

Applying Computer-Mediated Active Learning Intervention to Improve L2 Listening Comprehension

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Abstract: This study aims to apply active learning in a foreign language context to improve L2 learners' listening comprehension. Participants in this attempt were 56 EFL learners between 13 and 15 years old. To amass the required data, learners went through a ten-week treatment, in which participants in the experimental group received computer-mediated active learning intervention and those in the control group had computer-mediated listening activities in traditional lecture-based format. Since the focus of this study is on listening comprehension, tasks were designed in such a way so as to teach the basic tenets of listening including: a) reflective listening to comprehend meaning and content, b) reflective listening to clarify feelings, and c) listening to nonverbal cues. The aim was to find the possible effects of such intervention on learners' listening comprehension. Scores on final exams and an attitude interview were compared between the two groups. Results of independent samples t-tests revealed that, as opposed to students in the control group, students in the experimental group performed significantly better and had much more positive attitudes toward the course. It was found that the proposed intervention is beneficial for English-language learners by reducing their anxiety in listening tasks and enhancing their motivation to take part in classroom activities and to do independent test tasks as their homework.

Keywords: Active Learning, CALL, Listening Comprehension; Technology.

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Introduction

Active learning

Vygotsky (1978) pointed to the positive outcomes of simultaneous use of cognitive processes and social activities which contributed to sociocultural theory of development. This theory posits that learning takes place when the material and instruction given to learners is one step beyond their current level and support is received from peers and the instructor. Active learning, which is the instructional method applied in this study, rests on sociocultural branch of constructivist learning theory as it involves students' efforts to actively construct their knowledge and teachers' effort to develop each student's learning potential.

Active learning instructional techniques and strategies are found to be more effective than traditional lecture-based instruction for promoting student learning (Freeman et al. 2014; Prince 2004; Lund & Stains, 2015) as they help learners (a) do things and think critically or creatively, (b) learn by doing and collaboration with peers with increased autonomy and motivation (c) apply, analyze and evaluate and create meaning, (d) explore personal attitudes and values, (e) give and receive feedback, and (f) reflect upon the learning process.

Previous attempts on active learning mainly focused on various techniques to create active learning in the classroom such as problem-based learning (e.g. Yaqinuddin, 2013), individual response technology (e.g. Bachman & Bachman, 2011) and pointed to the positive learning outcomes of applying this intervention (Henderson, Dancy, & Niewiadomska-Bugaj, 2012; Prince, 2004) and the positive attitudes of learners (Daouk, Bahous, & Bacha, 2016; Killian & Bastas, 2015; Wood, 2009; Walker & Whiteside, 2009; Smith & Cardaciotto, 2011). Some studies provided tips, tools, and techniques for organizing, conducting and delivering active and high impact learning in the classroom (Auster & Wylie, 2006; Biech, 2015; Faust & Paulson, 1998; Keyser, 2000). Yet in the foreign language context, scant attention is paid to innovative approaches for creating an active learning environment.

Douglas, Burton and Durham (2008) encourage the use of active learning as they claim that in direct, teacher-centered method of instruction, "[t]eachers deposit information into students as opposed to providing students with opportunities to express their creativity or utilize their assets" (p. 184). In the same line, Hussain (2012) favors active learning in higher education classes as such approach builds on students' prior experiences to construct new knowledge, thus, it leads to the enhancement of students' reasoning skills.

A number of attempts aimed to review and analyze multiple active learning studies. One of such studies is the one carried out by Ruiz-Primo and colleagues who analyzed the

research items examining the effects of active learning approaches in undergraduate biology, chemistry, engineering and physics courses (Ruiz-Primo et al., 2011). The authors found that the inclusion of active learning approaches improved student outcomes. These results were supported by Freeman et al. (2014), who in a meta-analysis study showed that active learning increases performance in STEM (science, technology, engineering and mathematics) disciplines. In another integrative literature review, Arthurs and Kreager (2017) found four categories of in-class activities namely “(i) individual non-polling activities, (ii) in-class polling activities, (iii) whole-class discussion or activities, and (iv) in-class group activities” (p. 2073) and they observed a growing trend toward the implementation of in-class activities that facilitate active learning.

