency and multiple intelligences. At a private school in Kerman, Iran, a course on English conversation for EFL learners with a focus on vocabulary and grammar development was administered online during the academic year 2021-2022. The research participants were 30 primary-school Iranian female students who were assigned into two groups with the same level of English language proficiency. They had studied English for an average of 1 year at different registered English language institutes. The Oxford young learners' placement test was used to assess their language abilities so that they were almost homogeneous (elementary level). They were all 8 years old and in the second year of their primary education. At the time of the study, these students were enrolled in online courses due to the COVID-19 pandemic. It is also essential to note that they had sufficient knowledge of technology and knew how to use it. Despite being different in terms of social and economic distance, all families had a computer system with a broadband internet connection. The class met online two days per week for 90 minutes over six months. The students were assigned to two groups as follows: The teacher-mediated group (n=15) and the computer-mediated group (n=15).

Oxford young learners' placement test was used to identify the homogenous language learners. The test contains 30 questions. 14 questions are related to grammar and vocabulary, and 12 questions evaluate the learners' level of listening comprehension. It tests young learners aged 7-12 years. The system marks the answer as soon as the student moves on to the next question. To help the teachers make the right placement decision, it reports the numerical score and their English proficiency level (Pre-A1 to B1). The test adapts to the students' answers and takes around 35 minutes to complete (<https://www.oxfordenglishtesting.com>). The Persian presentation of ER89-R, a 10-item assessment of ego-resilience (Vecchione et al., 2010) was used for this study. Each participant was asked to rate each statement (from 1 = doesn't apply at all to 7 = very strongly applies) on a scale of 1-7. Samples items are, "I get over my anger at someone reasonably quickly," "I quickly get over and recover from being startled," and "I usually think carefully about something before acting". A Persian presentation of Candler's (2011) multiple intelligences scale was another instrument that was utilized in the present work. It is comprised of 24 items seeking students' degree of agreement or disagreement on a 5-point Likert scale that its alternatives are arranged

from 0 to 5 according to how well the description fits the participant (0 = Not at All to 5 = Very True). The highest possible score in one area is 15. It is used to assess Gardner's classification of multiple intelligences: Bodily-Kinesthetic Intelligence, Linguistic Intelligence, Intrapersonal Intelligence, Spatial Intelligence, Interpersonal Intelligence, Musical Intelligence, Naturalistic Intelligence, and Logical-Mathematical Intelligence. The score is achieved with the sum of the items that correspond to each of the types of intelligence; the higher marks the students get; the more types of intelligence they certainly possess. Cronbach's alpha test was carried out to indicate the scales' level of reliability, which was .89 for the multiple intelligences questionnaire and .85 for the ego-resiliency questionnaire for the current study. The researchers read the questions and answers in simple language to ensure that the children understood the questions.

The learners were enrolled in a semester course of English conversation for EFL learners. The main objective of the course was the improvement of the students' proficiency in aural-oral skills with a focus on vocabulary and grammar development. The Oxford university press textbook, *Family and Friends (3)* written by Naomi Simmons (2009), was used to instruct control and experimental group members. In each session, five new words were introduced on the themes of my family, countries, seasons, my things, hobbies, etc. We introduced the computer-mediated classroom mode during the first week. In the computer-mediated group, there was no teacher present during the first thirty minutes of class, and students could use the computer to determine the meaning of words presented from the full vocabulary list, and learners could use the capabilities of the computer to determine the meaning of the words presented from the full vocabulary list. Both groups received 24-week vocabulary training in the beginning 30 minutes of each conversation class but in different ways.

In the computer-mediated group, contrary to its teacher-mediated counterpart, there was no sign of teacher presence or assistance for the first thirty minutes of the classroom. The computer screen displayed new words. Clicking on the words enabled the learners to see animations, word charts, 3-D images, and electronic flashcards explaining the meaning of the words. The computer then read an animated story to the class using the new words as well as some of the words they had already learned. A variety of digital games could also be played with the new and old vocabulary. They could then use these words along with any of the words they had learned in previous sessions to make their stories and drawings. In addition, there were some digital tests to check the learners' comprehension and production. There was only one difference between the two groups, which was whether they received mediation via a teacher (human) or a computer (non-human).



