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On the Influence of Using Student Centered-Based vs. Text-Based Approach on Learning English Vocabulary of ESP Students of Aviation

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Abstract

The current study examined the effect of implementing student-centered versus text-based approaches on the learning vocabulary of Iranian ESP university students of aviation. To meet the objective of the study, a cohort of 40 male ESP university students of aviation, signified as homogenous pre-intermediate learners chosen through the Oxford Placement Test (OPT), were selected from a pool of 60 EFL learners at the University of Shahid Sattari in Tehran, Iran. The participants were divided randomly into two groups: experimental group A (student-centered approach) and experimental group B (text-based approach), each comprising 20 students. The researchers conducted six sessions lasting 60 minutes each, during which English aviation vocabulary items were taught to the students given their respective approaches. The results of Analysis of Covariance, $F(1, 37) = 9.50$, $p = 0.004$, showed that the student-centered approach yielded a more pronounced effect on the learners' aviation vocabulary acquisition than the text-based approach. These findings are discussed concerning the previous research. The study concludes with pedagogical implications for EFL teachers, material developers, course designers, and language assessors.

Keywords: aviation students, aviation vocabulary, student-centered approach, text-based approach

1. Introduction

In aviation, communication is crucial for ensuring timely flight operations (Torquato, 2004, as cited in Mahmood et al., 2023). It assesses the aircraft maintenance field that needs useful English communication to make sure no accidents happen (White, 2018). Misunderstandings or miscommunication during communication can lead to fatal consequences. Numerous tasks in aviation maintenance engage important reliance on the English language, necessitating maintenance personnel to possess fluency in English to execute tasks accurately and efficiently (Shukri et al., 2021). Thus, it is

necessary to expand and refine the communication skills of aviation personnel from the beginning of their undergraduate education.

As indicated by Dalkilic (2017, as cited in Shukri et al., 2021), approximately 10% of aircraft incidents were attributed to maintenance issues on average between 2009 and 2013. Despite the relatively small proportion of commercial aviation incidents attributed to maintenance issues, the outcomes of such accidents are frequently catastrophic (Cacciabue et al., 2003). This highlights the paramount importance of maintenance operations for sustaining the safety and financial viability of aircraft. The correlation between human factors and human error is significant. Maintenance errors can arise from a multitude of factors, including communication breakdowns and misinterpretations (Padil et al., 2018; Shukri et al., 2021).

Until recently vocabulary has been extensively overlooked in the ESL/EFL classroom. Maiguashca (1993) showed that "teaching or studying grammar is established upon a number set of rules with a coherent structure which students follow or remember, but the same is not true of vocabulary" (p. 91).

According to Richards and Renandya (2002), "Vocabulary is a core component of language proficiency and provides much of the basis for how well learners speak, listen, read, and write" (p. 255). Similarly, Nation (1990) maintained that vocabulary knowledge is either receptive or productive. Possessing the ability to spot vocabularies while listening or reading is receptive and having capability to create words when speaking or writing is productive. Accompanying the incremental favor in vocabulary constructing, several different methods and techniques developed; still, finding an operational method for the teaching of vocabulary in both EFL and ESL contexts is still a dilemma for teachers and for curriculum developers as well. Therefore, pursuing this aim, this study attempts to investigate the most effective approach to teaching vocabulary through exploring the effect of applying of student-centered vs. text-based approach on the teaching of aviation English vocabulary to the Iranian EFL university students of aviation.

The text-based approach to teach vocabulary entails acquiring target words through reading texts, like obtaining words' meaning and their typical language background from texts. Thornbury (2005) noted that language always occurs as text and not as isolated words and sentences. Texts enclose valuable lexical evidence like word meaning, word family, lexical chains, and word association. Johns and Davies (1983, p. 1) declared that "when using texts in learning and teaching vocabulary, a text can be described as a linguistic object, a vehicle for information and a stimulus for production".

However, students in the student-centered approach accept the responsibility to often cultivate concepts, thoughts, and opinions on their own as they strike to tackle the tasks they manage. Moreover, students have to learn to participate in a reciprocal idea generation, listen to one another, and direct questions to the teachers where they cannot handle the task. While they also take responsibility in the teacher-centered approach, students do not see it as their responsibility to develop any concepts or ideas unless asked by the teacher. It is teacher's responsibility to choose the thoughts and choose what topics to teach the students (Wolfgang, 2001).

Aviation English Standard Phraseology is not a conversational style, but a distinct register of English: a codified, abbreviated, jargon-filled register using numbers paired with descriptors to convey crucial information succinctly. As a form of radiotelephony, Aviation English Standard Phraseology is designed to be decipherable without face-to-face contact, in a time-critical environment that includes

radio static and multiple speakers sharing a single radio frequency (International Civil Aviation Organization, 2004; Philps, 1991; Melnichenko & Melnichenko, 2008).

