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Flipped classrooms and their effect on Omani students' vocabulary achievement and motivation towards learning English

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ABSTRACT

This quasi-experimental study aimed to investigate the effect of the flipped classroom strategy (FCS) on Omani grade ten students' vocabulary achievement and on their motivation towards learning English. This study also sought to explore the challenges that students face while learning via FCS. A total of 48 students participated in the study. There were 24 as an experimental group (taught via the FCS) and 24 as a control group (taught the same vocabulary using conventional teaching strategies). During the intervention, students in the experimental group practiced the core vocabulary using different materials (video clips, PDF files and group discussions via a WhatsApp group before carrying out face-to-face activities in the classroom). During the classroom time, the students engaged in activities with the practice materials individually, in pairs and in groups. The study used an achievement pre- and post-test. The study also used a motivation questionnaire (pre & post) to determine the students' motivation for English language learning for both groups. The findings indicated that the experimental group outperformed the control group in the vocabulary test and that they had high motivation towards learning English. In addition, the study also pointed out some of the challenges of learning via FCS such as connectivity issues, and lack of group cooperation. Considering these findings, practice implications and recommendations for further research are presented.

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1. INTRODUCTION

Education is one of the fields that have been greatly influenced by the unlimited assistance of technology. Teachers integrate technology in their classrooms to positively support their curricular goals and enhance classroom instruction [1]. Today, different kinds of media and technology are used widely in classrooms to introduce a topic, demonstrate a concept, enhance a lesson and practice an exercise [2]. Some teachers use 'free off the shelf' multimedia products which are available in the global network to support their teaching. Yet, with the ease of multimedia creation nowadays, some teachers are creating their own multimedia using different programs and applications [1]. The goal of this innovation in education is to make learning more inspiring, motivating, meaningful and enjoyable. As a result, a blend of traditional and

technology-rich instruction, namely 'Blended Learning' emerged and at the same time, many changes occurred in teachers' practices, strategies, and materials to cope with this new teaching approach.

With the development of information technology and the advent of blended instruction, the flipped classroom teaching model was born, and it has become an appealing approach all over the world. Teachers use this technology-based approach to "flip" or "invert" their classrooms, to introduce students to content outside the classroom and to actively engage students with concepts inside the classroom [3]. Bergmann and Sams [4] simply define it as "what is done at school done at home, homework done at home completed in class". By using technology, lectures are moved out of the classroom and delivered online to free up class time for interaction and collaboration. Generally, an inverted (or flipped) classroom is a specific type of blended learning design that uses technology to move lectures outside the classroom and uses learning activities to move practice with concepts inside the classroom [3].

Flipped learning has grown in popularity in recent years and has been widely used in different educational subjects and teaching areas. Some educators expect it to be the future standard of educational techniques [5], and it is accepted by many as the most popular and active based approach in teaching [6]. One of the most important features of the flipped classroom is that it uses teaching videos or other forms of materials to teach and deliver the basic knowledge before classroom instruction instead of merely in-class teaching. Therefore, it contributes to time saving for in-class group discussion and individual tutoring [7]. Hiebert [8] stated that utilizing different tools in teaching students may encourage different understandings and these tools can include physical materials, oral language, written notation, and any other tools that can increase students thinking.

The flipped classroom strategy is becoming more and more popular in foreign language classrooms, such as English as a foreign language (EFL). Teachers record grammar lessons and conversation starters to provide more opportunities for language usage and practice in the classroom, thus creating time for practicing more conversations, reading and writing in the target language [9]. Many researchers maintain that the flipped classroom strategy (FCS, hereafter) can be utilized in teaching a foreign language and it can promote learning achievement in different skills of the foreign language [10], [11].

