Iranian Journal of Applied Language Studies
University of Sistan and Baluchestan
Print ISSN: 2008-5494 Online ISSN: 2322-3650
Homepage: https://ijals.usb.ac.ir
Uppsala University

Anxiety Reduction and RALL Implementation in English Grammar Acquisition among EFL Learners

Minoo Alemi[1], Nayereh Bakhtyarifard[2], Atefeh Rezanejad[3]

[1] *Corresponding author*, Associate Professor, English Language Teaching Department, West Tehran Branch, Islamic Azad University, Tehran, Iran, Email: minooalemi2000@yahoo.com

[2] M.A., English Language Teaching Department, West Tehran Branch, Islamic Azad University, Tehran, Iran, Email: nayerehbakhtiarifard@gmail.com

[3] Instructor, Allame Tabataba'i University, Foreign Language Faculty, English Language Department, Tehran, Iran, Email: rezanejad_a@gmail.com

Abstract

The study is a part of a larger study on the impact of Robot-Assisted Language Learning (RALL) on English grammar acquisition and retention of adolescent English as a Foreign Language (EFL) learners. More specifically, the primary aim of the paper at hand was to examine the impact of RALL on adolescent EFL learners' anxiety levels. In this regard, three intact classes (N=45) in a private language institute in Tehran were evenly divided into two experimental groups of RALL and Game-based Language Learning (GBLL) and one control group. The participants were adolescent male EFL learners between 11 to 15 years old with a mean age of 13. While the teacher, the textbook, and the teaching materials were identical in all groups, a kid-sized humanoid social robot was exclusively used in the RALL group. The data were collected through questionnaires in the final session for each group, and the results of descriptive statistics and ANOVA indicated that lower anxiety rates were observed in the RALL group. Our findings could clearly be proof of the efficiency of socially assistive robots in the instruction of language skills in a more favorable teaching context.

Keywords: RALL, grammar acquisition, anxiety, adolescent EFL learners

Received: July 18, 2021 Revised: October 21, 2021 Accepted: January 26, 2022
Article type: Research Article DOI: 10.22111/IJALS.2022.7222
Publisher: University of Sistan and Baluchestan

How to cite: Alemi, M., Bakhtyarifard, N., & Rezanejad, A. (2022). Anxiety reduction and RALL implementation in English grammar acquisition among EFL Learners. *Iranian Journal of Applied Language Studies*, *14*(2), 1-16. https://doi.org/10.22111/IJALS.2022.7222

1. Introduction

Technology-enhanced education is rapidly infiltrating the realm of second language pedagogy. Every day more and more teachers around the world are convinced on the advantages of using different forms of technology in language classrooms and admit that technology in education can empower the instructors (Wilson et al., 2020). This seems to be more ubiquitous in countries where the learners have little or in some cases even no contact with native speakers. Over the past decades for instance, computer-assisted language learning (CALL) and mobile assisted language learning (MALL) have paved their way into the realm of second language instruction and proved to be very successful in unleashing the learners' real learning capacities. Nevertheless, in spite of the various merits offered by these technologies, some drawbacks were also observed, the most important of which was lack of interaction. In fact, the learners needed a more tangible object to interact with to fruitfully internalize learning. Therefore, attentions were turned to other forms of technology such as robots which have increasingly been used for numerous diverse purposes in the world in recent years (Engwall et al., 2021). Robots can interact with learners and have proved to be very helpful in increasing their motivation to learn better.

However, in spite of all improvements in educational technologies, some students are still achieving little due to some observed levels of anxiety in classrooms. Foreign language class anxiety (FLCA) has turned into one of the most extensively studied affective factors in second language acquisition research (Dewaele et al., 2019; Dewaele & Li, 2020; Li et al., 2021; MacIntyre, 2017) and is considered to be a negative affective factor influencing students' performance and success in second language instruction. As it is imperative to explore the sources of FLCA and possible ways to reduce it to the lowest degree, the academicians and practitioners have tried to reduce this anxiety level through different procedures. The current study aims at enriching this literature by focusing on technology-embedded learning contexts and explores the impact of RALL on the Iranian adolescent EFL learners' anxiety in English grammar acquisition.

2. Literature Review

2.1. Theoretical Foundation: FLCA

Horwitz et al. (1986) proposed their foreign language anxiety theory and defined anxiety as "a distinct complex of self-perceptions, beliefs, feelings, and behaviors related to classroom language learning arising from the uniqueness of the language learning process" (p. 128). In this theory, anxiety had three interrelated sections namely, *communication apprehension* defined as "a type of shyness characterized by fear of or anxiety about communicating with people" (p. 127), *Fear of negative evaluation* which refers to "apprehension about others" evaluation, avoidance of evaluative situations, and the expectation that others would evaluate oneself negatively" (p. 128),

and *test anxiety* defined as "a type of performance anxiety stemming from a fear of failure" (p. 128) experienced in tests carried out during language learning.