In second language context, the role of teamwork and cooperative learning is highly emphasized (Larsen-Freeman & Anderson, 2011) and as Long and Porter (1985) noted, they would result in higher motivation, more initiative on the part of learners and lower anxiety. However, scant attention has been given to the implementation of active learning intervention in second language context and the few conducted studies mainly focus on flipped learning (Marshall, 2014; Bauer-Ramazani et al., 2016). Thus, following previous studies which supported the significance of learners’ interaction and participation, which are more emphasized in active learning, in nurturing learners’ critical thinking and reasoning and problem-solving skills (e.g. Hussain, 2012), this study aims to shed light on applying active learning in a foreign language context to improve learners’ listening performance.

Listening Comprehension

Despite the common agreement among many language teachers and researchers over the primacy of listening compared to other language skills (Asher, 1969; Vandergrift, 1997, to name but a few), there is a lot of evidence that this skill is still undervalued. Most studies on listening pedagogy confirm the fact that teachers generally follow a testing model, through which after performing listening tasks, teachers check the answers and provide little information regarding how to improve their listening (Field, 2008).

According to O’Malley and Chamot (1990), learners apply three types of strategies while learning: cognitive, metacognitive and socio-affective. Since then, a number of attempts were conducted focusing on different skills and strategies applied by EFL learners. One of the pioneering attempts on listening strategies applied by adult ESL learners was carried out by Murphy (1985). Using a think-aloud procedure, he found that effective

listeners used a wider variety of strategies and engaged in more active interaction with the text. Vandergrift (1997) found that second language (French) listeners of higher proficiency level apply more strategies than those of lower levels. The author also pointed that successful listeners applied more metacognitive strategies, such as comprehension monitoring, problem identification, and selective attention than the less successful ones. Socio-affective strategies (such as questioning for clarification, cooperation, lowering anxiety, self-encouragement, and taking emotional temperature) also increased by course level, though the overall numbers were fewer than the numbers reported in the other two strategy categories. In a further study, Vandergrift (2002) found that reflection on the processes of listening can help students develop metacognitive knowledge and they might achieve greater success on these types of L2 listening tasks.

Given the difficulty that learners experience in this skill, there has been a concentrated effort to create learning opportunities that engage, inspire and motivate the students to learn both the language proficiency and listening skill and strategies that L2 learners need. To meet such requirements, there are a number of interventions which focus on learners' increased engagement in the tasks in lieu of the lecturing method, which is the predominant mode of instruction.

According to Meyers and Jones (1993), the focus of active learning is on developing not only students' knowledge but also their skills and abilities by providing opportunities "to talk and listen, read, write, and reflect as they approach course content" (p. xi). In addition, this student-centered instruction approach is claimed to be important for developing reasoning, problem solving and the application of concepts to new situations (Palinscar, 1998), which are required for a better performance in listening tasks. On the other hand, following Ellis (1993) and Swain (1985) who highlighted the efficiency of interaction in deeper comprehension and increased language practice, there is a need for innovative approaches that provide higher chances of interaction and opportunities to use their knowledge and test and assess it. In this attempt, the active learning intervention is used as a strategy to modify learners' listening performance through the assistance provided to them, to teach the listening strategies while working individually or collaboratively and subsequently an understanding of their perceptions of such strategies and their listening performance would be gained.

Given the learners' reliance on technology and their high consumption of it outside the instructional setting (Mutekwe, 2015; Chapelle & Voss, 2016) and considering the higher

motivation level obtained by learners and their favorable attitude and positive view of learning in computer-mediated active learning class environments (Dixon & Hondo, 2014; Park & Choi, 2014), this study aims to apply computer-mediated listening comprehension exercises to improve learners' listening comprehension level.