In the teacher-mediated group, in the same period, the teacher wrote the new words on the board first. In each session, five new words were introduced. Following the presentation on the board, the teacher helped the students understand the words by teaching them through paper flashcards, examples, role plays, and real objects. After that, the teacher read a story to the class using some of the new words as well as some words they already knew. As part of the lesson, the teacher also played some games (such as puzzles) with the class that involved both the new and old vocabulary. They were then asked to create stories and role-plays with all the new words and any words they had learned in previous sessions. The teacher also used multiple-choice, gap-filling, matching, cloze, and open-ended questions to check learners' comprehension and production in some sessions. Students at the final stage completed an ego-resiliency and multiple intelligences questionnaire. The researchers collected the data and analyzed it directly.

### 3. Findings

To answer the first research question- Among the teacher and computer mediators, which one is more effective at developing ego-resiliency in young children? - the results of paired samples t-tests do not show a significant difference in the mean scores for ego-resiliency in the teacher-mediated group (Table 1). Moreover, the findings show a significant difference in the mean scores for ego-resiliency in the pre-test and post-test of the experimental group. The effect size was  $ES=6.53$  and  $r=0.956$  (Table 2).

Table 1: Paired Sample T-Test of Ego-Resiliency (Teacher-Mediated Group)

Variable	Time	N	Mean	Std. Deviation	T-Test	df	P-Value
Ego Resiliency	Pretest	15	35.05	2.69	-1.05	14	0.3
	Posttest	15	35.90	2.91			

Table 2: Paired sample T-Test of Ego-Resiliency (Computer-Mediated Group)

Variable	Time	N	Mean	Std. Deviation	T-Test	df	P-Value
Ego Resiliency	Pretest	15	33.86	1.98	-19.07	14	0.000
	Posttest	15	51.57	3.44			

Independent t-tests reaffirmed that the groups were homogenous regarding ego-resiliency levels in the pre-test. Moreover, the results strongly confirmed a significant difference in the mean scores for ego-resiliency in the post-test of the control and experimental groups. The effect size was  $ES=4.93$  and  $r=0.93$  (Tables 3&4).

Table 3: Independent sample T-Test of Ego-Resiliency (Pre-test)

Variable	Group	N	Mean	St. Deviation	T-Test	df	P-Value
Ego Resiliency	Teacher-Mediated	15	35.05	2.69	1.63	28	0.1
	Computer-Mediated	15	33.86	1.98			

Table 4: Independent sample T-Test of Ego-Resiliency (Post-test)

Variable	Group	N	Mean	St. Deviation	T-Test	df	P-Value
Ego Resiliency	Teacher-Mediated	15	35.90	2.91	-15.92	28	0.000
	Computer-Mediated	15	51.57	3.44			

To answer the second research question- Among the teacher and computer mediators, which one is more effective at developing multiple intelligences in young children? - as illustrated in Tables 5 and 6, the groups were homogenous regarding multiple intelligences in the pre-test. Moreover, the computer-mediated group obtained a considerable increase in the mean scores for the linguistic, musical, spatial, bodily, logical intelligence, intrapersonal, and natural intelligences, but not for the teacher-mediated group in the post-test. Concerning interpersonal intelligence, just the teacher-mediated group obtained a considerable increase in the post-test mean scores.

Table 5: Independent sample T-Test of Research Variables (Pre-test)

Variable	Group	N	Mean	St. Deviation	T-Test	df	P-Value
Linguistic Intelligence	Teacher-Mediated Group	15	8.83	1.67	-0.12	28	0.90
	Computer-Mediated Group	15	8.90	1.30			
Logical Intelligence	Teacher-Mediated Group	15	9.97	0.83	-0.38	28	0.70
	Computer-Mediated Group	15	10.10	1.04			

Musical Intelligence	Teacher-Mediated Group	15	11.13	0.99	-0.70	28	0.49
	Computer-Mediated Group	15	11.37	0.65			
Spatial Intelligence	Teacher-Mediated Group	15	10.77	0.65	-0.79	28	0.44
	Computer-Mediated Group	15	11.00	0.94			
Bodily Intelligence	Teacher-Mediated Group	15	8.17	0.92	-1.28	28	0.21
	Computer-Mediated Group	15	8.70	1.37			
Interpersonal Intelligence	Teacher-Mediated Group	15	9.77	0.80	-1.53	28	0.14
	Computer-Mediated Group	15	10.10	0.69			
Intrapersonal Intelligence	Teacher-Mediated Group	15	10.50	1.57	-1.67	28	0.10
	Computer-Mediated Group	15	10.83	0.51			
Natural Intelligence	Teacher-Mediated Group	15	11.67	0.49	-1.73	28	0.09
	Computer-Mediated Group	15	12.00	1.53			