Gardner and MacIntyre (1993) defined FLCA as "the subjective feeling of tension and apprehension specifically associated with second language contexts, including speaking, listening and learning" (p. 284). Abu-Rabia (2004) also stated that anxious students are usually worried and not self-confident and can't engage in the process of learning very well. Safari Moghaddam and Ghafournia (2019) pointed out that language classrooms generally breed anxiety and this can adversely influence the students' success. This was the case especially when the students were obliged to speak in front of the teachers and the other classmates. In sum, anxiety and its detrimental effects cannot be denied in the field of language pedagogy. Maybe the most distinguishing factor of FLCA from the other types lies in the mere nature of this field which requires the most self-expression.

2.2. Technology and FLCA

According to Kompan et al. (2019), the academia in language pedagogy need to consider the important role of technology in enhancing the education quality more seriously. In fact, the impact of technology in the field of foreign language education cannot be denied. During the past decades and in parallel with advancements in technology, language classrooms have exploited different forms of technology such as cassettes, videos, smartphones, tablets, and computers to enhance language pedagogy. With regard to the impact of technology on language learners' affective filter, different studies were carried out. Cong-Lem (2018) reviewed 31 empirical studies and claimed that use of technology had beneficial effects specifically on the learners' speaking skills and anxiety levels. Moreover, the longitudinal study by Xiangming et al. (2020) over a period of 10 weeks showed that mobile-assisted learning of language could decrease anxiety rates among 158 postgraduate students in China. In the local context and in Iran, Alemi et al. (2015) explored the impact of assistive social robots on the vocabulary learning anxiety of adolescent EFL learners and discovered that the anxiety was much lower in RALL groups compared to non-RALL group students. Also, Ataeifar et al. (2020) investigated the impact of technology (voice thread) on 60 female Iranian university students' speaking ability and anxiety. Their results indicated that use of technology could enhance speaking ability and decrease the students' anxiety level.

2.3. Robot-Assisted Language Learning (RALL)

During the past decades, advanced technologies such as computers, mobiles, and tablets have gained momentum in education in general and revolutionized language pedagogy in particular. Whereas during the past years CALL and MALL were the most prevalent forms of technology-enhanced education, recently there has been more attention to other newer forms of technology such as robots. Due to their observed benefits and advantages, it is speculated that in

the near future robots will be as pervasive and ubiquitous as computers. Moreover, the use of robots is nowadays not just limited to engineering fields of studies and they are widely served for diverse purposes in social, educational, and clinical areas (Alemi et al., 2020). As language pedagogy is a social process and depends greatly on interaction, it is believed that robots are perfect partners to be employed in language classrooms. They are intelligent tangible companions who can socialize with the language learners, assist the teacher in the class, never get tired of teaching or repeating the lesson, can be customized according to the age, level, and gender of the students, and be a great source of motivation for the students (Alemi et al., 2017). Different studies around the world have proved that social robots are very helpful in the field of foreign language pedagogy and learning the different language skills with the presence of a social robot is generally more successful and durable (e.g., Engwall & Lopes, 2020; Iio et al., 2019; Wang et al., 2013).

In the EFL context of Iran, in recent years, several social robots were designed by the Social and Cognitive Research Group at the Center of Excellence in Design, Robotics, and Automation (CEDRA), Sharif University of Technology (e.g., Alemi et al., 2014; Alemi et al., 2017; Alemi et al., 2020; Meghdari et al., 2018). The results of all these studies indicated the positive impact of robots on the general social performance and learning outcomes. However, it needs to be stressed that there's still a need for more interdisciplinary or multidisciplinary research studies in the area of social robotics (Alemi et al., 2020). Although as mentioned before, the majority of previous studies on RALL have focused on the acquisition of the main language skills and very few have paid attention to the interrelationships between RALL and its impact on the learners' affective factors. This is in fact more critical in the EFL context of Iran. Hence the following research questions were put forward in the present study:

1. *What is the anxiety level of EFL learners in RALL, GBLL, and control groups towards English grammar acquisition?*
2. *Is there any significant difference among RALL, GBLL, and control groups towards English grammar acquisition?*

3. Method

3.1. Participants

The study aimed at investigating the impact of RALL and GBLL on the foreign language anxiety of EFL learners. Therefore, a total of 45 male EFL learners between 11 to 15 years old (with a Mean age of 13) were equally and randomly divided into RALL group, GBLL group, and the control group. All of the students came from the same language institute with the same language proficiency based on Oxford placement test and none had any direct contact with a robot before. In the RALL group (See Figure 1), the students were taught mainly by a human teacher with the simultaneous assistance of a kid-sized social robot. It needs to be pointed out that different language games were played both in the RALL (with the presence of the social robot) and GBLL

group. In the control group however, the students were taught solely by the human teacher and the lessons were taught through traditional teacher-centered methods through repetition and various drills.