As the world becomes a small village and English continues to be the international lingua franca all over the world, vocabulary knowledge is said to play a prominent role in learning a foreign language [12]. Yang and Liao [13] indicated that learning a foreign language relies heavily on building vocabulary, which is necessary for listening, reading, speaking, and writing. Therefore, teaching this central element needs effective methods to be utilized and applied by EFL teachers who are required to use different technologies to meet students' interests as well as to achieve the intended learning outcomes hand-in-hand with the traditional approaches. The flipped classroom approach is one of the alternative and successful strategies for teaching vocabulary, as revealed by research [7], [14], [15].

Studies in the Omani context revealed that dealing with vocabulary is among students' biggest problems in both reading [16] and writing [17]. Generally, students in Oman are rarely formally exposed to English and very few children have the opportunity to use English at home [18]. Research conducted in Oman indicated that teachers complain that most students do not understand what goes on in their EFL classes regardless of the focus of the lesson [19]. This is due to students' lack of core vocabulary which is their main tool for communicating in English and that has in effect developed a fossilized negative attitude towards the language. Al Maawalyia [20] declared that this lack of vocabulary is one of the main reasons for students not being able to communicate well in English and for low language achievement in general. Surveys such as that conducted by Al-Mahrooqi [21] have shown that some Omani students are afraid of the English language in general and consider it to be too difficult to learn. As a result, this has led to a noticeable weakness in using the language. Accordingly, students do not want to learn, improve, speak, or practice it and they focus only on memorizing vocabulary rather than understanding it. In this vein, this study aimed to investigate the effect of the flipped classroom strategy on grade ten students' vocabulary achievement and examine students' motivation for learning English because of using this strategy. It also aimed to highlight the challenges that students faced while learning through this teaching strategy.

The present study aims to answer three research questions. These are: i) Are there any statistically significant differences in vocabulary achievement between the experimental group taught by FCS and the control group taught by the conventional method?; ii) Are there any statistically significant differences in motivation towards learning English between the experimental group taught by FCS and the control group taught by the conventional method?; iii) What challenges do students face when using FCS?

2.   LITERATURE REVIEW

2.1. Flipped classrooms: Meanings, benefits, and drawbacks

The flipped classroom is known by various names including the inverted classroom, blended learning and more simply, the flip. A more accurate description of it is the process whereby that which is traditionally done in class is now done at home, and that which is traditionally done as homework is now completed in class [4]. A simple definition of the flipped classroom model was provided by Bretzmann [22] who described it as a process of making students watch video lectures at home and later do the work and activities in class. He also noted that the class is centred around the students since they are viewing, sharing, and completing their work. The teacher's role is to provide feedback and guidance. Generally, the main issue of the flipped classroom is to watch lessons at home and do all related work and activities in class.

The significance of flipping the classroom has been discussed widely. According to Gough [23], it is useful for absent and struggling students as they can view the lecture at their own homes. Not only that, but the flipped classroom also creates time for varied instructional techniques, as well as active learning and higher order thinking, along with increased student-teacher interaction.

Despite the successful results of implementing the flipped model, it has some drawbacks that may limit or compromise its success [4]. The first challenge is the accessibility of students, particularly in low-income areas, to view the digital videos in homes without computers or Internet [24]. The second challenge of flipped learning is related to teachers and the amount of time invested in recording videos. A further challenge is that this model relies heavily on students' self-motivation and some students are not interested in the idea of learning by technology [25]. Thus, they lose interest quickly.

2.2. Vocabulary learning and teaching

Vocabulary as the foundation of any language holds an important position in the linguistic system as it is a vehicle for thought, self-expression, communication, and interpretation. It is a vital aspect in language use and a core element in learning and mastering foreign languages as Robin and Thompson [26] indicated. People cannot convey any meaning without words which are considered the "building blocks of a language" since they label objects, actions and ideas [27]. Wilkins [28] stated that "… without grammar very little can be conveyed, without vocabulary nothing can be conveyed" and rich vocabulary makes better language readers, writers and speakers.