Table 6: Independent sample T-Test of Research Variables (post-test)

Variable	Group	N	Mean	St. Deviation	T-Test	df	P-Value
Linguistic Intelligence	Teacher-Mediated Group	15	10.47	2.33	-3.49	28	0.02
	Computer-Mediated Group	15	12.87	1.30			
Logical Intelligence	Teacher-Mediated Group	15	11.77	0.92	-3.69	28	0.00
	Computer-Mediated Group	15	13.47	1.53			
Musical Intelligence	Teacher-Mediated Group	15	12.87	0.64	-3.60	28	0.00
	Computer-Mediated Group	15	13.80	0.68			
Spatial Intelligence	Teacher-Mediated Group	15	12.60	0.66	-5.98	28	0.00
	Computer-Mediated Group	15	13.83	0.45			
Bodily Intelligence	Teacher-Mediated Group	15	12.20	0.80	-3.06	28	0.04
	Computer-Mediated Group	15	13.00	0.63			

Interpersonal Intelligence	Teacher-Mediated Group	15	12.30	0.80	-5.22	28	0.00
	Computer-Mediated Group	15	13.57	0.50			
Intrapersonal Intelligence	Teacher-Mediated Group	15	12.60	0.99	-6.29	28	0.00
	Computer-Mediated Group	15	14.40	0.51			
Natural Intelligence	Teacher-Mediated Group	15	12.40	0.51	-6.96	28	0.00
	Computer-Mediated Group	15	13.87	0.64			

#### 4. Discussion

The present study was an attempt to compare computer-mediated and teacher-mediated L2 instruction to children enrolled in a private primary school. Learners involved in computer-mediated instruction proved superior compared to the teacher-mediated group in the level of ego resiliency. Regarding multiple intelligences, there was no sign that the teacher-mediated program benefited, except for interpersonal intelligence. The results of the pre-and post-tests showed that children interacting with a computer mediator surpass those interacting with a human mediator, namely the teacher. This makes us believe that nonhuman mediators (technology in this study) may prove more effective than human mediators, which may be attributed to the enticing features of technology that can enhance children's motivation and interest.

Results confirm the importance of empowering students, especially children, to take responsibility for their learning, and see themselves as competent and effective through making learning interesting and appealing to them (Kinnula et al., 2017). This study supports Luthar et al. (2000) assertion that resilience is not a static or definitive concept, but a dynamic process in action. It implies a positive adjustment of an individual's social and personal characteristics because of a series of interactions. Therefore, to grow and socialize, children interact continuously with their environment (Vanistendael & Lecomte, 2002) . The results of this study suggest that ego resilience varies according to context, dependent on the particularity of every individual and moment. Challenging situations can put personal and social stability at risk (Zolkoski & Bullock, 2012). Greater resilience was shown when the students had to put it into practice. It is also mentioned by Luthar (2010) that the development of resilience is subject to the specific adjustment an individual makes in a challenging situation (computer-mediation in this study). As mentioned by Vaquero et al.(2014), resilience happens in interaction with the environment, so it can be assumed that the technology-integrated project in this study is a component

that can be considered in this interaction. This means resilience is not only a strictly personal or stable attribute but rather a dynamic one with strong socio-affective origins. Moreover, educational software's most important functionality is not teaching efficiency but arousing students' interest and thus enhancing their learning experience; it is the learning process that offers the greatest contribution, not the teaching activity. These kinds of technologies help students feel more responsible and self-regulated. This could be a contribution to teachers who have been trying to make students more responsible and self-regulated since the constructivist approach to learning emerged. Technology use can enhance the educational process as an educational assistant (Ghuloum, 2010), as a teaching prompt (Walker, 2012), or basically as a general aid (Leuski et al., 2006).

