The Comparison of Mind Mapping-Based Flipped Learning Approach on Introvert and Extrovert EFL Learners' Speaking Skill

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Abstract

The use of different types of creative teaching techniques such as mind-mapping has drawn the attention of teachers. In this regard, the present research aimed to investigate the effect of implementing mind mapping technique on the improvement of EFL learners' speaking skill in traditional and flipped classes. It also took a further step and examined the personality of the learners into account. To this end, 80 homogenous elementary EFL students who were studying English language teaching at Payam-e-Noor University, were divided into four equal groups based on their personality type and were assigned into the traditional and flipped classes. Before the treatment, a speaking pretest was taken and the results indicated that the groups were homogenous in terms of their speaking ability prior to the administration of the treatments. After the pre-test, the groups received treatment. The participants of the traditional groups drew mind maps about each speaking topic, and the participants of the flipped groups used digital mind mapping technique to brainstorm about the topic. After the twelve treatment sessions, the groups participated in a post-test. The findings indicated that in the post-test, there was a significant difference between the participants' speaking scores in terms of pronunciation, grammar, vocabulary, fluency and comprehension. The findings showed that the introverts had better gains in the flipped classes, while the extroverts benefited from the treatment in the traditional classes. Moreover, the positive effects of mind mapping technique were observed in all four groups. These results can provide both teachers and students with valuable insights into the application of mind mapping technique in flipped and traditional classrooms for both introverted and extroverted personalities.

Keywords: Flipped classes, Traditional Classroom, Introverted, Extroverted, Mind mapping technique

1. Introduction

The use of mind mapping technique has been referred to as one of the creative methods which can be employed to foster learning capacities. This learning technique is one type of pre-writing activities which is usually applied by teachers (Nasution, 2020) to help students to brainstorm and take notes and choose relevant ideas to the topic of writing in a visual form (Hemmati & Khodabandeh, 2017). This model also helps students associate new information to their background knowledge (AlMutairi, 2015; Araujo & Gadanidis, 2020; Riswanto & Prandika, 2012). With the use of this technique, students can indicate facts, the overall structure of a subject and its individual parts (AR, 2017). It is a fact that the application of mind mapping technique assists students in organizing their ideas to understand concepts better (Borovková, 2014; Srihandayani & Marlina, 2019), and learn information in a completely specialized way (Buzan, 2004; Stokhof, Vries, Bastiaens & Martens, 2020). The better students use mind mapping techniques, the more their metacognitive skills improve (Astriani, Susilo, Suwono, Lukiati & Purnomo, 2020). Accordingly, having students to develop mind mapping technique makes them capable of identifying clearly and creatively what they have learnt or what they have planned (Fatmawati, 2016).

Along with novel techniques such as mind mapping which provide students with more learning opportunities, technological developments, the Internet and new tendencies in the use of technology in teaching and learning processes have led to changes in learning forms from traditional classroom learning contexts to new contexts of learning such as, flipped classes (FCs). Teaching through FCs

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Chabahar Maritime University
Iranian Journal of English for Academic Purposes ISSN: 2476-3187
IJEAP, 2021, 10(1), 35-53 (Previously Published under the Title: Maritime English Journal)

refers to a means of instruction where students study instructional material at home through watching instructional videos or study the assigned text which their teacher has delivered online before their class (Umutlu& Akpinar, 2020). It allows learners to connect their traditional classes to online learning. In FC, the role of a teacher is changed from being a provider of knowledge to a facilitator and organizer (Basal, 2015) who sets up the content, maps out homework, and provides a welcoming learning space that allows students to use their class time to do their tasks (Roehl, Reddy & Shannon, 2013).

Given the significant role of mind mapping technique in learning on one hand, which has been investigated and demonstrated by different scholars of various fields (Fu, Lin, Hwang & Zhang, 2019; Ghonsooly & Hosienpour,2009; Naghmeh-Abbaspour & Rastgoo, 2020), and the beneficial role of FCs for English as Foreign Language (EFL) learners in active learning than the traditional classrooms on the other hand (e.g., Ekmekci, 2017; Mohammadi, Barati & Youhanaee, 2019; Qader & Yalcin Arslan, 2019; Vitanofa &Anwar, 2018; Yang & Chen, 2020), they could be useful tools to be employed in learning English speaking skill as well (AR, 2017; Nasution, 2020), as the main objective of English teaching is to enhance students' speaking abilities in EFL classrooms (Boonkit, 2010).