Computer Assisted Language Learning

Computer assisted language learning (CALL) is defined as the “study of applications of the computer in language teaching and learning” (Levy, 1997, p. 1) and it goes back to as early as 1960s. Previous studies on CALL pointed to its efficiency in learning and teaching of oral skills (Abdolrezapour, 2017; Sun, 2009; Winke, Gass, & Sydorenko, 2010) and have addressed such issues as distance learning (Qian & McCormic, 2014), collaborative learning and social context provided (Cuesta Medina & Alvarez, 2014), students or instructors' attitudes (Wiebe & Kabata, 2010), strategy use (Smidt & Hegelheimer, 2004), oral feedback (Xu & Peg, 2017), providing help options (Mohsen, 2016), captioning and subtitling (Danan, 2004, Winke, et al., 2010) and the test format (Batty, 2014).

Instructors mainly use CALL for providing learners with authentic situations in which they can develop and express their views and establish cooperatively meaningful communication (Chapelle & Voss, 2016; Mueller-Hartmann, 2000); it is also suggested that embedding multimedia in the second language context would lead to higher levels of motivation and learning gains (Dixon & Hondo, 2014; Roman-Odio & Hartlaub, 2003). Through technology-mediated listening comprehension tasks, both audio and video-mediated listening tasks can be provided to learners and thus nonverbal cues and gestures which are highly influential in learners' performance can be applied by language learners (Batty, 2014; Sueyoshi & Hardison, 2005; Suvorov, 2013).

Following the reform in education, a number of second language researchers and instructors tried the application of active learning or collaborative learning applying CALL. For instance, Cuesta Medina and Alvarez (2014) in a qualitative study on collaborative CALL found that both teacher trainees and their learners perceived virtual language resource centers as tools supporting the development of learner autonomy through the use of Web 2.0 technologies, various scaffolding agents, and instruction in learner strategies.

As one of the most important topics in the language instruction context is nurturing language learning strategies and given the efficiency of active learning in providing opportunities for testing the learning strategies and modeling the best ones as well as for

developing reasoning, this study aims to shed light on the application of active learning procedures in one of the most important and quite less investigated language skills, i.e. listening, and considering the usefulness of CALL in providing authentic materials to language learners, tasks are mostly presented through technology.

Research Questions

Since the main focus of active learning is on developing skills rather than transmitting information, it is more applicable in instructional settings where the focus is on teaching language skills and strategies. This kind of instruction can lead to higher interest, more engagement and greater amount of social connections. Considering the theoretical and empirical issues discussed above, this study aims to investigate the following research question:

Does exposing EFL learners to active learning intervention have any significant effect on their listening comprehension score?

Methodology

Following the main aim of the study, which was offering the hands-on tips and techniques for creating an active and high impact learning environment, the following methodology was adopted.

Participants

Participants were 56 students between 13 and 15 years old in an English institute in Iran in 2018. Upon enrollment, all were tested with a standardized test and two in-house assessments to make sure of their initial homogeneity. The participants were in two intact classes taught under the same instructor. One class was taken as the experimental condition with 27 students and the control condition had 29 students. Students in this language institute are simultaneously enrolled in speaking, listening, grammar, reading, and writing instructional activities; each session lasts for 2 hours per day, four days a week. This course strives for a principally eclectic approach, employing communicative, task-based, and focus on form approaches.

Instructional Intervention

The instructional treatment for both experimental and control groups took place over a ten-week period, with the primary difference being the focus of the program. In the experimental group, we had the active learning program employed to investigate its efficiency in doing

computer-mediated listening comprehension tasks and in the control group, only computer-mediated listening comprehension tasks were offered for improving this skill. To ensure consistent and parallel instruction across participants, the same instructor taught both groups.

Computer-mediated Listening Comprehension Tasks

Following the available evidence pointing to the efficacy of employing both the audio and visual media in making the text more comprehensible for non-native speakers (Flowerdew, 1994), the listening input provided to L2 learners were both in the form of audio file and video input. And the listening tasks included 11 items which were answered collaboratively (as for the experimental group) or independently (for both experimental and control group). These items included selecting the most pertinent summary, fill in the blanks tasks, multiple choice items, providing the summary of the lecture, repetition drills and short answer format. More information of each item is provided here:

- 1- select the most pertinent summary: L2 learners listened to the audio/watched the video and then a number of paragraphs were provided and they had to choose the one that best fitted the summary,
- 2- fill in the blanks: After listening to the audio file or watching the video file, test takers were provided with a written text on computer screen and they had to fill the gaps,
- 3- multiple choice: After listening to the audio file or watching the video file, test takers had a number of questions with multiple answers and they had to select the option(s) that best answered each question,
- 4- provide the summary of the lecture: after completing the listening task, L2 learners were asked to summarize the lecture,
- 5- repetition drills: L2 listeners were asked to repeat or retell the last three sentences that were heard,
- 6- short answer questions: a number of questions with a single-word answer or the maximum number of 3-word answer were given to learners and they were asked to write the most relevant answer.

Active learning program

Designing an active learning class is not an easy task. It requires teachers' effort and initiative to provide a learning environment that makes active learning possible. The active

learning teacher in this study devised the techniques and strategies based on a number of criteria such as: being exciting, encouraging learners to think deeply and critically, engaging learners in discussions on various motivating topics, teaching learners how to listen and guiding them to have self-assessment. During the ten-week program, experimental group students went through the active learning intervention for listening comprehension. In all stages of the listening activities, the teacher ensured that all students were engaged in attentive listening in a student-centered classroom and she herself stayed on track and tried to help stuck students. The activities applied for the purpose of active learning instructional strategies applied for listening comprehension tasks were:

1- Modeling Good Listening Strategies

Each session, the instructor devoted ten minutes of the class to talk about characteristics of a good listener and tried to apply them in front of students through listening to a lecture. The characteristics included pre-reading of a task, note-taking, concentrating, selective attention, using background knowledge, reading the first words in a sentence or reading the next segment to understand the previous one and guessing the following parts of the listening task. Then, she asked a number of volunteered students to listen to a short lecture and model good listening strategies in front of the class.

2- The Muddiest Point Technique

In this activity, some listening sections of a higher level were played. Then, students were asked to write notes on the most unclear or most confusing section of the task. Then, all answers were checked and the most common ones were used for further discussion. For the ones which were related to individual students, the teacher (or in some cases, the peers) provided individual feedback.

3- Questioning

In this part, a listening section was played and students were asked to take the role of the teacher and create their own questions about the listening. This technique not only helped them in listening comprehension activities, as they could guess the question and focus their attention to find the answer of that probable question, but it also helped them in other courses to be able to pinpoint the more significant parts of the course content and be prepared for future tests and exams.

4- Summarizing

A number of 5-minute excerpts were played and students were asked to take notes and then read their summaries in front of the class. Other students were asked to listen attentively to

the summary and add the important missing parts. They were scored based on the summary given considering the sole inclusion of important parts and avoiding the redundancies. This part made learners prepared for one type of listening comprehension tasks by observing how others approach and accomplish such task.

5- Independent Performance

Following Bjork, Dunlosky and Kornell (2013) who refer to “a need for self-initiated and self-managed learning” (p. 418), students were guided to take the responsibility of planning, monitoring and evaluating their learning and some tasks were given to be performed individually. In this way, the learners could test their performance and check the strategies they were applying and the ones that they were taught to adopt. Then, there was a group discussion in which each student talked about her experience.

6- Teamwork or Peer Learning

Students were divided in groups of three to four and they were asked to first answer the questions individually and then to discuss and correct the group’s answer and finally reach to an agreement for a single answer. In this strategy, they were working collaboratively to detect each other’s mistakes and to provide feedback for their peers and they could learn from the strategies applied by the peers.

Listening Comprehension Tests

In order to find the appropriate listening material to assess the subjects’ listening comprehension ability prior to and after the experiment, a series of 20 potentially useful texts was rated by a group of 4 colleagues. Teachers were asked to listen to each text once and, immediately afterwards, independently ranked it on a level of difficulty from one to five. On the basis of these responses, 10 authentic oral texts (each comprising 6 questions) at intermediate level were chosen and two listening comprehension tests, each comprising 30 items were prepared, one serving as the pre-test and the other for post-test. The listening test included several passages each followed by a few questions assessing listening ability in various forms, for example, multiple choice, short answer, and true/false. The reliability (Cronbach’s alpha) of the pre-test was 0.84 and for the post test, it was 0.87.

