

# A longitudinal investigation of the impact of code-switching versus target language only on Saudi EFL students' written receptive vocabulary knowledge development in terms of breadth

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**ABSTRACT:** This longitudinal research was conducted to investigate the effect of code-switching versus target language only on Saudi students' written receptive vocabulary knowledge development in terms of breadth. A total of sixty male samples were randomly chosen from the population of Saudi EFL students at Jouf University in Saudi Arabia who enrolled in extensive English courses. This course is provided for those who scored less than the direct admission score of 2.5 out of 5 in the English replacement test. Samples were equally divided and allocated into two classrooms. In the first class (i.e., C1), thirty students were instructed by a non-native English speaker who employed code-switching as a pedagogical strategy. Students in the second class (i.e., C2) were instructed by non-native English speakers who employed the target language only as a pedagogical strategy due to the different language backgrounds between the instructor and participants. Data were collected from samples of both classes using the Vocabulary Size Test developed by Nation and Beglar (2007) at four different intervals and over four months (i.e., one academic semester). Results revealed that Saudi students' vocabulary knowledge in terms of breadth had developed significantly at four different intervals in both classes. However, the development in C2 where the instructor employed the target language only, was significantly higher than in C1 where code-switching is employed. Moreover, results also indicated that samples in C1 where code-switching is employed experienced a newly coined linguistic status called Receptive Vocabulary Recission (RVR) which indicates the act of avoiding the acquisition of new English vocabulary since they were habituated to be given an additional explanation for new vocabulary using their first language knowledge. This rescission was very tangible from the mean difference between C1 and C2 score averages.

**KEYWORDS:** breadth; code-switching; receptive vocabulary development; vocabulary size test; receptive vocabulary rescission

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## 1. Introduction

Code-switching is defined as a way of communication that captures a speaker's alternation between one language and another in a particular communicative context (Stylianou-Panayi, 2015). In a similar view, Rezvani and Rasekh (2011) defined code-switching as a situation in which a bilingual individual

alternates between two languages during his/her speaking engagement with another bilingual speaker. In the same vein, Ibrahim et al. (2013) defined code-switching as a phenomenal switch of languages from one language to another in the communicative phenomenon.

Given these definitions above, it is clear that speakers employ code-switching for various reasons and functions. From a societal perspective, Modupeola (2013) argued that speakers sometimes code-switch not because they lack vocabulary in the target language, but because they want to be involved in the conversation and express or expose their opinions and make it known to others. From a classroom perspective, Isaac (2011) argued that code-switching in classrooms is mainly practiced either to offer opportunities for students to understand the taught concepts well or to ensure a smooth continuity of classroom instruction.

Over the past few decades, there has been an increasing interest in the use of code-switching in the process of teaching and learning second or foreign languages, particularly English language. This interest has created a controversial topic to be tackled by several scholars and researchers. These controversial views mainly discussed issues on whether to use the target language exclusively or to use it alongside the first language in a second or foreign language classroom context.

Proponents of exclusive use of the target language in classroom context support their views with the belief that it familiarises students to build their own language system through communication practice, unlike code-switching interference, which disinterests students in listening to the target language (Adebola, 2011; Auerbach, 1993; Macaro, 2001; Macaro and Lee, 2013). In this regard, Cummins (2007) argued that not only does extensive exposure to the target language help students to achieve native-like command, but also leaves room for the target language to be the only students' main resource of exposure. Furthermore, Littlewood and Yu (2011) stated that the use of a monolingual approach in a classroom context provides authenticity in the process of teaching and learning and thus substantially facilitates students' familiarity with the target language.

On the other hand, Butzkamm (2003) and Stylianou-Panayi (2015) argued that the use of students' first language should be incorporated in the second or foreign language teaching and learning encounters because this integration essentially facilitates teachers' relation to grammar explanation and helps students to comprehend difficult concepts and thereby consolidating their target language competencies. In the same vein, Sakaria and Priyana (2018) argued that the use of code-switching in the process of teaching and learning contributes to the development of student competence in the target language.

Confronted with these conflicting views, this paper seeks to investigate the impact of code-switching versus target language only on Saudi EFL students' written receptive vocabulary knowledge development in terms of breadth.

## **2. Literature review**

### **2.1. Vocabulary knowledge**

Second language acquisition scholars proposed different definitions of knowing a word as they introduced different concepts of what learners' word knowledge comprises and of statistical counts of their vocabulary size (Dóczy and Kormos, 2015). In this vein, Nation (2001) stated that "Knowing a word is simply described as recognizing the form of a word. Yet, vocabulary knowledge might push beyond this basic notion" (p. 15). Scholars such as Cronbach (1942) created a framework in which he highlighted five components of vocabulary knowledge, i.e., generalization, application,

availability, breadth of meaning, and precision of meaning. However, this framework has been criticized by several scholars since it identifies word meaning without dropping shade on other aspects of word knowledge such as collocational and morphological properties (Qian, 2002).