The results of the present study were in line with the prior findings on the superior effects of the digital condition compared to the traditional teacher-centered condition lacking technology (Alkhalifah et al., 2012; Finnsson, 2015; Garcia-Ruiz et al., 2008; Junn, 2022). The results showed higher levels of enjoyment and lower anxiety (Fraschini & Tao, 2021; Resnik & Dewaele, 2021), high levels of satisfaction (Lee, 2021), and self-efficacy (Lian et al., 2021) in computer-integrated learning contexts. However, our findings contradicted the results by Hitosugi et al. (2014), which showed that the digital environment was not a preferred mode in comparison with explicit instruction helping students learn vocabulary more effectively. The difference may be explained by the explicit place of the target words and reinforcement tasks in the mentioned study. In addition, Pawlak et al., 's (2022) survey of Iranian university students and teachers revealed that learners consider online classes more boring than offline classes. They reported having limited strategies to cope with boredom in online learning, with some simply resorting to debilitating strategies such as skipping classes. Yazdanmehr et al.'s (2021) study revealed changing levels of boredom across the semester, with the peak occurring in the initial stage.

Our results confirm the facilitating role of technology mediation in multiple intelligences activation supporting Dual Coding Theory (Pavio, 1986) and the Generative Multimedia Theory of Learning (Mayer, 2001) confirming the idea that multimedia input enhances learning by providing an additional route for meaning-making, reducing cognitive load in processing, and strengthening retention. The findings mentioned further lend support to the results of the previous research claiming multimedia input accessible online is more effective in vocabulary learning than the traditional teacher-centered approach to English vocabulary instruction (Walters, 2006; Webb, 2008). In addition, the multi-modality of computers has activated participants' different intelligences. Considering the theory and the positive findings obtained, it is thus proposed that technology can play the role of an efficient vocabulary-learning mediator for young learners. As proposed by Gao (2019), regarding language teacher agency, language teachers should explore ways to create and sustain the contextual conditions

that are conducive to changes in their learning and professional practice. The application of current computer mediation to support teaching may bring about the desired change. All in all, the findings imply that computers' multi-modality can provide learners with a combination of textual, visual, and auditory modalities in different formats like video, image, and text. This most surely offers an unprecedented form of mediation activating different intelligences simultaneously. However, far more research needs to be done before one may conclude that computer functions as a better mediator than a teacher or can be a more efficient replacement.

## **5. Conclusion**

The outbreak of COVID-19 has turned online teaching and learning into a global phenomenon in the history of language education. According to Hurwitz and Schmitt (2020), technology-integrated programs can be presented through a wide range of scenarios that simulate learners' experiences in real-life situations, enabling learners to communicate through interactive technologies with computer programs as support. They should not only be made available to language instructors to use as teaching materials in their classrooms but also for learners to make use of them, as mediators in- and out-of-class experiences. Additionally, when applying to programs that use online environments for language learning, a student-centered task must be designed and utilized to activate learners' passive intelligences. Therefore, the results achieved in the present paper point to a redefined role for computers.

You can find no research study without limitations. Thus, the outcomes of the current work should be interpreted considering some limitations. First, according to the rules and regulations of the school, the researcher was not permitted to divide learners into two groups through random assignment procedures. This is exactly what is meant by quasi-experimental research using existing classes. Although there were no substantial differences evident between conditions at pre-tests, possible effects of selection cannot be eliminated. Second, the generalizability of the present article's findings might be limited since our sample was comparatively small and selective. It would be beneficial to conduct the same study again with a larger sample that can be more representative. Moreover, it was not clear exactly what learners were doing when they appeared online, and what sort of activities were the most effective for their long-term progress and improvement. Unfortunately, another common limitation in this sort of study is that it's unclear how long the intervention results are sustained. It would be necessary to repeat the measures in the future to examine the impact of computer mediation as time moves on.