In the same vein, Nation and Waring [29] pointed to the importance of vocabulary knowledge. They considered it as an essential component of learning a second/foreign language because it inspires and leads the learner towards communication, and it is one of the fundamental aspects in learning the four language skills. Thus, it is obvious that vocabulary, as a crucial component of language, not only affords learners with all forms of communicative skills, but also enables them to have access to the written form of the words [30]. Likewise, it is a central element in literacy skills. Thornbury [31] asserted that vocabulary is the most important aspect of language learning because of its central role in developing effective reading, writing, listening, and speaking skills. Harmer [32] also emphasized its importance by stating that "if structures make up the skeleton of language, then it is vocabulary that provides the vital organs and the flesh".

Because of the importance of vocabulary knowledge in a language, learners need to possess a vocabulary of at least 5,000 word families in order to understand and learn efficiently from un-simplified texts [33]. According to Laufer [34], this provides a coverage of 98% of an authentic text. Hence, it can be said that vocabulary is basic to English language learning because without adequate vocabulary items, learners cannot appreciate others' expressions and ideas or express their own ideas. The storage of numerous known words is called vocabulary size. Cunningham and Stanovich [35] pointed out that an extensive vocabulary background helps to build a foundation for reading skills, which correlates with greater academic achievement later in life. Moreover, Seal [36] estimated that word knowledge is an essential component in the language users' communicative competence, as well as being important in foreign language production and comprehension. Therefore, mastering a rich vocabulary in any language is an important ingredient of any successful language learning. In contrast, lack of vocabulary can be an obstacle in learning any language. Schmitt [37] pointed out that a language learner should know at least between 2,000 to 5,000 word families through authentic language materials. Thus, vocabulary knowledge and language use complement each other.

Determining the best strategies and techniques for teaching vocabulary requires teachers to learn different approaches that enable learners to manipulate the language to support their communicative needs. Coady and Huckin [38] suggested three important elements to teach vocabulary: selection, sequencing and presentation. They recommended introducing and teaching these elements according to a descending order of importance, starting with high frequency general words and progressing to academic words technical terms and low frequency words.

Many studies showed that using FCS in teaching English vocabulary was very effective and helped students to learn, acquire and memorize vocabulary easily. For instance, a study conducted by Alnuhayt [14]

revealed that FCS promoted English vocabulary teaching outcomes. It was also described as "superior" to the traditional teaching model as it helped learners to complete the construction of their vocabulary knowledge [15]. Anwar [39] and Bensalem [40] suggested that the FCS can be an alternative and interesting approach for teachers of foreign languages to enhance their students' vocabulary mastery and it increased learners' vocabulary learning and motivation compared to the traditional method. It is hoped that the present study conducted in the Omani educational context, provides further evidence of the role that FCS plays not only in promoting students' vocabulary achievement, but also motivation towards learning English.

3.   RESEARCH METHOD

3.1. Design
This study adopted a quasi-experimental research design. It used a convenient sample of two intact classrooms which were taught by the same teacher. The researchers and the teacher selected two equivalent classes based upon their first semester results.

3.2. Population and sample
The population of the study consisted of all grades ten students at the governmental schools in North Al Batinah Governorate in Oman, which was a total of 8,124 students in the academic year 2018-2019. The sample of the study consisted of 48 grade ten female students distributed into two groups: an experimental group and a control group, each consisting of 24 students. Based on the first semester results of the academic year 2018-2019 and students' total achievement in English language, two equivalent classes were selected at Um A'Dardaa Post Basic Education School for girls in North Al Batinah Governorate. This grade level was selected because the students in this level can have access to mobile phones and most of them were familiar with using WhatsApp application in learning.

3.3. Instruments
The study employed three different instruments: iii) An achievement test, as the main tool of the study; ii) A motivation questionnaire; and iii) A semi-structured interview.