In response to Cronbach's framework, Richards (1976) proposed more components to vocabulary knowledge such as association, morpho-syntactic properties, register, and frequency level. A few years later, Nation (1990) incorporated other components such as collocation and pronunciation to make it more comprehensive and he also recommended a clear distinction between receptive and productive which means that using a word (i.e., production) needs extended knowledge beyond understanding it (i.e., reception). Later, Nation (2001) took further research steps to improve his earlier classification by using a process model that involved three distinct types of vocabulary knowledge form, meaning, and use.

Based on Nation's (2001) analytic framework of vocabulary knowledge, a new idea emerged by Daller et al. (2007) of lexical space which describes learners' vocabulary knowledge as a three-dimensional space of breadth, depth, and fluency. The breadth of vocabulary knowledge which is the main theme of this research refers to the number of words that language learners know at a particular time (Nation, 2001). In a more precise definition, breadth of vocabulary knowledge is an estimation of how many words examinees have in their linguistic repertoire in a decontextualized manner (i.e., form-meaning link without association of a lexical unit) (Schmitt, 1999). Depth of vocabulary on the other hand refers to the quality of word knowledge (Nation, 2001). That is, examinees' awareness of vocabulary network which involves linear relations of words with other words in a sentence and with their class inclusions (Schoonen and Verhallen, 2008). This research longitudinally investigated the impact of code-switching versus target language only on Saudi EFL students' vocabulary knowledge development in terms of breadth dimension while the second and the third dimensions were not explored due to their immense researchable nature.

## **2.2. Code-switching**

In foreign language classroom context, code-switching has long been considered a controversial phenomenon in terms of employability in that some researchers argued that it hinders the development of teaching and learning process (e.g., Adder and Bagui, 2020; Eldridge, 1996; Guo, 2009; Ja'afar and Maarof, 2016; Krashen, 1985; Modupeola, 2013; Skiba, 1997). For instance, during the 1970s and 1980s, code-switching was prohibited as a fundamental necessity for helping students to build creative powerful informative skills in the target language (Krashen, 1985). Modupeola (2013) in her study found that most EFL instructors code-switch to compensate for their deficiency in the target language, so they tend to employ their first language to express and deliver their intended messages. Furthermore, Adder and Bagui (2020) provided an in-depth analysis of the relationship between English and Algerian Arabic in EFL classrooms in the Department of English at Tlemcen University. The findings of their study revealed that EFL instructors at Tlemcen University exhibit a negative attitude toward employing code-switching in the EFL context. However, they believe that it is inevitable when explaining difficult words and expressions that are hard to grasp in the target language.

Nonetheless, the above views do not go well with a large segment of scholars who found code-switching very helpful since it facilitates the learning and teaching process from linguistic and social perspectives (e.g., Abedi et al., 2019; Hashemifardnia et al., 2018; Namaziandost et al., 2019; Tian and Macaro, 2012). For instance, Tian and Macaro (2012) investigated the effect of teachers' code-switching on 80 Chinese students' vocabulary knowledge who enrolled in an EFL classroom at one of the universities in China. Those 80 students were stratified by proficiency test and randomly allocated to

code-switching context and their performance in vocabulary test was compared to a control group of 37 students who were only taught by using the target language (i.e., English). Results indicated that the experimental group had outperformed the control group in their performance test.

Expressing a similar view, Namaziandost et al. (2019) investigated the impact of code-switching on Iranian upper intermediate EFL learners' vocabulary learning by conventionally selecting 64 Iranians at a private English institute based on their Oxford Quick Placement Test (OQPT). These participants were divided into two groups of experimental groups (i.e., where treatment is applied) and control group (where conventional teaching is applied). Both groups were examined at two different intervals only (i.e., pre-test and post-test) to find out whether code-switching has any significant effect on Iranian upper-intermediate EFL learner's vocabulary learning. Results revealed that the experimental group outperformed the control group in the post-test in which students got better scores in their performance.

The significance of this current research is derived from several perspectives. First, from a methodological perspective, the above-mentioned studies were conducted within a short period of time although the fact that investigating vocabulary development involves addressing several highly complex issues from which the most important is that words are learned incrementally (Adolphs and Schmitt, 2003). Also, there are different levels of knowing a word and that meaning is only one element of the whole process (Martin and Ellis, 2012). This complex and incremental nature of vocabulary development can only be observed over a longer period of time (Dóczy and Kormos, 2015). Therefore, a call for a longitudinal investigation of the effect of code-switching on Saudi EFL learners' vocabulary knowledge development over one academic semester is indispensable to gain deeper insight into the actual process of vocabulary development (Wolter, 2006).