## References

- Ahmadi, M., Sharifi, A., Dorosti, S., Jafarzadeh Ghouschi, S., & Ghanbari, N. (2020). Investigation of effective climatology parameters on COVID-19 outbreak in Iran, *The Science of the Total Environment*, 729, 138705. <https://doi.org/10.1016/j.scitotenv.2020.138705>.
- Alkhalifah, H., Hansen, E., Tapp, A., & Hansen, D. (2012, March). Does the use of Technology Actually Help English as a Second Language Students? In *Society for Information Technology & Teacher Education International Conference* (pp. 2212-2215). Association for the Advancement of Computing in Education (AACE).
- Alessandri, G., Vecchio, G. M., Steca, P., Caprara, M. G., & Caprara, G. V. (2007). A revised version of Kremen and Block's Ego Resiliency Scale in an Italian sample. *TPM-Testing, Psychometrics, Methodology in Applied Psychology*, 14(3-4), 165-183.
- Alessandri, G., Vecchione, M., Caprara, G. V., & Letzring, T. D. (2012). The Ego Resiliency Scale revised: A cross-cultural study in Italy, Spain, and the United States. *European Journal of Psychological Assessment*, 28(2), 139-146. <https://doi.org/10.1027/1015-5759/a000102>
- Anderson, R. A. (2022). *Credit Intelligence and Modelling: Many Paths Through the Forest of Credit Rating and Scoring*. Oxford University Press. <https://doi.org/10.1093/oso/9780192844194.001.0001>
- Arnold, J. & Fonseca, C. (2004). Multiple Intelligence Theory and Foreign Language Learning: A Brain-based Perspective, *International Journal of English Studies (IJES)*, 4 (1). <http://revistas.um.es/ijes/article/view/48141/46121>
- Badrkhani, P. (2021). How a catastrophic situation turns into an exceptional opportunity: Covid-19 pandemic in Iran and challenges of online education for new English language educators. *Interactive Learning Environments*, 1-19. <https://doi.org/10.1080/10494820.2021.1956545>
- Block, J. H., & Block, J. (2014). The role of ego-control and ego-resiliency in the organization of behavior. In *Development of cognition, affect, and social relations* (pp. 49-112). Psychology Press.
- Block, J., & Block, J. H. (2006). Nursery school personality and political orientation two decades later. *Journal of Research in Personality*, 40(5), 734-749. <https://doi.org/10.1016/j.jrp.2005.09.005>
- Block, J., & Kremen, A. M. (1996). IQ and ego-resiliency: Conceptual and empirical connections and separateness. *Journal of Personality and Social Psychology*, 70(2), 349-361. <https://doi.org/10.1037/0022-3514.70.2.349>
- Brooks, J. E. (2006). Strengthening resilience in children and youths: Maximizing opportunities through the schools. *Children & Schools*, 28(2), 69-76. <https://doi.org/10.1093/cs/28.2.69>

- Bursik, K., & Martin, T. A. (2006). Ego Development and Adolescent Academic Achievement. *Journal of Research on Adolescence*, 16(1), 1–18. <https://doi.org/10.1111/j.1532-7795.2006.00116.x>
- Candler, L. (2011). Multiple Intelligence survey for kids. *Obtenido de Teaching Resources: <http://www.lauracandler.com/free/misurvey>*.
- Choi, J., Kang, D., Choi, H., & Yim, D. (2020). How do affective variables (motivation, linguistic confidence, ego-resilience) predict language-based problem-solving skills in second language learners? *Clinical Archives of Communication Disorders*, 5(2), 66-76. <https://doi.org/10.21849/CACD.2020.00213>
- Currie, K. L. (2003). Multiple intelligence theory and the ESL classroom--preliminary considerations. *The Internet TESL Journal*, 4(4), 263-270.
- Dreke, L. L. (2009). *A conceptual model of the mechanisms by which ego resiliency impacts academic engagement and achievement: Social relatedness as a mediator*. Texas A&M University.
- Finnsson. (2015). *Computer Games & Their Effect on The Language Acquisition of Non-Native English Speakers*. Thesis. University of Iceland.
- Flavin, M. (2020). *Reboot the Messenger: A Narrative for Technology Enhanced Learning*. In *Reimagining Technology Enhanced Learning* (pp. 121-144). Palgrave Macmillan, Cham.
- Flores, C., Corcoll, C. (2015). *Learning a foreign language in infant education: a challenge for the school*. 1-6. <http://srvcnpbs.xtec.cat/cirel/cirel/docs/pdf/challenge.pdf>
- Fraschini, N., & Tao, Y. (2021). Emotions in online language learning: Exploratory findings from an ab initio Korean course. *Journal of Multilingual and Multicultural Development*, 1-19. <https://doi.org/10.1080/01434632.2021.1968875>
- Gao, X. (2019). The Douglas Fir Group framework as a resource map for language teacher education. *The Modern Language Journal*, 103(1), 161–166. <https://doi.org/10.1111/moj.12526>
- Garcia-Ruiz, M. A., Edwards, A., El-Seoud, S. A., & Aquino-Santos, R. (2008). Collaborating and learning a second language in a Wireless Virtual Reality Environment. *International Journal of Mobile Learning and Organization*, 2(4), 369-377. DOI:10.1504/IJML.2008.020689
- Gardner, H. (1999). *Intelligence reframed: Multiple intelligences for the 21st century*. Basic Books
- Ghaznavi, N., Narafshan, M. H., & Tajadini, M. (2021). Ego-Resiliency and physically disabled learners: The Implementation of a Multiple Intelligences Teaching Approach. *Research and Development in Medical Education*, 10(1). doi: 10.34172/rdme.2021.004
- Ghuloum, H. (2010). 3D hologram technology in learning environment. In *Proceedings of the Informing Science & IT Education Conference* (pp. 693– 704). Santa Rosa, CA: Informing Science Institute. doi:10.28945/1283