3.3.1. The achievement test
An achievement test was prepared to measure the participants' achievement in vocabulary. After determining the units to be taught, the researchers started to write down the test to examine the learners' prior knowledge of the units and to measure the effect of the intervention by comparing the pre- and post-test results. The researchers used the teacher's book, the class book, and the skills book to understand the components of the unit and to select the most appropriate content for the test. The test consisted of four different questions: Question 1 provided students with five separate sentences with a gap in each and expected them to fill them in from a list of words provided; Question 2 was a multiple choice question; Question 3 was similar to question 1 but gaps existed in a paragraph rather than in separate sentences; and Question 4 expected students to complete words in sentences where the first 2-3 letters of the words were provided. Each question was awarded 5 marks (one mark each for five items), giving a total of 20 marks. The test was administered to both groups before and after the intervention.

Both validity and reliability of the test were established. To obtain the face and content validity, the vocabulary test was distributed to a jury of specialists in English language teaching (14 validators) who had experience in designing and reviewing tests. The test was modified based on their recommendations. As for reliability, the test was administered to a group of (30) grade ten students to examine the suitability and appropriateness of the test in terms of duration, difficulty, and reliability. The results were recorded and statistically analysed. The test results showed no ambiguity, and the questions were clear, which reflected the test's good face validity. Moreover, the test reliability was computed using Cronbach alpha coefficient which was established at .788 showing good test reliability.

3.3.2. The motivation questionnaire
A motivation questionnaire was adopted from a similar study [9]. The same questionnaire was used before and after the experiment with both the control and experimental groups to measure students' motivation towards learning English. It consisted of 32 items covering five domains: i) Self–efficacy for learning English in general; ii) Task value for learning English; iii) Control beliefs; iv) Extrinsic goals for learning English, and v) The achievement goal, which in the case of this study was learning English vocabulary. A five-point Likert scale was used to rate the items of the questionnaire. To ensure that this questionnaire was applicable to Omani students and to guarantee the clarity of the items, the researchers piloted it at the same school which had been used for the pilot vocabulary test. The analysis revealed high

reliability as its Cronbach's Alpha coefficient was .916, which indicated that the scale is suitable and can be used in the study.

3.3.3. Semi-structured interviews

At the end of the intervention, semi-structured interviews were conducted with a sample of eight students from the experimental group. The interview aimed mainly at identifying the challenges that students encountered while learning vocabulary via FCS. To collect further details, the teacher was also interviewed.

3.3.4. Study materials

The researchers prepared the following materials: videos and supplementary materials, a teacher's manual, and classroom activities. Moreover, each student participating in the study was provided with a vocabulary log to take notes, reflect, and record information while watching the videos at home.

3.4. Procedures

Prior to the experiment, a pre-vocabulary test was administered to the experimental and the control groups to ensure homogeneity and equivalence in general academic vocabulary knowledge. A motivation questionnaire was also administered to compare the groups' motivations towards learning English. The results showed no significant difference between the groups' mean scores in terms of vocabulary achievement at $t(46)=.95$, $p=.347$ (two-tailed), and likewise in terms of motivation at $t(46)=-.81$, $p=.424$ (two-tailed).

During the eight weeks of the experiment, the experimental group received flipped classroom instruction in vocabulary classes whereas the control group was taught the same vocabulary items using conventional instruction. One day before the lesson, students were sent a video or other supplementary material containing the core vocabulary of the next lesson. It was sent to their devices via the WhatsApp application by their class teacher. Students watched the video/read the electronic supplementary materials and took notes in their vocabulary logs. Examples of students notes included vocabulary meaning, both in English and Arabic, synonyms, and example sentences. Then, they answered the question which was usually presented at the end of the video. They frequently asked questions about any ambiguous vocabulary in the WhatsApp group. The teacher checked that everybody had watched the video by monitoring the double blue ticks in the WhatsApp messaging system. The next day, the teacher first spent a few minutes asking questions about the video and encouraging students to discuss its content and vocabulary using a 'pair and share' strategy. Then, students performed some communicative activities related to the delivered content. These activities included individual, pair and group work. Interactive games were frequently used also. Finally, the teacher checked students' pronunciation and understanding of the lesson's vocabulary using the flash cards provided. After class, the students were required to finish the exercises.

