Writing Behaviors and Critical Thinking Styles: The Case of Blended Learning

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Introduction

Writing is considered as one of the most important language skills by many scholars in the field. In fact, writing is believed to be a difficult language skill for learners of English as a second language as well as English as a foreign language and even for native speakers (Ting, 2003). According to Wigglesworth and Storch (2009), writing has been a major concern for both English language teachers and learners. To this end, different approaches have been taken to teaching writing (e.g. product approach, process approach, and genre approach). In fact teaching of writing has become an important research area among educational researchers, linguists, applied linguists, and teachers since the early 1970s. The ability to write effectively is becoming increasingly important in our global community, and instruction in writing is thus assuming an increasing role in both second and foreign language education (Weigle, 2002).

Meanwhile, with the advent of computers, technology has also found its way into the realm of language teaching and learning (Gynn, 2001). This might be attributed to the fact that, "Computer-mediated communication… enhances understanding of writing as a social and collaborative act as it promotes awareness of the act of communication and helps develop a sense of audience in writing" (Kasper 1999, p. 2).

The individual differences and cognitive styles have been found to influence the way the process of writing transpires, both in conventional learning and blended learning environments (Chapelle & Jamieson, 2008; Godwin-Jones, 2000; Rourke & Lysynchuck, 2000; Sahragard & Mallahi, 2014; Srijongjai, 2011; Stanley, 2013). In this regard, one of the cognitive styles which seems to have gone rather

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unexplored in the blended learning environments is critical thinking. According to Gardiner (1995), the power of our cognition is one of the parameters that determine the quality of our lives. In particular, attempts to develop higher-order thoughts lead to the enhancement of the quality of life. On the other hand, lower-order thoughts are detrimental to our hopes and dreams. As a result, there is a widespread belief that educational institutions are responsible for helping students construct their cognitive abilities. These abilities, in turn, strengthen students' perceptions of the world and consequently rectify the decisions they make (Gardiner, 1995).

Critical thinking is one of the essential cognitive abilities emphasized by educational experts. According to Dewey (1933, as cited in Fisher, 2001), it is an "active, persistent, and careful consideration of a belief or supposed form of knowledge in the light of the ground which supports it and the further conclusions to which it depends" (p. 9). It has been viewed as a skill for a lifetime of complicated choices which individuals have to make in their personal, academic, and social lives. According to educational experts (e.g. Facione & Facione, 1996; Moon, 2008; Wright, 2002), in our fast-paced and ever-changing world, critical thinking has been considered by many scholars as a basic survival skill.

Given the importance of writing (Ting, 2003; Wigglesworth & Storch, 2009) and the widespread use of technology in language learning (Gynn, 2001; Kasper 1999) and considering the importance of critical thinking in educational contexts (Facione & Facione, 1996; Moon, 2008; Wright, 2002), the present study seeks to investigate the writing behaviors of Iranian EFL learners in a digitally blended environment in the light of critical thinking.

Literature Review

Critical Thinking

With respect to its nature, critical thinking is in fact a move from viewing learning as memorizing and repeating words to a constantly evolving process of discovering, questioning, and formulating hypotheses (Pennycook, 1994). It is a skill that should be acquired in order to step away from traditional rote-learning approaches to education and move toward recent, meaningful learning procedures. Philosophers of education (e.g. Ennis, 1996; Paul, 1988), therefore, agree that critical thinking is the fundamental goal of learning and particularly central to higher education.

In the English language teaching (ELT) context, critical thinking plays a more significant role than in any other area of education. In fact, since language is a means through which ideologies are transferred (Modiano, 2001), it is essential for language learners and teachers to be equipped with necessary instruments to

enhance their consciousness of the hidden ideologies that are implemented in language teaching materials to exercise hegemonies. Development of critical thinking abilities also helps language learners analyze various learning procedures and select the one that suits their purpose in a more appropriate way.

Critical thinking skills have increasingly gained attention in studies related to educational research, with the findings demonstrating the importance of promoting higher-order thinking skills and the positive influence of critical thinking on learners' achievement in EFL contexts (Davidson & Dunham, 1997; MacBride & Bonnette, 1995). According to these findings, critical thinking skills improve higher-order learning skills, which in turn facilitate attaining higher levels of language proficiency.