One of their required skills for the students of Shadi Sattari University is to acquire a good command of English to be able to speak English fluently and accurately. In fact, they must reach and maintain International Civil Aviation Organization (ICAO) Level 4, a speaking test, and the students need to know and use lots of words in aviation. If the officers (graduated students) know English satisfactorily, they will be able to communicate in English in order to learn new technical knowledge and have successful communication pertinent to their profession. For example, both fighting and UAV pilots need to speak English so that they can communicate with the air traffic controller on board and abroad using common aviation terms. In the case of communication failure, serious collisions and other disasters may occur. That's why knowing aviation words and terms is critical for these students.

2. Literature Review

2.1. Theoretical Concepts

Building vocabulary is extremely important for success in undergraduate or graduate studies. Nation and Waring (1997) reported that "5-year-old native English speakers beginning school will have a vocabulary of around 4,000 to 5,000-word families, adding roughly 1,000-word families a year until graduating from university with a vocabulary of around 20,000-word families" (p. 7).

Learning vocabulary is an incremental procedure that is time-consuming and requires lots of practice. Nakata (2006) acknowledged that "vocabulary acquisition requires continual repetition in order for effective vocabulary learning" (p. 19). Vocabulary acquisition does not address an issue that indicates that a student can spend time learning or remembering, like grammar, and be successful. Acquisition requires the learner to be well-organized, squandering time per day working on words they are not acquainted with in order for learners to reminisce frequently utilized words and deliver them to their long-term memory. Nation and Waring stated that "learners need to encounter the word multiple times in authentic speaking, reading, and writing context at the student's appropriate level" (p. 8).

Devising lessons that let the student meet novel words numerous times, providing them with opportunities to employ new lexical items into his/her long-term memory, is likely to require a great deal of time. Providing word lists from the context of the lesson can diminish the work burden, empowering the student to come across the word repeatedly via reading, listening, and speaking.

Vocabulary, like other facets of language learning, can be expedited when run via cooperative learning. Yongqi Gu (2003) stated, "Vocabulary acquisition is a very learner-centered activity with the effectiveness of the learner's strategies depending on his/her attitude and motivation towards new vocabulary acquisition" (p. 2). This is true because the foremost motivational learning element must originate from the student. Still, learning vocabulary in an interactive learning environment makes room for students to learn from peers closest to them. Murphey and Arao (2001) pinpointed that "students felt more relaxed and learned more from peers since they saw that making mistakes is acceptable, having goals is good, and learning English can be fun" (p. 2).

2.2. Aviation Vocabulary

Undoubtedly, having reliable and obvious communication between the pilot and the air traffic controller is regarded as the most important element of safe air traffic navigation (Tokar & Fainman,

2018). Given the significant role of communication between the pilot and the air traffic controller, Bieswanger (2016) noted that for several decades, communication has been considered as one of the main duties of pilots. In fact, there were three orders that pilot and flight crew must take into account and they included controlling the aircraft, making sure that aircrafts move in its own direction and communicating the intentions between the flight crews and getting instruction from the air traffic controller. However, communication is placed as the third factor; it does not mean that it is not important.

It is important to expand English proficiency of the flight crews and in fact, the English literacy of pilots and air-traffic controllers is very important for air transportation safety. One of the first steps for being proficient in English is to learn its vocabulary and in the field aviation, it refers to technical vocabulary related to aviation. Aviation experts proved that there is need to lexical proficiency in accuracy as well as speed and range of lexical skills that may cause interaction breakdown (Tokar & Fainman, 2018). In this respect, Wang (2002) stated that vocabulary is one of the main obstacles in the process of reading comprehension and also a great barrier in listening comprehension and speaking skill. It is so difficult to have a successful communication without knowing enough vocabulary. Besides, in Aviation field, it is also very crucial to accurate. Therefore, what is needed in Aviation English Course is acquiring lexical competence and thorough vocabulary teaching.

For a long time, it was common for teaching aviation vocabularies teachers used a list of technical vocabulary of this field and the learners have to read and translate the given information. Todays, more advances have been emerged in educational systems and in teaching in ESP field such as Aviation. There is need to move learners to become autonomous and expand lexical proficiency as a complicated and important skill. Besides, teaching vocabulary to Aviation students like other ESP students have to revise. However, there have been some studies (e.g., Wang, 2011; Secer & Sahin, 2014) on signifying proper techniques and methods of Aviation, yet there is no consensus among scholars and there is a need to more academic studies in respect to vocabulary and the methods of teaching of vocabulary to Aviation students.

Generally, Aviation English Course that is taught at universities and colleges can be considered as English for Specific Purposes (ESP). In this respect, Strevens (1988) noted that ESP is designed in order to satisfy the needs of the learners. Mostly, the language that is taught to ESP students is totally related to the content of the course. Besides, these activities need the language and it is the center of the course. The aim of ESP is to cover the needs of the students in their field.