At the end of the experiment, both groups did the post-test and filled the motivation questionnaire. Additionally, a group of eight students, from the experimental group, together with the class teacher, were interviewed to identify the challenges that they had faced during the experiment.

3.5. Study limitation

This study has some limitations. The intervention of the flipped classroom was applied with female participants only as the study was implemented in a females only school. Thus, the results of the study cannot be generalized to male students. Also, the study focused on using the flipped classroom strategy in teaching vocabulary only, with the exclusion of other language elements and skills. Moreover, the study used WhatsApp messages to deliver the vocabulary content to the students.

4.   RESULTS
4.1. The effect of the flipped classroom strategy on students' vocabulary achievement

To answer the first research question, a post-vocabulary achievement test was administered to both groups. Then, the data was analysed using the independent-samples t-test to compare the scores of the experimental and the control groups, as shown in Table 1. As can be seen in the table, significant differences were found in the mean scores of the experimental group (M=12.46, SD=4.01) and control group (M=8.71, SD=4.14); $t(46)=3.19$, $p=.003$, (two-tailed). The results also showed that there were statistically significant differences at ($\alpha \leq 0.05$) level between the experimental group and the control one in favour of the experimental one. This suggests that FCS had a positive effect on students' vocabulary learning, and it was more effective than the conventional method in promoting the students' achievement in English vocabulary.

Table 1. Independent sample t-test results for post-test scores of the experimental and control groups on vocabulary achievement (n=48)

Instrument	Group	N	M*	SD	T	Df	p-value
Vocabulary achievement Test	Experimental	24	12.46	4.01	3.19	46	.003
	Control	24	8.71	4.14			

*Total score=20

For further analysis and to show the extent of the FCS effect on the experimental group achievement in vocabulary, the "Effect Size" technique was applied. The researchers computed the effect size, and it was (.93) which, indicated a large effect size of using FCS in the post-test. This large effect could be attributed to the activities, techniques, and teaching aids which aimed at developing vocabulary that was used in the flipped classroom. It was also found that there were differences in the overall achievement in the post- test, where the experimental group also outperformed the control group in all the four sub-questions and domains of learning, as shown in Table 2.

Table 2. Means and standard deviations of the experimental and control groups within the post-test questions and domains

Instrument	Group	N	M	SD	T	Df	p-value
Motivation questionnaire	Experimental	24	4.49	.446	2.186	46	0.34
	Control	24	4.21	.451			

It is apparent from this table that the experimental group scored higher than the control group in word recognition, meaning comprehension and application questions. It is important to note here that, in the fourth domain which examines word spelling and general knowledge, the control group scored (M*=.83, SD=1.09). This finding accentuated the existing evidence of the effectiveness of FCS in vocabulary learning and teaching.

4.2. Differences in motivation towards learning English between the groups

To answer the second research question, a motivation questionnaire was administered to both the experimental and the control groups after the intervention. Means and standard deviations of both groups' results of the post application of the motivation questionnaire were computed. An independent samples t-test was also used to measure the significance of the differences between the two groups. Table 3 illustrates those results.

Table 3. Independent samples t-test results for post-administration of the motivation questionnaire of the experimental and control groups

No.	Domains	Groups	N	M*	SD	Sig. level
1)	Knowledge (Word recognition)	Experimental	24	3.04	1.49	.037
		Control	24	2.67	1.40	
2)	Comprehension (Meaning)	Experimental	24	3.83	1.00	.002
		Control	24	2.63	1.44	
3)	Application	Experimental	24	3.67	1.40	.017
		Control	24	2.58	1.61	
4)	Knowledge (Word spelling)	Experimental	24	1.92	1.56	.008
		Control	24	.83	1.09	
	Overall	Experimental	24	12.46	.40	.003
		Control	24	8.71	.41	

*Question score=5 – Total Test Score=20

As shown in Table 3, there was a statistically significant difference in students' motivation towards learning English between the experimental group (M=4.49, SD=.446) and the control group (M=4.21, SD=.451) in the total mean scores, in favor of the experimental group. The (t) value (46) is=(2.186) at the "sig" level=(.034), which is less than the statistical significance level of (0.05). This result indicates that using FCS was more effective than the conventional methods in developing not only students' performance in a specific language area, vocabulary but also in their motivation for learning the English language.

