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Iranian EFL Learners' Perception of the Efficacy and Affordance of Activity Theory-based Computer Assisted Language Learning in Writing Achievement

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Abstract

Second language writing instruction has been greatly influenced by the growing importance of technology and the recent shift of paradigm from a cognitive to a social orientation in second language acquisition (Lantolf & Thorne, 2006). Therefore, the applications of computer-assisted language learning and activity theory have been suggested as a promising framework for writing studies. The present study aimed to investigate the perception of Iranian EFL learners of the efficacy and affordance of activity theory integrated with computer-assisted language learning in writing improvement. To this end, sixty-seven sophomores majoring in English translation were selected as the participants of this study. The writing instruction was geared to an e-learning platform based on the six elements of activity theory--subject, object, mediating artifacts, rules, community, and division of labor--appropriate for the writing course. The students were assigned to write nine expository paragraphs on six different developmental patterns and share various relevant materials on the platform during the treatment. Their assignments were carefully monitored and evaluated by the instructor. Upon the completion of the treatment, the students completed a closed-ended questionnaire and an open-ended questionnaire and took part in a semi-structured focus group interview to express their perception. The results showed that the students held favorable perception toward the use of computer-assisted language learning within the activity theory framework. The findings of the study also revealed that there was a

significant difference among the students' perception concerning the four mediating elements of activity theory.

Keywords: activity theory, affordance, CALL, writing achievement

Writing in a second language (L2) can be a difficult skill to develop, and it is often not regarded as a high priority in language classrooms (Gordon, 2008). Students usually lack writing skills, and they are demotivated to write in a new language (Gedera, 2011). Engaging learners in writing in the target language with any degree of interest is a challenge for language teachers (Harmer, 2004). As a result, different theories have emerged over the years to provide teachers with a framework to guide students develop writing skills (Gordon, 2008).

Many second language scholars, trying to expand the scope of L2 writing research, stress the importance of sociocultural theory to L2 writing (e.g., Atkinson, 2003; Atkinson & Connor, 2008; Casanave, 2003). Sociocultural theory benefits from the idea that learning is socially positioned and is best obtained through a collaboration between peers and teachers (Slavkov, 2015). "From the sociocultural perspective, writing is seen as part of a socially and culturally situated set of literacy practices shared by a particular community" (Weigle, 2014, p. 223). Samuels (2014) claimed that activity theory (AT) as an extension of sociocultural theory could have particular pertinence to L2 writing.

AT is an extension of Vygotskian theory that was initially conceptualized to understand how human actions are performed through mediation (Lantolf & Pavlenko, 2001; Thorne, 2003). The unit of analysis in AT is the activity system. Engeström (1987,1999) expanded AT by incorporating additional elements into its original framework and provided a more socially- and culturally-grounded perspective. Engeström's activity system consists of six elements: Subject, tools/mediating artifacts, object, a division of labor, community, and rules (Figure 1). Engeström further maintained that to understand activity in its sociocultural setting; we must analyze the activity from the perspective of these six elements. AT focuses neither on the individual

nor the community but on the mediating artifacts that links them in a situated context (Barab, Evans, & Baek, 2004).

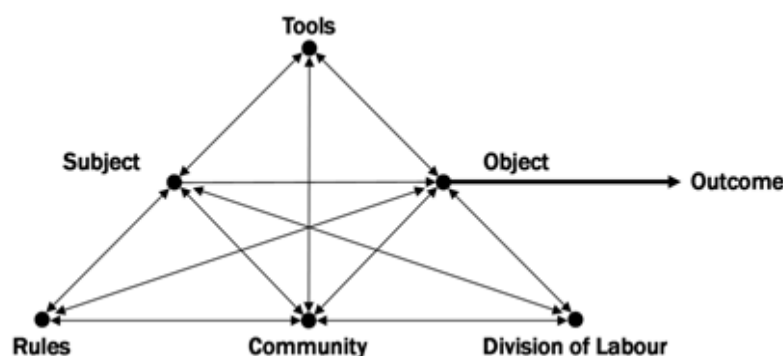


Figure 1. Activity theory system (Adopted from Engeström, 1987, p. 78)

In this activity system, the subject refers to the individual or group, whose motives and goals are taken in the analysis of the activity. The object is the target of the activity within the system. Mediation tools are the internal and external mediating means or instruments which help to achieve the outcome of the activity. The community consists of people who share the object with the subject. Rules from within or outside the activity system regulate actions and interactions within it. The division of labor involves how tasks are divided among community members (Engeström, 1987, 1999).

Behrend (2014) stated that AT with its six elements and the way they impact the production of L2 texts can illustrate the L2 writing processes from an alternative perspective, incorporating various social, historical, developmental, personal, ideological, and cultural phenomena as they play out in the course of completion of a writing task. Therefore, as Behrend maintained, AT can be used to analyze complexities within and surrounding academic activities, such as writing assignments or using online resources. AT provides a tool for the analysis of how an individual or groups use mediating artifacts to achieve a specific outcome.

Hence, based on Behrend (2014), in a writing activity, the way subjects act toward the object are mediated by four interdependent factors: mediating artifacts (e.g., computers, languages, course book, online sources), rules (e.g., class norms and sanctions, time limitation, and evaluation criteria), community (e.g., disciplinary community and discourse community, including teachers, students and their friends and family members, university classroom, and academic context), and division of labor (e.g., writers and readers, and the roles they play to be shared in learning activities).