Second, by examining the Saudi context of education in terms of research output, there are several studies conducted to date on code-switching at different social, political, and educational levels (e.g., Abalhassan and Alshalawi, 2000; Al Alaslaa, 2018; Al-Jarf, 2011; Aljasir, 2020; Alsalami, 2021; Alshahrani, 2017; Al Tale and AlQahtani, 2022; Omar and Ilyas, 2018; Sabir and Safi, 2008). However, these studies explored merely the code-switching phenomenon among Saudis as the main core of investigation by dropping shade on the functions of code-switching in different contexts, the attitude of their users toward employing this phenomenon in different contexts, and the general differences between the profiles of their users. However, the effect of code-switching on Saudis' linguistic repertoire remains unexplored, particularly in the field of vocabulary knowledge development.

Third, from pedagogical perspectives and as far as the context of this research is of our concern (i.e., universities of Saudi Arabia), using a first language in a foreign language learning context is considered by many scholars unfavourable and can hinder the process of a second or foreign language acquisition (e.g., Akynova et al., 2014; Amorim, 2017; Bailey and Nunan, 1996; Sridhar, 1996). In this regard, Akynova et al. (2014, p. 224) stated that code-switching is a "haphazard mixture of two languages; therefore, students were not allowed to switch forth and back between the target language and the native language". Also, Amorim (2017) stated that code-switching is a "sign of laziness or mental sloppiness and inadequate command of the language".

On the other hand, scholars such as Tarone (1977, p. 179), disputed the aforementioned statements and recommended employing code-switching in teaching a foreign language since it has functioned as a communicative strategy such as "translation, appeal for assistance, mime, paraphrase, or avoidance". Moreover, Sert (2005, p. 3) suggested that "a bridge from known (native language) to unknown (new foreign language content) is constructed to transfer the new content and meaning is made clear in this

way.” Indeed, these conflicting arguments necessitate further research to find out whether employing code-switching in a foreign language context can be of help to improve Saudi EFL students’ vocabulary knowledge or not.

This longitudinal research was conducted to investigate whether employing code-switching as a pedagogical strategy helps Saudi EFL students develop their written receptive vocabulary knowledge in terms of breadth over time and to track the rate of development in terms of written receptive vocabulary knowledge over time in both classes.

### **3. Research objectives**

This research addressed the following objectives:

- To investigate whether employing code-switching as a pedagogical strategy helps Saudi EFL students develop their written receptive vocabulary knowledge in terms of breadth over time.
- To track the rate of development in terms of written receptive vocabulary knowledge over time in both classes.

### **4. Research context**

The Ministry of Higher Education in Saudi Arabia recently converted some theoretical colleges, humanities, literature, and university colleges into applied colleges to add one more classification to the four existing models of Saudi universities. These are comprehensive, pedagogical, research, specialized, and applied (Writer, 2022). Like other government universities in Saudi Arabia, Jouf University has launched recently six different programs labeled with the applied college to profile graduates who can meet labor market requirements. The curriculum of all these new majors of accounting, finance, graphic design, information technology, cyber security, marketing, and digital design, had been carefully designed by curricula specialists to meet the new economic leaps and social changes that Saudi Arabia experiencing nowadays. One of the main goals of applied college is to promote a new generation who can communicate efficiently in the English language through several communication channels writing, reading, speaking, and listening.

Prospective students of applied college are placed into the English Replacement Test (ERT) managed by the English department at Jouf University. Those who score above 2.5 out of 5 will be exempted from a course named an extensive English course, while others who score less than 2.5 are to be enrolled in the course. This course provides students with 15 h a week in their first semester with a total of 255 h during the whole semester. English Grammar in Use book, 5th edition by Raymond Murphy is utilized during the whole course which is taught by several native and non-native English instructors who are experts and skillful in the field.

This research was conducted in the first semester of the academic year 2022 (from 1 September 2022 to 1 January 2023). A total of 700 Saudi students out of 2760 male and female students scored less than 2.5 out of 5 and thus enrolled in the course at different campuses due to gender segregation at the university level. This research was conducted in two male classrooms where the first classroom (C1) is taught by non-native English speakers who employ code-switching as a pedagogical strategy while the second classroom (C2) is also taught by non-native English speakers who employ target language only due to different language background between the instructor and the students.

## 5. Research design

This research is longitudinal in design and quantitative in nature since longitudinal design offers the opportunity to observe changes in linguistic behaviour over time in great detail (Rasinger, 2014). Therefore, a panel design was employed for two reasons. The first reason addresses the nature of the research objectives that this research is trying to fulfill (i.e., track the rate of development in terms of written receptive vocabulary knowledge over time in both classes). The second reason addresses the samples of this research since the instrument employed in this research was applied to the same samples from both classes on four different occasions. That is, data was collected from the same samples ( $N = 30$  for C1, and  $N = 30$  for C2) over four different occasions in one academic semester to investigate whether employing code-switching as a pedagogical strategy helps Saudi EFL students in developing their written receptive vocabulary knowledge in term of breadth over time and to track the rate of development in terms of written receptive vocabulary knowledge over time in both classes.