Figure 1

The RALL Group in the Institute (the teacher, the students, and Nima robot)

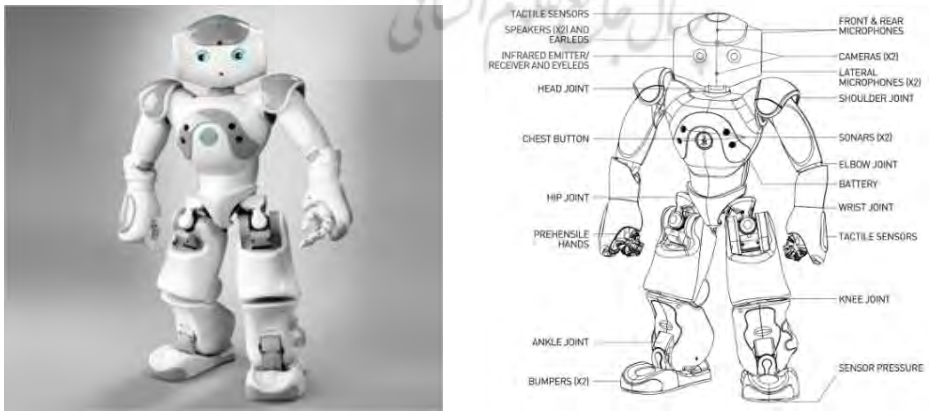
3.2. Instruments

3.2.1. The Humanoid Robot

This study used a humanoid, social, and programmable robot (NAO H21, designed and made by Aldebaran Robotics Company, http://www.aldebaran-robotics.com/en/). It was a kid-sized robot and its visual graphical programming language was Choreograph (See Figure 2). This robot was renamed to Nima (an Iranian name for boys) to keep a better relationship with the students. Every session and before taking the robot to the classroom it was piloted in the CEDRA laboratory of Sharif University of Technology to prevent any possible problems.

Figure 2

NAO Robot (Nima) H21 Version



3.2.2. Games

Some different language games were used in two groups of participants (See Figure 3). In the RALL group, they were played in the classroom with the help of Nima robot. However, in the GBLL group these games were played only between the teacher and the students. Finally, in the control group no game was played and the students learned grammar mainly through traditional deductive methods. The played games were *board game, hot potato game, game shopping,* and *verb ball toss* and were all downloaded from *ESLgamesplus* website (https://www.eslgamesplus.com).

Figure 3

(a) Sample Board Game to Practice Can/can't; (b) Teacher, Nima Robot, and the Learners Playing Verb Ball toss Game

(a) (b)

3.2.3. Foreign Language Class Anxiety Scale (FLCAS)

In order to examine the learners' anxiety level, the standard FLCA questionnaire proposed by Horwitz et al. (1986) which was translated to Persian and validated by Farsi, Rezaie, and Panahandeh (2015) was administered after the treatments among the three groups. The adopted version used for this study constituted 28 items (See Appendix A) and was based on a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree". Moreover, the reliability of this translated questionnaire (Cronbach Alpha) was 0.85 in this study.

4. Data Collection Procedure

The main aim of this study was to examine the role of RALL in the anxiety level of Iranian adolescent EFL learners. In this regard, three different groups of students were selected for this study. The first group was the RALL group and the students in this group were taught by the human teacher as well as an assistive social robot. In the GBLL group, the students learned English only by the same human teacher and different games were played. Finally, in the control group, the students were taught based on the traditional deductive teaching method by the same teacher and mainly learned English grammar through repetition and drills.

Figure 4

Nima Robot and Teacher Encouraging the Students

It needs to be pointed that the teacher as well as the instructional materials used for all three groups (RALL, GBLL, and control) were identical and based on English Book *Hey There 3A* (according to the established syllabus of the language institute). Overall, the treatments took for a total of 10 sessions for the RALL group (each lasting for 60 minutes), 15 sessions for the GBLL group (each lasting for 90 minutes), and 15 sessions for the control group (each lasting for 120 minutes). The data obtained through the FLCAS questionnaire, was analyzed by the SPSS 22 software. To answer the research question, descriptive statistics (mean and standard deviation plus percentage of each item in the Likert scale) were provided first. To evaluate the differences in the anxiety levels of the participants a one-way ANOVA was administered.

5. Results and Discussion

In order to answer the research questions and investigate the anxiety levels of RALL, GBLL, and the control group, we first computed the descriptive statistics of the different items of FLCAS. Also, we were interested to figure out the percentage, mean, and standard deviation of the different sections on the Likert scale chosen by our participants. The results provided the data displayed in Table 1.

