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The Role of Literature-Based Activities and Emotional Intelligence in WhatsApp Assisted Writing of Iranian Engineering Students*

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Abstract

The aim of this study was fourfold: (1) to investigate the effect of literature-based activities on the accuracy of Iranian Engineering students' writing (2) to examine the effect of literature-based activities on the accuracy of their WhatsApp assisted writing (3) to determine whether their emotional intelligence (EI) increases through literature-based activities in a WhatsApp assisted setting and (4) to survey the effect of literature-based activities and the produced emotional intelligence on the complexity and lexical diversity of students' WhatsApp assisted writing. In phase I, as students went through literature-based activities, no significant differences of accuracy were found; despite the fact that the mean difference and standard deviation scores were indicative of effective treatment, literature-based activities. In phase II, the results obtained from the analytic procedures of literature-based activities on the accuracy of students' WhatsApp assisted writing showed that the experimental group showed higher accuracy of writing. In phase III, the result of emotional intelligence improvement was more remarkable in the WhatsApp assisted writing. Additionally, the WhatsApp assisted written productions were significantly more diverse in using lexis, t-units and clauses but not other parameters of complexity. The results have some implications for teachers and researchers in the ESP setting.

Keywords: Literature-based activities; WhatsApp assisted writing; Emotional intelligence; Accuracy, Complexity, Lexical diversity.

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Introduction

Over the last century, teaching English as a foreign language has been regularly modernized with new approaches to meet L2 demands in the present modern society. With the advent of social technologies; for example, a number of studies have investigated their influence on ESP students' activities (Bikowski & Vithanage, 2016; Bueno-Alastuey, 2013). Through the interaction created via social activities, students can share information, negotiate meaning, practice critical reflection, and discuss the created controversial issue as much as they wish. They can boost knowledge construction as well as productive responses. The on-line productive responses also improve students' reactions as they discuss different topics and offer a number of profits such as improving the timeliness of feedback, posing new learning opportunities for both givers and receivers of feedback and humanizing the environment in which they produce their writing. Regarding the issue of writing, Andujar (2016) and Wu (2019) stated that document sharing and a daily interaction via online chats provide some opportunities to improve the student's writing performance in terms of fluency, accuracy and lexical diversity as they simultaneously have the potentials to motivate students' inquiry and endorse reflection and critical thinking.

On the other hand, a growing body of research has investigated the influence of other types of activities and strategies on students' writing, as such are literature based activities and application of emotional intelligence strategy (Beheshti et al., 2020; Shao, et al. 2013). However; there is a paucity of research to examine how these kinds of activities and strategies as assisted with mobile technology affect L2 writing performance, i.e., accuracy, complexity and lexical diversity. Therefore, the researchers considered this issue as an important subject to be examined in the present study. Thus, the study was conducted by the following research questions:

Q1. Do literature-based activities influence the accuracy of Iranian Engineering students' writing?

Q2. Do literature-based activities in a WhatsApp setting influence the accuracy of Iranian Engineering students' writing?

Q3: Do literature-based activities in a WhatsApp setting influence more on the emotional intelligence of Iranian Engineering students?

Q4: Does emotional intelligence schooled through literature-based activities in a WhatsApp setting influence the lexical diversity of Iranian Engineering students' writing?

Q5. Does emotional intelligence schooled through literature-based activities in a WhatsApp setting influence the complexity of Iranian Engineering students' writing?

Background

Collaborative writing, social constructivism and social technology

Despite the fact that there are some negative criticism and attitudes towards using social technologies in ESP classes (Dashtestani, 2016; Reinders & White, 2016), they are parts of our personal lives and their positive impact especially on our educational learning cannot be ignored. In fact, collaborative learning created through social technologies is explained by constructivists as a form of learning activity that is performed in group work to undertake an intended educational objective. Vygotsky's sociocultural theory explains this fact more clearly when he states that language learning takes place through collaboration and interaction. He says that collaborative activities improve L2 language skills via zone of proximal development (ZPD) (Vygotsky, 1978). ZPD as 'the gap between what the learner could himself accomplish unaided and what he could accomplish in collaboration with others lets L2 learner work at upper levels of activities and pool his linguistic resources. Many studies have revealed that social technology-supported collaborative writing can lead to more increased involvement in the writing processes, more chances for self-reflect, more level of confidence, more increase of learners' linguistic knowledge, and more attention to meaning rather than form (Bikowski & Vithanage, 2016; Wang, 2015; Wu, 2019). Nonetheless, how social technology- supported collaborative activities can influence students' emotional intelligence and their L2 writing performance in terms of accuracy, complexity and lexical diversity have received little attention and this study aimed to fill this gap.