On the other hand, electronic technology is being much used in the teaching of writing to develop interaction and collaboration in the stages of the writing process. Reviewing a wide range of recent research investigating the impact of technology on second language writing, Matsuda, Canagarajah, Harklau, Hyland, and Warschauer (2003) pointed out that "the diffusion of computers and the Internet is likely to be as important for the development of writing as was the earlier advent of the printing press" (p. 165). Therefore, computer-assisted language learning (CALL) as an approach to language teaching and learning can act as mediation and introduces a new paradigm in language teaching and research by putting the focus neither on the student nor the instructor, but on the relationship between them in the learning community (Leffa, 2009).

CALL has recently offered many ways of improving the learner's writing skills (Gedera, 2011). Teaching and learning in a writing class where CALL is used to promote a different communicative dynamic with more collaboration, more time spent on writing, and more learner active participation than in a traditional classroom. Where students can communicate with each other over a network, the level of participation by individual students is increased, and additional opportunities for collaboration are made available. Networks also bring many different kinds of tools and sources of information within reach of student users. These potentials of CALL and computer networks both increase the

learner's access to resources and add a new dimension to the L2 writing class (Pennington, 2004).

AT perspective can be useful in designing a variety of CALL activities. Gifford and Enyedy (1999) stated that AT is a suitable framework to motivate the design of CALL activities since AT can clarify the nature of collaborative activities and to indicate how people can socially participate while interacting with technology. This interactive nature of AT enables a more optimal design of tools to support CALL activities effectively in various contexts and to develop methods to put them into practice. AT provides a useful paradigm for understanding the effectiveness of emerging technologies (Hashim & Jones, 2007). Furthermore, CALL within AT framework encourages one to reconsider and evaluate whether the educational environment is providing a decisive role as an affordance.

Affordances, in van Lier's (2000) terms, are opportunities that the environment provides for learners to enable them to motivate themselves for learning, and, thus, they influence the learners' overall learning and identity construction. From the pedagogical perspective, rich affordances must be provided for learners to encourage their engagement in learning. When perceived, as van Lier further commented, an affordance allows actors to take actions that may satisfy specific needs, and a user can imagine what the object can allow them to do. In other words, affordances are described as a relationship between the learner and the environment, which signals an opportunity or an inhibition of action. As a result, the learner and the environment are in constant interaction, which creates affordances for language use.

An extensive literature review reveals that although there has been a significant amount of research that supports the use of either CALL or AT in improving writing skills (e.g., Brine & Franken, 2006; Son, 2007; Warschauer, 1996), the students' perception of using AT-based CALL in L2 writing instruction remains to be explored. Alamis (as cited in Nami, 2015, p. 256) claimed that "students' perspectives have not received the attention they deserve even if proven to have an enormous effect on the

whole process of teaching/learning." As a result, the extent to which learners perceive the effectiveness of AT-based CALL needs investigation.

To address this issue, the following research questions were formulated.

RQ1. Do Iranian EFL learners have a positive perception toward the efficacy of AT-based CALL in their writing achievement?

RQ2. Is there any statistically significant difference among Iranian EFL learners' perception toward the elements of AT-based CALL in their writing achievement?

RQ3. What affordances do Iranian EFL learners perceive in using AT-based CALL in their writing achievement?

Method

Participants

The participants of this study were 67 sophomores (25 male and 42 female) majoring in English translation at Islamic Azad University, Tehran Central Branch. The age range of the participants was among 19-26. They were selected out of a pool of 75 students from three entire classes by their performance on a version of the Oxford Placement Test (OPT) to ascertain their homogeneity concerning general language proficiency before the study. It must be mentioned that as the students were assigned to classes by the university registration office, it was practically impossible for the researchers to rearrange the classes by randomizing the participants. Therefore, all the available 75 students were selected non-randomly based on convenience sampling in the first phase of the study. Based on the results the OPT (Table 1), 67 students whose scores fell between one standard deviation above or below the mean ($M=138.12$, $SD=16.15$) were chosen as the participants of this study. In each class, the same instructor, the same method of instruction, and the same instructional materials and contents were used.

Table 1.

Descriptive Statistics of the OPT

	N	Min.	Max.	Mean statistic	Std. Error	Std. statistic
OPT	75	70	179	138.12	1.86	16.15

Instruments

E-learning platform. Eliademy, an e-learning platform that allows educators and students to create, share, and manage online courses, was used in this study. Eliademy is accessible on the World Wide Web at <https://eliademy.com>. An online Advanced Writing Course was created on Eliademy, based on the six elements of AT. These elements consisted of subjects (the students and the instructor); object (the general goal and performance objectives of the course, such as writing improvement, meeting gradation requirement, and being able to recognize and develop different types of an expository paragraph); mediating artifacts (grammar terms, connecting words and transition signals, online dictionaries, Grammarly software, general writing tips, and pre-writing techniques); rules (punctuation, page format, rating scale, correction symbols, time limitation, and plagiarism avoidance); community (the instructor, the students and their friends and family members, university members, academic context, and anyone in the social community who could help the students to achieve the object); and division of labor (the students' roles and responsibilities in the assigned labor, the instructor's role in preparing, monitoring, and evaluating the assignments). The instructor, the first writer of this paper, could post announcements and assignments on the course website. The students could get help from the course via mediating tools, object, rules, community, and division of labor, to develop a well-written academic English paragraph. In other words, the students could share their written materials and the instructor could check, monitor, and evaluate the students' shared materials and assignments. It must be mentioned that the course website was piloted in two classes of Advanced Writing Course one semester before the primary

treatment started; however, some minor changes were made in the content and organization of the website.