Table 1

Descriptive Statistics of FLCAS Items

	Group	N	1 (%)	2(%)	3(%)	4(%)	5(%)	Mean	SD	SE mean
Q1	RALL	15	40	33	20	6.7	0	1.93	.96	.24
	GBLL	15	13.3	40	40	0	6.7	2.46	.99	.25
	Control	15	13.3	46.7	13.3	26.7	0	2.46	.99	.25
Q2	RALL	15	6.7	13.3	6.7	26.7	46.7	3.93	1.33	.34
	GBLL	15	6.7	0	13.3	40	40	4	1.09	.28
	Control	15	0	60	20	0	20	4.06	1.09	.28
Q3	RALL	15	33.3	40	13.3	13.3	0	2.07	1.03	.26
	GBLL	15	33.3	33.3	26.7	6.7	0	2.06	.96	.24
	Control	15	26.7	40	20	13.3	0	2.06	.96	.24
Q4	RALL	15	46.7	20	20	13.3	0	2	1.13	.29
	GBLL	15	20	46.7	20	13.3	0	2.26	.96	.24
	Control	15	26.7	13.3	26.7	26.7	6.7	2.26	.96	.24
Q5	RALL	15	33.3	20	33.3	0	13.3	2.40	1.35	.34
	GBLL	15	33.3	46.7	6.7	6.7	6.7	2.06	.30	1.16
	Control	15	13.3	6.7	60	13.3	6.7	2.06	1.16	.30
Q6	RALL	15	40	26.7	13.3	6.7	13.3	2.27	1.43	.37
	GBLL	15	0	40	46.7	0	13.3	2.86	.99	.25
	Control	15	13.3	6.7	20	53.3	6.7	2.86	.99	.25
Q7	RALL	15	0	6.7	26.7	6.7	60	4.20	1.08	.27
	GBLL	15	6.7	6.7	20	26.7	40	3.86	.32	1.24
	Control	15	0	13.3	46.7	0	40	3.86	1.24	.32
Q8	RALL	15	40	20	26.7	13.3	0	2.13	1.12	.29
	GBLL	15	0	26.7	53.3	13.3	6.7	3	.84	.21
	Control	15	6.7	26.7	6.7	60	0	3	.84	.21
Q9	RALL	15	13.3	33.3	13.3	26.7	13.3	2.93	1.33	.34
	GBLL	15	20	33.3	6.7	33.3	6.7	2.73	1.33	.34
	Control	15	6.7	33.3	20	40	0	2.73	1.33	.34
Q10	RALL	15	46.7	40	6.7	6.7	0	1.73	.88	.22
	GBLL	15	46.7	33.3	13.3	6.7	0	1.80	.94	.24
	Control	15	6.7	53.3	20	6.7	13.3	1.80	.94	.24
Q11	RALL	15	46.7	33.3	6.7	6.7	6.7	1.93	1.22	.31
	GBLL	15	20	26.7	33.3	20	0	2.53	1.06	.27
	Control	15	26.7	6.7	33.3	33.3	0	2.53	1.06	.27
Q12	RALL	15	6.7	6.7	26.7	13.3	46.7	3.87	1.30	.33
	GBLL	15	26.7	6.7	33.3	13.3	20	2.93	1.48	.38
	Control	15	26.7	20	26.7	6.7	20	2.93	1.48	.38
Q13	RALL	15	46.7	6.7	13.3	13.3	20	2.53	1.68	.43
	GBLL	15	0	46.7	20	20	13.3	3	1.13	.29
	Control	15	0	26.7	20	26.7	26.7	3	1.13	.29
Q14	RALL	15	40	33.3	26.7	0	0	1.87	.83	.21
	GBLL	15	40	26.7	26.7	6.7	0	2	1	.25
	Control	15	33.3	53.3	13.3	0	0	2	1	.29
Q15	RALL	15	73.3	6.7	13.3	0	6.7	1.60	1.18	.30
	GBLL	15	40	33.3	6.7	13.3	6.7	2.13	1.30	.33
	Control	15	13.3	46.7	6.7	13.3	20	2.80	1.42	.36
Q16	RALL	15	6.7	0	20	26.7	46.7	4.07	1.16	.30
	GBLL	15	80	6.7	13.3	0	0	1.33	.72	.18
	Control	15	13.3	6.7	26.7	46.7	6.7	1.33	.72	.18
Q17	RALL	15	60	33.3	0	0	6.7	1.60	1.05	.27
	GBLL	15	26.7	33.3	20	13.3	6.7	2.40	1.24	.32
	Control	15	26.7	13.3	13.3	40	6.7	2.40	1.24	.32
Q18	RALL	15	60	20	6.7	6.7	6.7	1.80	1.26	.32
	GBLL	15	13.3	40	40	6.7	0	2.40	.82	.21
	Control	15	6.7	40	20	33.3	0	2.40	.82	.21
Q19	RALL	15	46.7	20	26.7	0	6.7	2	1.19	.30