To measure the effect size of the flipped classroom on the experimental group in the post application of the learning motivation questionnaire, the researchers applied the "Effect Size". The effect size was (.64), which showed a moderate effect size of FCS on students' motivation towards learning English. This result can be attributed to the activities and techniques used in the flipped classroom which may have developed

students' motivation for learning English. For additional analysis, means and standard deviations of the domains in the motivation questionnaire of both groups were analyzed. The results are shown in Table 4.

Table 4. Experimental and control groups' means and standard deviations for each domain
in the motivation questionnaire

No.	Domains	Groups	N	M*	SD
1)	Self-efficacy	Experimental	24	4.54	1.67
		Control	24	3.00	3.34
2)	Task value	Experimental	24	4.69	1.62
		Control	24	4.16	4.46
3)	Control beliefs about learning	Experimental	24	4.43	1.48
		Control	24	4.14	1.90
4)	Extrinsic goal	Experimental	24	4.15	2.23
		Control	24	3.50	2.87
5)	Achievement goal	Experimental	24	4.64	1.89
		Control	24	4.40	2.01
	Overall	Experimental	24	4.49	.446
		Control	24	4.21	.451

M*(5-points Likert scale), Questionnaire items=32, Number of domains=5

It is interesting to note that the experimental group scored higher mean scores than the control group in all the domains in the motivation questionnaire. The task value and achievement goal domains obtained the highest mean scores (4.69 and 4.64 respectively). It is also notable that the greatest difference in the mean scores between the two groups was in the self-efficacy domain (1.54). This showed that the experimental group gained great confidence through mastering the core vocabulary and that motivated them to complete the required tasks. Therefore, it can be concluded that FCS had a positive effect on increasing students' motivation towards learning English in general.

4.3. Students' challenges with the flipped classroom strategy

A semi-structured interview was conducted to answer this research question, which investigated the challenges that the students in the experimental group encountered during the flipped classroom instruction. A sample of eight students volunteered to be interviewed after the intervention and they were asked 7 open-ended questions. A qualitative analysis was used to analyze their responses. Figure 1 presents the challenges mentioned in the interview together with the response percentages.
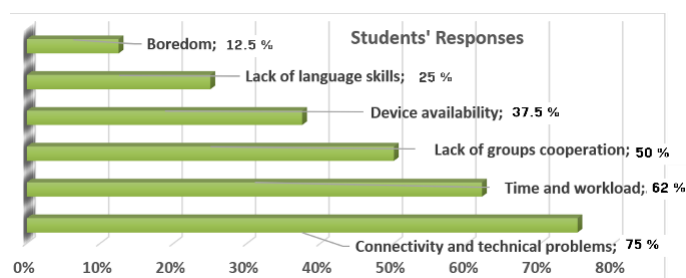

Figure 1. Challenges students encountered during the flipped classroom experience

The challenges that students encountered during learning via FCS can be divided into three main issues:

a)   Connectivity and technical problems

Connectivity and technical issues emerged as a major drawback that kept students from fully benefiting from FCS at home (75% of students' responses). Wi-Fi and internet data availability were particularly challenging for the students in the current study. However, whenever this was the case, the study proceeded as planned as the students affected borrowed the "emergency device" from their teacher the next day to watch the lesson. One student reported: "*sometimes the Wi-Fi at home is not working, so I could not watch the lesson*". Another student said: "*Our internet speed at home is very slow, downloading videos is*

very difficult for me". Additionally, three students mentioned that their devices could not open PDF files and they asked their teacher to send an image of the PDF content instead. Nevertheless, during the interview, students mentioned that they were able to overcome these challenges prior to the lesson with the help of their teacher and peers.