Although speaking is a crucial skill in studying English, many students in Iranian high schools do not know its importance or if they have information on this issue, it is too difficult for them to deal with it (Ghonsooly & Hosienpour, 2009). Students will not pay enough attention to speaking unless they are exposed to more practical methods which help them deal with the difficulties in a more convenient and understandable way. Mind mapping technique in the FCs (Zheng; Wu & Gou, 2018) may be able to provide such an opportunity for students in learning English speaking skill.

However, despite exposure to the same practical materials, there are some students in a class, performing differently while receiving the same treatment from their teacher. Some students have a better performance in a specific skill while other students may perform better in other kinds of skills. It shows that there are some factors which may impact the result of the study beside the treatment given by a teacher. One of these certain factors is students' personality which may affect their level and degree of learning (Pike, 2006). Personality is defined as total-complex psychophysics of an individual which is influenced by environment, innate capacity and several other factors which determine an individual's action and reaction (Pervin & John, 2001). Personality in this case can be described through two main types of extrovert and introvert that exist in a continuum at opposite poles. Studies show that extroverts have energetic behavior, and take part in group activities and interactions (Roccas, Sagiv, Schwartz, & Knafo, 2002). Whereas, introverts tend to work privately and prefer more time to themselves and enjoy asynchronous communication (Yeung, Read, & Schmid, 2012). Students with these two types of personalities have different capabilities and understanding and represent different levels of achievement in their learning process, although their teacher uses the same intervention and technique.

Knowing the problems students face in speaking, this research applies a mind mapping technique to help them in generating, developing, and organizing their ideas and subsequently enhancing their speaking capabilities. This study intends to find a response to the inquiry that whether mind mapping technique can help introvert and extrovert EFL learners improve their speaking skills. According to the objectives of the study, the following questions were raised:

Research Question One: Is there any significant difference between the impact of mind mapping technique on the speaking of the introvert and extrovert EFL learners in traditional and flipped classes?

Research Question Two: Is there any significant difference between the extrovert and introvert groups' performance on posttest of speaking?

Research Question Three: Is there any significant difference between the treatments and personality traits on posttest of speaking"?

2. Literature Review

2.1. Mind Mapping

As pointed out by a number of scholars, using mind-mapping technique in classes is highly beneficial for EFL learners as it is conducive to their speaking ability (e.g., Alwadi & Ismail, 2019; AR, 2017; Ghonsooly & Hosienpour, 2009; Nasution, 2020; Orlova, 2017; Rachmawati, Nugrahaeni & Mauludiyah, 2020; Srihandayani & Marlina, 2019) and has a positive influence in their reading comprehension (Liu & Yuizono, 2020; Malekzadeh & Bayat, 2015). Furthermore, introducing mind map technique into English classes can improve students' pronunciation (Al-Jarf, 2011) and their writing skills (Nurlaila, 2013; Rofi'i, 2017; Yunus & Chien, 2016; Wette, 2017). It can also serve as an effective learning strategy to help EFL learners enhance their vocabulary (Borovková, 2014; Inés Gómez Betancur & King, 2014; Karami Fard, 2013) and develop summarizing (Nouri Mohammed, 2013). Utilizing mind-map technique in EFL classes also help students to organize their ideas to understand content through the use of different learning materials (Inés Gómez Betancur & King, 2014) and promote their professional communicative competencies (Orlova, 2017). A mind mapping intervention can also increase learners' listening comprehension (Koster, van der Wilt, van Kruistum & van der Veen, 2017) and their interest in grammar learning (Suseno & Setyawan, 2014.; Wang, 2019). Its use has also shown to be a feasible teaching method in alleviating student's language anxiety (Yen, 2010).

2.2. Flipped Instruction

FCs, as new educational models concentrating on learner-based instruction, have attracted attention of different researchers and practitioners worldwide. Its use has been considered an effective instructional tool on students' skills such as writing (e.g., Abedi, Keshmirshekan & Namaziandost, 2019; Leis, Cooke & Tohei, 2015; Wu, Yang, Scott Chen Hsieh & Yamamoto, 2020), speaking (Amiryousefi, 2019; Chen & Hwang, 2020; Lin & Hwang, 2018), reading (Bhavsar, 2020; Karimi & Hamzavi, 2017; Tse, Choi & Tang, 2019), and listening (Namaziandost, Neisi & Momtaz, 2019). Former research has also highlighted the usefulness of flipped classes in promoting EFL learners' interest in grammar (Valizadeh & Soltanpour, 2020). Similarly, the application of the flipped model has been confirmed as efficient resource of learning which creates an interactive and collaborative context for students (Bohota, 2019). Studies also have shown that students who are taught in the FCs along with mind mapping technique have positive feedback about them (Goothy, Movva, Manyam & Reddy, 2019). Furthermore, those who are taught in the FCs are more open to the adoption of this innovative teaching strategy as an advanced instructional method in their classes (Strayer, 2012).