- Grotberg, E. H. (1996). The International Resilience Project: Research and application. In *Proceedings of the 53rd Annual Conventions of ICP: Cross-cultural encounters*. Emily Miao (Ed). Taipei, Taiwan: General Innovation Service (GIS).
- Hatlevik, O.E. & Christophersen, K.A. (2013). Digital competence at the beginning of upper secondary school: Identifying factors explaining digital inclusion. *Computers & Education*, 63(1), 240-247. Elsevier Ltd. Retrieved August 17, 2022, from <https://www.learntechlib.org/p/132296/>.
- Hidalgo, A., Gabaly, S., Morales-Alonso, G., & Urueña, A. (2020). The digital divide in light of sustainable development: An approach through advanced machine learning techniques. *Technological Forecasting and Social Change*, 150, 119754. <https://doi.org/10.1016/j.tech-ore.2019.119754>
- Hitosugi, C.I., Schmidt, M. and Hayashi, K. (2014) Digital Game-Based Learning (DGBL) in the L2 Classroom: The Impact of the UN's Off-the-Shelf Videogame, Food Force, on Learner Affect and Vocabulary Retention. *CALICO Journal*, 31, 19-39. <http://dx.doi.org/10.11139/cj.31.1.19-39>
- Hurwitz, L.B., & Schmitt, K.L. (2020). Can children benefit from early internet exposure? Short- and long-term links between internet use, digital skill, and academic performance. *Comput. Educ.*, 146.
- Junn, H. (2021). L2 communicative competence analysis via synchronous computer-mediated communication (SCMC) as an alternative to formal classrooms, *Innovation in Language Learning and Teaching*. doi: 10.1080/17501229.2021.189580
- Kinnula, M., Molin-Juustila, T., Sánchez Milara, I., Cortes, M., and Riekkari, J. 2017. "What If It Switched on the Sun? Exploring Creativity in a Brainstorming Session with Children through a Vygotskian Perspective," *Computer Supported Cooperative Work (CSCW): The Journal of Collaborative Computing* (26:4-6), pp. 423-452.
- Kırkgöz, Y. (2010). Catering for multiple intelligences in locally published ELT textbooks in Turkey. *Procedia-Social and Behavioral Sciences*, 3, 127-130. <https://doi.org/10.1016/j.sbspro.2010.07.023>
- Kotliarenko, M., Cáceres, I., & Fontecilla, M. (1997). *Estado de arte en resiliencia* (p. 52), [in French]
- Kruk, M., Pawlak, M., Elahi Shirvan, M., Taherian, T., & Yazdanmehr, E. (2022). A longitudinal study of foreign language enjoyment and boredom: A latent growth curve modeling. *Language Teaching Research*, 13621688221082303.
- Kwok, O.-m., Hughes, J. N., & Luo, W. (2007). Role of resilient personality on lower achieving first grade students' current and future achievement. *Journal of School Psychology*, 45(1), 61-82.
- Lee, S. M. (2021). Factors affecting the quality of online learning in a task-based college course. *Foreign Language Annals*. <https://doi.org/10.1111/flan.12572>