2.3. Basic Ideas for the Aviation Vocabulary Teaching Method

The critical analysis in respect to vocabulary teaching presented a ground to signify fundamental conceptual ideas that shaped the framework for method of teaching vocabulary in Aviation English course. Generally, we cannot only rely on the implicit incidental learning in the process of aviation vocabulary learning. However, sometimes there is need to explicit vocabulary teaching for elaborated systematically and effectively set workflow of steps. A word is regarded as a complicated item that consists of meaning, collocation, form, and discourse patterns. At the time of providing new lexical items, conveying the meaning is not everything. Collocation and word form need deliberate attention and work (Tokar & Fainman, 2018).

In aviation vocabulary teaching, recycling vocabulary and practice are very important and essential to stick in the mid the lexical for a long term, and to stimulate learners to retrieve words from

their memory and employ them for other language skills. Besides, by having a systematic and linear character, the method of teaching vocabulary does not exclude proper dynamic modifications in each stage. Generally, a teaching method is not regarded as a technological algorithm that must surely lead to a certain predetermined outcome. Even sometimes a well-planned teaching program cannot guarantee every learner to acquire the vocabulary taught, since there are many factors that may influence on the process learning vocabulary (Tokar & Fainman, 2018).

3. Research Questions

This study aimed to determine whether the learners who take courses based on the student-centered approach model will score significantly higher than those who take courses based on the text-based model. Specifically, the following research question was raised by the researchers:

RQ. Is there any statistically significant difference between the effects of applying student-centered and text-based approaches on ESP learners' aviation vocabulary learning?

4. Method

4.1. Research Design

This quasi-experimental study was used an empirical study utilized to estimate the causal influence of two interventions on its target population. This study is concerned with two variables: Technical English aviation vocabulary instruction with two layers (i.e., student-centered and text-based) as the independent variable i.e., vocabulary teaching approach, and ESP learners' aviation vocabulary learning as the dependent variables. There two experimental groups: Group A and B. They received different instructional treatments (Hatch & Farhady 1982; p. 20). Experimental group A was taught English aviation vocabulary using student-centered approach while experimental group B received English aviation vocabulary instruction through text-based approach. After experiencing the treatments, both groups took a post-test of aviation vocabulary.

4.2. Participants

The researchers selected 60 aviation students as the target participants of this study. After administering OPT and homogenizing the participants, 40 ESP aviation students were selected as the research sample. All of the participants were male and their ages ranged from 20 to 25 years old. At the time of conducting this study, they were studying aviation at the University of Shahid Sattari in Tehran, Iran. The researchers divided the participant randomly into two groups each with 20 students. Their mother language was Persian, and they had never experienced living in a foreign country.

4.3. Instrumentations and Materials

To meet the purpose of the present study, the following instruments were used: (a) OPT, a valid general proficiency test to evaluate the participants level of language proficiency, (b) English aviation vocabulary pretest, and (c) English aviation vocabulary posttest.

4.3.1. Oxford Placement Test (OPT)

The OPT consists of 60 multiple-choice items, which determine a student's general language ability and can place learners at the appropriate level for a language course. This test is different from most other placement tests. The students of this study were pre-intermediate, whose OPT scores ranged

between 30 and 39. The reliability index for OPT was reported to be .88 using Cronbach's Alpha. Besides the face and content validity of the OPT, it was accredited by three experienced EFL teachers.

4.3.2. English Aviation Vocabulary Pretest

In order to ensure the novelty of the target words, a pretest of the new words (see Appendix) was administered at the beginning of the study to see whether these words were unfamiliar to the participants. It included 20-lexical items and were chosen from the 'English for aviation for pilots and air traffic controllers' (Ellis & Gerighty, 2008). The test follows the multiple-choice format. Based on the participants' answers, the known words excluded from the list in the pilot study and the unknown words to the participants are considered as the material for the treatment. The first recognition test was administered to both groups prior to any attempts to learn the English aviation vocabulary either by student-centered or text-based classroom approach. The reliability index of the English aviation vocabulary pretest was assessed to be .81 using KR-21 in the pilot study.

4.3.3. English Aviation Vocabulary Posttest

To assess the participants for their knowledge of English aviation vocabulary regarding the instructed lexical items, a posttest including 20 vocabulary items including all the target words chosen from the taught textbook 'English for aviation for pilots and air traffic controllers' (Ellis & Gerighty, 2008) which are found unknown in the pilot study. In order to prevent the effect of possible memory effect during the treatment were administered to participants after the treatment. Posttest was again in multiple choice format. The stems of the items of posttest were decided to be the same as those in the pretest but with some variations and changes in the choices to reduce the probability of the test effect. Three experienced ESP experts approved the face validity of the English aviation vocabulary posttest in terms of a good layout, font type, and margin. And the KR-21 reliability value of the vocabulary posttest was measured in the pilot stage and turned out to be .83.

