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The Impact of Google Translate on Creativity in Writing Activities

Ayşe Tuzcu[a] *

[a] Turkish Ministry of National Education, Turkey, https://orcid.org/0000-0003-4770-2408

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Abstract

The fact that machine translators are accessible and free has brought them in the spotlight as educational tools in the field of language education. However, little amount of research has focused on its effect on creativity. This quasi-experimental study searched for the impact of using Google Translate (GT) on creativity as a pre-editing tool in writing activities with low proficient EFL learners. The four components of divergent thinking - fluency, flexibility, elaboration and originality - were investigated in pre and post tests and a statistically significant difference was found out for each item with a Wilcoxon test for fluency, originality and elaboration and with a paired sample T-test for the flexibility scores. It is concluded that implementing machine translation in writing activities as a pre-editing tool increases the creativity in the writen products of low proficient EFL learners.

Keywords: Creativity in writing activities, Google Translate, machine translation.

1. Introduction

Machine translation has gained popularity with the incredible improvements in technology in this rapidly changing global world. It is free and offers many opportunities for those who want to communicate in a foreign language. Therefore, language learners have been attracted by this accessible technology and have not ignored it in their language learning experiences. Research about implementing machine translation in language learning has shown that learners make use of MT to study vocabulary, to practice reading and writing skills (Kumar A., 2012; Alhaisoni & Alhaysony, 2017; Lee, 2019). In addition, learners keep addressing MT although it is frown upon by their teachers or the regulations which ban mobile phones in classrooms (White & Heidrich, 2013). Such a popular technology among the language learners has been investigated from many points of view: perception, grammar and lexical knowledge; however, a very important point has been neglected: creativity. Creativity has been questioned in educational research for many years. Creative personality, creativity in a product and the impact of the age, society, technology, education or the atmosphere on creativity are some of the investigated issues. However, there is little research which combines machine translation and creativity in language learning. Bearing these in mind, the present research tries to shed a light on this question:

* Ayşe Tuzcu. Turkish Ministry of National Education, Turkey.
e-mail adress: aysepisiren@gmail.com

- How does implementing machine translation in writing activities in English affect the participants' creativity in terms of fluency, flexibility, elaboration and originality?

The present research is significant in that it focuses on this research question by combining these two different topics: machine translation and creativity. What is more, the participants are low-level EFL learners, which is also rare in studies about implementing machine translation in writing activities.

2. Literature Review

2.1. Creativity

J. P. Guilford (March 7, 1897 – November 26, 1987) was one of the leading figures in factor analysis in creativity research. Thanks to his presidential address to the American Psychological Association in 1950, research in creativity gained speed (Amabile, 1983; Treffinger, Young, Selby and Shepards, 2002; Runco, 2004; Barbot, Besançon and Lubart, 2011) although research in creativity had already started back in the first half of the century (Runco and Jaeger, 2012).Guilford (1950) defines creativity as a "combination of abilities" which can be found in every individual in different amounts (as cited in Rubinstein, 2003; Runco & Jaeger, 2012). According to him, every human being somehow can bear creativity in his/her acts. Guilford offers a theory on human intelligence named "The Structure-of-Intellect" (SOI; Guilford, 1956). He argues that human intelligence is a combination of many mental factors and it is not dominated by only one of them (Behr, 1970). In his Structure of Intellect Theory (SOI), Guilford (1968) makes a distinction between divergent thinking and convergent thinking (cited in Rubinstein, 2003; Kozbelt, Beghetto and Runco, 2010). Convergent thinking is the process leading to a convergent product, which is defined by Guilford as "Generation of information from given information, where the needed information is fully determined by the given information; a search for logical imperatives" (Guilford, 1970, p.158). On the other hand, divergent thinking is the process of creating a divergent product, which is again described by Guilford as "Generation of information from given information, where the emphasis is upon variety and quantity of output from the same source; a search for logical alternatives" (Guilford, 1970, p.158). He suggests that original and novel ideas or products are more likely to emerge when the creativity test allows divergent thinking. He is of the opinion that the more the participants are allowed to think farther from the starting point, the more they are likely to be creative (Kozbelt et al., 2010).