2.3. Extrovert and Introvert Personalities

Comparing the effect of extroversion and introversion personality types on EFL learners' skills has received considerable attention during the past few years. For example, Lestari, Sada, and Suhartono (2015) compared extroverted and introverted students on speaking performance and indicated that introvert students prefer to study by themselves while extroverts want to study with their peers. Similarly, Rahmawati and Nurmayasari (2016) and Rofi'i (2017) found out that there is no difference between extroverted and introverted students in their speaking skill. On the words of Murphy, Eduljee, Croteau, Parkman (2017) both extroverts and introverts show similar preferences to participate in classroom activities.

On the other hand, Wulandari (2017), Samand, Sailan and Lio (2019) in their study found that introvert students had better performance in their speaking skill compared to the extrovert ones. Likewise, Stanković and Čolović (2016) confirmed that there is a significant association between students' personality type and their language learning styles. Moreover, according to Noprianto (2017), Nurianfar, Azizi Far, and Gowhary (2014), extrovert students tend to use more strategies in their reading activities than introvert students. Involving introvert students in group activities enables them to interact as much as possible (Hakim, 2015). Extrovert learners show higher self-regulation level in reading activities compared to introvert students (Nosratinia & Abbasi, 2017). In addition, it

Chabahar Maritime University
Iranian Journal of English for Academic Purposes ISSN: 2476-3187
IJEAP, 2021, 10(1), 35-53 (Previously Published under the Title: Maritime English Journal)

was found that both personality types can predict learners' reading fluency (Foroozandehfar &Famil Khalili, 2019).

In a recent research which is similar to the present study, Yuliani, Linggar Bharati and Warsono (2019) proved that both extrovert and introvert students can benefit from the advantages of using brainstorming and mind mapping techniques in their writing skill. More to the point, Hussain, Abu Sa'aleek and Elenzi (2020) studied the effect of flipped learning and students' personality traits on their English achievement and confirmed that both introvert and extrovert students performed better in the flipped classes.

The review of the previous studies shows that, although very limited research has been carried out on comparing the flipped and traditional classes in general (Abedi, et al., 2019; Ekmekci, 2017; Karimi & Hamzavi, 2017; Namaziandost et., 2019) and examining the flipped-based instruction on students' speaking skill (Amiryousefi, 2019) in specific, no study has examined the impact of mind mapping-based flipped learning approach on introvert and extrovert EFL Learners' speaking skill. Therefore, the present study can contribute to the existing literature with filling this gap.

3. Methodology

3.1. Research Design

The design of the present study was a quasi-experimental with pre and posttest since random selection of the participants was not possible. This study involved the comparison of four separate groups, one extroverted and one introverted group for traditional and the same for the flipped classes. All groups were under the instruction of the same instructor in the same university during the same educational year.

3.2. Participants

The participants of the study consisted of eighty university students who were studying English language teaching at Payam-e-Noor University. They took the two-credit obligatory course of Conversation One in the first semester of the 2019-2020 academic year. Although the participants were at the same level, for more accuracy, and for homogenization sake, an Oxford Placement Test (OPT) was given to them prior to the experiment. Based on the test results, all of them had an elementary English language level. They were in the age range of 18 to 35 years old. They were divided into four groups with 20 students in each group based on their personality type; two introvert and extrovert flipped groups (40 students) and two extrovert and introvert traditional groups (40 students).

3.3. Data Collection Tools

To collect the data required for the research, the following tools were employed:

3.3.1. Questionnaire

In order to determine the personality types of the participants, they were given the Eysenck Personality Questionnaire (EPQ) (Eysenck & Eysenck, as cited in Arniatika, 2020) which consists of 10 items. The first 5 items are about extroverted personality while the second 5 questions examine the introverted personality type. The questionnaire has a good validity and reliability (.74) and is recommended to be used for determining extrovert and introvert personality traits (Yousefi, 2016).