Emotional intelligence, literature-based activities and WhatsApp setting

Traditionally, the end product of writing was grammar and vocabulary but now writing is considered as a set of intricate cognitive operations that uses a cluster of strategies (Hedge, 2000). One such cluster of strategies in the new approach is the application of emotional intelligence in an ESP setting. The other one can be the application of WhatsApp assisted activities that reduce students' anxiety and improve their language acquisition (Bin- hadi, 2019)

Regarding Ghosn's (2002) statement, emotional intelligence can be nurtured through the feeling found in literary excerpts. With the advent of out-of-class learning (Hafner & Miller, 2019; Sockett & Toffoli, 2012), it is also possible that emotional intelligence could be schooled through WhatsApp setting but how. Let's break down EI into its components, based on Goleman's framework, and discover the relationship between these components, literature-based activities, WhatsApp assisted activities and written productions.

Self-awareness

It is defined as the ability to recognize one's emotions. This helps to form a particular mindset. Different types of activities such as WhatsApp online chats and reading real life represented by literary text provide the opportunity to demonstrate deep knowing of our own self and others' and reflect this particular mindset in written production (Preston, 2003).

Self-regulation

The control of thoughts, performances and emotions by target literature with its strong and influential written grammatical and lexical usage, and the interactions created through WhatsApp indirectly affect self-regulation as students socially are faced with their self-versus others (Barrett, 2013).

Motivation

In the land of literary based writing, it would drive students to return to the caves of literary texts as a model repeatedly since they want to create

high level of creation to be satisfied with. Meanwhile, literary texts as the outcome of the writers' individual feeling about particular aspect of life create a great deal of motivation. Students can simply be encouraged to express their outlook and opinion when they are in the literary-based activities and relate the subjects, topics, events and the characters in the literary texts to their own life (Speck 1985; Tasneen 1996). In a WhatsApp setting, the immediacy of response to the text, a strong bonding and backing created among learners or between learners and teachers help students feel more at ease as they want to reflect their opinions in the text. In such a setting, students find opportunities to speak and to be in contact with others with no formal class limitation as shortage of time, lack of self-assurance, self-confidence and self-reliance that most introvert students are faced with as they want to ask questions in public (Storch, 2013, Yilmaz, 2015).

Empathy

It is the ability to know how you would feel in others' shoes. It takes place in interactions and where individuals are sharing sentiment and emotion with each other and with characters in the story. Thus, WhatsApp setting and literature activities together could create a good atmosphere for it to be nourished (Cunico, et al., 2012).

Social skills

They come into existence when every written word has been influenced or inspired by another human being in a WhatsApp setting or by different characters in short stories. The truth is that our creative vision is the product of community and so is our writing accomplishment. Indeed, interacting with others through online language course enables students to think appropriately and use proper, suitable and accurate expressions, structures and language (Chang & Windeatt, 2016).

Meanwhile, in written responses to literature, students show understanding of literary texts by connecting what has been read to the broader world of ideas, concepts, and issues drawn from the experience of other people. The mentioned activities in written responses to literature strengthen students' choice of words, phrases and structures on their effectiveness since the literary texts as the authentic models of

the target language reflect the real sample of that language. Therefore, their influence on the students' L2 writing style, quality, structure, pattern and organization of ideas could be notable.

Complexity, Accuracy, and Lexical Diversity of Writing

Since accuracy, complexity and lexical diversity can be explained as the target-like use of the language by the L2 learners, they can be measured by the degree of conformity to the target language norms. At first glance, it seems pretty easy to detect a deviation from a target-like use but in operation, this paradigm shows some problems yet to be solved. The error, for instance, can be defined as any deviance from the accepted standard, but which standard is to be accepted as the real standard. Additionally, what is considered applicable in one occasion may not be acceptable in another and it is impossible to have a golden rule that fits all occasions. Nevertheless, with reference to the prescriptive grammar and the commonly accepted conventions in each field, researchers have come to agree upon some major measures.

