The implication of Age and Use of Technologies in Reading Comprehension on Ecuadorian A2 Learners in Tertiary Education

Implicaciones de la Edad y Uso de Tecnología en la Comprensión Lectora en Estudiantes Ecuatorianos de Nivel A2 en Educación Superior

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ABSTRACT

This study aims to determine if learners´ age has an incidence in students` reading comprehension ability, analyzing these variables throughout three sceneries, using Google translator, a specialized software named Rewordify and without any technological resource. This study follows a quantitative approach, where a sample of 130 student`s responses was studied. The data analyzed lead researchers to conclude that there is no significant difference between learners from different ages on their capacity to understand a text in the Ecuadorian context; also, technology seems to be useful equally among aged groups.

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RESUMEN

Este estudio tiene como objetivo determinar si la edad de los estudiantes tiene incidencia en la capacidad de comprensión lectora de los mismos, analizando estas variables a través de tres escenarios, con google traductor, software especializado en lectura llamado Rewordify y sin la utilización de algún recurso tecnológico. Esta investigación sigue un enfoque cuantitativo, donde se estudió una muestra de 130 respuestas de estudiantes. Los datos analizados permiten concluir que no existe una diferencia significativa entre estudiantes de diferentes edades en su capacidad para comprender un texto en el contexto ecuatoriano; además, la tecnología parece ser igualmente útil en los diversos grupos de edad.

Palabras clave: *Alumnos nivel A2, Comprensión lectora, Edades, Rewordify*

INTRODUCTION

Over the last decades, people around the world have been witnesses of how the world has constantly been changing in its different areas, technology and education are not separate chapters. Technology has revolutionized the way that educators plan their activities in their lessons inside and outside the classroom. The technology has come to ease the application of strategies to get the learning outcomes programmed and, in that way, to reach the standards of each educational program. Technology may help in different areas, such as helping the students to enhance their skills and competences. It also facilitates the learning process as learners can explore, analyze, discover, and choose activities that are real and meaningful, enhancing interaction between real and virtual environments, favoring self-learning and learners centered approach, promoting interpersonal relationship by avoiding any hierarchical barrier (Hong, 2010).

Applying technology on the teaching and learning process of any language will favor the students' attitude toward it; young people are attracted by the use of technology and enjoy its use. However, older people could have problems dealing with it. Technology might become a generational gap between them, which can be a cause that prevents the development of the students' learning (Adair-Hauck, Willingham-McLain, & Youngs, 2000).

The receptive skills are reading and listening, and the productive ones are speaking, writing, and conversation. Reading could be one of the most challenging skills in the learning of the English language. Some authors have worked on different software to help to improve the students' performance in this skill. Also, it helps to overcome deficiencies at the time of understanding texts with several levels of awkwardness. One of the software found free online to use is Rewordify.com (Morales, Mora, & Alvarez, 2019; Athanasiadou, Andreou, & Gana, 2020).

Many researchers stated that language learning acquisition success when learners are involved in a naturalistic environment (Krashen, Long, & Scarcella, 1979; Loup, Boustagui, El Tigi, & Moselle, 1994). According to Chomsky (1967), all children are born with a Language Acquisition Device (LAD); it ensures human beings' ability to communicate; complementing this hypothesis Krashen, Long, and Scarcella (1979) pointed out the importance of exposure learners as much as possible to the second language. Therefore, learners who start exposure to a new language at an early age tend to perform better than learners who begin as adults (Muñoz, 2006).

However, not all language learning processes are performed in a naturalistic environment where learners have total exposure to second language (L2) inside and outside classrooms; for instance, in Latin America where learners only have exposure to L2 during schooling. According to Patkowski (2003), it seems to be more critical the exposure to the second language than accomplishing the moment when "Critical Period Hypothesis" (CPH) happens; further, some studies demonstrated that even if learners are inside the CPH, when there is an absence of enough exposure to L2, the acquisition is not successfully carried out (Patkowski, 2003, p. 183).

Cenoz (2002) and Lázaro (2002) conducted some studies aimed to identify differences in language acquisition across learners of different ages. The findings demonstrated that in terms of language learning, both groups performed satisfactory, in general, there was not a significant difference between groups; however, early learners seem to have performed much better in listening and speaking, while older ones tend to perform much better in reading comprehension and grammar knowledge.