Guilford, as a factor analytic scientist, proposes that divergent thinking, which focuses on creative thinking, has four components: Fluency, flexibility, elaboration and originality (Hickey, 2001; Kim, 2006). According to Runco and Acar (2012), although divergent thinking had been mentioned in previous studies, it was Guilford who made the systematic connection between divergent thinking and creativity;therefore, divergent thinking tests now are investigating on fluency, originality, flexibility, and elaboration. For example, the most widely used creativity test Torrance Test of Creative Thinking (TTCT; Torrance, 1974), which is a pen-and-paper test, basically depends on the idea of divergent thinking and the responses of the test takers are considered in terms of fluency, flexibility, elaboration and originality (Hickey, 2001; Kim, 2006). The quantity of the responses is the fluency score; the number of the categories in the list is considered as the flexibility score; the number of the infrequent responses in relation to the others' responses in the group is the originality score; the number of the details determines the elaboration score. In Guilford's words "Fluency is a matter of facility with which an individual retrieves information from his personal information in storage" (Guilford, 1966, p. 188). The only source for an individual to find out information in order to create something is his memory. Torrance (1990) describes fluency as the number of the ideas or thoughts that are listed by a single participant. The scoring demonstrates the ability of the individual of creating a flow of figural image. Flexibility is defined by Guilford as "a matter of fluidity of information or a lack of fixedness or rigidity. Novel output

automatically implies new and unusual uses of retrieved information and also revisions of that information" (Guilford, 1966, p. 188). It is considered as the basis of originality. The tests ask the participants to produce titles for poems, stories or riddles; or to talk about the consequences of a particular event. Originality is usually described in terms of novelty (Runco & Acar, 2012). The most infrequent ideas or thoughts are considered as the original ones. Originality of ideas are simply labeled by collecting ideas and identifying the most infrequent ones. Ball & Torrance (1984) and Torrance (1990) describe originality in a similar way: the number of the unique ideas orthoughts that is stated by a participant, which shows the ability of an individual to produce unique and uncommon ideas. The scoring is based on normative data. Uniqueness is decided by compiling all the responses in the group and an idea or thought that is stated once in the group takes 1 and the others take 0 (Kim, 2006; Nusbaum and Silvia, 2011). The last component of creativity is elaboration. It is regarded by Guilford as "a facility for adding a variety of details to information that has already been produced" and it is called as "finishing touches" (Guilford, 1966, p. 188). According to Torrance (1990) elaboration is the number of the additional ideas, which proves the ability of an individual to produce and elaborate ideas. The test of elaboration can be conducted by giving an outline of a plan for a fair and ask the participant to elaborate the plan in order to organize a successful fair.

The fact that Guilford made this distinction between convergent and divergent thinking has not put an end to the contention in the measurement and assessment of creativity resulting from the diversity in definition. Therefore, the reliability and validity issues in the techniques are still a challenge for the researchers. Barbot et al. (2011) argue that:

> *Due to the multiplicity of the conceptual approaches of creativity used at that time, the field of creativity assessment was viewed as experiencing a "mid-life crisis" with a problematic proliferation of assessment techniques showing lack of definition and limited educational applications. Most of these numerous techniques and new assessment tools have also been critizied for their weak psychometric properties or lack of up-to-date norms to situate individual performance in developmental, gendered and cultural relevant groups of comparison. (p. 59)*