	GBLL	15	13.3	73.3	6.7	6.7	0	2.06	.70	.18
	Control	15	53.3	26.7	6.7	13.3	0	2.06	.70	.18
Q20	RALL	15	6.7	20	13.3	13.3	46.7	3.73	1.43	.37
	GBLL	15	0	13.3	40	33.3	13.3	3.46	.91	.23
	Control	15	0	13.3	33.3	53.3	0	3.46	.91	.23
Q21	RALL	15	53.3	26.7	13.3	6.7	0	1.73	.96	.24
	GBLL	15	0	40	46.7	13.3	0	2.73	.70	.18
	Control	15	6.7	6.7	46.7	33.3	6.7	2.73	.70	.18
Q22	RALL	15	40	13.3	6.7	13.3	26.7	2.73	1.75	.45
	GBLL	15	13.3	26.7	13.3	33.3	13.3	3.06	1.33	.34
	Control	15	0	6.7	40	26.7	26.7	3.06	1.33	.34
Q23	RALL	15	60	20	6.7	13.3	0	1.73	1.10	.28
	GBLL	15	20	53.3	20	6.7	0	2.13	.83	.21
	Control	15	6.7	33.3	46.7	13.3	0	2.13	.83	.21
Q24	RALL	15	53.3	26.7	20	0	0	1.67	.81	.21
	GBLL	15	26.7	46.7	20	6.7	0	2.06	.88	.22
	Control	15	13.3	40	26.7	20	0	2.06	.88	.22
Q25	RALL	15	33.3	40	6.7	6.7	13.3	2.27	.35	1.38
	GBLL	15	20	26.7	26.7	26.7	0	2.60	1.12	.28
	Control	15	13.3	6.7	46.7	33.3	0	2.06	1.12	.28
Q26	RALL	15	53.3	20	13.3	13.3	0	1.87	1.12	.29
	GBLL	15	40	33.3	6.7	20	0	2.06	1.16	.30
	Control	15	13.3	20	0	53.3	13.3	2.06	1.16	.30
Q27	RALL	15	46.7	6.7	26.7	6.7	13.3	2.33	1.49	.38
	GBLL	15	13.3	20	46.7	6.7	13.3	2.86	1.18	.30
	Control	15	6.7	13.3	6.7	60	13.3	2.86	1.18	.30
Q28	RALL	15	26.7	20	26.7	20	6.7	2.60	1.29	.33
	GBLL	15	6.7	6.7	53.3	20	13.3	3.26	1.03	.26
	Control	15	6.7	6.7	13.3	46.7	26.7	3.26	1.03	.26

In the next stage, the overall mean of the FLCAS in the three groups of participants was computed. As it was mentioned before, this questionnaire was based on a 5-point Likert scale and accordingly lower scores represented high anxiety levels and higher scores were evidence of lower levels of anxiety. As can be seen in Table 2, the RALL group scored the lowest on the FLCAS. As shown, the overall anxiety mean of the RALL group was 2.07 (SD=0.72). The GBLL group was ranked as the second group and received a mean score of 2.53 (SD=0.47). The highest mean for the anxiety scores was for the control group with a mean score of 2.87 (SD=0.51).

Table 2

Descriptive Statistics for the Overall Mean of FLCAS among the Participants

	N	Mean	SD	SE Mean	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
RALL group	15	2.07	0.72	0.19	1.68	2.47	1.29	3.89
GBLL group	15	2.53	0.47	0.12	2.27	2.79	1.96	3.68
Control group	15	2.87	0.51	0.13	2.59	3.15	1.68	4.00
Total	45	2.49	0.65	0.10	2.30	2.69	1.29	4.00

In order to see if there was any significant difference in the anxiety scores of RALL, GBLL, and control groups, a one-way ANOVA was run as shown in Table 3. The Levene's test of homogeneity variance showed no violation before implementing the ANOVA, $F=.81$, $p=.45$. As

can be seen, there was a significant difference in the anxiety scores of the students in the RALL, GBLL, and control group, $F(2, 42)=7.23$, $p=.00$. Generally, the results are a piece of good evidence that RALL could decrease anxiety in learners to a great extent and led to more fruitful learning.

Table 3

ANOVA Results for the Overall Mean of FLCAS

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.80	2.00	2.40	7.23	0.00
Within Groups	13.96	42.00	0.33		
Total	18.76	44.00			

Moreover, Post hoc Bonferroni showed that there was a significant mean difference between the RALL group and the control group. As depicted in Table 4, RALL group students were less anxious ($M=2.07$, $SD=.72$) than the control group ($M=2.87$, $SD=.51$). However, no other significant differences were observed.

Table 4

The Results of Post Hoc Bonferroni

Group		Mean Difference	Std. Error	Sig.	95% CI	
					Lower Bound	Upper Bound
RALL group	GBLL group	-0.45	0.21	0.11	-0.98	0.07
	control group	-.79762*	0.21	0.00	-1.32	-0.27
GBLL group	RALL group	0.45	0.21	0.11	-0.07	0.98
	control group	-0.34	0.21	0.33	-0.87	0.18
Control group	RALL group	.79762*	0.21	0.00	0.27	1.32
	GBLL group	0.34	0.21	0.33	-0.18	0.87

The results of the current study were in consistency with several previous studies which also showed technology-assisted instruction could alleviate anxiety levels (See e.g., Adair-Hauck et al., 2000; Alemi et al., 2015; Ataiefar & Sadighi, 2017; Aydın, 2018; Sad, 2008; White, 2014). The overall privilege of RALL and its success in lowering the anxiety levels of the students can best be justified based on one of the most significant features of robots and that is their instructiveness. The students in the RALL group believed Nima robot as a real member of the class who helped them master the language without judging them. This may have never happened with having the human teacher as the sole presenter of information in the classroom. As depicted in Table 1, the descriptive statistics regarding item number 23 (*being more tense and nervous in language class*) is a clear indication of this point. Whereas 80% of the students in the RALL group (M=1.73) disagreed with this item, nearly 70% and 40% of the students in the GBLL group (M=2.13) and control group (M=2.13) respectively disagreed with this item. This finding clearly indicates that students in the RALL group experienced the least anxiety in a language class and the assistive robot could diminish their affective filter to a great extent. This lower anxiety can also be attributed to the notion of enjoyment. The students in the RALL group enjoyed the class and had fun interacting with the robot and this indeed made them less anxious in the classroom environment. Similar results have been found by

some other scholars who have also confirmed that classroom enjoyment has a negative correlation with language anxiety (e.g., Dewaele & MacIntyre, 2014; Dewaele & Alfawzan, 2018; Sarani & Malmir, 2019).