4.3.4. Material

The textbook used to teach English aviation vocabulary to the study participants was 'English for Aviation for Pilots and Air Traffic Controllers' by Ellis and Gerighty (2008). The book is for aviation students who already have a reasonable command of the basic structures of English and who now wish to learn and expand their English aviation vocabulary. It can be used both in the classroom and at home. It gives valuable assistance to students preparing for English for aviation International Civil Aviation Organization (ICAO) examinations. New lexical items are introduced through techniques that include gap-filling, matching, word-formation, and word-building exercises.

4.4. Procedure

For the aim of this study, the researchers selected 40 Aviation students. The participants were randomly divided into two experimental groups, each with 20 students. The homogeneity of the English proficiency level of the two groups was checked using OPT. In addition, a pilot study was done with 25 pre-intermediate EFL learners who shared similar features with the main participants of the study.

Prior to the study itself, and in order to ensure that selected words are unknown to the participants, a pretest containing 20 English aviation vocabulary items was given to the students of the two groups before the instruction. Vocabulary test was designed based on the students' both known and unknown English aviation vocabulary; the known or familiar vocabulary item list consists of the vocabularies taught in the class based on their course book; the unknown words or unfamiliar items

consisted of the new vocabularies of the upcoming lesson. It is important to mention that the test had multiple choice format and the students were required to circle their answers on the answer sheet.

Then, the instructional treatments were applied. The researchers taught English aviation vocabulary items to the students in Experimental Group A using student-centered approach in 6 sessions. Each session lasted 60 minutes and the classes were held twice a week. The textbook was not used, and the teacher introduced the topic of the lesson and encouraged the students to generate the related words in their contexts. The teacher helped the students generate new ideas and therefore new words so that more vocabulary items were created. In fact, the students collaborated in groups or pairs with respect to the requests and aims of the tasks. In addition, in Group A, the class situation was held primarily in groups and negotiations and the teacher was bound to be comfortable with the fact that the students were highly probable to make mistakes that he/she might not hear and correct (Jeanne, 2009). In terms of evaluation, assessment plays the role of spotting and encouraging learning among the students and the desired learning was directly assessed through portfolios, presentations, papers, and projects (Good & Brophy, 2003).

However, the participants in the Experimental Group B received English aviation vocabulary instruction through text-based approach. The number of sessions was the same as the Group A (6 sessions, each session of 60 minutes). In fact, texts were chosen as the framework for teaching, and learners in different contexts had to master the use of the text types occurring most frequently in specific contexts. They were guided to learn the target words through reading texts, such as obtaining words' meaning and their typical language background from texts Thornbury (2005). The assessment was in the conventional paper-based written format with no immediate related feedback based on the tests.

In the last phase of the study, a posttest of English aviation vocabulary was administered to two groups of the study in order to compare the effects of these two approaches to teach vocabulary. The posttest was in similar format as the pretest which consisted of 20 multiple choice items. The items were the same as the pretest with some changes and rewords in the stems and choices of the items in order not to be remembered by the participants. After collecting the data, the obtained scores were submitted to statistical software SPSS Version 24 to answer the research questions of the study.

4.5. Statistical Analysis

Paired samples t-test was adopted to compare the student-centered and text-based groups' improvement of aviation vocabulary from pretest to posttest per se.

Additionally, one-way analysis of covariance (1-way ANCOVA) was adopted answer the research question of the study as there were two independent groups with one set of aviation vocabulary learning scores as the depended variables i.e., pretest and posttest scores. The scores on the pretest were considered as the covariates.

5. Results

Paired samples t-test was applied to the pretest and posttest scores in the text-based group. The first assumption for using parametric statistical method is not violated as the present data are measured on an interval scale. According to Bachman (2005, p. 236), the assumption of independence of subjects is met when "the performance of any given individual is independent of the performance of other individuals" as this was true in this study. The third assumption is the normality of the data which was

checked using the ratios of skewness and kurtosis. Table 1 contains the results of normality test for aviation vocabulary scores. As it can be seen in Table 1, all sets of aviation vocabulary scores in the student-centered group obtained on both pretest and posttest phases have normal distribution since the ratios of skewness and kurtosis over their respective standard errors are not beyond the ranges of +/- 1.96. Thus, the present researchers were justified enough to use a paired samples t-test that is parametric instead of the Wilcoxon signed rank test.

Table 1

Skewness and Kurtosis Test of Normality for Aviation Vocabulary Scores in the Student-Centered Group (Pretest & Posttest)

Test time	N	Skewness	Std. Error	Skewness Ratio	Kurtosis	Std. Error	Kurtosis Ratio
Posttest	20	-0.049	0.512	-0.095	-0.629	0.992	0-.634
Pretest	20	0.101	0.512	0.197	-0.958	0.992	-0.965

Table 2 below represents the results of descriptive statistics for the aviation vocabulary scores in the student-centered group. Table 2 shows that the mean score of aviation vocabulary gained on the posttest (M = 15.85, SD = 1.95) is greater than the pretest (M = 11.30, SD = 3.08) in the student-centered group.