AT-based CALL questionnaire. At the end of the semester, all the participants filled out a 38-item questionnaire (see Appendix A). The purpose of the questionnaire was to investigate the participants' perception toward the four mediating elements of AT-based CALL in writing achievement (Table 2). It must be mentioned that the other two elements of AT--subject and object--were also taken into account in the questionnaire. In fact, the subjects were the participants whose perception toward the four mediating elements of AT-based CALL in achieving the object--writing improvement--was investigated. Therefore, all the six elements of AT were involved in the questionnaire. The questionnaire was designed and validated by the researchers in the piloting phase of the study. The questionnaire is a five-point Likert scale ranging from 1 to 5 (1=not at all, 2=not really, 3=to some extent, 4=quite a lot, and 5=very much).

Table 2

AT-based CALL Questionnaire Elements

Elements	Total Number of Items	Question Items
Mediating-artifacts	15	1-15
Rule	8	16-23
Community	7	24-30
Division of Labor	8	31-38

Open-ended questionnaire. An open-ended questionnaire (see Appendix B) was given to the participants to determine their perception of the effectiveness and affordances of AT-based CALL. The questionnaire consisted of 5 questions. The participants were asked to reflect on their overall perception toward the instruction, such as whether they liked the class and recommended it to others or not. They were also required to give reasons for their answers. Besides, the participants were

asked to share their ideas about the strengths and weaknesses of the instruction and suggest some ways to improve it. The questionnaire was distributed after the treatment at the end of the semester. According to Cohen, Manion, and Morrison (2000), open-ended questionnaires are typically used to compensate for the shortcomings of pre-set responses in closed-ended questionnaires.

A semi-structured focus group post-interview. A semi-structured focus group interview was conducted to elicit more information and cross-validate the data obtained in the open-ended questionnaire addressing the participants' perception of the efficacy and affordances of AT-based CALL in the writing class. Care was taken to convince the interviewees that the instructor did not hold any preconceived notions regarding the outcome of the study. The interview was conducted with 20 students (6-7 students from each class), and the whole interview took about 90 minutes.

Procedure

To achieve the purpose of this study, the following steps were taken. This section is divided into two phases: The pilot study and the primary study.

Pilot study. A pilot study was carried out before the primary study to validate the research instruments. To explore the perception of Iranian EFL learners toward the mediating elements of AT-based CALL in writing achievement, a questionnaire was developed based on the relevant literature, the elements of AT, and the criteria proposed by Dörnyei (2003), and then it was validated.

First, a questionnaire with 42 items was drafted, scrutinized, and reworded several times. To avoid bias in the students' answers, because of their tendency to answer positively to questions, seven items in the questionnaire appeared in a negative format and then were converted to a real scale in the data analysis. Next, the researchers asked five participants to comment on the face validity of the questionnaire. Afterward, five experts were asked to go through the questionnaire items

and provide comments and judgments to ensure the content validity of the questionnaire. As a result, based on the participants' point of view and the experts' opinion, four items were excluded from the questionnaire, and many modifications were made. Finally, a new version of the questionnaire with 38 items was developed.

After that, the questionnaire was administered to a group of 45 students who were similar to the target population. They were asked to answer the questionnaire during class time. It took the participants about 30 minutes to fill out the questionnaire. The participants were asked to respond, using a 5-point Likert scale, with five indicating "very much" and one indicating "not at all." Afterward, to fine-tune and finalize the questionnaire, the items were first checked for any missing responses and possible signs of misunderstanding by several respondents. No signs of several missing responses or misunderstanding were seen. The second aspect that was checked was the range of the responses elicited by each item. The results showed that there was an item variation in the responses, and, therefore, no items were endorsed by almost everyone or by almost no one. Finally, the internal consistency of the questionnaire was calculated through Cronbach's alpha to make sure that each item on a multi-item scale correlates with the other items and with the total score. The reliability estimated was .72 which is an acceptable value. Besides, the results of item-total statistics including Cronbach's alpha if item deleted revealed that no item was needed to be deleted from the questionnaire because all the values of Cronbach's alpha if item deleted were less than the reliability index of the questionnaire (.72).

With regard to the construct validity of the questionnaire, it is noteworthy to mention that since the AT-based CALL questionnaire "questions about people's beliefs, opinions, characteristics, and behavior", having some experts examine the items of the survey and judge their appropriateness was an acceptable way to ensure the construct validity of the questionnaire (Ary, Jacobs, Sorensen, & Razavieh, 2010,

p. 372). Hence, no more statistical approaches were conducted to validate the instrument.