Despite most of the experts' belief in the combination of skills and disposition in critical thinking, the most common measures and models of critical thinking are skill-based (Frijters, Dam, & Rijlaarsdam, 2007). For example, Watson and Claser (2002), who designed the most popular instrument to measure critical thinking, associated it with the following abilities: discriminating among degrees of truth or falsity of inferences; recognizing unstated assumptions in a series of statements; interpreting whether conclusions are warranted or not; determining if conclusions follow from information in given statements, and evaluating arguments as being strong and relevant or weak and irrelevant. More information about this measure will be presented in the instrumentation section.

Supporters of critical thinking skills have all argued that one of the top priorities of educational experts should be the development of critical thinking skills among learners. The importance of providing conditions for the enhancement of learners' higher-order thinking skills is reflected in Dewey's (1933) writings, who believes that nurturing reflective thinking must be at the core of education (Giancarlo & Facione, 2001). Brookfield (1987) pointed out that educational systems should make attempts to "awaken, prompt, nurture and encourage the process of thinking critically and reflectively" (p. 11). Similarly, Meyers (1986) argued that teachers can foster critical thinking through the activities they assign, the tasks they set, and the feedback they provide. Scholars in the field of higher education believe that critical thinking is a standard of intellectual excellence required for full and constructive participation in academic, individual, and social lives of students (Scriven & Paul, 1992).

The significant contribution of critical thinking to students' mental and social development has recently been reflected in the ELT context. More specifically, researchers and practitioners in this domain have mainly focused on the way critical thinking skills can be taught and reinforced through different techniques

implemented in the classroom. Dantas-Whitney (2002), for example, indicated that the use of reflective audiotaped journals enhanced ESL university students' critical thinking. Yeh (2004) studied the effect of a computer simulation program on improving student teachers' reflective thinking. The findings revealed that computer simulation is an effective instrument for teaching general critical thinking skills. Liaw's (2007) study also demonstrated that the implementation of content-based approach promotes EFL learner's critical thinking skills.

CALL and the Development of Writing Skill

Writing is "an act that takes place within a context, that accomplishes a particular purpose, and that is appropriately shaped for its intended audience" (Hamp-Lyons and Kroll, 1997, p.8). The ability to write properly is an indication of critical thinking and reasoning (Weigle, 2002). Accordingly, due to its standardized system, writing needs instruction in order to be acquired effectively (Grabowski, 1996). Yet developing a course for teaching writing, that also involves other skills, notably the skills of planning, drafting and revising" (Dudley-Evanns and St John, 1998, p.115) does not appear to be an easy task; hence, educators need to search for, develop, and present different mediums that lend themselves to the effective and fruitful teaching of writing. The process of writing and its complexities have been subject to a lot of studies in one of these mediums, i.e. Computer-Assisted Language Learning (CALL), recently.

Over the past two decades, more than 200 studies have examined the impact of word processing on student writing. Over half of these studies, however, were conducted prior to presence and wide-scale use of current menu-driven word processors (Goldberg, Russell, and Cook, 2002). The possibilities presented by computers ranging from the word processing system to online spaces have resulted in an awareness on the part of practitioners for conducting computer-assisted writing projects and studies (Murphy, Kruger, and Grieszl, 1998). Syntheses of early research provide some evidence of affirmative effects. For example, important findings emerged from the qualitative literature review of Cochran-Smith, Paris, and Kahn (1991) on word processing and writing in elementary classrooms. In general, the research on word processors and student writing conducted during the 1980's and early 1990's suggests many ways in which writing on computers may help students produce better work. (Owston, 1991; Etchison, 1989; Williamson and Pence, 1989; Hannafin and Dalton, 1987; Vacc, 1987; Dauite, 1986; and Kerchner and Kistinger, 1984). Furthermore, earlier research has been focused more on developing computational software for writing.

Along the same lines, Virtual learning environments (VLE) have been created to make use of the Internet's advantages while controlling the learning process and

learning management, in which students and their tutors participate in online interactions of various kinds, including online learning (Kember, McNaught, Chong, Lam, and Cheng, 2010; Schober and Keller, 2012). E-learning, a method which evolved from distance education, has received special attention from public universities. However, for e-learning to be effective, it must be combined with other forms of learning such as face-to-face learning. This combination leads to a new methodology called blended learning (Lin & Wang, 2012).