## 6. Participants and sampling procedures

There is an inseparable link between research design and sampling procedures. That is, to design a valid and reliable study, the researcher must carefully consider the sampling procedures (Rasinger, 2014). Dörnyei (2007) highlighted that sampling procedures can be divided into two groups: the first addresses probability sampling which involves complex procedures that usually satisfy the demands of linguists, and the second group namely non-probability sampling which contains several strategies that try to suit ordinary researchers. This research belongs to the first group and probability sampling was applied particularly a stratified random sampling procedure. This procedure was employed to increase the reliability of the findings by ensuring that the samples of this research are a true reflection of its population and by eliminating any possible bias.

That is, a group or a stratum from the population of Saudi EFL students was chosen first and then a random selection was conducted within the chosen group or stratum. The participants of this research were all male Saudi EFL students due to gender segregation at the university level ( $N = 60$ ). All students were schooled in government schools in the northern part of Saudi Arabia, were between the ages of eighteen and twenty years old, and were placed into the English Replacement Test managed by the English department at the university and obtained less than 2.5 out of 5.

## 7. Instruments

Most of the instruments used to measure the size of vocabulary are based on the concept of word frequency. Nation's (1990) Vocabulary Level Test (VLT) is one of the most frequently used tests. The main purpose of this test is to measure learners' knowledge of words at 2.000, 3.000, 5.000, and 10.000 frequency levels. This test provides examinees with a list of six words and definitions for three of the words in the list. Examinees have to distinguish and match the word from the list with their corresponding definition (see **Figure 1**). However, this test doesn't deliver an exact measure of vocabulary size but describes examinees' ability to recognize the meaning of the words at various word levels (Schmitt et al., 2001).

Choose the right word to go with each meaning. Write the number of that word next to its meaning.			
1. original	<input type="checkbox"/> complete	1. apply	<input type="checkbox"/> choose by voting
2. private	<input type="checkbox"/> first	2. elect	<input type="checkbox"/> become like water
3. royal	<input type="checkbox"/> not public	3. jump	<input type="checkbox"/> make
4. slow		4. manufacture	
5. sorry		5. melt	
6. total		6. threaten	

**Figure 1.** Illustration of items in the Vocabulary Levels Test at the 2000-word frequency level (Nation, 1990).

Another widely employed test that exists in literature is the Vocabulary Size Test (VST) which was originated by Nation and Beglar (2007). In this test, examinees have to select the correct definition of the target word in a sentence from the four multiple-choice lists (see **Figure 2**). The test battery consists of 8 to 10 items for each of the 14 frequency levels identified. In a validation study conducted by Beglar (2010) on Japanese students learning English as L2, this test was found to have appropriate psychometrics and provide a precise measure of test-examinees' vocabulary size. Results, however, indicated that some very frequent words were unpredictably difficult; whereas some low-frequency words were easy for Japanese students. These results highlight other characteristics of words in addition to frequency such as L1 influence and correctness which should be taken into account when measuring vocabulary size.

<p>1. DEFICIT: The company had a large <b>deficit</b>.</p> <p>a. spent more money than it earned</p> <p>b. went down in value</p> <p>c. had a plan for spending that used a lot of money</p> <p>d. had a lot of money in the bank</p>
<p>2. WEEP: He <b>wept</b>.</p> <p>a. finished his course</p> <p>b. cried</p> <p>c. died</p> <p>d. worried</p>

**Figure 2.** Illustration of items of the Vocabulary Size Test at the 5000-word frequency level (Nation and Beglar, 2007).

Another well-known test is the Productive Vocabulary Level Test (PVLTL) which was proposed by Laufer and Nation (1999). This test requires examinees to produce targeted words in the context of a sentence by providing them with the initial letters of the targeted words (see **Figure 3**). This test compromises 1000-, 2000-, 3000-, 5000-, and 10,000-word frequency bands. Also, it includes an Academic World List and each band is represented by 18 to 14 items.

1. I'm glad we had this opp . . . to talk.
2. There are a doz . . . eggs in the basket.
3. Every working person must pay income t. . . .
4. The pirates buried the trea . . . on a desert island.
5. Her beauty and ch . . . had a powerful effect on men.

**Figure 3.** Illustration of items of the Productive Vocabulary Levels Test at the 2000-word frequency level (Laufer and Nation, 1999).

Another different technique to measure vocabulary breadth in literature is Meara's (1992) Yes-No Test (YNT). In this test, examinees are required to indicate whether they are familiar with the meaning of a list of sixty words in five frequency bands (5000–10,000). Some words are true lexical words while others are not real words although they agree with phonotactic regularities of the English language (see **Figure 4**). This test has been criticized by several scholars such as Mochida and Harrington (2006) who claimed that the test possibly overestimates the size of vocabulary although it has demonstrated acceptable reliability and validity statistics.