In other words, the vagueness in the definition of creativity results in the difficulty of creating new, reliable and valid techniques in creativity assessment. Nevertheless, there are attempts to assess creativity. For example, there are some validated tests created by the pioneers, such as "the Alternate Uses" test by Guilford in the 1950s; "the Torrance Test of Creativity" (the TTCT) by Torrance based on the Guilford's previous psychometric studies; "the Abbreviated Torrance Test for Adults" (ATTA) by Goff and Torrance (2002); "the Abedi Test of Creativity" (ATC; Abedi, 2000) and many other divergent thinking tests. In addition, generating a creativity test proposes another challenge for the researchers: scoring. There are some different ways of scoring in such divergent thinking tests which are mainly concerned about the fluency, flexibility, originality and/or elaboration. The most common one is generated by Wallach and Kogan in 1965 as cited in Silvia, Winterstein, Willse, Barona, Cram, Hess and Richard (2008). The test requires the participants to write about unusual uses of an objects, e.g. a brick, a cardboard, a knife and the raters count the responses of each participants in order to determine the score for fluency and then they search for the responses that are stated just once in the study group in order to determine the score for uniqueness, in other words originality. The statement that is mentioned once gets 1 point and the others a 0. Therefore, the results indicate two results, one for quantity, and the other for quality of divergent thinking (Silvia et al., 2008).

2.2. Machine Translation

Machine translation (MT), the starting point of which was to form a universal language (Rehm, Sasaki, Stein & Witt, 2018), is defined as "the process by which computer software is used to translate and compatible with PC systems and smart phones" (Lee, 2019). Now that machine translation has become an essential part of communication in this global world, it has recently gained reputation in recent educational research as a promising source of information, especially in foreign language classrooms. Among the studies on machine translation, Chandra and Yuyun (2018) studied on how students made use of Google Translate (GT) in writing tasks and they found out that the students mostly regarded GT as an online dictionary and looked up words rather than translating full sentences or texts. In addition, Garcia & Pena (2011) searched for its impact on beginners' writing skills. They found out that the participants communicate better via machine translation when they write directly in their foreign language. In other words they can produce more sentences when they get help from machine translation. O'Neill (2011) follows a more complicated process in order to find out the effect of using machine translation in teaching French as a foreign language. The results suggest that the first two groups did better compared to the control group in overall comprehensibility, content, spelling, and remaining grammar and the difference is statistically significant. A study by Lee (2019) employs a different procedure in writing. The results show that using machine translator as a CALL tool reduces the level of lexico-grammatical errors and has a positive impact on students' revision ability. What is more, the students state in the interview that they are in favour of using machine translation in their writing classes. A similar procedure is employed by Tsai (2019) and the results are more or less similar. The use of Google Translate in writing results in less grammatical and lexical errors providing students with more advanced level of vocabulary. However, as can easily be seen from the examples above, there is little research compiling creativity and machine translation. The present study is significant in that ithas a different point of view for the impact of using machine translation in writing activities on creativity.

3. Methodology

The research on MT is numerous; however, its implementation in the foreign language education field has been the subject of few studies with especially beginner level of participants. What is more, the effect of machine translation as a learning tool on creativity has rarely been a research subject. Accordingly, the aim of this research is to put light on the potential of MT as a MALL tool in foreign language classrooms in terms of creativity.

3.1. Research Model/Design

This study had a one-group quasi-experimental design. The study had not an experimental group. It lasted for ten weeks including a training session, pre and post-tests. Quantitative data were collected through a pre and post-test design and were analysed in terms of four components of creativity by the researcher.

3.2. Participants/Sampling

The present study took part in a state Anatolian high school in Bursa, Turkey in the first semester of the educational year with 35 of the 9th grade students who were all beginners as EFL learners. Their parents had given a consent form. As the study had a quasi-experimental design there was only one group of students who had a pre-test, a training session, a seven-week treatment and a post test.

3.3. Instruments/Materials

The quantitative data set includes the products which students wrote in pre and post-tests. Implementing MT in writing tasks in EFL classes forms the core of the present research so one of the most frequently used mobile applications, Google Translate (GT, https://translate.google.com.tr/), was decided on to be the instrument of the study. In addition, GT is a free and accessible application for every operating system used for mobile devices and has an easy interface. It can also offer instant translation, which helped with the time management during the implementation. GT provides dual translation in more than a hundred languages. However, the methods it uses while translating and how accurate the translation are out of the scope of this research. The only thing that is concerned is whether using GT affects the creativity of the participants. Thus the students brought their mobile phones to the classroom and operated GT application during the treatment process. Due to the technological deficiencies in the classroom, it was made sure that every student had a personal Internet access. The researcher shared the Internet with those who needed.