Table 2

Descriptive Statistics for Pretest and Posttest of Aviation Vocabulary Scores (Student-Centered Group)

Test	N	M	SD	SEM
Posttest	20	15.85	1.95	0.437
Pretest	20	11.30	3.08	0.465

Table 3 indicates that the paired samples t-test found a statistically significant increase, $t(19) = 15.00$, $p < 0.05$, in aviation vocabulary scores from the pretest to the posttest for the students in the in the student-centered group. In fact, the gained score in aviation vocabulary learning was 4.55 (out of 20) with a .95% confidence interval ranging from 3.91 to 5.18.

Table 3

Paired Samples T-test for the Pretest and Posttest of Aviation Vocabulary Scores in the Student-Centered Group

Gain Score	SD	95% Confidence Interval of the Difference		T	DF	Sig. (2-tailed)
		Lower	Upper			
4.55	1.356	3.915	5.185	15.003	19	0.000

The first assumption for using parametric statistical method is not violated as the present data are measured on an interval scale and the assumption of independence of subjects is met since the performance of any given individual in this study was independent of the performance of other individuals. Table 4 shows that all sets of aviation vocabulary scores in the text-based group gained on both pretest and posttest are normally distributed as the ratios of skewness and kurtosis over their respective standard errors do not exceed the ranges of +/- 1.96.

Table 4

Skewness and Kurtosis Test of Normality for Aviation Vocabulary Scores in the Text-based Group (Pretest & Posttest)

Test time	N	Skewness	Std. Error	Skewness Ratio	Kurtosis	Std. Error	Kurtosis Ratio
Posttest	20	-0.356	0.512	-0.695	-0.190	0.992	-0.191
Pretest	20	-0.316	0.512	-0.617	-0.460	0.992	-0.463

Table 5 shows that the mean score of aviation vocabulary gained on the posttest (M = 14.15, SD = 1.82) is very larger than the pretest (M = 10.85, SD = 1.84) in the text-based group.

Table 5

Descriptive Statistics for Pretest and Posttest of Aviation Vocabulary Scores (Text-Based Group)

Test	N	M	SD	SEM
Posttest	20	14.15	1.823	0.403
Pretest	20	10.85	1.843	0.412

According to the results shown in Table 6, paired samples t-test detected a statistically significant increase, $t(19) = 8.29$, $p = .000$, in aviation vocabulary scores from the pretest to the posttest for the students in the in the text-based group. In reality, the gained score in aviation vocabulary learning was 3.30 (out of 20) with a .95% confidence interval ranging from 2.47 to 4.13.

Table 6

Paired Samples T-test for the Pretest and Posttest of Aviation Vocabulary Scores in the Text-Based Group

Gain Score	SD	95% Confidence Interval of the Difference		T	DF	Sig. (2-tailed)
		Lower	Upper			
3.300	1.780	2.467	4.133	8.291	19	0.000

To see if there is a statistically significant difference between the effects of applying student-centered and text-based approach on ESP learners' aviation vocabulary learning, analysis of Covariance was applied. As Pallant (2013) believed, ANCOVA is employed when we have a two-group pretest/posttest design (e.g., comparing the impact of different interventions, taking before and after measures for each group). The scores on the pretest are dealt as a covariate to control for pre-existing differences between the groups. Table 7 contains the results of checking the assumption of linear relationship between the dependent variable (posttest of aviation vocabulary) and the covariates (pretest of aviation vocabulary). As seen in Table 7, the linear relationship between posttest of aviation vocabulary and the covariate of aviation vocabulary was significant, $F = 24.41$, $p = 0.000$, therefore the linearity assumption was met.

Table 7

Linear Relationship between the Posttest Aviation Vocabulary and the Covariate of Aviation Vocabulary

		Sum of Squares	DF	Mean Square	F	Sig.
Between Groups	(Combined)	77.190	8	9.649	3.368	0.007
	Linearity	69.931	1	69.931	24.410	0.000
	Deviation from Linearity	7.259	7	1.037	0.362	0.917
Within Groups		88.810	31	2.865		
Total		166.000	39			

Table 8 reflects that the significant value associated with Levene's test (0.28) exceeded the selected significant level (0.05) and so the homogeneity of variance assumption was not violated for aviation vocabulary scores in the two groups.

Table 8

Levene's Test of Equality of Error Variances for Aviation Vocabulary Scores by Group

Levene Statistic	DF1	DF2	Sig.
1.208	1	38	0.279

The fourth assumption relates to homogeneity of regression slopes. As set forth in Table 9 below, the results indicated that the significance level of the interaction (Group * Pretest) between group and the pretest of total aviation vocabulary was above .05, $F(1, 36) = 0.66$, $p = 0.42$, and therefore not statistically significant. That means the conclusion that the pretest and posttest of aviation vocabulary scores in the two groups enjoyed the assumption of homogeneity of regression slopes.