- For each word: if you know what it means, check the box beside the word, if you aren't sure, do not check the box.
1.  galpin
  2.  impulse
  3.  suggest
  4.  advance
  5.  peculiar
  6.  benevolate
  7.  indicate
  8.  needle
  9.  destruction
  10.  compose
  11.  ager
  12.  debt

**Figure 4.** Illustration of items of the Yes-No test at the 2000-word frequency level (Meara, 1992).

Dóczy and Kormos (2016) in their review, argued that particular issues should be addressed when employing these methods of measurement which the most important are that these methods assess learners' knowledge of vocabulary in a decontextualized manner and for each of the frequency bands in the test, only a small selection of items is included. Therefore, generalization is potential since measuring knowledge of a frequency band of 1000 words, for example, 10 or 20 items are examined only.

Therefore, to mark these issues in vocabulary size measurement procedures, alternative methods have been used which involve analysis of lexical characteristics of texts produced by L2 learners (Dóczy and Kormos, 2016). Traditionally, these methods include various calculations of the variety of words in learners' text and are based on type-token-ratio, e.g., Measure of Textual Density (MTLD) by McCarthy and Jarvis (2010). This calculation method is based on an assumption that the more vocabulary size L2 learners master, the greater lexical variety and lesser repetition of words they demonstrate in text. However, this assumption is disputed since different tasks demand different lexical varieties (Dóczy and Kormos, 2016). Moreover, the repetition of words in either written or spoken discourse can be used for stylistic and other communicative purposes (Meara and Acloy, 2010).

Another method used to measure vocabulary size is the Lexical Frequency Profile (LEP) by Nation and Heatley (1996). The main core of this method of calculation is to interpret what proportions of the words belong to particular frequency bands based on the General Service List (GSL) of West (1953). By employing this method, Meara (2005) found out that LEP analysis provides a good tool to differentiate between learners whose vocabulary size is markedly different but fails to detect smaller differences among learners. Following this research, Edwards and Collins (2011) concluded that the



proportion of words used at 1000-word frequency bands is not a reliable indicator of vocabulary size at higher levels of competence and the proportion of words used at 3000-word frequency bands might indicate more accurate estimation.

All the above-mentioned assessment methods of vocabulary size are conducted concerning word frequency data of L1 learners' corpus. This presumes that L2 learners are exposed to the same linguistic input as L1 learners and that the more frequent words are acquired before the less frequent ones. However, in one research conducted by Beglar (2010), results revealed that certain low-frequency words were timely to be mastered by L2 learners compared to the high-frequency ones. Moreover, Meara (1992) in her study found that L2 learners in their vocabulary development journey experienced different patterns and profiles of development. That is, as the frequencies of words decrease, L2 learners become less familiar with words in low-frequency bands. Meara's (1992) study revealed different profiles and patterns of development in which high-frequency words are well-known. Furthermore, Milton (2009) conducted several tests in a variety of contexts that support Meara's (1992) model and found the same results. However, it is worth noting that the participants of all of these studies were from a single cohort of students and therefore these researches were descriptive, i.e., describe a state of learners' knowledge rather than measuring a path of development.

Vocabulary Size Test as developed by Nation and Beglar (2007) was employed in this research. A 14.000 version containing 140 multiple-choice items with 10 items from each 1000-word family level. The words included in this test are based on 14.000 BNC word lists developed by Nation (2006). The core block of this test is based on the notion of the word family as the unit of organization. In this regard, Beglar (2010, p. 103) argued that "a word family is an appropriate unit of a receptive vocabulary measure because second language learners beyond a beginning proficiency level have some control of word building devices and can identify both formal and meaning-based relationships between regularly affixed members of a word family (e.g., produce, producing, producer)." Moreover, empirical evidence from other researchers validates the convention of word family as a unit of a receptive vocabulary measure from psychological aspects (i.e., Bertram et al., 2000; Ling et al., 2015).

Word family unit employed in the 14.000 BNC word family lists is set at level 6 of Bauer and Nation's (1993) scale of levels in which family members at this level meet the criteria of regularity, frequency, productivity, and predictability. Furthermore, the rationale of employing multiple choice format in the test is the fact that it allows a wide range of content to be sampled efficiently, allows examinees from different language background to participate in the test, control the level of difficulty of the items in the test, simplify the marking process and make it more efficient and reliable, and finally allows examinees to demonstrate their knowledge of each item in the test (Beglar, 2010).

The test was administered to two groups of Saudi EFL students in different classes (i.e., C1 and C2) at different dates and times with 21-day intervals (i.e., 20 September 2022; 11 October 2022; 1 November 2022; and 22 November 2022) to investigate whether employing code-switching phenomenon helps Saudi students developing their written receptive vocabulary knowledge in term of breadth over time and to track the rate of development of written receptive vocabulary knowledge in both classes. Consent was sought and obtained from all participants before initiating this research.