Main study. The primary study included both quantitative and qualitative research methods. Data were collected in regular class time and over a period of 14 weeks. In other words, the treatment was given once a week, in 14 sessions, and each session took 90 minutes. The first and the last sessions were allotted to the pre- and posttests. The other class sessions were devoted to writing instruction and paragraph development via AT-based CALL. In what follows, the procedure is described.

Website introduction. The first three sessions of the class were devoted to the introduction to the course and the class website (Eliademy). The instructor introduced the class website to the participants by demonstrating how to work on. The demonstration was given via a laptop computer connected to a big screen in front of the class.

Implementing AT-based CALL. The students had to write nine expository paragraphs during the semester on six different developmental patterns: enumeration, process, chronology, cause and effect, comparison and contrast, and definition following their course book, *Paragraph Development* by Arnaudet and Barrett (1990). For this purpose, after teaching a developmental pattern of the paragraph, the instructor posted two topics as weekly assignments in the discussion section of the website. In addition to the topics, some writing tips concerning that particular topic, the objectives of that developmental pattern, and two or more sample paragraphs were posted. Furthermore, another file named assigned labor was posted by the instructor to divide labor among the participants. Some students were assigned to provide various ideas related to the topic (brainstorm), some others to find related transitional markers and examples in which those markers were used, some to provide topic-related vocabulary items and phrases, and still, others to find paragraph models. The instructor rotated the roles of the participants every week to allow the participants to adopt different roles at different

times and to avoid rigid group structures. All the participants were required to be vigorously engaged in the activities and accomplish their assigned roles. In doing so, the participants could get help from the instructor, classmates' shared materials, other members of the community, and elements of the course website. Other members of the community, such as the students' family members and friends could assist the students in accomplishing their assigned roles and in developing a paragraph providing that they have adequate knowledge of English and computer skills. For example, the community members could help the students in brainstorming, finding related vocabulary items and examples, reviewing group members' paragraphs, providing comments, etc.

After the participants wrote the first drafts of the paragraphs, they had to check them against the rules and conventions available on the website, such as page format, punctuation rules, and self-check and then email it to the instructor. All the participants were warned against plagiarism. Afterward, the instructor evaluated and corrected the students' assignments based on the writing scale developed by Jacobs, Zinkgraf, Wormuth, Hartfiel, and Hughey (1981, p. 30), provided written comments and unfocused feedback on them, and then posted some corrected samples anonymously to be visible for all. Finally, the participants had to check the corrected samples and edit their paragraphs based on the comments provided. They had to email their edited paragraphs to the instructor at the end of the semester. At the end of the course, the students filled out the closed- and open-ended questionnaires and the instructor scheduled interview with 20 students. Figure 2 illustrates the elements of the designed AT-based CALL framework of the study.

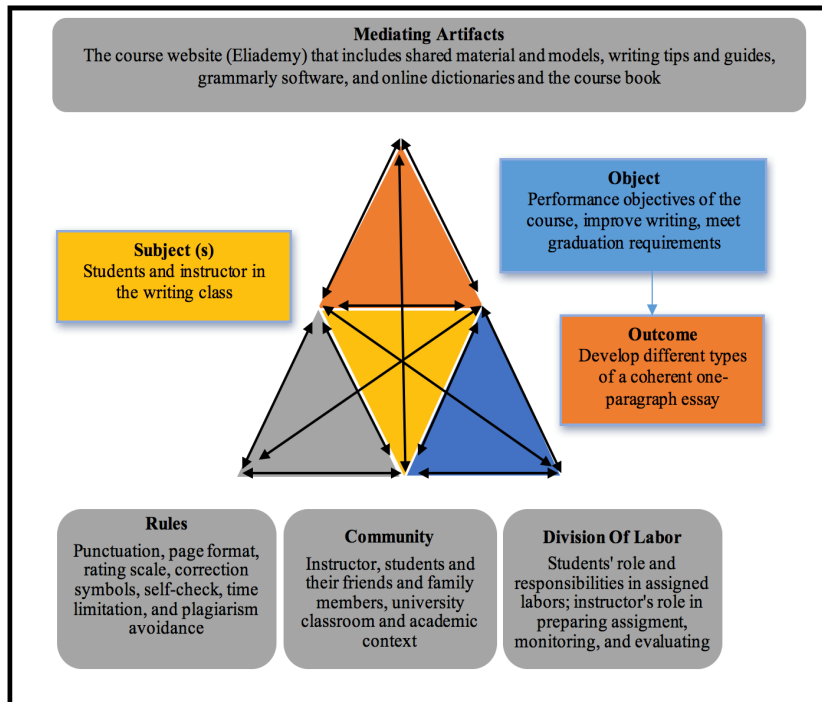


Figure 2. Designed AT-based CALL framework of the study

RESULTS

Both qualitative and quantitative techniques were employed to analyze the data.

Quantitative Results

The post-instruction questionnaire measured Students' perception of the efficacy of AT-based CALL. The internal consistency of the questionnaire was calculated through Cronbach's Alpha formula, and it came out to be .88 (Table 3).

Table 3.

Reliability Statistics of the AT-based CALL Questionnaire

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
.881	.879	38

The mean scores of the participants on the questionnaire, ranging from 1 to 5, show a comprehensive picture of the participants' perception. Drawing upon the information given on the characteristics of factors reflecting students' perception, the results of the descriptive analyses of the participants' self-report (Table 4) are presented to answer the first research question.