Blended learning is an effective learning system, which combines face-to-face (F2F) instruction with computer-mediated instruction or e-learning in a unique learning scenario (Graham, 2005; Howard, Remenyi, and Pap, 2006; Álvarez, Martín, Fernández-Castro and Urretavizcaya, 2013). B-Learning is considered as a unique approach that aims to solve a series of tasks connected with the necessity of raising education quality (Krasnova, 2015).

Some case studies have been conducted to examine the possible contributions computer-mediated collaboration makes to the development of language skills (Chang & Smith, 1991; Johnson & Chung, 1999; Mergendoller et al., 2000). The findings of these studies show that learners benefit from the positive effects of such collaborations in particular within the context of problem solving and arriving at final solutions.

Kruger and Cohen (1996) compared computer-mediated collaborations with face-to-face interactions, with the results showing in computer-mediated environment the leaners have the tendency to share the ideas without the restrictions typical of traditional interactions. Similarly, many studies (e.g. Dede, 1996) have indicated how very different technical applications can be used to facilitate collaborative and distributed teaching and learning, including special network applications, different multimedia/hypermedia applications and experiential simulations. It is not only the features of the applied technology but especially the way of implementation of the technology which support student collaboration.

A study conducted by Vilmi (2003) found out that online collaborative writing projects improved the learners' cultural awareness and their proficiency. Nelson (2006) in another research on Multimedia writing (MW) with five L2 speakers of English at the University of California worked on multimedia essays in digital format. He concluded that MW potentially increased the quality of authorial voice of the participants who might not otherwise gain a chance for expressing themselves in a second language.

Abuseileek (2007) investigated two types of learning environments, namely, collaborative vs. individual, in a CALL context. Two groups participated in the

research. One group used the computer individually while the other group was divided into small groups to use computer collaboratively. The findings indicated that the group using collaborative computer technique got better results on the listening and speaking tests than the other group using computer individually. Collaborative computer-based teaching turned out to be beneficial to the students who felt uncomfortably asking or speaking.

Ghalami Nobar and Ahangari (2012) investigated the impact of language learning supported by computer on Iranian EFL learners' listening performance. The study was conducted using one experimental and one control group. The findings showed that the students accessing computer outperformed the other group in terms of listening comprehension.

Esmaeilifard and Nabifar (2011) studied the impact of computer-assisted language learning on Iranian learners' reading comprehension. The results showed that the experimental group outperformed the control group regarding reading comprehension. Some researchers argued that CALL when combined with collaborative work can be of much use for second language learners.

As the literature review indicates, a lot of studies (e.g., Chapelle & Jamieson, 2008; Godwin-Jones, 2000; Rourke & Lysynchuck, 2000; Sahragard & Mallahi, 2014; Srijongjai, 2011; Stanley, 2013) have examined the effects of CALL on learning styles, and writing performance in general. However, the literature review shows that no study, to date, has sought to examine the impact of critical thinking styles on the writing process of EFL learners in a single study in a digitally blended environment. The present study thus aims at exploring the possible relationship between students' critical thinking and the writing process of Iranian EFL learners.

Purpose of the Study

The widespread use of technology makes exploration of the relationship between critical thinking styles and writing behavior of students a necessity. Therefore, in the present study, we sought to explore if the provision of an online writing module in a blended learning environment would facilitate the active involvement of EFL learners with different critical thinking styles in the process of completing the assigned writing tasks so that it would be possible to detect their writing behaviors in terms of pausing, switching and revision.

To achieve the abovementioned objectives, the following research questions were formulated:

1- Is there any significant relationship between students' critical thinking types and the amount of time they spend on theory, practice and case sections of the module?
2- Is there any significant relationship between students' critical thinking types and their pausing, revision and switching behavior in a digitally blended environment?
3- Which one of the critical thinking types is the best predictor of pausing, revision and switching behaviors of the participants?

Method

Participants

A purposive sampling procedure was adopted to choose 30 sophomore students. They were all majoring in TEFL at the State University of Mazandaran and had all passed pre-grammar and writing courses prior to this study. These students were required to pass the essay-writing course at the time of conducting the study, so they appeared to be the right candidates to take part in the investigation. The ratio of male to female participants was equal to avoid bias caused by possible gender differences. The participants' age ranged from 20 to 32.