In the case of accuracy, many studies stated that it can be measured as the proportion of error-free structures to the overall performance (Ahmadian & Tavakoli, 2011; Rahimpour & Hosseini, 2010). To assess the accuracy of language, the researchers considered the parameters in Table 1.

In the case of complexity, SLA researchers quoted complexity as one of language aspects that uses more advanced language and more complex ideas (Skehan, 2009). So, learners' development in complexity can be detected in an increasingly elaborated language and a progressively diversity of patterns (Foster & Skehan 1996).

Table 1.
Parameters of accuracy, complexity and lexical diversity

Accuracy	Complexity	Lexical diversity
Grammar errors (GE)	Clauses (C)	Mean segmental type token Ratio (MSTTR)
Grammar errors per word (GEW)	T-units (TU)	
Lexical errors (LE)	Words per clause (WPC)	
Lexical errors per word (LEW)	Words per T-unit (WPTU)	
Mechanical errors (ME)	Clauses per t-unit (CPT)	
Mechanical errors per word (MEW)		
Proportion of error free T-units (PEFT)		
Proportion of error free Clauses (PEFC)		

In this study, the complexity of written production measured syntactically. From a syntactic point of view, the complexity was mainly measured by the total number of separate clauses that are divided by the total number of sentential units, e.g. T or C-units (Ellis 2012). As the complexity of the text measured with the help of software in this study, other parameters as words per clause, words per t-unit and clauses per t-unit were also considered to further examine the researchers' results.

In the case of lexical diversity, the number of different words used in a text is the benchmark of analysis. The more varied the vocabulary manifested by a text, the higher lexical diversity and the less repetition of already-used words would be. In this study, the D measure compares 100-400 text-length written productions (McCarthy, 2007). Table 1 shows different parameters used in this study to compare the accuracy, complexity and lexical diversity of L2 written productions.

Method

Participants

In the present study, the participants were 71 MSc intermediate freshmen learners selected from among 101 university students of Engineering Faculties in Isfahan, Iran. They were all between 20–25 years old. They were native speakers of Persian and they had passed 11-credit English courses in their Bachelor program, and had little extra exposure to English language except in cases which are almost no possibility to control for such as internet and the normal TV programs. None of students had any external chance to use English language for communicative purposes outside the classroom context and they had never been to an English-speaking country and approximately all had passed the English courses with significantly no different mean scores. Almost all students were familiar with WhatsApp services and had mobile phones with a 3G internet connection as well as an available Wi-Fi at the University at the time of the study. They participated in the following study shown in Figure 1. Their productions in phase II were handled by the teacher in three different links.

Instruments

This study focuses on determining the influence of ESP students' literature-based activities and emotional intelligence on their WhatsApp assisted writing. At first, participants were homogenized in terms of proficiency level via the procedure of Tavakoli and Skehan (2005). Then, WhatsApp application is used to boost interaction and participation in a foreign language classroom. Other instruments such as questionnaires (TEIQue and demographic information), and writing tests of accuracy, complexity and lexical diversity were also used in the present study. Following foregoing studies of written texts (Dobao 2012; Goleman 1995; Wigglesworth & Storch 2009), emotional intelligence, accuracy, lexical diversity and syntactic complexity were measured and the data analysis was performed by using means, standard deviations and independent sample t-tests.