Table 4.

Descriptive Statistics of the Perception of AT-based CALL

	Mean	Std. Deviation	Min.	Max.	Variance	No. of Items
Item Means	3.275	1.07	1	5	.679	38

The results demonstrate that Iranian EFL learners had a moderate to positive perception toward AT-based CALL in writing achievement ($M=3.275$, $SD=1.07$) because the participants' responses to the questionnaire fell into the upper intermediate category. Therefore, the answer to the first research question is confirmed.

To answer the second research question, one-way repeated measures ANOVA was conducted to determine whether any difference is observable among the students' perception toward the four mediating elements of AT--mediating artifacts, rules, community, and division of labor.

The results of descriptive statistics (Table 5) indicate that the participants' perception toward mediating artifacts, rules, and division of labor fell into the upper intermediate category, with the mean scores of $M=3.54$, $M=3.57$, and $M=3.49$, respectively. However, the results show that the participants' perception toward community fell into the lower category, with the mean score of $M=2.05$.

Table 5.

Descriptive Statistics of the Perception of AT-based CALL Elements

AT Elements	Mean	Std. Deviation	No. of Students
1. Mediating Artifacts	3.54	.573	67
2. Rules	3.57	.587	67
3. Community	2.05	.503	67
4. Division of Labor	3.49	.678	67

The results of multivariate tests (Table 6) reveal that there was a statistically significant difference among the students' perception toward the four mediating elements of AT, Wilks' Lambda = .116, $F(3, 64) = 162.401$, $p < .001$. It means that the students perceived some of the mediating elements to be more effective than the others. Besides, the value of partial eta squared (.884) obtained from the multivariate tests yields a large effect size. Based on these results, the answer to the second research question is supported by immense effect size.

Table 6.

Multivariate Tests for AT Elements

	Effect	Value	F	Hypot hesis df	Error df	Sig.	Partial Eta Squared
AT Elements	Pillai's Trace	.884	162.401 ^b	3.000	64.00	.000	.884
	Wilks' Lambda	.116	162.401 ^b	3.000	64.00	.000	.884
	Hotelling 's Trace	7.613	162.401 ^b	3.000	64.00	.000	.884
	Roy's Largest Root	7.613	162.401 ^b	3.000	64.00	.000	.884

Moreover, the results of Pairwise Comparisons (Table 7) show that the difference was only between the students' perception toward the element of community and the other elements; i.e., the students perceived the element of community significantly different from the other elements;

however, there was no statistically significant difference among their perception toward mediating artifacts, rules, and division of labor. It means that the students expressed positive perception toward mediating artifacts, rules, and division of labor, but they held moderate to negative perception toward community, indicating that community was perceived to be the least essential element in their writing achievement.

Table 7.
Pairwise Comparisons of AT Elements

Measure: MEASURE 1

(I) AT.Elements	(J) AT.Elements	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
1	2	-.028	.067	1.000	-.211	.155
	3	1.491*	.068	.000	1.306	1.677
	4	.047	.063	1.000	-.125	.219
2	1	.028	.067	1.000	-.155	.211
	3	1.519*	.086	.000	1.285	1.753
	4	.074	.082	1.000	-.149	.298
3	1	-1.491*	.068	.000	-1.677	-1.306
	2	-1.519*	.086	.000	-1.753	-1.285
	4	-1.445*	.087	.000	-1.681	-1.208
4	1	-.047	.063	1.000	-.219	.125
	2	-.074	.082	1.000	-.298	.149
	3	1.445*	.087	.000	1.208	1.681

Based on estimated marginal means

*. The mean difference is significant at the

b. Adjustment for multiple comparisons: Bonferroni.

These findings were also supported by the students' responses to the open-ended questionnaire and interview, as shown in the following sections.

Qualitative Results

The participants' overall perception and their perceived affordances of AT-based CALL were collected via the open-ended questionnaire and

semi-structured focus group interview. The researchers read the data collected from the open-ended questionnaire over and over again and grouped them into themes that recurred frequently. The interview responses were transcribed verbatim, translated into English where necessary, coded, and then analyzed.

The main themes obtained can be categorized into eight dimensions concerning both overall perception and perceived affordances: (1) novelty; (2) motivation, comfort, and enjoyment; (3) computer skills; (4) website characteristics; (5) interaction and cooperation; (6) time and effort; (7) instructor's role; and (8) outcome.

1. Novelty. Almost all the students (91%) acknowledged the novelty of the procedure followed in this course as a reason to liking the course. The students stated they had never had such an experience before. Representative of most of their responses are "It was a new method and different from other conventional methods that are used in most of the classes"; "It was really new for students in Iran"; "I liked the course because of the new ways of teaching like using website, assigned labor, etc."

2. Motivation, comfort, and enjoyment. Increased motivation, comfort, and enjoyment were observed in majority (83%) of the students' responses. They found the course very interesting and enjoyable working with online tools. They also asserted that the class and website atmosphere was stress free and motivating for them. Comments made by some of the students highlight this issue. "The website-based learning was very comfortable, enjoyable, and useful," said one student. Another commented that "using technology, computer, and video projector motivated me to write." Still another student noted that "this class procedure reduced my stress and I could do my assignments passionately."