The different abilities of Nima robot (e.g., playing games and singing songs) in our study could enliven the class atmosphere and make the learners enjoy language learning. Needless to say that the more the students enjoy learning the less anxiety and stress they will experience. A closer look at item 15 (a negative inclination to language class) further proves this point. Nearly 80% of the students in the RALL group (M=1.60) either partially or strongly disagreed with this item. Only 6.7% of the students agreed with this item. This clearly shows that the RALL students enjoyed the class and felt happy being in it. By contrast, nearly 20% of the students in the GBLL group agreed that sometimes they feel like not going to language class. This rate was the highest among the students in the control group where 33.3% of the students agreed that they may have such feelings. The different procedures undertaken in these classes and the methods applied can be the main reason behind this finding.

Also, it is worth mentioning that one of the main sources of anxiety in language learners is making mistakes. In our study, Nima robot was designed to intentionally make some mistakes during the class and this could dramatically decrease the students' fear and anxiety of making mistakes. This is more evident in RALL students' responses to item 17 (*concern about error correction by teacher*) where more than 90% of them slightly or strongly disagreed with this item (M=1.60, SD=1.05). In the case of the students in the GBLL and control group the rates were much lower and only nearly 60% and 40% of them (equally M=2.40, SD=1.24) respectively disagreed with this item. Moreover, item 26 (*being worried about making mistakes*) also received the lowest mean rating score from the students in the RALL group (M=1.87, SD=1.12) with more than 70% disagreement from them. Whereas 40% of the students in the GBLL group disagreed with item 26, only 13.3% strongly disagreed that they are worried about making mistakes in class.

It was also discovered that the Nima robot's ability to call out the students by their names could have a great impact on lowering their stress and anxiety about being called out by the teacher in class. The results of the questionnaire clearly show this. A closer look at item 18 (*feeling nervous upon being called in class*) shows that the anxiety level in the RALL group (M=1.80, SD=1.26) was much lower than the GBLL and control group (M=2.40, SD=0.82). Whereas 80% of the RALL students disagreed with this statement, only nearly half of the participants in the two other groups showed disagreement. Answers to item 28 (*regarding speaking anxiety*) can further be a piece of evidence to this finding. The results indicated that the students in the RALL group felt less self-conscious (M=2.60, SD=1.29) than the students in the GBLL and control group (M=3.26, SD=1.03).

It was also interesting to note that the robot could influence the student's self-confidence level in volunteering in the class. As it was mentioned before the robot in the current study played music and danced in response to correct answers from the students and this can be regarded as the

main source of motivation for the students to answer the questions in the class. This was evident in item 11 (*attitude toward volunteering in class*). As depicted in Table 1, it was found that nearly 80% of the RALL students (M=1.93, SD=1.22) claimed that they had no problem with volunteering and found it all right. However, in the GBLL group nearly half of the students disagreed with this item (M=2.53, SD=1.06) and thought volunteering would be embarrassing. This observed disagreement was even lower, in fact the lowest, in the control group (M=2.53, SD=1.06) where nearly 30% of the students either slightly or strongly disagreed with this statement.

6. Conclusion

The main goal of the study was to investigate the impact of employing an assistive humanoid social robot on the anxiety level of Iranian adolescent EFL learners. The obtained results were clearly a shred of evidence for the efficiency of technology-embedded instructional contexts in removing restraining affective filters. The results of the present study indicated that Nima robot made a significant difference in the anxiety of the students and there were lower levels of anxiety in the RALL system compared to the non-RALL ones. The students in the RALL group enjoyed the class more, were more actively engaged in learning, were less reserved and anxious in class, felt more motivated and had a positive attitude toward the use of robots in the class.

The present study had some limitations that should be considered by the readers as they may affect the generalizability of the findings. We investigated the impact of RALL on the anxiety level of adolescent male students in a private language institute. Forthcoming research could study this trend among students of both genders and different age levels. Also, the important role of sociocultural backgrounds in the anxiety level of the learners should be taken into account. Replications of the current study may lead to different results in various sociocultural contexts.

The findings of this study have important pedagogical implications. Overall, educational policymakers are to be reminded of the positive role of technology in language instruction, especially among adolescent learners. Not only technology is increasingly becoming an indispensable part of foreign language learning courses, but also the majority of adolescent students around the world have literally grown up with diverse forms of technology and are attached to and comfortable with it to a great extent. We would like to encourage educators, policymakers, and materials developers to take into account the importance of integrating technology into foreign language acquisition, as it can create more appealing and engaging learning opportunities and be more effective than the older traditional instructional methods. This is of course more than just taking the necessary tools and equipment to the class. More importantly, teachers need to be made aware of the advantages of the integration of technology in class as well as being educated on its successful implementation.