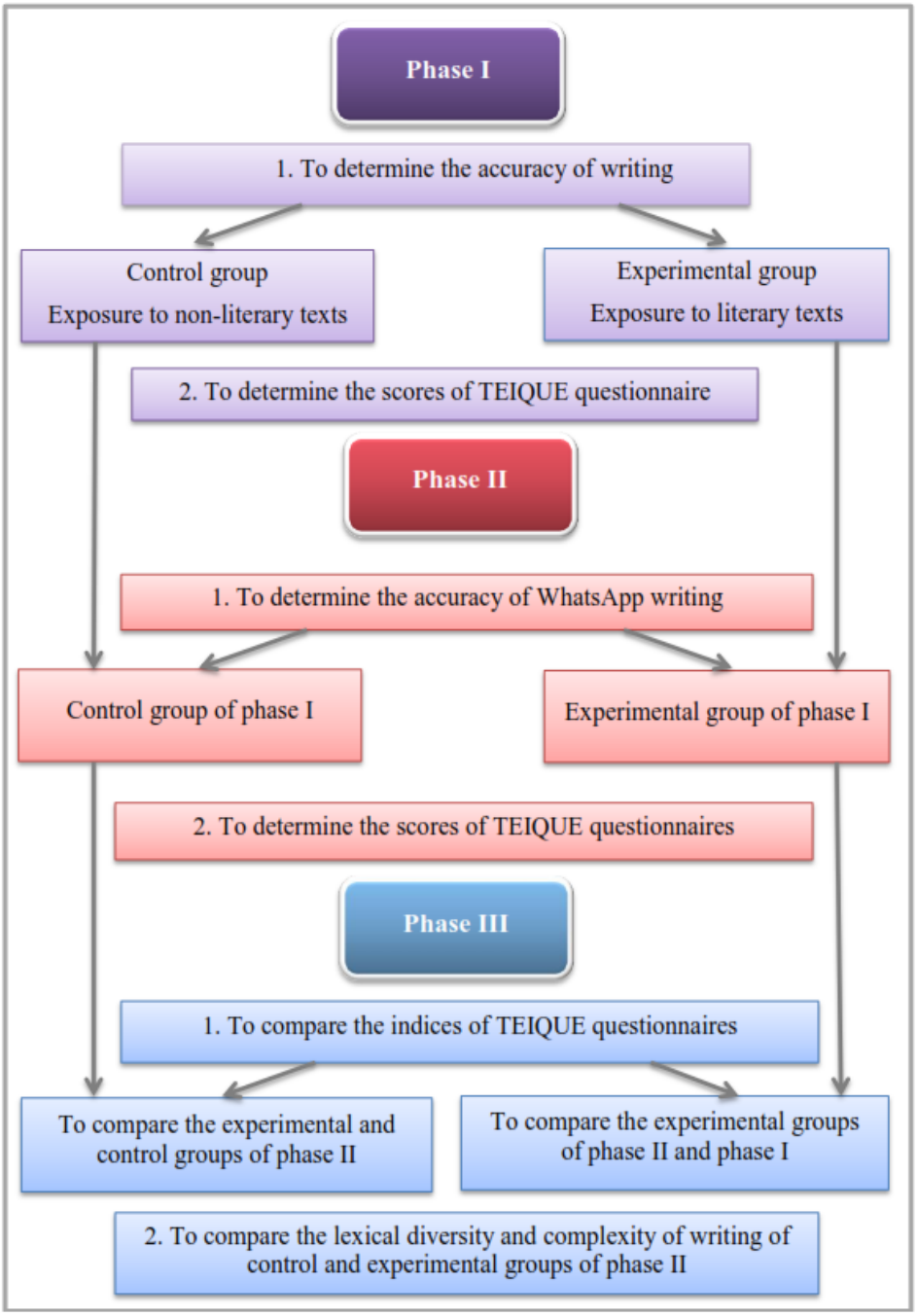

Figure 1. Design of study

Procedures

After homogenizing the ESP learners at Engineering Department, they were randomly assigned to two groups and the study was conducted in 3 phases. The length of the whole study was 8 months and the students participated in the assigned activities for almost 6 hours per week.

Phase I

As the influence of literature-based activities on emotional intelligence, complexity and lexical diversity of writing was determined in the previous study (Beheshti et al., 2020), only their influence on the accuracy of writing was investigated in phase I.

Experimental group activities

In the first phase of study, some short stories with high emotional content were administered to the subjects in the experimental group and they were asked to write about both their own emotions and those of minor and major characters in the story. They were also asked to answer some questions related to the content of reading, following Goleman's EI framework. Then, they were asked to write a narrative essay based on events of literary pieces and Vermont framework (Vermont Department of Education, 2002). Following Vermont standard- based rubrics for responses to literature; students separate a whole into its parts with an examination of these parts to find out their nature and function. Here is a part of one of short stories given to students.