## **8. Data analysis methods and results**

The collected test results at different intervals from both classes (i.e., C1 and C2) were marked first and then coded using Statistical Package for the Social Sciences (SPSS) version 29. The following analysis

was conducted to fulfill the research objectives:

First, to find if there are statistical differences between intervals in both classes, a non-parametric test (i.e., Friedman’s two-way analysis) was conducted since the coded data meets the following criteria; data is continuous, data comes from a single group, measured on at least four different occasions, the sample was created with a random sampling method, blocks are mutually independent (i.e., all of the pairs are independent—one doesn’t affect the other), and finally observations are ranked within blocks with no ties.

As **Figure 5** below indicates, Friedman’s two-way analysis was conducted to measure the mean scores of Saudi EFL students in C1 ( $N = 30$ ) at four intervals. The corresponding  $p$ -value is ( $p = 0.000$ ) and less than 0.05, so the null hypothesis was rejected which means that statistical responses are not the same in all intervals. Similarly, the same test was conducted for C2 scores ( $N = 30$ ) as **Figure 6** below shows. The same statistical results were obtained from both classes (i.e., C1 and C2).

**Hypothesis Test Summary**

	Null Hypothesis	Test	Sig.	Decision
1	The distributions of 1st Interval 20-9-2022, 2nd Interval 11-10-2022, 3rd Interval 1-11-2022 and 4th Interval 22-11-2022 are the same.	Related-Samples Friedman's Two-Way Analysis of Variance by Ranks	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

**Figure 5.** Friedman’s two-way analysis test for C1.

**Hypothesis Test Summary**

	Null Hypothesis	Test	Sig.	Decision
1	The distributions of 1st Interval 20-9-2022, 2nd Interval 11-10-2022, 3rd Interval 1-11-2022 and 4th Interval 22-11-2022 are the same.	Related-Samples Friedman's Two-Way Analysis of Variance by Ranks	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

**Figure 6.** Friedman’s two-way analysis test for C2.

Second, to address the first objective of this research, i.e., to investigate whether employing code-switching as a pedagogical strategy helps Saudi EFL students in developing their written receptive vocabulary knowledge in terms of breadth over time, a descriptive statistics analysis was conducted for C1 scores at different intervals to recapitulate data frequency and measure central tendency (i.e., mean, median, and mode).

From the output shown in **Table 1**, Saudi EFL students’ vocabulary knowledge in terms of size in C1 where code-switching is implemented, had increased significantly as the mean score of the 4th interval ( $M = 6293.33$ ,  $SD = 916.490$ ) is significantly higher than the mean score of third interval ( $M = 4106.67$ ,  $SD = 806.411$ ). Moreover, the mean score of the 2nd interval ( $M = 2693.33$ ,  $SD = 631.328$ ) is higher than the mean score of the 1st interval ( $M = 2096.67$ ,  $SD = 504.110$ ). Furthermore, the minimum score obtained from all participants in the 4th interval ( $Min = 4700$ ) is significantly higher than the minimum score obtained in the 1st interval ( $Min = 1200$ ) and the maximum score obtained in the 4th interval ( $Max = 8100$ ) is significantly higher than the maximum score obtained in 1st interval ( $Max = 3000$ ).

**Table 1.** Vocabulary knowledge development in terms of size for C1.

		1st interval, 20 September 2022	2nd interval, 11 October 2022	3rd interval, 1 November 2022	4th interval, 22 November 2022
N	Valid	30	30	30	30
	Missing	0	0	0	0
Mean		2096.67	2693.33	4106.67	6293.33
Std. error of mean		92.037	115.264	147.230	167.327
Median		2000.00	2550.00	4200.00	6400.00
Mode		2000	2000 <sup>a</sup>	3200 <sup>a</sup>	6500
Std. deviation		504.110	631.328	806.411	916.490
Variance		254,126.437	398,574.713	650,298.851	839,954.023
Skewness		-0.067	0.512	-0.296	0.136
Std. error of skewness		0.427	0.427	0.427	0.427
Kurtosis		-0.924	-0.730	0.233	-0.600
Std. error of kurtosis		0.833	0.833	0.833	0.833
Range		1800	2300	3700	3400
Minimum		1200	1700	2000	4700
Maximum		3000	4000	5700	8100
Sum		62,900	80,800	123,200	188,800

<sup>a</sup>. Multiple modes exist. The smallest value is shown.

The results above indicated that employing code-switching as a pedagogical strategy in C1 significantly helps Saudi students improve their written receptive vocabulary knowledge in terms of size over time. That is, Saudi students' mean scores had increased from (M = 2096.67) at the 1st interval dated 20 September 2022 to (M = 6293.33) at the 4th interval dated 22 November 2022.

Third, descriptive statistics analysis was conducted for C2 scores at different intervals to summarize data frequency and measure central tendency (i.e., mean, median, and mode).