3. Computer skills. Notable in a large number of students' accounts (79%) was improvement in their computer skills as exemplified in the following excerpts: "The good point was that we had to learn how to work with the website and how to use the Microsoft Word Document"; "I

think it was a good way to start learning how to use technology in learning English”; “My computer skills have improved during this course.”

4. Website characteristics. The fourth main theme extracted from students’ responses was related to the website characteristics. These characteristics were further categorized into 3 sub-themes: (1) access and use, (2) organization, and (3) content and materials.

4.1. Access and use. In most cases (71%), the students noted the accessibility and usefulness of the website designed for this course. They also wished they had the same website for other courses because it helped them learn a lot. Some examples of the students’ comments are as follows: “I think the website was very good because we could easily access previous assignments and models. Actually, everything was available, so it was very useful”; “It was not only useful for this course but also beneficial for other courses and other purposes.”

However, a few students (25%) reported some difficulty in connecting to the website. They pointed out that the only problem that sometimes prevented them from accessing the website was the speed of the Internet connection. Their view is illustrated in the following excerpts: “We could not sometimes open or access the website due to the Internet speed”; “Sometimes connecting to the Internet and log in to the website was impossible.”

4.2. Organization. Many students (70%) acknowledged the organization of the website. For example, one student noted “I personally think that the way this website was designed is perfect. There is no chaos and you can find everything you need very quickly.” Another claimed that “everything was well-organized and I did not get confused at all.”

4.3. Website content and materials. Closely related to the website access and organization was the students’ perception of the effectiveness of the website content and materials. About 64% of the students commented that the website was very good because all the sources and instruments were available on the website. Some of their responses are

mentioned as follows: "A good point for me was that everything we required to write well was available on the website, no need to search for necessary materials from different books, websites etc."; "The website was very good because we did not need any other sources to write, and everything we needed was gathered in one place."

5. Interaction and cooperation. Most of the students (80%) noted the effectiveness of interaction and cooperation in the class procedure. They found these affordances in the division of labor. For instance, they mentioned that "division of labor brought cooperation among class members which was very good"; "I think our assignments were like teamwork, and the instructor guided us, and we worked together, and that was the best aspect I believe"; "The most effective aspect was the interaction between the instructor and the students"; "The major strength was group work and division of labor"; "The idea of dividing labor was brilliant."

6. Time and effort. Students had differing ideas regarding the amount of time and effort required in this class. Some (58%) commented that following the class procedure was easy and did not take a lot of time; however, some others (41%) noted that it was difficult somehow and time consuming. They mostly mentioned that they practiced a lot every week, and it was very good. Representative of their responses are as follows: "I had a lot of time to do the assignments, and because it was all online, it was easier for me to do them"; "It was easy and did not take a lot of time to do class assignments." However, the comments made by those who found this procedure difficult are represented as follows: "I really improved, but it took a lot of time to do my assignments"; "We had time limitation. If we had more time, we could write better"; "It was difficult to send emails and share weekly assignments in due time."

7. Instructor's role. Almost all the students (92%) appreciated the prominent role of the instructor in class procedure. They acknowledged her support, patience, and teaching method. Examples of the students' perception are the following extracts: "I sincerely believe that our instructor played the most important role in this course"; "I liked the

patience and hard-working characteristic of our instructor”; “Working with this website could not be good without our instructor. It could be an awful experience with an impatient instructor.”

8. Outcome. All the students acknowledged improvement in their writing skills at the end of this course. Some of them (41%) also noted that their attitude toward writing had changed. Some of the excerpts are as follows: “During this course, I really found out that my writing skill has improved”; “Now I can write different types of academic paragraphs”; “It really improved my writing, and writing a paragraph became easy for me”; “I did not use to like writing because of the traditional writing methods, but now I like it.”

Discussion

This study sought to investigate Iranian EFL learners’ perception and perceived affordances of AT-based CALL in writing achievement. The results of the closed-ended questionnaire revealed that Iranian EFL learners have a moderate to positive perception toward AT-based CALL, thus validating the use of AT-based CALL for second language writing. This result aligns with the findings of other studies that have shown positive perception toward either AT or CALL in second language writing. The favorable perception of the students of the present study is consistent with that of previous studies concerning students’ positive attitude toward web-based ESL/EFL writing instruction (e.g., Brine & Franken, 2006; Seyyedrezaie, Ghonsooly, Shahriari, & Fatemi, 2016; Son, 2007; Warschauer, 1996). In general, there is substantial data acknowledging students’ favorable perception of CALL. Such a perception is also in agreement with the findings of Portnov-Neeman and Barak’s (2013) study reporting students’ positive perception toward learning within the AT framework.

The findings of the closed-ended questionnaire also demonstrated that there was a substantial difference among the students’ perception toward the mediating elements of AT. The students rated mediating

artifacts, rules, and division of labor moderate to positive; however, their perception toward the element of the community was moderate to negative. The researchers could not find any empirical research investigating learners' perception toward AT-based CALL in writing achievement. The only study found in this regard was conducted by Portnov-Neeman and Barak (2013) who used the activity theory as the conceptual framework for exploring students' perception about how learning in school is affected by the elements of AT. The findings of their study revealed that the students evaluated the object and division of labor categories positive, but had less appreciation of the roles of tools, rules, and community to learning.