> …. Her husband, Bill went over to his wife and forced the slip of paper out of her hand. It had a black spot on it. Bill Hutchinson held it up, and there was a stir in the crowd. Tessie Hutchinson was in the center of a cleared space by now, and she held her hands out desperately as the villagers moved in on her. 'It isn't fair,' she said. A stone hit her on the side of the head. Old Man Warner was saying, 'Come on, come on, everyone ….

The Lottery by Shirley Jackson

After reading such a text, the teacher asked students the following questions to implement implicitly Goleman's framework of thoughts.

- Are you able to express your emotions well in such a case?
- What reaction makes you satisfied in objection to the villagers' actions?
- What would you do to feel a bit better if you were faced with such a situation in your life?
- How could the villagers turn the hurtful events to positive outcomes?
- How does your life get better today with new kinds of harmful happenings that occur to you every day?

Then, students were encouraged to make a list of appropriate words used by different characters in different situations and write a narrative essay by putting themselves into the shoes of other characters and express themselves from multiple points of views. They were also asked to simulate literary vocabulary, structures, sentences and phrases and connect them in a logical, cohesive fashion, using specific and concrete details of literary text with appropriate quotes. In this way, students' writing became closely similar to original works as they analyzed and simulated literary texts.

Throughout the study, the teacher attempted to empower students through useful feedback and to ease their tension via active engagement in text in order to raise the level of emotional intelligence and to enhance the academic achievement of learners and to make these practices as automatic and integral components of their mind.

Control group activities

Students in the control group were asked to read some ordinary narrative readings. The teacher provided them with the explanation of some challenging vocabulary, phrases and some ambiguous cultural differences which may limit their ability to understand the text. Then, they were asked to talk and to write about their own related experiences based on internalizing the ideas, terms, phrases and structures they met. The teachers' role is the same as what she played in experimental group activities and the students were taught through didactic lectures as the experimental group in phase I.

Phase II

Since the circulation of mobile technologies has created enormous possibilities for language teaching and learning, the present paper in phase II assumed to have relevance with it as its focus. Among different technologies, WhatsApp as an interactive and collaborative tool was chosen in this study. After assuring of the fact that the same participants in the control and experimental groups of phase I could use the program, they were asked to participate in the following activities.

Experimental group activities

The students were asked to write simple narrative texts on literary topics which were explained and worked on in class in phase I in the WhatsApp setting. Later they were asked to share their productions with each other and make comments on each other's written productions. As students carried on their chatting, the teacher wrote her comments on their narrative essay, posted the necessary information and uploaded documents that were useful to foster students' writing skills. Since every two- hour message of WhatsApp was automatically backed up on the mobile, the teacher and students could back up their saved backs or send them to their own email and refer to them when they were needed. Meanwhile, the teacher's reformation text and students' homework were electronically sent and posted in the group which could be followed by open audio, video or class chat feedback activities. Throughout the study, every student could also have a direct channel to access to feedback and comment on his work from the teacher and his classmates. The teacher's role here was to prevent non-target like strategies, forms and practices and provide students with some guidelines. She provided feedback in the document and gave advice led to higher accuracy, too.

At the end of these online sessions, students were asked to participate in a face to face class test and write the same narrative story written at the post test of phase I, which was presumed to be the result of pre-test in phase II, in order to compare scores of accuracy parameters with pre-test results.

Control group activities

The control group in phase II went through the same process as in phase I but the difference is that their writing was produced through WhatsApp mediation. At the end of these online sessions, their WhatsApp assisted written productions were analyzed and compared with participants in the experimental group who were exposed to literature based activities via WhatsApp mediation and with the control group of phase I who attended in a formal face to face class.

Phase III

As the positive results of raising accuracy scores were determined in phase II, the researchers in phase III decided to determine the outcome of emotional intelligence scores of students whose activities were in a WhatsApp setting. They also examined the results of post-test complexity and lexical diversity of WhatsApp assisted writing in this phase.

Results

The results of phase I, phase II and phase III are summarized under two sub-titles as follows.

Findings of literature-based treatment on L2 face to face class writing

Table 2 shows the descriptive statistics of mean scores of accuracy for both the control group and experimental group preceding the treatment, literature-based activities. As shown in Table 2, the mean difference and standard deviation scores of accuracy tests are very alike across the two groups.

Table 2 shows that $p > 0.05$; therefore, the difference in the means of the two groups was not significant and the two groups were equal in terms of accuracy.