3.3.2. Teaching Material

The instructional material used in the present research was, Top Notch Fundamentals (3rd Edition) (Saslow, Ascher& Rouse, 2006) which includes a student book, a work book, and an educational CD. The book consists of seven units which is designed for true beginning students. This book includes communication goals, grammar and vocabulary exercises. It also includes extra features such as digital full-color Vocabulary Flash Cards, Conversation Activator videos, Pronunciation Cooch videos, and a Writing Booster.

3.3.3. Speaking Pre and Post-tests

In order to evaluate the participants' speaking ability before and after the treatment sessions, two speaking tests were used (Appendix A). The topics of both pre- and post -tests were chosen from the participants' designated book, and the scoring procedure was done by two English instructors. Evaluations were carried out according to five criteria (Appendix B), including pronunciation, grammar, vocabulary, fluency and comprehension (Harris as cited in Ounis, 2017).

3.4. The Traditional Class

There were two traditional groups, namely; extroverted and introverted which received their instruction separately in traditional classrooms. Their classes were held two days a week on Sundays and Wednesdays from 8:30-10:00 a.m. for the introverted traditional group and 10:30 to 12:00 a.m. for the extroverted traditional group. In the first session, the researcher taught both traditional groups the techniques of speaking such as brainstorming, listing the ideas that were relevant to the speaking topic and drawing a mind-map. The participants were taught to place the main topic of the speaking in the center of the page or the board, and make a note of different ideas that might cross their mind and make a list of them all. After brainstorming, they were asked to go through the list to choose the ideas that were relevant to the topic and draw a map for them. They were taught to connect the lines that radiated from the central word to create branches and show sub-topic branches and represent different ideas. Two examples of the mind maps drawn by the students can be seen in Figure 1 and 2.
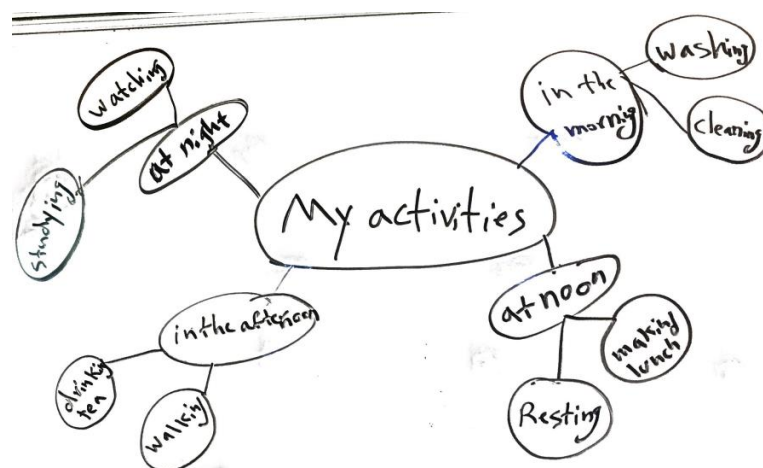

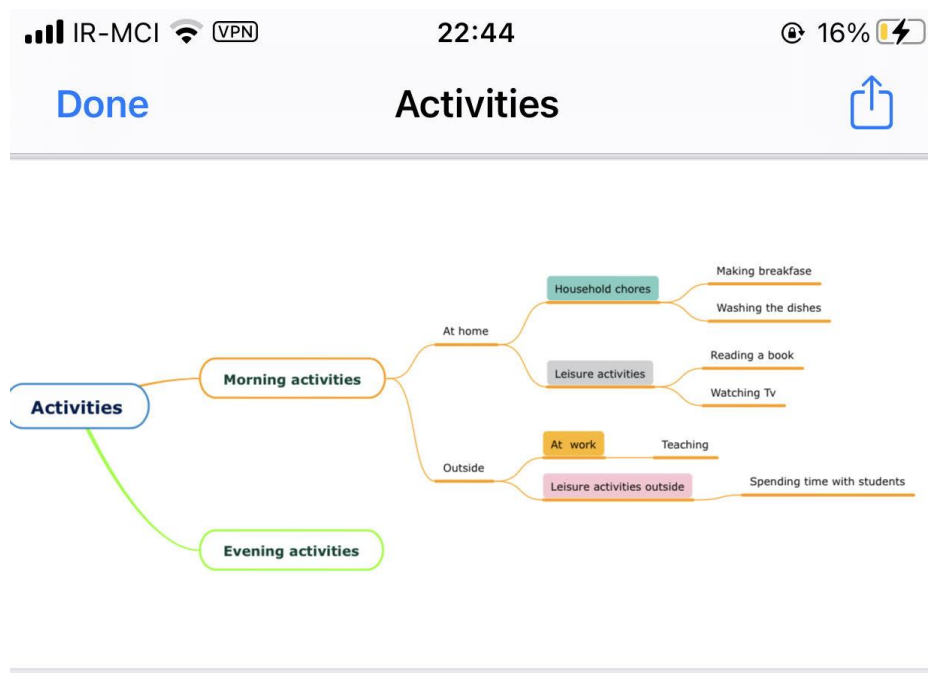Figure 1: An Example of a Mind Map Drawn on the White Board