References

Abu-Rabia, S. (2004). Teachers' role, learners' gender differences, and FL anxiety among seventh-grade students studying English as a FL. *Educational Psychology, 24*, 711- 721. https://doi.org/10.1080/0144341042000263006

Adair-Hauck, B., Willinghammclain, L., & Youngs, B. E. (2000). Evaluating the integration of technology and second language learning. *CALICO Journal, 17*(2), 269-306. https://www.jstor.org/stable/24152630

Alemi, M., Meghdari, A., & Ghazisaedy, M. (2014). Employing humanoid robots for teaching English language in Iranian junior high-schools. *International Journal of HumanoidRobotics, 11*(03), 1450022. https://doi.org/10.1142/S0219843614500224

Alemi, M., Meghdari, A., & Ghazisaedy, M. (2015). The impact of social robotics on L2 learners' anxiety and attitude in English vocabulary acquisition. *International Journal of Social Robotics*, *7*(4), 523-535. https://doi.org/10.1007/s12369-015-0286-y

Alemi, M., Meghdari, A., & Haeri, N. S. (2017). Young EFL learners' attitude towards RALL: An observational study focusing on motivation, anxiety, and interaction. *Lecture Notes in Computer Science (LNCS): Social Robotics* (Vol. 10652, pp. 252-261).

Alemi, M., Taheri, A., Shariati, A., & Meghdari, A. (2020). Social robotics, education, and religion in the Islamic world: An Iranian perspective. *Science and Engineering Ethics, 26*(5), 2709-2734. https://doi.org/10.1007/s11948-020-00225-1

Ataiefar, F., & Sadighi, F. (2017). Lowering foreign language anxiety through technology: A case of Iranian EFL sophomore students. *English Literature and Language Review, 3*(4), 23-34. https://ideas.repec.org/a/arp/ellrar/2017p23-34.html

Ataeifar, F., Sadighi, F., Bagheri, M. S., & Behjat, F. (2020). Alleviating Iranian EFL Students' Speaking Anxiety: Mobile-assisted instruction vs. traditional instruction. *International Journal of Foreign Language Teaching and Research*, *8*(30), 11-24.

Aydın, S. (2018). Technology and foreign language anxiety: Implications for practice and future research. *Journal of Language and Linguistic Studies, 14*(2), 193-211. https://dergipark.org.tr/en/pub/jlls/issue/43364/527966

Bradley, T., & Lomicka, L. (2000). A case study of learner interaction in technology-enhanced language learning environments. *Journal of Educational Computing Research, 22*, 347-368. https://doi.org/10.2190/TCUA-3YUV-B1P5-26P3

Cong-Lem, N. (2018). Web-based language learning (WBLL) for enhancing L2 speaking performance: A review. *Advances in Language and Literary Studies, 9*(4), 143-152. http://dx.doi.org/10.7575/aiac.alls.v.9n.4p.143

Dewaele, J. M., & Alfawzan, M. (2018). Does the effect of enjoyment outweigh that of anxiety in foreign language performance?. *Studies in Second Language Learning and Teaching, 8*(1), 21-45. https://doi.org/10.14746/ssllt.2018.8.1.2.

Dewaele, J. M., & Li, C. (2020). Emotions in second language acquisition: A critical review and research agenda. A positive psychology perspective on emotions in SLA. *Foreign Language World, 196*(1), 34-49.

Dewaele, J. M., & MacIntyre, P. (2014). The two faces of Janus? Anxiety and enjoyment in the foreign language classroom. *Studies in Second Language Learning and Teaching, 4*(2), 237-274. https://doi.org/10.14746/ssllt.2014.4.2.5.

Dewaele, J. M., Magdalena, A. F., & Saito, K. (2019). The effect of perception of teacher characteristics on Spanish EFL Learners'Anxiety and Enjoyment. *The Modern Language Journal, 103*(2), 412-427. https://doi.org/10.1111/modl.12555

Engwall, O., & Lopes, J. (2020). Interaction and collaboration in robot-assisted language learning for adults. *Computer Assisted Language Learning*, 1-37. https://doi.org/10.1080/09588221.2020.1799821

Engwall, O., Lopes, J., & Åhlund, A. (2021). Robot interaction styles for conversation practice in second language learning. *International Journal of Social Robotics, 13*(2), 251-276. https://doi.org/10.1007/s12369-020-00635-y

Foss, A. K., & Reitzel, A. C. (1988). A relational model for managing second language anxiety. *TESOL Quarterly, 22*(3), 437-454. https://doi.org/10.2307/3587288

Gardner, R. C., & MacIntyre, P. D. (1993). A student's contributions to second-language learning. Part II: Affective variables. *Language teaching*, *26*(1), 1-11. https://doi.org/10.1017/S0261444800000045

Horwitz, E. K., Horwitz, M. B., & Cope, J. (1986). Foreign language classroom anxiety. *The Modern Language Journal, 70*(2), 125-132. https://doi.org/10.2307/327317

Iio, T., Maeda, R., Ogawa, K., Yoshikawa, Y., Ishiguro, H., Suzuki, K., Aoki, T., Maesaki, M., & Hama, M. (2019). Improvement of Japanese adults' English speaking skills via experiences speaking to a robot. *Journal of Computer Assisted Learning*, *35*(2), 228-245. https://doi.org/10.1111/jcal.12325