Table 2.

Pre- test measures of components of accuracy in phase I

Parameters	Control Group			Experimental Group		
	MD	SD	Sig.	MD	SD	Sig.
GE	0.86	3.12	0.11	0.97	3.51	0.12

GE	0.74	4.01	0.31	0.70	3.89	0.21
LE	1.09	2.00	0.28	0.99	2.51	0.17
LEPW	2.32	3.23	0.12	2.41	3.43	0.13
ME	3.01	4.09	0.12	3.21	4.21	0.34
MEPW	2.12	4.43	0.33	2.31	4.23	0.24
PEFT-U	0.65	2.43	0.21	0.83	2.13	0.41
PEFC	0.19	0.52	0.10	0.17	0.25	0.18

Post-test scores of phase I subsequent to the treatment show the increase of mean difference and decrease of standard deviation in Table 3.

Table 3 shows that literature- based activities had positive effect on the written productions of ESP learners but no significant differences between pre and post test scores were determined.

Table 3.

Post- test Measures of Components of Accuracy in Phase I

Parameters	Control Group			Experimental Group		
	MD	SD	Sig.	MD	SD	Sig.
GE	0.96	2.92	0.12	2.10	1.56	0.16
GEPW	0.83	3.91	0.21	2.28	2.98	0.11
LE	1.14	1.90	0.21	2.32	2.01	1.70
LEPW	2.41	2.99	0.24	4.45	3.09	1.23
ME	2.16	4.19	0.10	3.29	1.77	0.33
MEPW	1.28	3.92	0.33	3.91	0.12	0.49
PEFT-U	0.78	2.99	0.43	1.82	1.37	0.11
PEFC	0.26	0.08	0.43	3.15	0.13	0.33

Findings of literature-based treatment on L2 WhatsApp assisted writing

In the second phase of study, the researchers investigated the influence of literature-based treatment on WhatsApp assisted writing in terms of accuracy. Indeed, the post test result of accuracy in phase I was supposed to be the result of pretest in phase II.

Table 4.

Post-test measures of accuracy of control and experimental groups of Phase I in Phase II

Parameters	Control Group			Experimental Group		
	MD	SD	Sig.	MD	SD	Sig.
GE	1.01	1.99	0.20	4.95	3.51	0.12
GEPW	1.00	2.98	0.13	4.70	3.89	0.01*
LE	1.00	2.89	1.24	4.99	2.51	1.87
LEPW	2.02	2.92	0.12	5.41	3.43	0.03*
ME	2.01	3.99	0.32	5.21	4.21	3.34
MEPW	1.09	3.34	0.19	4.31	4.23	0.04*
PEFT-U	0.38	2.21	0.12	0.83	2.13	0.01*
PEFC	0.72	0.50	0.00	0.17	0.25	0.08*

*Statistically significant difference between experimental and control groups ($p < .05$)

As shown in Table 4, WhatsApp assisted productions show higher accuracy compared with those created in a formal face to face class. The higher mean difference and the lower standard deviation are indicatives of this fact but statistically significant differences were only found in the experimental group. The Sidak test result for multiple comparisons ($p < 0.5$) also reinforces this fact.

As the researchers found out the WhatsApp significant results of accuracy in the second phase of study, they decided to analyze WhatsApp assisted writing of those students who are exposed to literature based activities in terms of emotional intelligence, complexity and lexical diversity. Table 5 shows the emotional intelligence results in online setting and face to face class.

Table 5.

Measures of emotional intelligence

Phase I						Phase II					
Control group			Experimental group			Control group			Experimental group		
MD	SD	Sig.	MD	SD	Sig.	MD	SD	Sig.	MD	SD	Sig.

1.21	4.59	0.11	2.63	1.78	0.01*	1.90	3.78	0.00*	3.21	0.98	0.00*

*Statistically significant difference between experimental and control groups ($p < .05$)

Table 5 shows that literature- based activities influence ESP students' emotional intelligence and when these kinds of activities done in a WhatsApp setting, the result is more significant due to the lower rates of standard deviation and higher mean difference. Meanwhile, the comparison of mean differences and standard deviations in the two control groups in phase I and phase II shows that WhatsApp application was influential in emotional intelligences development of all students. Then, to compare WhatsApp assisted writing of the control and experimental groups in terms of lexical diversity and complexity, the post test results of their writing in phase I were analyzed to be used as the pretest for phase II.