Figure 2: An Example of a Mind Map Drawn with Mindomo App

After the participants of the traditional group learned to draw mind maps, the teacher gave them a topic in the class and asked them to think and try to prepare the related mind map in the given time. When the works were completed, the teacher called some participants to draw their mind maps on the board and the others were expected to give their comments and brainstorm on the provided maps. This way, they learned more and could reach better understanding of the concept of mind mapping. After short discussions and brainstorming, the participants were given time to prepare themselves to speak in the class. The teacher randomly selected some participants to talk about the topic, and asked other students to give some feedback. During each student presentation, new words and expressions required by the learners were provided by their classmates or the teacher. Finally, the participants were asked to think about the topics covered in the class for their following session, while a new topic was always determined for them to draw a new mind map and practice speaking at home.

3.5. The Flipped Classes

In the flipped classes, the instructor made two online groups in WhatsApp in which the introverted and extroverted participants were added to their assigned groups. The classes were held two days a week on Saturdays and Tuesdays from 8:30 to 10:00 a.m. for the introverted group and 10:30-12:00 a.m. for the extroverted group. In the first session, the teacher taught pre-speaking activities to both groups like the traditional classes, except that they were taught to use digital mind mapping called Mindomo software instead of drawing by hand. An example of digital mind maps provided by the students in the flipped class is presented in Figure 3.

Figure 3: An Example of Mind Map shared by the participants in the Introverted Flipped Class

In both flipped classes in WhatsApp groups, the participants accessed the topic of the speaking activity at the group and were asked to prepare a digital mind map for it and share in the group. This is opposite to the traditional groups which were introduced new topic at the traditional classrooms, and drew their mind maps at the class. In the flipped classes, the participants received the speaking topics in the group and then were asked to think about the topic and draw mind maps using Mindomo software and share their mind maps in their assigned group before the class. In the following session, they attended the traditional classroom and talked about the designated topic along with some background knowledge. After the treatment sessions, all the participants took part in the speaking post-test and their interviews were graded by two raters and the groups were then compared.

4. Results

To explore the research questions raised in this study, two-way ANOVA[2] was run to compare the extrovert and introvert flipped and traditional groups' means on pretest and posttest of speaking. Table 1 displayed the normality of the data which was checked through Kolmogorov-Smirnov and Shapiro-Wilk tests. The non-significant results of these tests (p > .05) indicated that the assumption of normality was retained.

Table 1: Kolmogorov-Smirnov and Shapiro-Wilk Tests of Normality

Group	Personality		Kolmogorov-Smirnov			Shapiro-Wilk		
			Statistic	df	Sig.	Statistic	df	Sig.
Traditional	Introverted	Pretest	.191	20	.054	.941	20	.246
		Posttest	.190	20	.058	.919	20	.094
	Extroverted	Pretest	.158	20	.200	.948	20	.340
		Posttest	.128	20	.200	.947	20	.327
Flipped	Introverted	Pretest	.115	20	.200	.962	20	.577
		Posttest	.191	20	.055	.947	20	.327
	Extroverted	Pretest	.162	20	.175	.936	20	.205
		Posttest	.169	20	.136	.926	20	.127

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[2] The researcher tried to run one-way ANCOVA; however, the assumption of linearity was not retained (Refer to Appendix C)

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Iranian Journal of English for Academic Purposes   ISSN: 2476-3187
IJEAP, 2021, 10(1), 35-53   (Previously Published under the Title: Maritime English Journal)

Table 2 displays the groups' means on the pretest of speaking. The results showed that the traditional and flipped extrovert and introvert participants had almost equal means on the pretest of speaking.