Instruments

Watson-Glaser Critical Thinking Appraisal (CTA)

The Watson-Glaser Critical Thinking Appraisal (CTA) (Form A), which has been reported to have a reliability index of .78 (Hashemi & Ghanizadeh, 2012), was used in this study. This questionnaire comprises 80 items, with five consisting subtests as follows:

(A) Test 1. Inference: Discriminating among degrees of truth or falsity of inference drawn from given data (items 1-16); (B) Test 2: Recognizing Unstated Assumptions: Recognizing unstated assumptions or presuppositions in given statements or assertions (items 17-32); (C) Test 3: Deduction: Determining whether certain conclusions necessarily follow from information in given statement or premises (33-48); (D) Test 4: Interpretation: Weighing evidence and deciding if generalizations or conclusions based on the given data are warranted (49-64); (E) Test 5: Evaluation of Arguments: Distinguishing between arguments that are strong and relevant and those that are weak or relevant to a particular question at issue (65-80).

For each of these five tests, the following scoring procedure was followed: the correctness of the responses was determined based on the available scoring key. After that, the number of correct responses was added up in order to come up with a total raw score. Then, these raw scores were converted to standardized scores based on the available norm group tables (which are downloadable from www.talentlens.co.uk). In each of the subtests, a higher score indicates a stronger disposition toward critical thinking in that area.

Online Writing Module

For this experiment, an online module was constructed based on an online writing center developed at the University of Antwerp in Belgium (Van Waes, Weijen & Leijten, 2014). The module was designed to practice three different genres of writing, i.e. letter writing (thank you letter, bad news letter) and argumentative essay writing. The reason for choosing these genres of writing was to add to the previous literature regarding these genres and the frequent demand from language learners. The module consisted of a general introduction page and three inter-linked sections: (a) a theory section, (b) a set of short exercises in the practice section, and (c) a case. The theory section contains general information on writing, for example, related to style, structure, strategy or wording. In other words, it increases students' awareness about discoursal and sentential features of the target genres. The practice section contains exercises that students could draw on in order to train specific sub-skills that are relevant for a specific type of writing task. The case section includes a description of a communicative context with an assignment students are required to carry out in order to complete the module. The module is designed in such a way that each of the sections is explicitly linked to the others through hyperlinks on several levels, which potentially provide the users with the freedom to access them in the order they prefer.

Data Collection Procedure

The participants of the study took part in a four session writing program (about 12 hours) in which they were required to develop their writing texts using the online module. Since each section in the module was explicitly linked to the others through hyperlinks on several levels, users had the freedom to access them in the order they preferred. Students' navigation was unrestricted which entailed access to almost any route through the module. Data collection was completed in the computer lab at University of Mazandaran while running an online essay-writing course.

Initially, in order to measure the students' critical thinking ability, the Watson-Glaser Critical Thinking Appraisal (CTA) (Form A), which has been shown to be

both valid and highly reliable with a reliability index of .78 (Hashemi & Ghanizadeh, 2012), was used.

Secondly, data were required to reveal the pausing, revision and switching behavior of the participants. To gain the relevant data, each student was initially required to write four different texts based on three different genres: two letters (A thank you letter, a bad newsletter) and two argumentative essays during the study. The texts were written in Microsoft Word, and the participants were given three hours to complete each one of the tasks in a computer site with the presence of the researchers (instructor). Firstly, it deemed necessary to determine the amount of time the writers spent on each part of the module. To this end, the Stat counter and Input log data were combined based on the time stamps in both logging files. As both data collections contained identical time based data, it was possible to merge the datasets and combine the complementary information into one large data set. By doing so, the detailed basis to describe the writing and learning processes from different perspectives was created (Leijten & VanWaes, 2013; VanWaes et al., 2014): (1) pausing behavior (e.g., length and location of the pauses during writing as an indicator of cognitive effort; P-Bursts, i.e. writing episodes divided by pauses above a certain threshold, e.g., two seconds; pausing time vs. active writing time), (2) revision behavior (e.g., ratio of characters in the final text vs. total characters produced during the complete writing process), and (3) switching behavior (e.g., switches from the learning module (task environment) to Word and from one section of the module to another). For the latter, each switch was coded and characterized (time, duration, origin, and destination). Earlier research has shown that the moment at which writers carry out certain activities during the writing process can influence the quality of the texts they produce (Van Waes et al., 2014). Therefore, the writing phase was considered as a factor in the analysis of the logged writing processes. In doing so, the researchers were also able to examine when the different types of switches occurred during the writing/learning process and how much time each writer devoted to each section during the different phases of the process.