3.4. Procedure

3.4.1. The implementation of the pre-test and the post-test

In much of the research on MT, the participants were require to translate or write a text with MT and these artifacts were evaluated to search for its impact on vocabulary or grammar knowledge, participants' strategies or their perceptions (see Alhaisoni and Alhaysony, 2017; Bahri and Mahadi, 2016; Calis and Dikilitas, 2012; Case, 2015; Clifford, Merschel and Munné, 2013; Garcia and Pena, 2011; Groves and Mundt, 2014; Jin and Deifell, 2013; Jolley & Maimone, 2015; Kliffer, 2005; Kumar, 2012; Nino, 2008; Nino, 2009; Tsai, 2019; White and Heidrich, 2013). One of them was conducted by White and Heidrich (2013) and they required the participants to write in their first language, English in that case, and then translate it into their foreign language, which was German, by using machine translation and lastly they were asked to make necessary editing to create a final work. Their aim was to see the participants' strategies in translation tasks. In another study by Garcia & Pena (2011), the participants were divided into two in the writing process. One of the groups wrote by means of machine translation assistance and the other group wrote directly in their second language in order to see which way was more productive in written communication. They found that participants could produce more number of words by using machine translation and also the quality of the writings was higher with MT assistance. O'Neill (2012) conducted an experimental research in order to find out the impact of MT on the participants' writing skill. During this research, which is unique in the MT field in terms of being experimental, the students had an instruction process and made use of MT but in the pre and post-test they were not allowed to use it, so that their sheer writing ability could be revealed. The current research combines these techniques. For the pre-test, the students produced a paragraph and wrote about a stick man in English without any help from any MT or any friends, as in the research by O'Neill (2012). The content was not restricted; they were free to write anything they wanted about the stick man. As for the post-test, the students were asked to write a text directly in English in twenty minutes by looking at a picture of a blurry image of a human which is very similar to the stick-man in the pre-test. Then they consulted to Google Translate in order to pre-edit their writing and create a final version in another 20 minutes. These final versions were regarded as post-test products. As for creativity aspect of the pre and post-test, according to a study conducted by Amabile (1988), 74% of the participants mention that freedom is among the qualities of an environment which fosters creativity. In other words, these people possess the opinion that they can be more creative if they are free to have control over their own work, making their own decision about how to manage their study. Thus, in the pre-test the participants were provided just with a drawing of a stick man, which was an adaption of a study by Baer (1994), and a blurry figure of a human-being in the post-test as a prompt to start writing and they were told that they were free about whatever or however they

wanted to write about these pictures. On the other hand, in the same study by Amabile (1988), 52% of the participants state that they need sufficient sources to be creative. Namely, they feel themselves more creative when the necessary resources such as information or equipment is accessible. Therefore, the students were just required to imagine and to write about these pictures on a piece of paper in the allotted time and they were not allowed to add any details by drawing in case they might feel inhibited just because they did not have necessary equipment or drawing skills.

3.4.2. The instruction process

Before starting writing with Google Translate the participants were given a one-hour training session on how to use Google Translate and how to type machine translation-friendly sentences. The participants first discussed the advantages and disadvantages of machine translate and then machine-translated some example sentences both from English to Turkish and from Turkish to English. The example sentences were determined beforehand in order to serve a practical objective of the session. For instance, they translated a poem and an idiom to find out that MT is not good at getting the cultural issues. They also realized that some of the words did not necessarily have a strict translation, such as yellow-blonde, kara-siyah. The role of the punctuation and capitalization was emphasized with some striking examples. After the training session, the instruction lasted for seven weeks; however, after the sixth week the students went on a one-week semester holiday.