b)   Time and workload

FCS is basically homework-based instruction and some students in the present study complained that this strategy stressed them and took up some of their daily study time at home. As the intervention lasted eight weeks, they mentioned that during exam days, there was an additional pressure associated with the flipped homework. All the interviewed students revealed that they did the assigned flipping tasks late at night or early in the morning when they had exams. One student stated: "*I did not find time to watch the video during exam days*". Moreover, having other homework, assignments and school duties at home made some students watch the lesson in a hurry and did not study the related words at all. In the present study, the teacher tried to solve this issue by having group or whole class discussions at the beginning of each class. Furthermore, the teacher revised and brainstormed the core vocabulary to ensure that all students had learnt the words.

c)   Lack of group cooperation

Another challenge mentioned by the students was lack of in-class cooperation. Four students mentioned that not all students were cooperative when carrying out group activities and that generally lazy and weak students depended mostly on higher achieving students to complete the required in-class work. One student stated: "*some group members do not like to share information*". Another one said: "*some girls do not work, and their role is only to copy the answers from their friends because they did not study the words at home*". During classroom observations, the researchers noticed that the teacher solved this problem by encouraging reluctant and weak students to join in the activities. The teacher was also reinforcing the effort made by the students who showed cooperation with others by drawing stars on their activity sheets.

In addition to the three main challenges mentioned, students mentioned some minor difficulties, such as: device availability at home, lack of language skills and boredom. One student stated: "*I watch the lesson on my brother's mobile; sometimes he is not available in the afternoons*". Two students commented that "*the speakers in the video say difficult words and speak quickly and we do not understand them*". This comprehension difficulty was due to the low proficiency in English language of some students, as their teacher had indicated. The researchers asked the students in the interview about the clarity of the videos and most of them stated that "*the language was simple and clear*". Additionally, only a small number of students described the PDF reading texts as "boring" stating that they preferred to have texts full of colourful pictures as these were more attractive to read than less colourful. In fact, all the assigned readings included pictures; however, the number of visual illustrations provided with texts depends on the type of the reading, the necessity to provide pictures and the clarity of the core vocabulary.

5.   DISCUSSION

In this study, the FCS led to an increase in students' overall achievement in the subject of English as foreign language (EFL). The results of this study indicated that the flipped classroom had a positive effect on students' general achievement. This concurs with the findings of other studies [41], [42], which reported that there was a remarkable increase in their experimental groups' achievement after implementing the FCS.

In terms of vocabulary achievement, the findings of the present study corroborate the results of several other studies that noted higher achievement of their participants in vocabulary learning due to the implementation of FCS [7], [14], [15], [39], [43], [44].

The findings indicated that the FCS helped in constructing students' vocabulary knowledge and enhancing students' vocabulary learning. According to the teacher and the researchers' classroom observations, the students in the experimental group were able to give definitions, provide English and Arabic meanings of words they had studied in the readings, and they were also able to use the learnt words in different contexts. In addition, they memorised the words faster since the videos and the supplementary materials linked their meanings with pictures, definitions, synonyms, and pronunciation. This confirms the findings of studies other studies whose participants showed a significant improvement in acquiring, identifying, retaining and using the targeted vocabulary after being taught via FCS [45]–[48]. The participants of the present study stated that they enjoyed the eight weeks of the experiment and that it was very interesting to see the flipped vocabulary used in further writing, listening, speaking, and reading lessons since they became familiar with their meanings. They described the experiment as: "amazing, entertaining, useful, rich, new, fun and educating". This finding corroborated those of other studies where participants reported high levels of satisfaction and interest towards learning via the FCS [9], [14], [42]–[44].

Furthermore, the results of the achievement test showed a significant difference in the experimental group's results regarding Bloom's domains of learning applied in this study which were knowledge, comprehension, and application. The highest means in the post-test were recorded in the comprehension question (M*=3.83) and the application question (M*=3.67). This result showed that students were able to look at the learnt words and grasp their meanings directly. They were also able to use what they had learned in more complex situations and make connections between different words. Moreover, the teacher stated that the students started to think critically about different topics and reflect on their own performance. This finding seems to be consistent with other research which found that the FCS increased students' knowledge acquisition, understanding and critical thinking skills [49]–[51].