In the next phase of the study, the learners' written products were scored to obtain data regarding the improvement of the participants' overall writing practice. Two experienced EFL writing instructors rated the students' written products. A combination of holistic and analytic scoring was used to guarantee a sound perspective on text quality (Charney, 1984). In the first place, the raters reviewed the texts and gave each a holistic rating on a scale of 1 (poorest) to 10 (best) (Van Waes et al., 2014). After a week, they rated the texts for a second time using an analytic scoring scheme. The students' final versions were also graded both holistically and analytically following the analytic method proposed by Jacobs,

Zinkgraf, Wormuth, Hartfiel and Hughey (1981, as cited in Hughes, 2003, p.104). Inter-rater and intra-rater reliabilities were calculated to ensure the reliability of scoring procedures. To assure the validity of the scoring scheme "differential experiment" procedure proposed by Brown, (2007) was employed.

Results

To investigate the research questions formulated for the purpose of this study, it was initially deemed necessary to establish the normality assumption. To this aim, One-Sample Kolmogorov-Smirnov Normality Test was utilized. Tables 1, 2 and 3 illustrate the results of normality analysis for the critical thinking types, pausing, revision and switching behaviors of the participants, as well as time spent on different sections of the module, respectively.

Table 1: One-Sample Kolmogorov-Smirnov Normality Test for the Participants' Critical Thinking Types

	N	Most Extreme Differences			Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
		Absolute	Positive	Negative		
Inference	30	.210	.231	-.321	.968	.110
Recognizing unstated assumptions	30	.124	.321	-.314	1.125	.403
Deduction	30	.214	.118	-.168	.743	.229
Interpretation	30	.321	.145	-.145	1.254	.310
Evaluation of arguments	30	.145	.253	-.111	1.245	.235

Table 2: One-Sample Kolmogorov-Smirnov Normality Test for the Pausing, Revision and Switching Behavior of the Participants

	N	Most Extreme Differences			Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
		Absolute	Positive	Negative		
Pausing Behavior	30	.239	.122	-.239	1.309	.565
Revision Behavior	30	.310	.310	-.231	1.700	.356
Switching Behavior	30	.158	.097	-.158	.865	.453

Table 3: One-Sample Kolmogorov-Smirnov Normality Test for Time Spent on Different Sections

	N	Most Extreme Differences			Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
		Absolute	Positive	Negative		

Time Spent on Theory section	30	.146	.146	-.124	.801	.542
Time Spent on Practice section	30	.206	.206	-.104	1.127	.157
Time Spent on Case section	30	.139	.139	-.128	.759	.612

As it can be seen in Tables 1, 2, and 3, all the significant levels are higher than 0.05. Thus, it can be concluded that all data sets are normally distributed. Therefore, the parametric test of Pearson correlation Coefficient can be run to investigate the existence of any significant relationship between the five critical thinking types and the pausing, revision and switching behavior of the participants.

Investigating the First Question

To investigate the first research question, the Parametric test of Pearson Correlation Coefficient was run on the data to find out any significant relationship between the five critical thinking types among learners and the amount of time they had spent on the theory, practice and case sections of the module. Table 4 shows the results.

Table 4: Results of Pearson Correlation Coefficient between Critical thinking Types and Time Spent on the Different Sections of the Module

		Time Spent on Theory section	Time Spent on Practice section	Time Spent on Case section
Inference	Pearson Correlation	.421**	.102	.198
	Sig. (2-tailed)	.009	.209	.178
	N	30	30	30
Recognizing Unstated Assumptions	Pearson Correlation	.115	.147	.124
	Sig. (2-tailed)	.487	.089	.712
	N	30	30	30
Deduction	Pearson Correlation	.299*	.109	.129
	Sig. (2-tailed)	.017	.428	.319
	N	30	30	30
Interpretation	Pearson Correlation	.114	.261*	.455**
	Sig. (2-tailed)	.124	.041	.003
	N	30	30	30
Evaluation of arguments	Pearson Correlation	.120	.119	.211
	Sig. (2-tailed)	.457	.369	.312
	N	30	30	30