Language teachers usually include in their lesson plans, activities to improve the reading skill and this kind of activities must be done with the purpose of encouraging to the learners to the reading (Harmer, 2010). However, most of the time this purpose is not gotten due to that in classes there is a variety of levels in the domain of the English language and, besides, there can be found mixed aged learners, and for that reason, to get the learning outcomes may be challenging for them (Snow & Kim, 2007).

A study has demonstrated that aged affects reading comprehension. It indicates that advancing ages affects learners` retention capacity, especially for digits and words when text presents complex grammatical constructions. This study also demonstrated that adults' reading comprehension is enhanced when complex grammatical structures are reduced and it helps to "improve elderly adult`s comprehension even when they read under times constraints" (Norman, Kemper, & Kynette, 1992, p. 260).

Curtis and Kruidenier (2005) declared that to reach comprehension learners need to interpret words and connect them with the meaning. The decoding process bases on learners` storage of vocabulary and context of the word or phrase in the whole paragraph. Also, this comprehension contributes to raising a higher level of understanding in following statements; in other words, it "enables better word analysis, increase vocabulary and result in more fluent reading." (p. 9)

According to Harmer (2001), "When language teachers ask the students to read, the success of the activity will often depend on the level of the text we are asking them to work with" (p. 100). Consequently, it is important that language teachers analyze each text before applying it to their learners; it contributes to determining if it is according to their levels. Despite reading texts, there will always be new words that could be truly difficult to understand for the learners, even when they try to get the meaning of the word from the context.

According to Gough, Hoover, Peterson, Cornoldi, and Oakhill (1996), while learners are getting older, the correlation between word reading and comprehension decreases. In other words, age has a negative effect on decoding and comprehension of words in text. Sabatini (2002) studied the effect of speed and memory on reading comprehension in adults and children, and his findings suggested adult learners presented some limitations while compared with children, especially those adult learners who have low literacy.

However, studies conducted demonstrated that children and adults use a different cognitive process to achieve comprehension, while children are not affected by age; adult learners use other strategies of compensation to decode a message (Greenberg, Ehri, & Perin, 2002).

Regarding these strategies, Davidson and Strucker (2002) pointed out these strategies as guessing meaning from context and word substitution, these language tools help to compensate for a low level of word recognition.

Mixed ages among learners could become an issue to be faced in class; there are many studies that demonstrate that the older the person is more problem has for dealing with the learning of a new language as Norman, et al. (1992) demonstrated that working memory limitation affect elderly adults' ability to process complex syntactic construction, lowering comprehension in the timed test, therefore language teachers must make use of different kind of tools to facilitate to the learners to overcome their weaknesses regarding their lack of vocabulary.

Rewordify is an application designed to help learners understand what they read, especially those with a basic English language. This software allows learners to comprehend a piece of text throughout modifying the text into a less complex piece of text, facilitating learners decoding process and further comprehension (Edyburn, 2000; Athanasiadou, et al., 2020).

Morales, Mora, and Alvarez (2019) researched to evaluate the effectiveness of Rewordify in the Ecuadorian tertiary context, where they concluded that this application demonstrated positive effects in allowing learners to achieve comprehension of certain types of texts. Despite this research, there is not information about its effectiveness among learners from different ages. Therefore, this study is based on reading skills and pretends to analyze the impact of rewordify.com software on the development of the reading skill in learners of the English language as a foreign language. It also aims to determine whether or not having any influence of age in learners' reading comprehension and the implication of technology usage in their comprehension across ages; being the research questions the followings:

1. Is there any correlation between age and reading comprehension skills in learners?
2. Is it observed any gap in learner`s scores with groups in their twenties or less and thirties or more?

3. Is it observed any significant difference between aged groups when using technology to help in understanding reading comprehension?

METHODOLOGY

This study follows a quantitative approach, applying some tests to a specific sample of learners. The participants' ages were from 19 to 55, all of them were university A2 students from the language center, they belong to level four and this sample was selected randomly.