- Leuski, A., Pair, J., Traum, D., McNerey, P., Georgiou, P., Patel, R. (2006). How to Talk to a Hologram. *International Conference on Intelligent User Interfaces*, 360-362. Association for Computing Machinery, New York, NY, USA, 360-362. <https://doi.org/10.1145/1111449.1111537>
- Lian, J., Chai, C. S., Zheng, C., & Liang, J.-C. (2021). Modelling the relationship between Chinese university students' authentic language learning and their English self-efficacy during the COVID-19 pandemic. *The Asia-Pacific Education Researcher*, 30(3), 217-228.
- Liew, J., McTigue, E. M., Barrois, L., & Hughes, J. N. (2008). Adaptive and effortful control and academic self-efficacy beliefs on achievement: A longitudinal study of 1st through 3rd graders. *Early Childhood Research Quarterly*, 23(4), 515-526. <https://doi.org/10.1016/j.ecresq.2008.07.003>
- Lösel, Friedrich, Bliesener, Thomas and Köferl, Peter. "On the Concept of "Invulnerability": Evaluation and First Results of the Bielefeld Project". *Children at Risk: Assessment, Longitudinal Research, and Intervention*, edited by Michael Brambring, Friedrich Lösel and Helmut Skowronek, Berlin, Boston: De Gruyter, 2015, pp. 186-219. <https://doi.org/10.1515/9783110860153-013>
- Lotfi-Khajouei, M., Baharlooei, R., Salehi, H., & Tabatabaei, O. (2022). Impact of Multiple Intelligence-Based Activities (MIBAs) on the Improvement of Male and Female EFL Students' Aural-Oral Performance. *Argentinian Journal of Applied Linguistics-ISSN 2314-3576*, 10(1), 79-94.
- Luthar, S. S. (2010). Early Age Resilience and its Impact on Child Psychosocial Development In: Tremblay RE, Boivin M, Peters RDeV, eds. Masten AS, ed. theme. *Encyclopedia of Early Childhood Development* [online]. <https://www.encyclopedia-infantes.com/resiliencia/segun-los-expertos/resiliencia-edad-temprana-y-su-impacto-en-el-desarrollo-psicosocial>.
- Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child Development*, 71(3), 543-562. <https://doi.org/10.1111/1467-8624.00164>
- Mayer, R. (2001). *Multimedia Learning*. Cambridge: Cambridge University Press. doi:10.1017/CB09781139164603
- Masten, A.S., & Cicchetti, D. (2016). Resilience in Development: Progress and Transformation. *Development and Psychopathology*, 1-63.
- Mcgonagle, I. (2012). What does it take to transfer what you learn in the classroom to your daily nursing practice? In: *Nurses clinical education in Europe- organisation, innovations and challenges*, 12-14. The Medical University, Lublin, Poland.
- Motejlek, J., & Alpay, E. (2021). Taxonomy of Virtual and Augmented Reality Applications in Education. *IEEE Transactions on Learning Technologies*, 14, 415-429.
- Paivio, A. (1990). *Mental representations: A dual coding approach*. Oxford University Press.