From the output shown in **Table 2**, Saudi EFL students' vocabulary knowledge in terms of size in C2 where the direct method is instigated, had increased significantly as the mean score of the 4th interval (M = 6160.00, SD = 869.641) which is significantly higher than the mean score of third interval (M = 4853.33, SD = 616.292), the mean score of the 2nd interval (M = 3806.67, SD = 819.139) and the mean score of the 1st interval (M = 3273.33, SD = 1103.266). Furthermore, the minimum score obtained from all participants in the 4th interval (Min = 4200) is significantly higher than the minimum score obtained in the 1st interval of (Min = 900) and the maximum score obtained in the 4th interval (Max = 8300) is significantly higher than the maximum score obtained in 1st interval (Max = 5800).

**Table 2.** Vocabulary knowledge development in terms of size for C2.

		1st interval, 20 September 2022	2nd interval, 11 October 2022	3rd interval, 1 November 2022	4th interval, 22 November 2022
N	Valid	30	30	30	30
	Missing	0	0	0	0
Mean		3273.33	3806.67	4853.33	6160.00
Std. error of mean		201.428	149.554	112.519	158.774
Median		3150.00	3700.00	4700.00	6100.00
Mode		2800 <sup>a</sup>	3500 <sup>a</sup>	4200	5800 <sup>a</sup>
Std. deviation		1103.266	819.139	616.292	869.641
Variance		1,217,195.402	670,988.506	379,816.092	756,275.862
Skewness		-0.002	0.170	0.402	-0.005
Std. error of skewness		0.427	0.427	0.427	0.427
Kurtosis		0.002	-0.485	-0.884	0.353
Std. error of kurtosis		0.833	0.833	0.833	0.833
Range		4900	3200	2300	4100
Minimum		900	2200	3800	4200
Maximum		5800	5400	6100	8300
Sum		98,200	114,200	145,600	184,800

<sup>a</sup>. Multiple modes exist. The smallest value is shown.

Fourth, to address the second research objective, i.e., to track the rate of development in terms of written receptive vocabulary knowledge over time in both classes, a *T*-Test was conducted. However, before conducting this test, a test of normality by using Kolmogorov-Smirnova or Shapiro-Wilk was conducted to ensure the reliability of the aforementioned test and that the variables of the study are normally distributed.

As analysis in **Table 3** below shows, the test statistics of C1 = 0.968 and the *p*-value = 0.496 is more than 0.05 which means that there are normal distributions of study variables. For C2, results also show that test statistics of C2 = 0.983 and the *p*-value = 0.907 which is more than 0.05. These results provide sufficient evidence to highlight those variable points are normally distributed.

**Table 3.** Tests of normality.

Codes	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Average C1	0.102	30	0.200*	0.968	30	0.496
C2	0.098	30	0.200*	0.983	30	0.907

\*. This is a lower bound of the true significance.

<sup>a</sup>. Lilliefors significance correction.

As group statistics in **Table 4** below show, the mean score of C2 in all intervals where target language only is implemented (M = 4523.33) was higher than the mean scores of all intervals in C1 where code-switching is implemented (M = 3797.50). Moreover, as **Table 5** below shows, the mean difference between the two classes (MD = -725.8333) and the significant value of the *T*-Test (Sig. = 0.000) which is lower than 0.05 which means that there is a statistical difference between the scores of C1 and C2.

**Table 4.** Group statistics.

Codes	N	Mean	Std. deviation	Std. error mean
Average C1	30	3797.50	570.403	104.141
C2	30	4523.33	703.346	128.413

**Table 5.** Independent samples test.

	Levene's test for equality of variances	T-test for equality of means								
		F	Sig.	<i>t</i>	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% confidence interval of the difference	
									Lower	Upper
Average	Equal variances assumed	0.373	0.544	-4.390	58	0.000	-725.833	165.334	-1056.784	-394.882
	Equal variances not assumed			-4.390	55.628	0.000	-725.833	165.334	-1057.085	-394.582

## 9. Discussion and conclusion

The results of this research indicate that Saudi EFL students' written receptive vocabulary knowledge had developed significantly over one academic semester in both classes. However, the rate of

development in C2 where the English language is the main and the only mean of instruction is significantly higher than the rate of development in C1 where code-switching is used. These results go along with a large segment of scholars in the sense that the exclusiveness of English use only in English classroom context warrants achievement in the acquisition of the language (Adebola, 2011; Auerbach, 1993; Cummins, 2007; Macaro, 2001; Macaro and Lee, 2013).

Furthermore, these research results are not consistent with existing literature (e.g., Namaziandost et al., 2019; Tian and Macaro, 2012). For example, Namaziandost et al. (2019), in a recent study, experimentally explored the effect of code-switching on 65 Iranian EFL students' vocabulary development in terms of size. Selected students were placed into two groups in which the first group (i.e., experimental group) received the treatment and the second group (i.e., control group) where the direct method in teaching and learning vocabulary was employed. The results of their study indicated that the experimental group outperformed the control group in their vocabulary size test once they were post-tested. Moreover, Tian and Macaro (2012) investigated the effect of teachers' usage of code-switching on 80 Chinese students' vocabulary knowledge who enrolled in an EFL classroom at one of the universities in China. Those 80 students were stratified by proficiency test and randomly allocated to code-switching context and their performance in vocabulary test was compared to a control group of 37 students who were only taught by using the target language (i.e., English). Results indicated that the experimental group had outperformed the control group in their performance test.