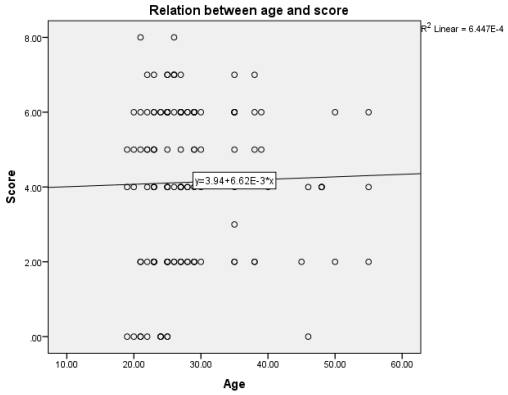
A total of 130 samples were obtained, and tests applied focuses on reading comprehension exercises with multiple choices, true and false, and answering questions through interpreting a text. All of the participants received the same type of instruction; it was in general English for a month according to the language center curriculum program. Also, the test results were scored out of 10. The raw data obtained throughout the tests provide information in terms of score and time required to fulfill each reading exercise. The data analysis requires the use of SPSS statistic program. Also, three types of analysis were conducted, such as Pearson correlation analysis, T-test, and Two-ways Analysis of Variance (ANOVA).

RESULTS

Correlation Between Age And Reading Comprehension Scores

This research question intends to study the relation between two variables: age of learners and tests scores on reading comprehension tests. In regards of the two variables, the data was analyzed with Person bivariate correlation analysis (see picture 1).

Graphic 1. *Correlation among test scores and age of students*



Source: test scores; CI: 95% Confidence Interval

The significance level sig.(2-tailed) is 0.774, it is higher than 0.05 implying that there is not a significant correlation between the variables age and scores. In addition, Pearson correlation (r) is 0,025; which is close to 0 indicating that the there is an insignificant correlation between age and scores, in other words, age does not execute any effect on test results in this group of study (see table 1).

Table 1. *Pearson correlation among test scores and age of students*

		Age of Students	Scores of test
Age of Students	Pearson Correlation	1	,025
	Sig. (2-tailed)		,774
	N	130	130
Scores of test	Pearson Correlation	,025	1
	Sig. (2-tailed)	,774	
	N	130	130

Source: test scores; CI: 95% Confidence Interval

Throughout a regression analysis carried out with the dependant variable (score) and independent variable (age) it was possible to determine the influence of age in the score of the reading tests scores, R Square is 0.001. It implies that in this group of study the age of students affects their tests results in 0.10%. This result supports the findings mentioned above where it demonstrated that age does not influence in this group of learners´ scores.

Table 2. *Regression analysis in test scores and age of students*

Model Summary

					Change Statistics		
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1
1	.025[a]	.001	-.007	2.10730	.001	.083	1

a. Dependent Variable: Score b. Predictors: (Constant), Age

Differences Between Learner`s Scores In Tests Across Aged Groups

This research questions aims to determine if there is a significant difference in the scores of two groups, group 1 learners, whom are equal or older than 30 years old; in contrast with group two which included learners equal or younger than 29.

The mean of scores for older group is 4,2121, while the means for younger group is 4,16.

The comparison of the means was done through One-sample Test (see table 3).

Table 3. *Comparison of test scores means for old and young groups of learners*

	Test Value = 4.2121					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Scores of test	-,236	99	,814	-,05210	-,4897	,3855

Source: test scores; CI: 95% Confidence Interval; one sample t test; mean older group: 4,2121

The p value is 0.814 which is higher than p: 0,05. It implies that there is not a significant difference in the results obtained for both groups of learners.

Also, a pair wise analysis comparing students ages and scores among the different participants, it demonstrated that the levels of significance for each age was higher than 0.05, implying that there is no a significant difference between the scores of learners with different ages. In table 4, the lowest levels of significance (sig) for each age are presented being 0.052 the lowest of this group.

Table 4. *Pair wise comparison between the lowest level of significance*

(I) Age of learners	(J) Age of learners	Sig.[c]
19	26	0.109
20	26	0.225
21	26	0.066
22	26	0.227

23	46	0.182
24	26	0.261
25	46	0.181
26	21	0.066
27	46	0.132
28	26	0.173
29	46	0.149
30	46	0.234
35	26	0.208
38	46	0.221
39	46	0.110
40	46	0.454
45	26	0.146
46	26	0.052
48	46	0.316
50	46	0.359
55	46	0.316

Dependent Variable: Score of reading tests. Based on estimated marginal means: a. An estimate of the modified population marginal mean (I). b. An estimate of the modified population marginal mean (J). c. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Difference Between Groups When Using Technology To Help In Understanding Reading Comprehension

This research question analyses the influence of age and technology exposure in learner`s reading comprehension scores. Therefore, Two-way ANOVA was applied to the data (see results in table 4). The results indicated that p-value for situation, which is technology exposure is 0,133; p value for age is 0,999; and p value of the incidence of both variable on tests is 0,804. All of them represent a (p) value higher than 0,05. It indicates that there is no

a significant relation, hence there is no effect of the magnitude of the interaction between age and technology exposure on result in reading comprehension tests.