Data Collection

First, the research purposes were explained to the participants and they were pretested applying a test of listening comprehension to check the equality of the experimental and

control groups in terms of listening comprehension. Then, learners went through a ten-week treatment. Participants in the experimental group received active learning intervention and those in the control group had the usual procedures of the institute. Since the focus of this study is on listening comprehension, tasks needed to be designed in such a way so as to teach the basic tenets of listening including: a) reflective listening to comprehend meaning and content, b) reflective listening to clarify feelings, and c) listening to nonverbal cues. Students of the experimental group were engaged in active listening through relating, analyzing and using what they were hearing. Further discussions and interactive lectures were also applied when deemed necessary.

In each session of the experimental class, there was a relatively short (from 2 minutes to 5 minutes) introduction by the instructor in which she talked about the benefits of applying active learning followed by a group discussion, in which learners talked about their own experiences of previous active learning classes. Then, the listening strategies training section was offered to students of both experimental and control groups. Then, an excerpt (e.g., such as a radio broadcast file, a video file or a lecture) with a duration of 3 to 5 minutes was played and students were asked to answer the questions applying listening strategies.

In order to ensure the internal validity, the same instructor taught both classes with the same course outline and the same listening strategies training section. The listening tests and tasks and textbook were the same and similar mid-term and final exam were administered. The only difference between these two groups was the active learning intervention which was only offered to the experimental group.

A semi-structured interview with some of the learners of the experimental group (see Appendix) was used to find a more fine-grained understanding of the learners' perception of the active learning program and to triangulate the research data. To facilitate learners' task and to prevent any language-related hindrances, the interview items were prepared in Persian (i.e. the learners' mother tongue). Each interview took between 4 and 5 minutes. The interviews conducted and audio-recorded by the researcher were transcribed for further investigation.

Data Analysis

Learners' listening comprehension scores both in pre-test and post-test were assessed using quantitative methods. The data obtained were analyzed using the statistical package for social sciences (SPSS) to provide plausible answers to the research question posed above. First,

descriptive statistics were used and the obtained scores were checked in terms of the normality of distribution using such indices as Kurtosis and Skewedness. Then, independent sample t-tests were performed to check the significance of the differences in obtained scores.

Results

Table 1 shows the descriptive statistics and the results of t-tests for the scores obtained from subjects' listening comprehension on pre-tests. As shown, the experimental and control groups were fairly similar in terms of listening comprehension.

Table 1. *Descriptive and Inferential Statistics on Pre-test*

	Group	N	Mean	SD	Sig
Listening Comprehension	CG	29	17.64	2.43	.275
	EG	27	17.84	2.29	

Level of significance is 0.05

In order to see whether the positive effects of exposing learners to active learning intervention transferred to their listening scores, the mean scores were compared across the two groups after the two-month period. Results of the inferential statistics displayed in Table 2 point to the statistically significant differences between the experimental and control groups in terms of listening comprehension ($p < 0.05$).

Table 2. *Descriptive and Inferential Statistics on Post-test*

	Group	N	Mean	SD	Sig
Listening Comprehension	CG	29	20.31	3.03	.000*
	EG	27	24.98	2.14	

Results showed a significant increase in listening comprehension of the experimental group and no significant change was observed in the control group's scores in both tests.

Discussion

Despite the potential role that listening skill has in learning the second language and developing other language skills (Vandergrift, 2007), most second language learners have difficulty communicating in real-life situations in the foreign language setting. The aim of this study was to adopt an active learning approach toward listening comprehension processes of L2 learners. The reason for adopting such approach was the effect of active learning on learners' learning process and the retention of much more of the information given to them. During the instruction, it was found that learners became much more active

listeners and were more responsive and much more independent to accomplish the tasks as they were required to regularly assess their learning progress and handle the problems independently or in collaboration with their peers. In such an engaging learning context, they could obtain social support, feedback and encouragement from their teacher and peers and they became much more motivated.