Kompan, R. T., Edirisingha, P., Canaleta, X., Alsina, M., & Monguet, J. M. (2019). Personal learning environments based on Web 2.0 services in higher education. *Telematics and Informatics, 38*, 194-206. http://doi.org/10.1016/j.tele.2018.10.003

Li, Ch., Huang, J., & Li, B. (2021). The predictive effects of classroom environment and trait emotional intelligence on foreign language enjoyment and anxiety. *System, 96*, 102393. https://doi.org/10.1016/j.system.2020.102393

MacIntyre, P. D. (2017). An overview of language anxiety research and trends in its development. In C. Gkonou, M. Daubney, & J.-M. Dewaele (Eds.), *New insights into language anxiety: Theory, research and educational implications* (pp. 11-30). Bristol: Multilingual Matters.

Meghdari, A., Shariati, A., Alemi, M., Amoozandeh, A., Khamooshi, M., & Mozafari, B. (2018). Design performance characteristics of a social robot companion "arash" for pediatric hospitals. *International Journal of Humanoid Robotics, 15*(5), 1850019. https://doi.org/10.1142/S0219843618500196

Sad, S. N. (2008). Using mobile phone technology in EFL classes. *English Teaching Forum, 46*(4), 34-40. https://eric.ed.gov/?id=EJ1096315

Safari Moghaddam, M., & Ghafournia, N. (2019). Elaboration on foreign language anxiety in L2 speaking: A study of Iranian EFL learners. *International Journal of Foreign Language Teaching and Research, 7(*26), 138-157.

Sarani, A., & Malmir, A. (2019). The effect of Dogme language teaching (Dogme ELT) on L2 speaking and willingness to communicate (WTC). *Journal of English Language Teaching and Learning, 11*(24), 261–288.

Vandewaetere, M., & Desmet, P. (2009). Introducing psychometrical validation of questionnaires in CALL research: The case of measuring attitude towards CALL. *Computer Assisted Language Learning*, *22*(4), 349-380. https://doi.org/10.1080/09588220903186547

Wang, Y. H., Young, S. S. C., & Jang, J. S. R. (2013). Using tangible companions for enhancing learning English conversation. *Journal of Educational Technology and Society, 16*(2), 296-309. https://www.jstor.org/stable/10.2307/jeductechsoci.16.2.296

White, J. (2014). The use of call as a means of reducing anxiety of students studying abroad. *Procedia Technology, 18,* 113-119. https://doi.org/10.1016/j.protcy.2014.11.022

Wilson, M. L., Ritzhaupt, A. D., & Cheng, L. (2020). The impact of teacher education courses for technology integration on pre-service teacher knowledge: A meta-analysis study. *Computers & Education, 156*, 103941. https://doi.org/10.1016/j.compedu.2020.103941

Xiangming, L., Liu, M., & Zhang, C. (2020). Technological impact on language anxiety dynamic. *Computers & Education*, *150*, 103839. https://doi.org/10.1016/j.compedu.2020.103839

Appendix A: Foreign Language Classroom Anxiety Scale (Modified English version)

FLCAS Statements
Q1
I never feel quite sure of myself when I am speaking in my foreign language class.
Q2
I don't worry about making mistakes in language class.
Q3
I tremble when I know that I'm going to be called on in language class.
Q4
It frightens me when I don't understand what the teacher is saying in the foreign language.
Q5
During language class, I find myself thinking about things that have nothing to do with the course.
Q6
I keep thinking that the other students are better at languages than I am.
Q7
I am usually at ease during tests in my language class.
Reversed: I feel very stressed out during test in my language class.
Q8
I start to panic when I have to speak without preparation in language class.
Q9
I don't understand why some people get so upset over foreign language classes.
Reversed: I understand why some people get so upset over foreign language classes.
Q10
In language class, I can get so nervous I forget things I know.
Q11
It embarrasses me to volunteer answers in my language class.
Q12
I would not be nervous speaking the foreign language with native speakers.
Reversed: I would feel nervous speaking the foreign language with native speakers.
Q13
I get upset when I don't understand what the teacher is correcting.
Q14
Even if I am well prepared for language class, I feel anxious about it.
Q15
I often feel like not going to my language class.
Q16
I feel confident when I speak in foreign language class.
Reversed: I don't feel confident when I speak in the foreign language.
Q17
I am afraid that my language teacher is ready to correct every mistake I make.
Q18
I can feel my heart pounding when I'm going to be called on in language class.

Q19

The more I study for a language test, the more con- fused I get.

Q20

I don't feel pressure to prepare very well for language class.

Q21

I always feel that the other students speak the foreign language better than I do.

Q22

Language class moves so quickly I worry about getting left behind.

Q23

I feel more tense and nervous in my language class than in my other classes.

Q24

I get nervous and confused when I am speaking in my language class.

Q25

I get nervous when I don't understand every word the language teacher says.

Q26

I am afraid that the other students will laugh at me when I speak the foreign language.

Q27

I get nervous when the language teacher asks questions which I haven't prepared in advance.

Q28

I feel very self-conscious about speaking the foreign language in front of other students.