Table 5. *Analysis of Variance on scores, age and technology exposure of learners*

Tests of Between-Subjects Effects

Dependent Variable: Scores of reading test exercise out of 10

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	129.534[a]	35	3.701	.785	.790	.221
Intercept	1298.383	1	1298.383	275.293	.000	.739
Situation	19.457	2	9.728	2.063	.133	.041
Age	25.206	20	1.260	.267	.999	.052
Situation * Age	39.966	13	3.074	.652	.804	.080
Error	457.488	97	4.716			
Total	2903.000	133				
Corrected Total	587.023	132				

a. R Squared = .221 (Adjusted R Squared = -.061) Source: test scores; CI: 95% Confidence Interval

DISCUSSION

Regarding the relation between age and reading comprehension, some studies have demonstrated a negative effect (Norman et al., 1992; Gough et al., 1996; Sabatini, 2002). However, the results of this research demonstrated an absence of correlation between age and scores of reading comprehension tests, (r) is 0,025. Besides, the difference between the means of the scores for adults group and the young group is not significant, (p) value is 0,814; which is higher than 0,05; in other words, the scores for both groups with different ranges of ages are equal statistically. Other studies have identified similar results; for instance, even when age tends to affect comprehension, adults use other strategies to achieve reading comprehension. Hence they can alleviate aging affectation and achieve a comparable level

of comprehension compared with younger learners (Greenberg, 2002; Davidson & Strucker, 2002).

Research question aimed to determine if the lack of technology, the use of normal technological tools *google translator* and then use of specialized technological instruments as rewordify combined with different ages of learners presents an incidence on reading comprehension scores. The data analysis demonstrated that the interaction of independent variables such as: age and technology do not present any incidence on learners reading comprehension scores, p-value is 0,804 higher than 0,05. Partially results in the use of rewordify were identified by Morales et al (2019). They found that rewordify is especially useful with certain types of reading exercise, for instance, true and false; however, it was not different from other resources for other types of reading exercise activities.

Hence, this study has demonstrated that there is no a difference between young and adults learners in terms of reading comprehension among different sceneries with or without technological tools; this assumption is correlated with Hannon & Daneman (2009), this study demonstrated that aging has a negative effect on some reading comprehension component as "text memory, text inference, knowledge integration, and knowledge access" (p. 18). However, this study also found that despite existing a decline in the component studies mentioned above with age, the power of these components in promoting reading comprehension have no differences among learners' ages, concluding that "*older learners use the same cognitive process to the same extent than younger adults when they comprehend a text, suggesting that comprehension might be the same for younger and older adults*." (Hannon & Daneman, 2009, p. 19)

CONCLUSIONS

It is well-known that starting learning a second language during early life stages implies gaining a higher level of proficiency in second language acquisition (Chomsky, 1967; Krashen, Long, & Scarcella, 1979). However, it does not imply that people who start learning a foreign language during adultness cannot achieve a similar level of proficiency (Cenoz, 2002, Lázaro, 2002, Greenberg, Ehri, & Perin, 2002; Davidson & Strucker, 2002; Hannon & Daneman, 2009). Following this premise, the results of this research lead to

conclude that age is not a determinant factor in the capability of learners to comprehend a reading passage. In other words, adults and younger learners in regular English classes perform similarly in different reading exercises activities. Additionally, it seems to indicate that even though certain levels of technology were to use, the results of both groups of learners are statistically similar.

The assumption for this research needs to be considered when designing a curriculum program in favor of higher levels of learner`s exposure to the second language and motivating adult learners to achieve proficiency, even though pronunciation would not be as perfect as native. To conclude, it is necessary to remark that since reading comprehension is a process that includes a group of variables, they need to be studied in depth. Jackson (2005) stated that a depth analysis of reading comprehension must include decoding accuracy, reading speed, and text comprehension.

Moreover, some studies indicated that the kind of instrument used to assess reading could generate an effect on study results (Fletcher, 2006; Francis, Fletcher, Catts, & Tomblin, 2005). Therefore, it is necessary to consider the variable to study carefully and the type of instrument to use for any similar study.

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