Added to that, the results of the study also showed that FCS increased students' internal motivation for learning English, and improved classroom interactions. First, students started to develop more positive attitudes towards learning English. They explained that because they gained more confidence in vocabulary knowledge, they became more engaged and curious to learn English. For instance, in the semi-structured interview, the students reported that they were "eagerly" awaiting the videos and other supplementary materials at home as well as feeling more "confident to give words' meanings and definitions" in the classroom. Therefore, utilizing WhatsApp made the students more excited, engaged and attentive to the delivered vocabulary content.

In addition, the results of the study pointed to the effect of the FCS in increasing students' interactions in the classroom. The students became active learners who watched the videos at home and came to class well-prepared. The teacher stated that the flipped classroom gave more time for group conversations and interactions and helped her in consolidating what had already been studied. She also mentioned that the new strategy maximized face-to-face time for discussion, and allowed more time for the students to ask questions and interact with their teacher and peers. It is encouraging to compare this finding with other studies that also found that the flipped classroom stimulated students' motivation and interaction [25], [52]–[54].

The results of the present study also showed that the new teaching strategy, with its social classroom environment, affected not only vocabulary lessons but also other English lessons. The students stated that during the eight weeks of the flipped learning, "English became a special and different subject". They liked studying it more and gave it more attention and time. The teacher pointed out that she noticed that the experimental class became very active in all other language lessons and always came to class prepared.

Findings revealed that in spite of these positive effects, students still faced challenges. The first challenge was connectivity and technical problems such as device and Wi-Fi availability. This was consistent with the findings of several studies [24], [55], [56]. This finding might be explained by the fact that internet accessibility depends to some extent on the social, economic and cultural situation of the female students and their families' decisions with regards to the possession of personal mobiles or unmonitored accessibility to the internet.

The second challenge mentioned in this study was time and workload constraints. This findings supports the findings of other studies where some participants reported that they sometimes did not have sufficient time to view the video clips at home and, therefore, would come to class unprepared [43], [52]. For instance, Abuhamid [52] noted that their students faced time constraints because they had other assignments, and they recommended taking into consideration students' workload while designing the tasks.

Another challenge found in this study was lack of group cooperation, as reported by the students themselves. In fact, this is a consequence of the Inanpreviously mentioned challenges. Due to the fact that some students were not able to do the required assignments, they became demotivated and unwilling to cooperate with their group members. The results of the present study in this regard concurs with a few other studies which have noted similar challenges regarding participants' resistance to engage in classroom activities [9], [44].

6. CONCLUSION

The study revealed that the FCS had a positive impact on students' vocabulary learning. The experimental group outperformed the control group in the post vocabulary achievement test; therefore, it can be concluded that the FCS has a positive effect on students' vocabulary achievement. In addition, there were statistically significant differences between the experimental and the control groups' motivation scores, in favour of the experimental group. This further demonstrated the positive impact of FCS on developing more positive attitudes towards the English language and learning it.

Considering the findings of the study, the following recommendations are made. The Ministry of Education (MoE) in Oman should adopt FCS in its teaching practices due to its positive effects on students' achievement, motivation, and interaction. This is becoming especially important in view of the implications

of COVID-19 pandemic on the teaching and learning process. The alternative teaching plans that a lot of countries are considering, including on-line learning seem to provide an ideal opportunity for trying out the flipped classroom, as students are doing so much learning from home anyway.

To help achieve this, the MoE in Oman should create more training programs and opportunities for teachers to receive professional development for teaching English using the FCS or other forms of Blended Learning. Teachers can in fact benefit from different mobile applications, such as WhatsApp, in teaching different language skills. Students will also need to be trained on the dynamics of FCS and the new roles expected of them so that they benefit fully from the experience both academically and socially.

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