Table 9

Homogeneity Test of Regression Slopes for the Effect of Student-Centered VS. Text-Based Approach on Aviation Vocabulary Learning

Source	Type III Sum of Squares	DF	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	90.936a	3	30.312	14.537	0.000	0.548
Intercept	73.394	1	73.394	35.199	0.000	0.494
Group * Pretest	1.375	1	1.375	0.659	0.422	0.018
Error	75.064	36	2.085			
Total	9166.000	40				
Corrected Total	166.000	39				

As all assumptions were met, one-way ANCOVA was decided to be applied to compare the effectiveness of applying student-centered vs. text-based approach on aviation vocabulary. The independent variable is type of teaching aviation vocabulary approach (Group), and the dependent variable is aviation vocabulary. Participants' scores on the pretest of aviation vocabulary are used as the covariate in this analysis.

The number of students, mean, standard deviation, and standard error of means for the scores in the student-centered and text-based groups were calculated (Table 10) before explaining the results of ANCOVA. Table 10 shows that the mean of aviation vocabulary in the student-centered group (M =

11.30, *SD* = 2.08) and text-based group (*M* = 10.85, *SD* = 1.84) are close to each other on the pretest; however, the mean of aviation vocabulary in the Student-centered Group (*M* = 15.85, *SD* = 1.95) is much higher than the mean in the text-based group (*M* = 14.15, *SD* = 1.84) on the posttest.

Table 10

Descriptive Statistics of Aviation Vocabulary Scores on Pretest and Posttest by Group (Scores out of 20)

Test	Group	N	M	SD	SEM
Pretest	Student-centered	20	11.30	2.080	0.465
	Text-based	20	10.85	1.843	0.412
Posttest	Student-centered	20	15.85	1.954	0.437
	Text-based	20	14.15	1.843	0.412

In order to depict the results of both pretest and posttest for both groups in terms of aviation vocabulary, a Line Chart (Figure 1) was made. As it's observable from the Line Chart, the means of aviation vocabulary in the student-centered and text-based groups are almost at the same level on the pretest, still, on the posttest, the mean for the text-based group is considerably higher than the student-centered group.

Figure 1

Line Chart for Two Groups' Means of Aviation Vocabulary (Pretest & Posttest)

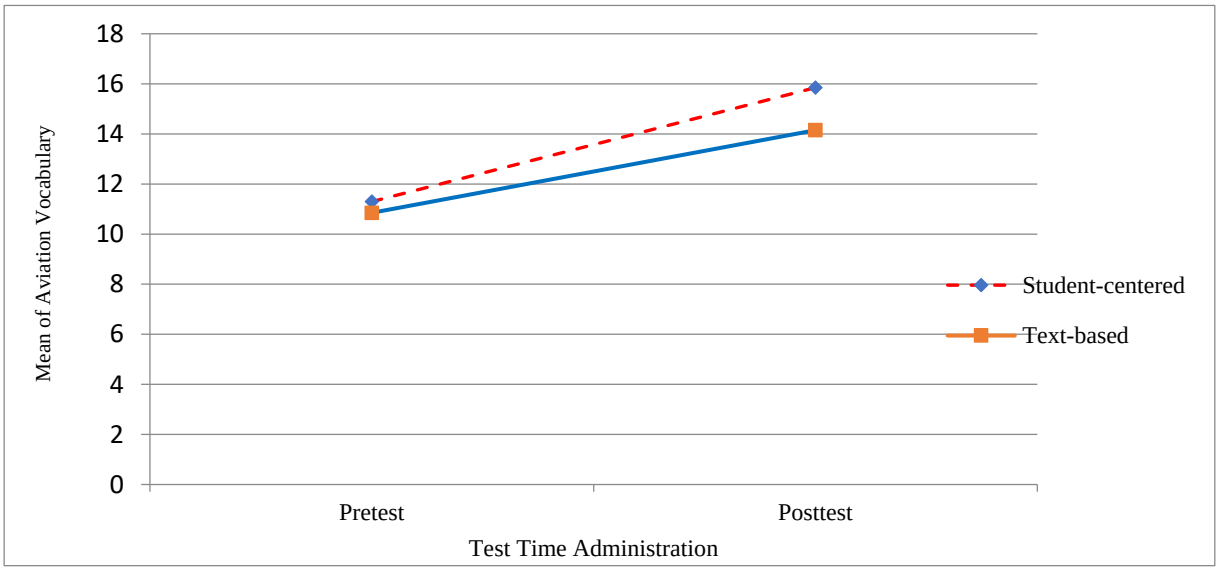

Table 11 summarizes the results of ANCOVA. After adjusting for the aviation vocabulary scores on the pretest, there was a significant difference between the two groups' aviation vocabulary scores on the posttest, $F(1, 37) = 9.50$, $p = 0.004$ ($\eta 2 = 0.20$); as a result, it can be claimed that implementing student-centered approach is more effective than text-based approach to improve ESP learners' aviation vocabulary learning.