The writing activities were as follows: 1st week - The students thought of unusual uses of a clock and wrote a paragraph (Unusual Uses). 2nd week - The students made a list of as many questions as they could ask (Asking Questions). 3rd week (Revision Week) – They wrote a text of four paragraph 4th week – They wrote a paragraph about one of their belongings and added some new imaginary features (Product improvement). 5th week - They made as many excuses as possible for a friend who was inviting them to cinema. They tried to be fluent and original with the excuses. 6th week – They imagined being a director and wrote about their own movies (Just suppose). 7th week – They commented on their friends' movies (Expressing opinions) During the instruction process, the students learned how to write creative products in English by using GT as low level learners. While the objectives of the tasks were adopted from the curriculum published by the Ministry of National Education (MoNE, 2018), the divergent thinking skills - which are listed in Cramond, Matthews-Morgan, Bandalos & Zuo (2005) as "asking questions, guessing causes, guessing consequences, product improvement, unusual uses, and just suppose" (p. 284)- were taken into consideration in the regulation of the activities. It is essential to note that the aim of this instruction process was to introduce the participants to the pre-editing technique and to let them use MT in an accurate way while doing this. In this research, Google Translate was chosen as it was free and easy to use. All the writing activities in this research were designed as pre-editing, which was grouped into three by Shei (2002). The last group of hers was applied in the research: The participants first wrote a text in their second language (English) without any help and translated it into their first language (Turkish) on Google Translate sentence by sentence to see if the sentences in English could give the intended meaning when translated into Turkish. If so, they proceeded with the next sentence. If not, they pre-edited the text in L2 with the help of GT until they could convey the meaning accurately in L1 version.

3.5. Data Collection and Analysis

As it is discussed in Runco and Acar (2012), several ways of assessment in creativity studies have been suggested by many researchers, such as simply adding the scores or getting a proportional score or scoring only fluency and originality or using median weighs. In addition, it is cited in Cramond et al. (2005, p.284) "Torrance maintained that the composite score was not the most useful way to look at a person's creative functioning because he knew it could mask individual strengths". Therefore, the

researcher scored the four indices independently in the current study and did not get a total score of creativity in order to get rid of statistical biases. As for fluency, every sentence which was grammatically accurate enough to get the supposed meaning was simply counted. The flexibility scores were the number of the ideational categories that were generated by each participant, such as physical appearance, personality, daily routines or abilities. A dichotomous scoring was applied for originality and elaboration. Every idea which was unique in the group got 1 point in order to find out the originality scores. As for the elaboration scoring, the artefacts were analysed and such ways of elaboration were determined: a title, some adverbs or adjectives to give details, some exclamation expressions, conjunctions and sequencing words. Every elaboration element got 1 point.

4. Results and Discussion

Creativity is a multi-layered issue and it has long been searched from different aspects. In a number of studies conducted by Guilford, one of the pioneers in the field, four components of creativity were identified by means of factor analysis: fluency, flexibility, originality and elaboration (Hickey, 2001; Kim, 2006). Although creativity involves some basic cognitive processes of thought which results in creative productions, such as divergent thinking, defining a problem or associative thinking; some standardized creativity tests, such as *Torrance Test of Creative Thinking*, refer to divergent thinking only (Barbot et al., 2011). The reason for this lies under the idea of Guilford that divergent thinking is a must for creativity (Guilford, 1970). As for the assessment of divergent thinking, the creative products of individuals are examined in terms of fluency, flexibility, originality and elaboration. Thus the products were analysed by the researcher regarding the four components of divergent thinking, namely creativity, which are identified in Guilford's studies as fluency, flexibility, originality and elaboration. In order not to cause statistical biases, the results of each component are discussed separately. As discussed in the literature review part, fluency is the total number of generated ideas; flexibility is the total number of ideational categories; originality is the total number of the unique ideas among the participants; and elaboration is the total number of the details which elaborate the product. In order to detect these numbers, the researcher herself examined the products of the participants in pre and post-tests one by one in detail and simply got a total number for each of these components.