As it was pointed out earlier, the students perceived the mediating artifacts of AT-based CALL moderate to positive. Among the mediating artifacts, they noteworthy acknowledged the website designed based on AT elements for this course and its ease of use. Indeed, this website was the main mediating artifact of this study. The same result was found in the students' comments to the questions asked in the open-ended questionnaire and semi-structured interview. Students mentioned that they were tired of conventional ways of teaching methods, and the use of website was an innovative way that made them motivated to learn L2 writing. Therefore, the primary affordances of AT-based CALL identified by the students of this study were the novelty of the method and its motivating feature. The same finding was captured in some previous studies reporting that CALL is motivating, and it offers development of innovative language learning materials and activities (e.g., Erguvan, 2015; Seyyedrezaie et al., 2016; Shams-Abadi, Ahmadi, & Mehrdad, 2015).

Another affordance attributed to the mediating artifacts of AT-based CALL reported by the students was an enhancement in their computer skills during this course. Most of the participants noted that working with the course website provided them with precious opportunities to enhance their necessary digital skills. This finding adds to the case for the

educative value of CALL, thus confirming current literature (e.g., Armstrong & Franklin, 2008; Warschauer, 1996).

Another significant affordance of the mediating artifacts repeatedly mentioned by the students was related to the website characteristics including its access, organization, as well as content and materials. The students frequently emphasized that it was beneficial that they could access the materials easily because of the well-organized course website. They acknowledged the accessibility of the website content and materials. These findings were in agreement with the synchronous quality of CALL. As Warschauer (2007) puts it, asynchronous quality makes the CALL materials available anywhere and anytime. The same results were mentioned in Che Wan Ibrahim's (2013) study as availability, easy to use, and easy to access. Availability of all instructional materials as one of the helpful features of the online environment was also reported in a study done by Seyyedrezaie et al. (2016).

Still another affordance found in students' reports concerning the mediating artifacts was about time and effort. Many of the students pointed out that AT-based CALL helped them to spend less time and effort on their writing assignments. The same result was found in students' perception in Ozturk's (2012) study in which the students claimed that they could use their time effectively to complete the tasks on the computer.

The second element that captured the students' positive perception was a division of labor. The students noted that the idea of group work and cooperation was significant. They found dividing responsibilities and assigning roles effective as well as enjoyable. The students also mentioned that they benefited noticeably from their classmates' shared materials. Furthermore, they underlined the paramount role of interaction that division of labor brought to their class. This finding is similar to that of other studies emphasizing that integration of technology to writing

classes facilitates collaboration and interaction among students (e.g., Ahmadi & Marandi, 2014; Chapelle, 1998; Seyyedrezaie et al., 2016).

The third element of AT perceived positive by the students was rules. The students pointed out that the rules specified for them were helpful and applicable. Also, they marked that they learned a great deal from the rules, and following those rules was not demanding at all. Many of the students also acknowledged the effectiveness of setting deadlines as a rule and mentioned that it helped them to manage their time. For these students, rules were perceived as affordances. However, a few students reported that setting deadlines were the weakness of this course. Consequently, it can be interpreted that some students found rules as affordances, while others perceived them as constraints.

As it was mentioned previously, the students had moderate to negative perception toward the element of the community which includes the teacher, other university instructors, classmates, other students, friends, and family members. This finding indicates that community members did not play a crucial role in the students' writing achievement. However, the results highlight that although a sizeable amount of survey participants held moderate to negative perception toward community, they still expressed a highly favorable perception toward the teacher as a member of the community. Hence, the teacher seems to be significant in contributing to the affordances students perceived. This result is in line with the finding of other studies that have affirmed the prominent role of the teacher (e.g., Baskaran & Shafeeq, 2015; Haines, 2015; Ozturk, 2012; Potrnov-Neeman & Barak, 2013; Seyyedrezaie et al., 2016). This finding can be explained by Asian culture in which teachers are respected as an important individual influencing students' achievement.

Another affordance identified by the students of this study was the change in their attitude toward writing and witnessing and noting their improvement in L2 writing. These affordances are related to the outcome of AT-based CALL. The same points were found in Bagheri, Yamini, and Behjat's (2013) study. They concluded that blended learning environment considerably enhanced EFL students' writing performance.

Despite the affordances mentioned above, a severe constraint found in the students' reports. The primary constraint mentioned was the Internet access and speed which can usually be a problematic issue. The students in some other studies mentioned the same problem (see, e.g., Brine & Franken, 2006; Seyyedrezaie et al., 2016).

Conclusion

The findings of this study indicated that Iranian EFL learners possessed relatively positive perception toward AT-based CALL in writing achievement. They showed interest in using online tools to work as a group within a system to improve their writing. Besides, they found many affordances and few constraints in the instruction. They perceived AT-based CALL very fruitful, motivating, and innovative. The students' positive perception can be attributed to the novelty of the treatment in incorporating technology into L2 writing instruction and encouraging social learning among the students who are in line with the needs of students in the 21st century.

The findings also showed that the students considered the instructor as the primary source of knowledge and the most perceived affordance, while other mediating elements, such as books or computers were only assumed as complementary aides to improve L2 writing. These findings signify the prominent role of instructors in motivating students to engage in learning and in providing opportunities for them to perceive the affordances of the learning environment.