As Table 4 demonstrates, a significant and positive correlation exists between Inference and the time spent on theory section (r=0.421, p = 0.003 < 0.01). Moreover, a significant and positive correlation was found between deduction and the time spent on theory section (r=0.299, p = 0.017 < 0.05). Additionally, a significant and positive correlation was revealed between Interpretation and the time spent on practice section (r=0.261, p = 0.041 < 0.05) as well as the time spent on case section (r=0.455, p = 0.003 < 0.01) of the module.

Investigating the Second Question

The second question of the study was investigated through running Pearson Correlation Coefficient Formula on the data. Table 5 displays the respective results.

Table 5: Results of Pearson Correlation Coefficient between Critical Thinking Types and the Pausing, Revision and Switching Behaviors of the Participants

		Pausing Behavior	Revision Behavior	Switching Behavior
Inference	Pearson Correlation	-.351*	.108	.102
	Sig. (2-tailed)	.003	.351	.415
	N	30	30	30
Recognizing Unstated Assumptions	Pearson Correlation	.101	.145	.114
	Sig. (2-tailed)	-.354	.325	.319
	N	30	30	30
Deduction	Pearson Correlation	-.102	.127	.158
	Sig. (2-tailed)	.411	.412	.441
	N	30	30	30
Interpretation	Pearson Correlation	.311**	189	.312*
	Sig. (2-tailed)	.004	.112	.048
	N	30	30	30
Evaluation of arguments	Pearson Correlation	-.122	.286*	.211
	Sig. (2-tailed)	.369	.045	.245
	N	30	30	30

As Table 5 demonstrates, a negative and significant correlation exists between inference and pausing behavior (r = -.351, p = 0.003< 0.05). Moreover, a

statistically positive and significant relationship was found between the interpretation and the pausing behavior ($r = 0.311$, $p = 0.004 < 0.01$). Furthermore, the relationship between the evaluation and the revision behavior was also positively significant ($r = 0.286$, $p = 0.045 < 0.05$). Additionally, a positive and significant relationship between the interpretation and the switching behavior was observed ($r = 0.312$, $p = 0.048 < 0.05$). As Table 5 indicates except for the previously mentioned relationships, no other significant correlation indices were found between other critical thinking types and the pausing, revision and switching behavior of the participants.

Investigating the Third Question

To address the third question about the critical thinking types best predicting the pausing, revision and switching behavior of the participants, as indicated in Table 5, the only critical thinking type which correlates positively with the pausing behavior is interpretation thinking ability ($r = 0.311$, $p = 0.004 < 0.01$) and hence is the best predictor of this behavior. Moreover, the only critical thinking type which has a positive correlation with the revision behavior is the evaluation of arguments ($r = 0.286$, $p = 0.045 < 0.05$) and thus the best predictor of this writing behavior. Additionally, the only critical thinking type correlating with the switching behavior is the interpretation ($r = 0.312$, $p = 0.048 < 0.05$) and therefore the best predictor of this behavior.

Discussion

The purpose of the current study was to explore the writing behaviors of EFL learners in a blended learning environment in the light of critical thinking styles. A huge number of studies have explored the state of critical thinking in the learning process (Giancarlo & Facione, 2001; Moore, 1995; Tsui, 1998), and its role in English language learning has been emphasized (Modiano, 2001; Moore, 1995; Stapleton, 2001). Larsen-Freeman (1991), favors the significant role of metacognitive factors, e.g. critical thinking, in language learning. The ELT context, however, has documented comparatively few studies focusing on the correlates of critical thinking.