Moreover, as evident from Table 11, there was seen a strong relationship between the pre-intervention and post-intervention scores on the total aviation vocabulary, as shown by a *p* value of .000, $F(1, 37) = 29.36$. That means the aviation vocabulary scores gained on the pretest affected the aviation

vocabulary scores gained on the posttest. Additionally, Table 11 shows that the partial eta squared (effect size) value is 0.44.

Table 11

Tests of Between-Subjects Effects of Student-Centered VS. Text-Based Approach on Aviation Vocabulary

Source	Type III Sum of Squares	DF	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	89.560	2	44.780	21.676	0.000	0.540
Intercept	72.126	1	72.126	34.912	0.000	0.485
Pretest	60.660	1	60.660	29.362	0.000	0.442
Group	19.629	1	19.629	9.501	0.004	0.204
Error	76.440	37	2.066			
Total	9166.000	40				
Corrected Total	166.000	39				

6. Discussion

The results of conducting a paired-samples t-test revealed that executing student-centered approach has a significant effect on ESP learners' aviation vocabulary learning. This conclusion was further corroborated by Mahmood et al. (2023), affirming the outcomes of the study. The results of the current study were also in line with Minalla (2023)'s study. He concluded that student-centered learning is a very useful method for developing language skills of learners. Furthermore, Zhu and Engels' (2014) claim supports the result of this study. According to them, student-centered learning is the most important innovation on the micro level that can be placed beside the communication technologies and the utilization of cooperative learning approaches. In fact, they believe that advances like student-centered learning are most usual in organizations that have intertwined structures, stress variety and that also emphasize partnership and cooperation. Likewise, as Harkema and Schout (2008) believe, the main features of a student-centered approach are the concerns given to the experiences, standpoints, experiences, desires, aptitudes and requirements of individual learners. Regarding this approach, teachers mainly pay heed to the content students should learn and underscore why (Bransford et al., 2002).

Moreover, this finding also was in line with Mclean and Gibbs' (2010) idea that the students should be included also at all levels of curriculum design, execution and evaluation. As 'clients', students are necessary to be part of the process of emerging a learner-centered curriculum. The school out to support student diversity and personalized learning needs and the mental and social aspects of student diversity, assign time to autonomous learning and grasping areas of desire, generate students' self-learning skills, recurrently review the central curriculum content, learn that their education continues beyond graduation, and offer ample chance for student professional improvement.

Paired-samples t-test results indicated that utilizing a text-based approach affects ESP learners' aviation vocabulary learning. This finding is in line with Thornbury's (2005) opinion that language always happens as text and not as isolated words and sentences. Texts enfold valuable lexical evidence such as word family, word meaning, lexical chains, and word association. In addition, Johns and Davies (1983) believe that when using texts in learning and teaching vocabulary, a text can be described as a linguistic object, a vehicle for information and a stimulus for production.

Similarly, the results were in line with Nation and Coady's (1988) notion that the target words can be picked by teachers or by learners. The objective for dealing with target words and meanings is to avoid the occurrence of erroneous guesstimating or just overlooking the new words. According to Nation and Coady (1988, p. 101), "the very redundancy or richness of information in a given context which enables a reader to guess an unknown word successfully could also predict that the same reader is less likely to learn the word because he or she was able to comprehend the text without knowing the word" (1988, p. 101).

Finally, concerning the third research question, the results of performing a paired-samples t-test demonstrated that using student-centered approach is more effective than text-based approach to enhance learning aviation vocabulary. Actually, reading through the literature uncovered that almost no special study has investigated to compare the effects of applying these two approaches of student-centered and text-based approach on ESP learners' aviation vocabulary learning. In fact, these two approaches are useful to be pursued by the EFL educators and teachers to enhance teaching and learning vocabulary. The choice of adopting each one depends on various factors such as students' culture, personality, background knowledge, context, objectives, and so on. One important point is that in adopting either approach, the teachers become informed of the basic and original features of that special approach and apply them correctly.

7. Conclusions and Implications

The main purpose of the present study was to compare the effects of using student-centered approach and text-based approach on the teaching of English aviation vocabulary to the Iranian EFL Learners. As the research has demonstrated, implementing student-centered approach enhances aviation vocabulary learning. In fact, during the classes, the textbooks were not used, and the teacher introduced the topic of the lesson and inspired the learners to create the related words in their contexts. The teacher helped the students generate new ideas and new words so that more vocabulary items were made. Furthermore, when the students faced problems with the words in the context, the teacher helped or allows them to consult the dictionary. In reality, the learners collaborated in groups or pairs in relation to the requests and goals of the tasks. Act in this way, teaching and learning turn into an enjoyable and friendly dynamic and satisfying activity, thus making it facilitative for the students to understand the lesson as they are willingly involved in the learning.