It should be noted that the core aspect of this current research is neither to support nor to decline the aforementioned studies but rather to report the non-parallel development of Saudi EFL learners' vocabulary size in both classes in terms of the pedagogy employed. Saudi EFL students in both classes experienced a significant development in their vocabulary in terms of size over time. However, those students in C2 who were taught the target language only scored more in their VST over one academic semester. This adds to the existing literature, new longitudinal research where comparison had been made quantitatively between two pedagogical preferences in the EFL context at the global level in general and at the local level in particular, i.e., at one of the universities in Saudi Arabia.

Also, results indicated that samples in C1 where code-switching is employed experienced a newly coined linguistic status called Receptive Vocabulary Recission (RVR) which indicates the act of avoiding the acquisition of new English vocabulary since they were habituated to be given an additional explanation for new vocabulary using their first language knowledge. This rescission was very tangible from the mean difference (MD = -725.833) between the C1 and C2 score averages (see **Table 5** above).

### **Research limitation**

This research is longitudinal and thus data has been collected from the same participants over one academic semester (i.e., four intervals). This allows researchers to track the development of Saudi EFL students' vocabulary knowledge in terms of breadth in both classes and finally compare their average scores. This time perspective (i.e., four months) can be one of the potential limitations in this research since several scholars argued that to enhance the trustworthiness and credibility levels of longitudinal research, a minimum of one-year time perspective should be considered when collecting data (Davis, 1995; Gao et al., 2001; Riazi, 2016). Another potential limitation in this research can be related to the representativeness or generalizability aspect since this research considered only male samples due to gender segregation at the higher education level in KSA. Therefore, results cannot be generalized to the linguistic domain where data was compiled from (i.e., Jouf University).

## **10. Implication for pedagogy**

As mentioned earlier in this research, code-switching employability preference in the EFL classroom context has long been considered a controversial subject. For instance, at the Saudi higher education level, Alshahrani (2017) qualitatively investigated the reasons and functions of code-switching performed by two non-native English instructors at King Khalid University. Results of his research indicated that the main functions behind employing code-switching were to switch topics, affective function, giving instructions, and explaining new vocabulary. Results also indicated that the highest frequency measurement was related to explaining new vocabulary functions. Alshahrani (2017) concluded his research by providing a pedagogical recommendation that EFL instructors should achieve a balance between using the target language and the first language in their classrooms. On the same page of arguments, Al Tale and AlQahtani (2022) explore the impact of code-switching versus target language only on EFL students. Results of their study indicated that most participants believe that employing code-switching in an EFL context is a valuable and effective tool that helps them learn difficult concepts and new vocabulary.

The results of this research indicate a major pedagogical concern of employing code-switching as a pedagogical strategy in the EFL classroom context at the higher education level in Saudi Arabia. As results indicated, Saudi EFL students in C2 where English was the main and the only medium of instruction performed more resourcefully than those students in C1 where code-switching was allowed. These results demand policymakers and curriculum developers at Jouf University to encourage EFL instructors and to restrict employing code-switching in the EFL context. Applying these new educational constraints will provide Saudi EFL students with a real chance to be immersed in the EFL context and withdraw their minimum chances to find an escape window to express their thoughts in their first language since the main objective of these courses is to enrich Saudi EFL students' proficiency level and prepare them to meet the needs of the labor market.

## **11. Direction for future research**

Based on the results of this research, several future research directions have emerged. For instance, future researchers can sail into answering questions such as how patterns of learning L2 vocabulary can be best described. In this regard, some scholars assumed that it is a nonlinear process and that L2 learners' vocabulary does not grow ramblingly with exposure and the development of proficiency (Larsen-Freeman, 1997). Another potential research direction can be related to the depth of vocabulary knowledge which is referred to as the quality of word knowledge (Nation, 2001). That is, examinees' awareness of vocabulary network which involves linear relations of words with other words in a sentence and with their class inclusions (Schoonen and Verhallen, 2008).

## **Author contributions**

Conceptualization, AIA and TFA; methodology, AIA and TFA; software, AIA and TFA; validation, AIA and TFA; formal analysis, AIA and TFA; investigation, AIA and TFA; resources, AIA and TFA; data curation, AIA and TFA; writing—original draft preparation, AIA and TFA; writing—review and editing, AIA and TFA; visualization, AIA and TFA; supervision, AIA and TFA; project administration, AIA and TFA; funding acquisition, AIA and TFA. All authors have read and agreed to the published version of the manuscript.

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## Conflict of interest

The authors declare no conflict of interest.

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