Table 2: Descriptive Statistics; Pretest of Speaking by Group by Personality Traits

Group	Personality	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Traditional	Introverted	7.700	.590	6.526	8.874
	Extroverted	8.600	.590	7.426	9.774
Flipped	Introverted	8.350	.590	7.176	9.524
	Extroverted	8.500	.590	7.326	9.674

A two-way between-groups analysis of variance (Table 3) was conducted to explore the impact of treatment, personality trait and their interaction on the pretest of speaking. The Levene's test showed that the assumption of homogeneity of variances was retained (Appendix C). The results indicated that there was not any statistically significant main effect for type of treatment, $F (1, 76) = .217$, $p = .642$; moreover, the effect size was small (partial eta squared = .003). There was not any statistically significant main effect for personality trait, $F (1, 76) = .793$, $p = .376$; moreover, the effect size was small (partial eta squared = .010). And finally; the interaction effect between group and personality was not statistically significant, $F (1, 76) = .404$, $p = .527$. It also showed a weak effect size (partial eta squared = .005). These results indicated that the groups were homogenous in terms of their speaking ability prior to the administration of the treatments.

Table 3 : Tests of Between-Subjects Effects; Pretest of Speaking by Groups by Personality

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Group	1.513	1	1.513	.217	.642	.003
Personality	5.513	1	5.513	.793	.376	.010
Group * Personality	2.813	1	2.813	.404	.527	.005
Error	528.550	76	6.955			
Total	6033.000	80				

Table 4 displays the groups' means on the posttest of speaking. The results showed that the extrovert EFL learners in the tradition group had a higher mean than the introvert group, while the introvert students in flipped group had a higher mean.

Table 4: Descriptive Statistics; Posttest of Speaking by Group by Personality Traits

Group	Personality	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Traditional	Introverted	10.450	.542	9.370	11.530
	Extroverted	12.000	.542	10.920	13.080
Flipped	Introverted	16.950	.542	15.870	18.030
	Extroverted	14.400	.542	13.320	15.480

A two-way between-groups analysis of variance (Table 5) was conducted to explore the impact of treatment, personality trait and their interaction on the posttest of speaking. The Levene's test showed that the assumption of homogeneity of variances was retained (Appendix C). The results indicated that there was a statistically significant main effect for type of treatment; favoring the flipped group, $F (1, 76) = 67.37$, $p = .000$; moreover, the effect size was large (partial eta squared = .470). There was not any statistically significant main effect for personality trait, $F (1, 76) = .851$, $p = .359$; moreover, the effect size was small (partial eta squared = .011). And finally; the interaction effect between group and personality was statistically significant, $F (1, 76) = 14.30$, $p = .000$. It also showed a large effect size (partial eta squared = .158).

Table 5: Tests of Between-Subjects Effects; Pretest of Speaking by Groups by Personality

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Group	396.050	1	396.050	67.383	.000	.470
Personality	5.000	1	5.000	.851	.359	.011
Group * Personality	84.050	1	84.050	14.300	.000	.158
Error	446.700	76	5.878			
Total	15404.000	80				

However, personality traits did not exercise any significant effect on the performance of the EFL learners on posttest of speaking; thus the second null-hypothesis as "there was not any significant difference between the extrovert and introvert groups' performance on posttest of speaking" was supported. And finally; there was a significant interaction between treatments and personality trait; thus the third null-hypothesis as "there was not any significant interaction between the treatments and personality traits on posttest of speaking" was rejected.

5. Discussion

Based on the results discussed above it can be concluded that the groups were homogenous in terms of their performance on the pretest of speaking. However, there was significant difference between the impact of mind mapping technique on the posttest of speaking of the introvert and extrovert EFL learners in the traditional and flipped classes. According to the results, mind mapping technique had general positive effects on all participants' speaking ability. Previous studies have also referred to the positive effects of mind mapping as it is conducive to EFL learners' speaking ability (e.g., AlWadi & Ismail, 2019; AR, 2017; Ghonsooly & Hosienpour, 2009; Nasution, 2020; Orlova, 2017; Rachmawati et al., 2020; Srihandayani & Marlina, 2019). However, unlike the present study which has concluded that introvert students in the flipped class benefited mind mapping more than extroverts, Yuliani et al. (2019) have come to the conclusion that mind mapping technique has affected both personality types, while extroverts have been more affected by the technique. This discrepancy can be due to application of the flipped method along with the mind mapping technique. However, more studies are required to obtain more reliable results in this regard. So, regarding the second research question, the results show that personality traits did not exercise any significant effect on the performance of the EFL learners on the posttest of speaking.