In order to find out the fluency values of the participants every meaningful sentence of each artefact was simply counted ignoring the simple grammatical or lexical errors. When the results were tested through a Shapiro-Wilk test, it was found out that the homogeneity of the variances was not normally distributed. While the median value (min – max) for the pre-test was 10 (4 – 29), it was 15 (7 – 28) for the post-test. As the homogeneity of the variances were not normally distributed, a Wilcoxon test was applied to see the significance level of the difference between the two tests and it was found out that there was a statistically significant difference in the fluency scores of the pre and post-test products.

The researcher analysed the written products one by one and categorized the ideational groups in them, such as age, ability, job, background knowledge, feeling, family, friends in order to get the flexibility scores. These results were tested through a Shapiro-Wilk test and found out to be normally distributed.

The mean value of the participants in the pre-test was calculated as $M = 5.88$ ($SD = 1.95$) and with an increase in the post-test mean value was calculated as $M = 8.82$ ($SD = 1.79$). The difference between the pre and post-tests' mean values was found to be $p < 0.001$ with the help of a paired samples T-test, which yielded a statistically significant difference. It is argued in Acar, Alabbasi, Runco and Beketayev that "ideas tend to become more original and are more likely to be drawn from new conceptual categories" (Acar, Alabbasi, Runco & Beketayev, 2019, p. 2). In other words, the more ideational categories generated the more likely to be original.

Originality is one of the main aspects of creative products. As Runco and Jaeger suggest "Originality is undoubtedly required. It is often labelled novelty, but whatever the label, if something is not unusual, novel, or unique, it is commonplace, mundane, or conventional. It is not original, and therefore not creative" (Runco & Jaeger, 2012,p. 92). Taking this into consideration, the researcher analysed the products in terms of original, in other words unique, ideas. Every idea was considered and those which were not written by anyone else in the group was regarded and counted as original. After the analysis, the homogeneity of this variance was found to be not normally distributed by means of a Shapiro-Wilk test.

The findings suggested that the median score (min-max) of the pre-test was 2 (0-10) and it was 9 (2 – 27) in the post-test. There was a 7-point difference between the pre and the post-test. When this difference was tested through a Wilcoxon test – as they were not normally distributed – it was found out that the increase between the pre and the post-tests were statistically significant with a p value lower than 0.001.

Elaboration is described by Guilford (1966, p. 188) as "finishing touches". It can be anything that embroiders the product. When the written products were analysed by the researcher, it was found out that the students tried to elaborate their writing with a title, some adverbs or adjectives to give details, some exclamation expressions, conjunctions and sequencing words. When they were simply counted, an elaboration score was determined for each student. The homogeneity of this variance was found out not to be normally distributed by means of a Shapiro-Wilk test. The median (min-max) of the pre-test was 1 (0 – 4), it was 3 (0 – 13) in the post-test. It is clear that there was an increase in the number of the elaboration items in the students' writings. This difference was calculated with a Wilcoxon test and the difference was found to be statistically significant.

As the homogeneity of fluency scores are not normally distributed, the median scores give an idea about the impact of using Google Translate. While it was 10 in the pre-test, it was calculated as 15 in the post-test with a 5-point increase. This difference is statistically significant with $p < 0.001$. It is obvious that implementing Google Translate in writing activities assisted the students to create more ideas and to express them in their second language. They werelow-proficient learners and the impact of Google Translate in the fluency scores was enormous. It can be concluded that using a machine translator in writing activities as a MALL assistant in pre-editing is an effective way in flourishing the fluency of low-proficient learners.

The homogeneity of flexibility scores is calculated to be normally distributed, the mean scores were considered as an indicator. The mean score in the pre-test was $M = 5.88$ ($SD = 1.95$) and with almost a 4-point increase it was $M = 8.82$ ($SD = 1.79$) in the post-test. The difference between these results were found to be statistically significant with a p value < 0.001. The results indicate that there is an absolute increase in the number of the ideational categories of the students when they pre-edit their writing with Google Translate.