This paper has explained that Individual differences in writing proficiency can be related to individual differences in either comprehensive critical thinking measures or specific thinking skills (Preiss, Castillo, Flotts, and San Martín, 2013). Our

findings suggest that critical thinking skill can have direct effect on the writing behaviour of the learners and this finding can be in line with findings of many researchers' studies in which they provided compelling evidence that critical thinking tasks are able to positively influence Iranian EFL learners' argumentative essay writing. (Kolour & Yaghoubi, 2015; Malmir & Shoorcheh, 2012)

The results of this study are also in harmony with the Gu and Johnson (1996) who found that using critical thinking as one of the learning strategies has a significant impact on students' language vocabulary learning in argumentative essay writing. Based on the nature of using technology for education and the freedom these spaces provided for learning, we can discuss that the nature of the online module which was used in this study provided condition for learners to act freely, be independent and discover he information the needed themselves. Furthermore, Critical thinking is considered as a special method since it tries to make learners discover different concepts, not to teach them those concepts directly, and this causes learners to keep them in their minds permanently and be active learners all the time (Gorjian, Pazhakh, & Parang, 2012). The finding of this study similar to the study done by Y Lin (2014), tried to show that critical thinking enables learners to gather relevant knowledge and thoughts, add personal understanding and values, and select and integrate useful information, and thus become more able to reconstruct knowledge in order to create meaning.

The significant relationships found in this study seem to confirm the findings of previous studies indicating the influence of critical thinking skills in the language learning process; however, despite this confirmation and the medium effect size, based on the principles of meta-analysis studies, it seems to be legitimate to argue about a causal relationship between critical thinking skills and the writing behaviors of the learners. However, it cannot be ignored that the magnitude of the relationship between the variables in this study raises doubts about the meaningfulness of the relationships (Springer, 2010). Perhaps other studies would reduce this uncertainty through replicating this study in similar and different contexts.

The findings of the present study necessitate an understanding of different factors which play significant roles in the learning process. Therefore, teachers as well as teacher educators need to develop their awareness of the fact that learners have various thinking abilities which consequently affects the way they approach different learning tasks.

Implications of the study

Learning outcomes achieved from the blended studies on L2 literacy sub-skills and skills learning are thought as having implications for practitioners and educators to influence the indoor and outdoor learning sites to arrange the foundations for grasping omnipresent L2 literacy sub-skill and skills learning.

All proponents of critical thinking skills have argued that developing thinking skills must be a compelling priority for educationalists, and that critical thinking is a standard of intellectual excellence required for full and constructive participation in academic, individual and social lives of students (Hashemi and Ghanizadeh, 2012).

Teachers' awareness about such relationship between critical thinking styles and online writing behaviors can also be crucial as they can choose more appropriate mediating strategies. Van Gog and Scheiter (2010) noted that instructors play an important role in influencing the online learning outcomes of the students. Therefore, the teachers are suggested to implement critical thinking techniques as useful elements in their teaching to improve students' different language skills, and more specifically to progress writing achievement of the learners (Mall-Amiri and Sheikhy, 2014).

According to the findings of this study, if the instructor creates at least slight differences in terms of nature of behaviour and thinking processes that the student will show in the writing process, the performance of learners increases. As instructors we should deliver our students with rich learning environments and a multiplicity of learning possibilities for real teaching which shows the significant of considering individual differences and variety in our instructional design processes (Bonk, 2002; Walker, 2005). Thus, future research studies should reconsider similar discussion topics or dilemma, and make use of different instructional techniques in order to measure critical thinking and dispositions by changing the duration and number of participants.

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Summary

Writing Behaviors and Critical Thinking Styles: The Case of Blended Learning

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The advent in technology has shown that the individual differences and cognitive styles influence the way the process of writing transpires . Setting up the quasi-experimental study, the researchers sought to explore the writing behaviors of EFL learners in a blended learning environment in the light of critical thinking styles. To this end, 30 advanced language students took part in the four weeks experiment of this study. They were asked to write texts based on the provided information presented by the online module, designed by the researchers. Watson-Glaser Critical Thinking Appraisal (CTA) was used to measure the students' critical thinking ability. The detailed basis to describe the writing and learning processes from different perspectives was created through using input log program. The results of data analysis indicated a significant and positive correlation between different sections of CTA (inference, interpretation and evaluation) and online module (theory, practice and case). The best predictors for the pausing, revision and switching behavior of the participants were found to be interpretation, evaluation of arguments, and interpretation, respectively. The findings of the present study necessitate an understanding of different factors which play significant roles in the learning process. Therefore, teachers as well as teacher educators need to develop their awareness of the fact that learners have various thinking abilities which consequently affects the way they approach different learning tasks.

Keywords: Critical thinking; Blended learning; The quasi-experimental study, Writing behaviors; Input log