And finally, there was a significant interaction between treatments and personality trait, as it was shown in the results, the extroverts in the traditional group had higher scores than those in the flipped classes, while the introverts in the flipped classes gained higher scores than those in the traditional classes. The introverted participants benefitted from the flipped class more than the extroverted ones as they prefer quiet contexts, and think prior to each activity. The results of the study contradict Hussain et al., (2020) who confirm that both introvert and extrovert students perform better in flipped classes. According to the results of the current research, the flipped classes helped the introverted participants to have a quiet reflective place before the class in which they were able to think about the topic and prepare their mind maps. The combination of the flipped class and the traditional one gave the introverted participants a chance to balance their time in the WhatsApp group with the traditional classroom. In contrast, the extrovert participants were energized by the traditional class as they tended to be with their peers to think about the topic.

The findings of this study in terms of significant positive impact of flipped teaching strategy on speaking skill of learners are in line with the findings of the previous research studies ran by Amiryousefi, (2019), Chen and Hwang (2020), Lin and Hwang (2018) who concluded that students taught by flipped method outperform those who are taught in traditional classrooms. The application of flipped teaching method makes students more interactive as well as collaborative (Akmal, 2019; Pavenelli, 2018). Sharing mind-maps and brainstorming in the group, helped the participants to improve their collaborative skills. They also experienced fruitful interactions and cooperation with each other and their teacher. According to Zheng et al (2018), flipped classes can improve students' learning outcomes, while significantly enhance their capabilities. Moreover, Goothy et al., (2019)

Chabahar Maritime University
Iranian Journal of English for Academic Purposes   ISSN: 2476-3187
IJEAP, 2021, 10(1), 35-53   (Previously Published under the Title: Maritime English Journal)

came to the conclusion that FCs along with mind mapping technique can lead to positive feedback and effects.

Interestingly, Bohota (2019) found out that a combination of flipped and traditional methods of teaching can result in more interesting learning outcomes for both types of personalities. This is in line with the results of the present study, indicating that the two types of personality can benefit flipped and traditional methods of teaching differently.

6. Conclusion and Implications

The ability to speak English as a foreign language fluently and accurately is considered as an important skill in academic development. In order to achieve this skill, teachers should take their learners' personality into account. This study was conducted to find a response to the inquiry that whether mind mapping technique could help introvert and extrovert EFL learners improve their speaking skills, while also investigating the effect of flipped teaching strategy on their personality traits. This research concludes that the participants' personality traits were interrelated to the teaching method and in order to help learning take place, they should be synchronized.

According to the findings of the present study, it can be concluded that mind mapping technique was effective to help students improve their speaking skills in terms of enriching their vocabulary, promoting their pronunciation, enhancing their grammar, fluency and comprehension. As a result, the mind mapping technique was suitable to help students in improving their speaking, since the technique motivated them to brainstorm the topics before their speaking. Mind mapping technique makes this happen by mirroring the cognitive processes that all human beings go through in constructing understanding and enabling students to see relationships between concepts (Davies, 2011).

On the other hand, the findings of this study showed that the introvert students could benefit more from the flipped classes, while extroverts benefited more from the traditional settings of teaching. Accordingly, it seems that blending traditional classroom with FC can give many positive impacts on students' achievement in both personality types. It might be an impossible task to have a total shift from traditional classroom to FC approach in EFL classrooms in Iranian context and it may require greater effort and time in the development of the online classes. Therefore, this study can be used as an opportunity to make the best use of the traditional and the FC approaches in order to benefit introverted as well as extroverted students.

This study has some valuable implications for teachers and students. First of all, students of both personality types are encouraged to apply mind mapping technique in improving their speaking skills in both traditional and flipped contexts. Since this technique showed its effectiveness in both conditions and for both types of personalities, it can be a good and efficient tool to promote different language skills, particularly speaking. On the other hand, teachers should use mind mapping as a teaching technique at the pre-speaking phase to motivate their students to activate their prior knowledge and generate some ideas about the topic.

While this study provides some beneficial information for researchers, students and teachers, additional research is needed to further explore and understand how educators can evaluate, modify or adapt their usual or preferred teaching methods to meet the needs of both extroverted and introverted students in their classrooms. Thus, it is recommended that teachers consider how to incorporate a variety of Ed-tech tools in their classrooms to provide an opportunity for all students to experience innovative teaching methods and broaden students and teachers view of what is considered participation in the classroom.