There is a great seven-point of increase in the originality of the products between the two tests, which is statistically significant. This tremendous increase is a spark in the creativity of the products. The result indicates that the low-proficient learners can generate more original ideas in writing with the help of Google Translate as a pre-edition assistant.

As for elaboration, the increase in the post-test with 2 points yields a statistically significant difference. This shows that participants can elaborate their ideas if they get help.

To sum up, Google Translate helped the participants to produce more creative work in terms of fluency, flexibility, originality and elaboration and so the research question finds an answer. Implementing

machine translation in writing activities in English affects the participants' creativity in their written products positively in terms of fluency, flexibility, originality and elaboration. Correa (2014) argues that implementing Google Translate is another way of cheating. However, it is noteworthy that in this research students used GT as a pre-editing tool which helped them after they wrote their passages in L2 first on their own.These results of the study are consistent with some other studies in the field which support the idea that creativity can be sparked with the help of an appropriate training (Fontenot, 1993; Gendrop, 1996; Wang & Horng, 2002; Vincent, Decker, & Mumford, 2002; Scott, Leritz & Mumford, 2004; Simms, 2009; Vally, Salloum, AlQedra, El Shazly, Albloshi, Alsheraifi and Alkaabi, 2019).

As a means of blended learning, this study combines technology with language education and tries to find out the impact of technology on creativity. As for using a technological device in order to flourish creativity, there is a fruitful amount of studies, the results of which are in line with the present study. For example, Demiröz (2019) discusses the impact of integrating literature with technology in EFL classes on the creativity of the students and suggests that implementing v-log, blogs, Twitter, infographics and dictation tools in literature classes enhances the creativity of EFL learners. Robin (2008) states that digital storytelling is a powerful technology in order the students to become creative story tellers. Apart from these studies, Abugohar, Yunus, Rabab'ah & Ahmed, (2019) suggest that the integration of such handheld technological devices as I-pads, tablets and smart phones is a way of fostering students' creative thinking abilities. What is more, the results of a study by Anggereini, Budiarti & Sanjaya (2018) about the effect of technological tools on the students' motivation in being creative reveal that the students are more motivated to be creative when they use technological devices. It should be highlighted that among the aforementioned studies and many others, it is difficult to find machine translators accompanied with their impact on creativity. In the literature, a tremendous amount of studies has been interested in the correlation between technology and the creativity, but not the machine translators. This present study is significant in that it fills this gap and starts a spark for further studies.

5. Conclusion

Prensky (2001) states that our students were born into technology so he calls them as "digital natives", which actually means that our students are so involved in technology that our classical teaching methods cannot compete with such multi-modal and interactive technologies. Thus, he suggests the teachers to pick up new methods and techniques to keep up with the students' needs. Bearing this in mind, we, as teachers, cannot ignore any technological tools which offer EFL learners new language learning experiences by giving them the opportunity to be more creative with the help of multi-modal items such as sounds, visuals, animations or graphics (Yoon, 2013). The upcoming requirements of digital societies force the individuals to be more creative to keep up with the rapid developments in every field of our life. The field of education has inevitably been affected by these dramatic changes. Beforehand bringing a tape recorder to the class might be enough to attract students' attention, today it is impossible to keep them alert enough to have them participate in the classroom activities.

As a conclusion, Google Translate can serve as an effective learning tool in raising creativity in low-proficient learners' written products when it is used as a MALL assistant in pre-editing. As it is obvious that technology has surrounded everywhere in our life in an accessible and inexorable manner, we should welcome any useful form of it to meet the needs of our students who are born into it.

6. Limitations and Suggestions for Further Research

This quasi-experitmental research has shed some light on the impact of implementing Google translate as a pre-editing tool during the writing activities by low proficient language learners. The results yielded that

using Google Translate helped the participants produce more creative texts, which shows that the use of machine tranlsation in learning a foreign language worths more attention from the researchers.

Notes

The present study is a part of an unpublished MA Thesis.

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