Table 6.

Measures of lexical diversity and complexity of phase I used as a pretest in phase II

	Control Group			Experimental Group		
Parameters	MD	SD	Sig.	MD	SD	Sig.
MSTTR	2.44	2.00	0.21	3.79	0.90	0.00*
Complexity	1.11	3.69	0.24	3.08	1.75	0.21

Table 6. shows that there are statistically significant differences between experimental and control groups ($p < .05$) in terms of MSTTR but not in terms of complexity. Then, the WhatsApp written productions of students were analyzed as they were exposed to literary and non- literary texts. The results are shown in Table 7.

Table 7.

Post- test measures of lexical diversity and complexity of control and experimental groups of phase II

	Control Group			Experimental Group		
Parameters	MD	SD	Sig.	MD	SD	Sig.

MSTTR	2.84	1.23	0.15	4.99	0.09	0.00*
Complexity	1.71	3.29	0.24	3.98	2.15	0.21

Descriptive statistics of post-test scores in Table 7 revealed a weighty difference in standard deviation and mean difference values of the control and the experimental groups in terms of lexical diversity and complexity; whereas, the result of independent t-tests with alpha level of 0.05 showed no significance difference of complexity in experimental group but a significant difference of lexical diversity.

Discussion

Overall, this study reinforces the idea that exposing students to literature-based activities via WhatsApp assisted writing leads to the development of students' emotional intelligence and their L2 writing in terms of accuracy, lexical diversity but not complexity.

Concerning the first research question, the influence of literature-based activities on the written productions of ESP students, the result indicated no significant effects of these activities on the accuracy of ESP students' written productions; despite the fact that authentic literary texts with various learning styles, structures and vocabulary of target language are reliable sources of language and linguistics inputs that help students practice the four skills, and so does writing (Speck 1985; Tasneen 1996). Of course, the decrease of standard deviation and increase of mean differences are indicative of the fact the treatment, exposing students to literature based structures, was not so ineffective. Indeed, literature is not referential but representational. While referential language tends to be informational only at one level, literature with its representational language presents the perceptions and feelings of the real world that students experience every day. Thus, the target like vocabulary and structure implicitly remain in mind as the reader follows the presented experience step by step.

Referring to the second research question, the accuracy increase of WhatsApp written productions of ESP students who were exposed to literature-based activities can be tracked through the analysis of language-related episodes (LREs) aroused as a result of learners' collaboration (Swain & Watanabe, 2012) in the WhatsApp community.

Indeed, literature-based writing created in a WhatsApp atmosphere can be ended up in creating target like forms as mistakes were corrected by the teacher who supervised, monitored and examined the activities closely in the WhatsApp application and simultaneously drew his students' attention towards authentic and original literary text used as a model. Throughout the study, their written productions, if necessary, were reformulated by the teacher. Honaoka and Izumi (2012) as well as Wang (2015) recommended that reformulated parts help to raise lower proficiency of learners, promote participants' noticing, and provide immediate feedback to the participants. As students focused on language, questioning their language use or correcting themselves or others through LREs, novice learners construct and promote their knowledge in collaboration with more capable individuals (Dobao, 2012) and through the fertile ground created for LREs, and through the combination of error perception and negotiation of meaning, accurate writing development takes place (Bin- hadi, 2019; Bueno-Alastuey, 2013). The mentioned statements reinforce the importance of sociocultural theory (SCT) that explains co-authored writing can push learners to use language as a tool to pool L2 resources together to scaffold their writing (Storch, 2013). Obviously, students who are provided with this chance could produce texts with a richer, clearer and stronger structure and organization of ideas, and also with better quality and quantity of arguments (Zhang, 2018). Therefore, students' involvement in a joint and collaborative work in every stage of the writing process, in consort with sharing feedback of the teacher and peers, could help students form their ideas and meaning nearer to the targeted goal (Kim et al. 2010), especially when literature acts a model and reference data. Overall, in the second phase of study, beside the injection of a rich input of vocabulary, syntactic forms and structure extracted from literary texts into L2 learners who participated in the literature based activities, in the WhatsApp assisted atmosphere, instead of only one source of input, all inputs of students who participate in the creation of writing collected together to fulfill real communicative needs. This cooperative learning proceeding encourages students to be more accurate in their writing activity.