The active learning procedures were also more favored by learners than the traditional teacher-centered method, which was in support of the previous studies pointing to the positive outcomes of collaborative learning (*Daouk, et al., 2015; Wood, 2009; Walker & Whiteside, 2009; Smith & Cardaciotto, 2011*). Students showed higher interest to have more engaging listening tasks in which they not only obtain knowledge of listening strategies but also they would understand how to adopt the active approach in unprecedented listening situations they face in real-life or in testing situations. They expressed that their initial understanding of applicable listening strategies was challenged in the collaborative active learning tasks which motivated them to listen more and do the tasks even individually to apply the newly-taught strategies. They appreciated the sense of belonging to a group with the same shared goal.

One of the students of the experimental group, commented that “being involved in learning activities and modelling learning strategies helped me to revise the strategies that I previously applied and that made me more interested”. Another student maintained that “in our group activities, I became aware of difficulties that my friends experience and we could understand that some parts are unclear to all of us but our teacher helped us tackle such problems”. Regarding the teacher’s role, a learner commented that “the teacher was more acting as a guide and tried to engage us in activities; this class was different from the conventional ones that we mostly have. In fact, our active participation in listening activities highly motivated us”. With regard to the effect of this intervention on decreasing learners’ tension in listening activities, a student mentioned “I used to spend a great deal of time worrying about various things, the things which went wrong and the ones I could have changed but I did not, and these things always occupied my mind while studying. In the case of listening, I was always worry about the parts I already have missed and the parts that I may miss after that and that would underscore my grade, but the activities applied in this class helped me to be relaxed and focus on the main content and my final score was radically different from the final score I obtained last term”.

However, there are some limitations and obstacles of adopting an active learning approach such as the teacher's resistance to adopt such approach due to the time and energy required for pre-class preparation. The approach, also, might not be applicable to classes with large number of students as it is not possible to involve all students in class discussions or to check their learning states. In addition, few course content can be covered in such classes and students might erroneously suppose that the teacher has done nothing.

The observed significant differences between the listening scores of experimental and control groups and the improvement in the listening scores of the control group from pretest to posttest could be attributed to the influence of the technology-mediated active learning intervention with its numerous opportunities for applying various listening strategies in a critical manner. A number of studies have documented empirical evidence in support of the positive outcomes of teaching listening strategies and adopting active learning intervention (Henderson, et al., 2012; Prince, 2004) and there is some evidence indicating that applying computer-mediated instruction and improvement in second language oral performance are positively related (e.g. Abdolrezapour, 2017). In this regard, then, this study shows the possibility of improving L2 learners' oral performance through active learning intervention.

Of course, it should be pointed out that the active learning intervention applied in this L2 instructional setting helps far more than promoting one's listening comprehension; in effect, it has the potential to help learners have better performance in other language skills, i.e. reading, writing, and speaking as well as in other academic contexts. Its effect on other language skills and its long-term effect, however, cannot be supported with the data obtained for the present study and thus needs to be tested in further research.

Implications

Implementing an active learning instructional intervention allows one to focus on difficult parts of the lesson, instead of following a routine teaching technique with little attention to learners' state of learning. Applying this instructional intervention in this study, learners were found to be more engaged, motivated and even showed higher independence. The active learning intervention proposed in this study can be incorporated in most instructional settings and it can provide feedback for language teachers concerning learners' understanding and retention of the language strategies and concepts taught. They can also help learners to apply the knowledge to wider contexts. Thus, I propose that providing initiatives which incorporate active learning may offer significant opportunities to improve educational gains. For instance,

through such activities as the muddiest point technique, learners can receive immediate peer feedback and support of the similar situations experienced by their friends and they can receive guidance from the peers and the instructor on how to tackle such tasks.

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Appendix

Interview items

1. What is your idea about the instructional activities? Were they effective in helping you to learn the listening strategies?
2. How do you perceive the teacher's role? Could she help you to accomplish listening tests and tasks?
3. Did you have any difficulty cooperating with other class members?
4. What is your feeling about this course in general?
5. Do you like to have group activities in future listening classes?