The findings of this study have implications for EFL teachers and syllabus designers in that they become familiar with the positive effects that AT-based CALL can have in promoting interest, motivation, and cooperation among students. Moreover, foreign language educators, researchers, and curriculum planners can gain insight into the probable affordances and constraints of AT-based CALL in writing classes.

For pedagogical benefits, traditional teaching methods should be replaced with methods that can create a constructivist learning

environment in which students interact with tools, community, a division of labor, and rules and play an active part in forming these aspects of learning to achieve a better outcome. Besides, because CALL is a diversion from the traditional teaching methods, language teachers need to be aware of technology integration and the possibilities it holds for EFL classes.

However, the present study was constrained by some limitations which precluded the researchers from making firm inferential conclusions. Any conclusions are thus tentative pending confirmation from further research. Accordingly, the following suggestions are presented to future researchers who are willing to conduct a similar investigation. First of all, future research is required to find more detailed information concerning students' perception and perceived affordances of AT-based CALL at different levels of language proficiency. Moreover, further studies are required to investigate whether a broader range of language students--male or female, skilled or unskilled at using computers, and experienced or inexperienced in using computers--have positive perception toward using CALL within AT in L2 writing classes. Another possible direction for future research is to replicate the study with a larger sample size to generalize the findings. Finally, other studies can be carried out on the same topic through an extended course of instruction since the length of the course may affect results.

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Appendix A
Activity Theory-Based CALL Questionnaire
December 2016

Dear Students,

I would like to ask you to help me by answering the following questions concerning your experience in the Advanced Writing Course. This survey is in activity theory. This is not a test, so there is no "right" or "wrong" answer, and you do not even have to write your name on the questionnaire. I am interested in your personal opinion. Please give your answers sincerely because your responses guarantee the success of the investigation. All the responses will be kept confidential. Thank you very much for your help.

Basic Demographic Information:

Age: -----

Sex: Male Female

Instructions:

- Please indicate to what extent each statement is right in your case:
Not at all (1), not really (2), to some extent (3), quite a lot (4), or very much (5).

Example: If the statement is not at all accurate in your case, mark:

	1	2	3	4	5
Item	Not at all	Not really	To some extent	Quite a lot	Very much
1. I enjoyed working on the course website.	<input checked="" type="checkbox"/>				

Item	1 Not at all	2 Not really	3 To some extent	4 Quite a lot	5 Very much
1. I enjoyed working on the course website.					
2. I used online sources to write better.					
3. My classmates' shared materials helped me to write better.					
4. I used online dictionaries to write better.					
5. The course book helped me to write better.					
6. The Grammar Terms available on the website helped me to write better.					
7. The Writing Tips helped me to write better.					
8. The Sentence Types and Connecting Words guide available on the website helped me to write better.					
9. The Connecting Words and Transition Signals guide available on the website helped me to write better.					
10. The Pre-writing Techniques helped me to write better.					
11. Grammarly software helped me to improve my writing.					
12. I used my teacher's graded samples and feedback to improve my writing.					
13. It was difficult for me to work on the course website.					
14. I followed my way of writing.					
15. I used materials other than those available or shared on the website to write better.					
16. The Rating Scale available on the website helped me to write better.					
17. The Punctuation Rules helped me to use correct punctuation marks in my writing.					
18. I followed the Page Format rules to write with the correct format.					
19. The Correction Symbols guide helped me to edit my writing.					
20. The Writer's Self-Check questionnaires helped me to check and edit my writing.					
21. It was difficult for me to meet the deadline for the assignments.					
22. I avoided plagiarism.					
23. It was difficult for me to email my writing every					

	1	2	3	4	5
Item	Not at all	Not really	To some extent	Quite a lot	Very much
week.					
24. My teacher helped me to write better.					
25. Other university instructors at my university helped me to write better.					
26. My classmates helped me to write better.					
27. Other students in my educational environment helped me to write better.					
28. My friends helped me to write better.					
29. My family members helped me to write better.					
30. Other people outside of the university helped me to write better.					
31. Dividing responsibilities among class members helped me to write better.					
32. My classmates' brainstorming of ideas helped me to get more ideas to write.					
33. My classmates' shared transition signals and examples helped me to use correct transition signals in my writing.					
34. My classmates' shared topic related vocabulary helped me to use more effective words in my writing.					
35. My classmates' shared models helped me to write better.					
36. My teacher's shared models helped me to write better.					
37. It took much time to do my assigned tasks following the class procedure.					
38. It was difficult for me to share materials on the course website every week.					

Thank You

Appendix B

Activity Theory-based CALL Questionnaire

Instructions: Based on your experience in the Advanced Writing Course, please answer the following questions. You can answer the questions in Persian if you like. This is not a test, so there is no right or wrong answer. Your responses help us to improve the course. All of your responses will be kept confidential. Thank you very much for your help.

1. I liked/disliked this writing course because-----
2. I recommend/do not recommend my friends to take the same writing course because-----
3. Was the website designed for this course useful? If yes, what were the most useful aspects of the website?
4. What were the main strengths and weaknesses of the class procedure followed in this course?
5. Can this class procedure be improved? How?