The result in phase II also supports the claims of scholars who mention that corrective feedback helps learners to notice their errors in their written productions (SriRahayu, 2016). Thus, it is plausible to see the increase of error- free productions as a result of immediate corrective feedback that guides students step by step to compose their accurate micro-scripts that leads to writing a concluding manuscript appropriately.

Relating to the third research question; students' literature-based activities in a WhatsApp setting influence their EI more than when students were exposed to literature-based activities in a face to face class. As students were faced with the didactic lecture, vis-a`-vis the possibility of exposing to literature-based activities, their EI will be nurtured and schooled (Beheshti, et al., 2020; Ghosn, 2002; Shao, 2013). Exposing those learners to WhatsApp assisted learning also doubles the result of EI. Because learners can improve their self-confidence, self - awareness and empathy and also increase their learning presentation in a stress-free environment that has significant impact on their motivation (Yilmaz, 2015). Hussin et al. (2015) stated that factors contributing to ESL/ESP writing anxiety and apprehension might be tackled through the use of online learning environments. Meanwhile, these rubrics as an individual's motivation, empathy, sociability, self- confidence, and backing through editing and revision stage in a stress free community that stimulated both through literature-based activities in a WhatsApp setting are the bedrocks of Goleman's EI framework which influence ESP learners' writing performance (Goleman, 1995; Shao, et al., 2013). Thus, the raise of TEIQue score as a result of literature-based activities and due to WhatsApp application can be reasonably justified as a sound consequence.

Returning to the fourth and fifth research questions, the higher lexical diversity in phase II can first be attributed to the statements of some scholars (Andujar, 2016; Bikowski & Vithanage, 2016; Lund, 2008; Mahdi, 2018; Ortega, 2007) who express the role of social technologies and mobile devices in L2 writing as facilitators that improve vocabulary language learning as well as L2 writing skills and

performance. And second to the characteristic of authentic and original literary texts themselves which provide profound and multiple sources of vocabulary, syntax and structures. And third to the raise of EI which in turn leads to the success in language skill and L2 achievement (Abdolrezapour & Tavakoli, 2012; Fahim & Pishghadam, 2007; Parker, 2004; Pishghadam, 2009; Rouhani, 2008; Shao et al., 2013). The complexity results of ESP students' written productions are also in line with trade-off hypotheses (Ahmadian & Tavakoli, 2011; Skehan & Foster, 1999) in which ESP learners with a narrow attentional capacity cannot equally pay attention to all proportions of CAF in L2 production. These results do not support Robinson's cognition hypothesis, which argues that language learners have accessible parallel resources and can equally and easily address all dimensions of L2 production when they carry out a cognitive performance (Robinson, 2001).

Meanwhile, despite Korpi' s (2016) idea that exposing ESP students to literature-based activities has weighty positive effects on the CAF of their writing, a rational conclusion grown from findings of this study and the previous one (Beheshti et al., 2020) revealed no such an influence on the accuracy and complexity of writing. However, when these kinds of activities take place in an interactive platform provided through WhatsApp setting, the created bedrock facilitates the increase of students' L2 written productions. This finding is in line with numerous previous scholars' ideas regarding advantages of mobile online technologies in English Language courses (Mahdi, 2018; Wue, 2019).

Conclusion

Consequently, the present study reinforces the hypothesis that exposing ESP students to literature-based activities in a WhatsApp setting leads to the development of their emotional intelligence as well as the accuracy and lexical diversity of their written productions. The justification behind these findings can be attributed to LREs happened in the application, to the reformulation done by teacher, to the corrective feedbacks and to the bedrocks created through the atmosphere of authentic and original literary text in WhatsApp community, where

learners use language as a tool to pool or scaffold L2 resources together in a free-stress society.

Regarding the syntactic complexity, no statistically significant difference was yielded in this study and the result behind this can be attributed to the trade-off theory. Briefly, it can be concluded that the use of swift and incessant developments in mobiles technologies offers numerous tools and means to the use of teachers in the language writing classroom and further studies could be conducted in order to shed more light on this issue.

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