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Iranian Journal of English for Academic Purposes   ISSN: 2476-3187
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Appendix A: Pre- Test

Describe your daily activities. What do you do in the morning, at noon, in the evening and at night.

Post-test

Describe what you are wearing now? What do you usually wear at university, outside, at parties and at home?

Appendix B:

David P. Harris' Scale Rating Scores

Aspect	Competency	Score
Pronunciation	Have few traces of foreign accent	5
	Always intelligible, though one in conscious of a definite accent	4
	Pronunciation problems necessitate concentrated listening and occasionally lead to misunderstanding.	3
	Very hard to understand because of pronunciation problems, must frequently be asked to repeat.	2
	Pronunciation problems so serve as to make speech virtually unintelligible.	1

Chabahar Maritime University
Iranian Journal of English for Academic Purposes ISSN: 2476-3187
IJEAP, 2021, 10(1), 35-53 (Previously Published under the Title: Maritime English Journal)

Grammar	Makes few noticeable errors of grammar or word-order	5
	Occasionally makes grammatical and/or word-order errors which do not, however, obscure meaning.	4
	Makes frequent errors of grammar and word-order which occasionally obscure meaning.	3
	Grammar and word-order errors make comprehension difficult. Must often rephrase sentences and/or restrict him to basic patterns.	2
	Errors in grammar and word-order so several as to make speech virtually unintelligible.	1
Vocabulary	Use of vocabulary and idioms is virtually that as a native speaker.	5
	Sometimes uses in appropriate terms and/or must rephrase ideas because of lexical inadequacies.	4
	Frequently uses the wrong words; conversation somewhat limited because of adequate vocabulary.	3
	Misuse of words and very limited vocabulary make comprehension quite difficult.	2
	Vocabulary limitations so extreme as to make conversation virtually impossible.	1
Fluency	Speech as fluent and effortless as that of a native speaker.	5
	Speed of speech seems to be slightly affected by language problems.	4
	Speed are rather strongly affected by language problems.	3
	Usually hesitant, often forced into silence by language limitations.	2
	Speech is as halting and fragmentary as to make	1

Chabahar Maritime University
Iranian Journal of English for Academic Purposes   ISSN: 2476-3187
IJEAP, 2021, 10(1), 35-53   (Previously Published under the Title: Maritime English Journal)

	conversation virtually impossible.	
Comprehension	Appears to understands everything without difficult.	5
	Understands nearly everything at normal speed, although occasional repetition may be necessary.	4
	Understand most of what is said at slower than normal speed with repetitions.	3
	Has great difficulty following what is said. Can comprehend only "social conversation" spoken slowly and with frequent repetitions.	2
	Cannot be said to understand even sample conversation English.	1

Note: Maximum score= 25

$$Score = \frac{The\ result\ of\ score \times 100}{Maximum\ Score}$$

(David P.Harris, 1977:81-82).

-Do the Best-

Appendix C

The researcher tried to run one-way ANCOVA on posttest of speaking after controlling for the effect of pretest in order to explore the research questions; however, as displayed in Table 6, the assumption of linearity was violated. The non-significant results of the linearity test, $F_{(1, 67)} = .847$, $p = .073$.

Table 6: ANOVA Test of Linearity of ANCOVA Model

			Sum of Squares	df	Mean Square	F	Sig.
Posttest * Pretest	Between Groups	(Combined)	155.398	12	12.950	1.118	.361
		Linearity	.847	1	.847	.073	.788
		Deviation from Linearity	154.551	11	14.050	1.212	.296
	Within Groups		776.402	67	11.588		
	Total		931.800	79			

Table 7 and Table 8 display the results of the Levene's tests on pretest and posttest of speaking. The non-significant results of the tests indicated that the assumption of homogeneity of variances was met on both pretest and posttest.

Table 7: Levene's Test of Equality of Error Variances; Pretest of Speaking

		Levene Statistic	df1	df2	Sig.
Pretest	Based on Mean	2.513	3	76	.065
	Based on Median	2.084	3	76	.109
	Based on Median and with adjusted df	2.084	3	70.166	.110
	Based on trimmed mean	2.465	3	76	.069

Table 8: Levene's Test of Equality of Error Variances; Posttest of Speaking

		Levene Statistic	df1	df2	Sig.
Posttest	Based on Mean	1.916	3	76	.134
	Based on Median	1.776	3	76	.159
	Based on Median and with adjusted df	1.776	3	59.485	.161
	Based on trimmed mean	1.969	3	76	.126