- Pawlak, M., Derakhshan, A., Mehdizadeh, M., & Kruk, M. (2021). Boredom in online English language classes: Mediating variables and coping strategies. *Language Teaching Research*, 13621688211064944.
- Resnik, P., & Dewaele, J. M. (2021). Learner emotions, autonomy and trait emotional intelligence in 'in-person' versus emergency remote English foreign language teaching in Europe. *Applied Linguistics Review*.
- Riker, R. R., & Fraser, G. L. (2018). In the middle of difficulty lies opportunity. —Albert Einstein. *Critical care medicine*, 46(11), 1881-1882.
- Roohani, A., Mirzaei, A., & Poorzangeneh, M. (2015). Effect of Multiple Intelligences-Based Reading Intervention on EFL Learners' Reading Comprehension and Critical Thinking Skills. *Iranian Journal of Applied Linguistics (IJAL)*, 18(1), 167-200. <http://dx.doi.org/10.18869/acadpub.ijal.18.1.167>
- Sahebkhair, F. (2019). The Effect of Multiple Intelligences on Language Achievement of Iranian EFL Learners. *Language Teaching Research Quarterly*, 9, 23-30. doi: 10.32038/ltrq.2018.09.02
- Snider, D. P. (2001). *Multiple intelligences theory and foreign language teaching*. Unpublished doctoral dissertation, University of Utah, U.S.A.
- Soleimani, H., Moinzadeh, A., Kassaian, Z., & Ketabi, S. (2012). The Effect of Instruction Based on Multiple Intelligences Theory on the Attitude and Learning of General English. *English Language Teaching*, 5, 45-53. URL: <http://dx.doi.org/10.5539/let.v5n9p45>
- Swanson, J., Valiente, C., Lemery-Chalfant, K., & Caitlin O'Brien, T. (2011). Predicting early adolescents' academic achievement, social competence, and physical health from parenting, ego resilience, and engagement coping. *The Journal of Early Adolescence*, 31(4), 548-576.
- Taaseh, Y., Mohebbi, A., & Mirzaei, F. (2014). Intelligence profile of Iranian domestically designed and published ELT textbooks and students' multiple intelligences. *International Journal of Language and Linguistics*, 2(1), 24-31.
- Tao, J., & Gao, X. (2022). Teaching and learning languages online: Challenges and responses. *System*, 107, 102819. <https://doi.org/10.1016/j.system.2022.102819>
- van Dijk, J. A. G. M., & van Deursen, A. J. A. M. (2014). *Digital skills: unlocking the information society*. (Digital education and learning). Palgrave Macmillan Ltd. <https://doi.org/10.1057/9781137437037>
- Vanistendael, S. (1995). *Growth in the Muddle of Life: Resilience: Building on people's strengths* (2nd ed.). Geneva: International Catholic Child Bureau.
- Vanistendael, S. (1996), *Growth in the Muddle of Life: Resilience: Building on People's Strengths*. Geneva, Switzerland: International Catholic Child Bureau.
- Vanistendael, S., & Lecomte, J. (2002). *Happiness is possible: awakening self-confidence in abused children: building resilience*. Stefan Vanistendael, Jacques Lecomte.

- Vaquero Tió, E., Urrea Monclús, A., & Mundet Bolós, A. (2014). Promoting resilience through technology, art and a child rights-based approach. *Revista de Cercetare si Interventie Sociala*, 45, 144-159.
- Vecchione, M., Alessandri, G., Barbaranelli, C., & Gerbino, M. (2010). Stability and change of ego resiliency from late adolescence to young adulthood: A multiperspective study using the ER89-R Scale. *Journal of personality assessment*, 92(3), 212-221.
- Vygotsky, L. S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
- Vygotsky, L. S. (1979). Consciousness as a problem in the psychology of behavior. *Soviet psychology*, 17(4), 3-35.
- Walker, R.A. (2012). Holograms as Teaching Agents. *Journal of Physics: Conference Series*, 415, 1-5.
- Walters, J. (2006) Methods of teaching inferring meaning from context. *RELC Journal*, 37, 176-190.
- Webb, S. (2008). The Effects of Context on Incidental Vocabulary Learning. *Reading in a foreign language*, 20, 232-245.
- Yam, L. P. K. (2021). Creative teaching and communication: A study of creative teachers' traits and skills as perceived by primary school students. *Journal of Communication and Education*, 5(1), 104-120.
- Yazdanmehr, E., Elahi Shirvan, M., & Saghafi, K. (2021). A process tracing study of the dynamic patterns of boredom in an online L3 course of German during COVID-19 pandemic. *Foreign Language Annals*, 54(3), 714-739. <https://doi.org/10.1111/flan.12548>
- Kamp, A. (2017). Humans, nonhumans, and the mediation of workplace learning in the senior school curriculum. *Journal of Vocational Education & Training*, 69(2), 214-228. <https://doi.10.1080/13636820.2016.1278395>
- Kotliarenco, M., Cáceres, I., & Fontecilla, M. (1997). *Status of Art in Resilience*. Pan American Health Organization. Pan American Sanitary Bureau, Regional Office of the World Health Organization
- Zeraatpishe, M., Seifoori, Z., & Hadidi Tamjid, N. (2019). The Impact of Multiple Intelligence-Oriented Writing Tasks on the Accuracy, Fluency, and Organization of ELT Students' Writing. *The Journal of English Language Pedagogy and Practice*, 12 (25), 1-31. 10.30495/JAL.2020.674520
- Zolkoski, S. M., & Bullock, L. M. (2012). Resilience in children and youth: A review. *Children and Youth Services Review*, 34(12), 2295-2303. <https://doi.org/10.1016/j.childyouth.2012.08.009>