In addition, the second conclusion of this study was that applying text-based approach could be used to improve aviation vocabulary learning. Actually, in the text-based approach, texts were used as the framework for teaching, and learners in different contexts have to know the use of the text types occurring most recurrently in specific contexts. Additionally, the vocabulary items were explicitly instructed and their uses are connected to the cultural context.

Besides, the students were equipped with guided practice as they improve English aviation vocabulary knowledge for meaningful communication through the whole texts. They were guided to learn the target words through reading texts such as obtaining words' meaning and their typical language background from texts.

Furthermore, in this research we can see that following student-centered approach has more benefits than the text-based approach to facilitate and accelerate the aviation vocabulary knowledge. Applying either approach to teach ESP vocabulary depends on the context and when there is equal

chance for the ESP teacher to choose one of the two approaches, it is advisable to select the student-centered approach based on the main conclusion of this study.

One of the pedagogical implications of this research is that the student-centered approach makes the learners accept the responsibility to often promote concepts, thought, and opinion on their own as they deal with the tasks they manage. To do so, the students have to learn to take part in a mutual idea generating and listen to one another and direct questions to the teachers where they are not able to handle the task. In fact, they will gradually become independent on the teacher to learn language (Wolfgang, 2001). In ESP classes, especially in the military context, where the instructors usually lecture and the students get bored, the student-centered approach can be motivating and enjoyable since the students are active, responsible, and know their needs and requirements. They can generate new ideas, interact with the peers and instructor, ask their real questions, try to reach the responses, and use different sources.

The finding of this study is useful for the material developers in that they can make tasks that entail the ESP students' creativity and responsibility to be done. In fact, the tasks should be rather open and varied so that the ESP students be forced to cultivate concepts, thoughts, and ideas to generate notions and interact with other students. In addition, the ESP students are free to bring different materials to the classroom such as magazines, journals, books, social media, films, news, photos, flowcharts, pamphlets, etc. using internet and cellphone. The instructor can manage to use the most appropriate ones and add some more if needed.

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Authors' Contributions

All authors have conducted the study, collected data, analyzed and interpreted the data, and written up the manuscript.

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Competing Interests

The authors declare that there is no conflict of interest.

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Appendix

Aviation Vocabulary Test

Choose the most appropriate word to complete each sentence.

1. Weather condition is good, with _____ clouds at 5000 feet. Prepare for landing.
   a. assigned
   b. **scattered**
   c. aborted
   d. enthusiastic
2. There are two planes in _____ of you.
   a. next
   b. **front**
   c. above
   d. behind
3. On a clear July day, Scott Dittamo was training at the Newwark Tower when he _____ an Air India flight with 409 passengers.
   a. cleared
   b. seized
   c. **spotted**
   d. declared
4. The aircraft was at 2400 feet. The controller gave _____ to decent four zero cleared for approach.
   a. patience
   b. separation
   c. vibration
   d. **clearance**
5. According to the study reported in this paper, there were nine incidents in the last three months when passenger jets _____ wet runways after landing at various airports.
   a. **Skidded off**
   b. achieved
   c. remained
   d. spent

6. The aircraft was not configured to land. The landing gear was up and the flaps, normally down for landing, were _____.
   a. smooth
   b. **retracted**
   c. sincere
   d. directed
7. If I can keep _____ this speed, we won't be late.
   a. **up**
   b. for
   c. into
   d. until
8. When the airbase was in sight, the plane was too high and too fast, so Piche _____ a series of side-slipping maneuvers to lose altitude and slow the plane.
   a. **executed**
   b. warned
   c. confused
   d. dropped
9. An aircraft with two crew landed on runway 24R and _____ the runway onto the rapid exit taxiway KC.
   a. vibrated
   b. interacted
   c. **vacated**
   d. avoided
10. Reduced _____ times can cause problems, however. Small delays early in the day can make a whole series of flights run late.
   a. flame
   b. debris
   c. taxilane
   d. **turnaround**
11. Did the tug break _____?
   a. in
   b. back
   c. over
   d. **down**
12. If an aircraft suffers engine failure on take-off it _____ climb more slowly than expected.
   a. is unlikely
   b. **is likely to**
   c. probably won't
   d. should
13. Is there a _____ with the tanker?
   a. stop
   b. break
   c. damage
   d. **problem**
14. There's something _____ with it.
   a. break
   b. delay
   c. **wrong**
   d. problem
15. A snowplough is used for getting _____ of compacted ice.
   a. **rid**

b. out
c. away
d. remove

16. The situation is under _____ .
a. clear
b. solve
c. **control**
d. serious

17. Pilots _____ get clearance for flight plans.
a. would
b. **must**
c. should
d. might

18. We're _____ stand C65.
a. in
b. to
c. **on**
d. for

19. Can we delay departure _____ 2000 UTC?
a. at
b. for
c. **until**
d. because

2. The pilots received warning of a fuel imbalance, then they tried to correct it by _____ fuel.
a. joining
b. emerging
c. paving
d. **diverting**