Enhancing EFL Students' Active Learning by Using 'Formative' on Mobile Devices

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Abstract—The aim of the present study is to analyze the factors that contribute to engage students in active learning by using the Web tool 'Formative' on mobile devices. It is also focused on English as a Foreign Language (EFL) students' perceptions of using this tool for enhancing active learning. The participants were 82 adult on-site learners enrolled in five different courses of an English program at university level. Additionally, 5 English instructors were in charge of teaching the aforementioned students. A combination of an action-research design and a mixed-method approach was used in this study. The information was gathered through observations, diagnostic and perception questionnaires. The results evidenced that engagement, motivation, participation, and reduction in students' anxiety are the most relevant factors that contributed to involve students in active learning through 'Formative' on mobile devices. 'Formative' was perceived as motivating and engaging because it allowed students to enhance active learning, get directly involved in the class activities, and demonstrate their knowledge.

Keywords—EFL teachers, active learning, 'Formative', mobile devices.

1 Introduction

Pedagogical practices have changed with the emergence of technology and e-learning solutions [1]. The use of mobile technology in EFL teaching and learning involves a number of tools that allow students to have more dynamic and accessible learning[2]. Certainly, using these devices contributes to innovating the teaching-learning process in higher education around the world [3].

For the teaching-learning process to be more effective, the use of active learning as an approach in which students process, discover, and apply learned information to solve novice problems is important [4]. In fact, the appropriate implementation of active learning can be effective to promote students learning[5] According to [6], this approach includes some learning strategies such as portfolios, debates, asking questions, gathering information, writing short papers, focused listening, and group work.

With the advances of technology, mobile devices have become useful instruments that support the teaching and learning process due to their ubiquity, multi-functionality,

and Internet connectivity [7]. Due to these advantages, the application of the active learning approach using mobile devices would allow learners to adopt an active role in the language acquisition process [8].

In this respect, 'Formative' is a web-based tool that can be used by instructors to design digital 'Formative' easy-to-access assessments or assignments from any electronic device [9]. Moreover, 'Formative' can be used in the classroom to assign tasks that will be reviewed and scored by the teacher in a short period of time; thus, it allows to support communication between teacher and students [10]. For all these reasons, this tool can be used to promote active learning so that teacher-centered education can be turned into a student-centered approach [11].

Despite the aforementioned benefits of using 'Formative', research conducted on the use of this tool to enhance active learning in EFL is scarce. Therefore, the present study attempts to analyze the factors that contribute to engage students in active learning through 'Formative' on mobile devices and find out learners' perceptions of using this tool to enhance this type of learning. The results will contribute to shed light on EFL education, especially in the Latin American context. Thus, the research questions proposed for this study are the following:

What are the factors that contribute to enhance students in active learning through 'Formative' on mobile devices?

What are the EFL students' perceptions of using 'Formative' as a tool for enhancing active learning through mobile devices?

2 Literature Review

2.1 Active learning in EFL instruction

In recent years, a global consideration has been given to active learning since it is crucial for the successful practice of English teaching because it contributes to respond to the communicative needs of the language learners [12]. Furthermore,[13] defines active learning as a way of learning where students are able to decide about certain characteristics of their acquisition process. He also states that this type of learning is a mental activity through which students are asked to use their intellectual capabilities. In addition, [4] states that active learning is when students are able to process, discover, and apply learned knowledge to new fields and try to solve novice problems using the previous information. Furthermore, [14] point out that active learning is a process in which learners are engaged in tasks that allow them to build an understanding of facts, ideas and skills by following the teacher's directions. Thus, active learning constitutes any kind of activity that gets pupils involved in the learning process.

2.2 Technological tools for active learning

Active learning is very useful in the teaching-learning process, and it can be fostered by implementing active learning strategies such as academic portfolios, debates, asking

questions, gathering information, writing short papers, focused listening, and group work [6].

With the progress of technology, a variety of computer-based tools can be incorporated in the teaching-learning process in order to improve active learning. For instance, the use of interactive multimedia components can promote interaction, debate, and reflection[15].

Another example of the use of computer-based tools in active learning is the implementation of the Web 2.0 to engage students as active learners through the use of social networks such as Facebook, D3hoops.com, and MBR.org in which students could create posts and participate in online discussions[16]. The integration of active learning into online courses has also been a subject of research when designing and testing activities that facilitate student active engagement in an online course environment [17].

All in all, a number of technological options, especially those of the Web 2.0, can be creatively implemented to contribute to active learning in EFL, and it can also offer a plethora of possibilities to be explored in the future.

2.3 Using mobile devices in EFL learning

Technology has offered very important tools to support education [18]. Mobile technology includes innumerable applications and tools that allow learning to be more dynamic and accessible so that students are no longer restricted to their classrooms when it comes to interacting with learning processes [2]. In fact, mobile devices are becoming a part of people's daily lives; thus, using these devices for learning constitutes a valuable contribution in higher education around the world[3].

Certainly, researchers have found several benefits related to the use of mobile devices for learning. Nowadays, students require that e-learning be more flexible; thus, using mobile devices provides a solution to the limited time and space[19]. Indeed, mobile devices such as smartphones can provide rich and interactive multimedia content for educational purposes in almost all fields of knowledge [8]. Furthermore, [3] emphasize that mobile devices offer a variety of functions that are required during the learning process.

Regarding language learning, [8] assert that the incorporation of mobile learning empowers learners to adopt an active role in the language acquisition process. Thus, the availability of free applications or software programs makes smartphones very useful tools for students in an EFL learning context [20]. As [21] acknowledges, the increasing availability of wireless networks and the characteristics of current smartphones multiply the possibilities of using them in EFL learning.

2.4 Previous studies

A study conducted by [22] attempted to determine the role that mobile technology plays in enhancing students' active learning in an EFL reading context at Najran University in Saudi Arabia. The participants were 30 students who used technological tools such as WhatsApp and Google to access reading materials and interact with their peers and teachers outside the classroom. The participants were asked to use internet search

engines and WhatsApp groups to share their readings. Additionally, they were interviewed and asked to organize students' portfolios, which after being qualitatively analyzed, reported the learners' reading practices and use of mobile technology. The results revealed that the participants' learning autonomy improved due to the use of the selected mobile applications because they were more responsible when making decisions about the time spent, the reading materials, and the places selected to do these activities.

The students' perceptions of ICT and mobile-learning in an EFL context in Japan were examined by [23]. Quantitative and qualitative methods were used to determine students' attitudes and preferences for a period of twelve weeks. Pre and post-tests as well as interviews were applied to a group of 42 EFL learners. The results show that students had positive attitudes regarding ICT and mobile-learning because of the big opportunities they provide. Additionally, they pointed out that even though technology can distract students, ICT, especially mobile learning can create a more student-centered learning environment in the EFL classroom.

The aim of the study carried out by [24] was to identify students' use of mobile devices and their attitudes towards them, especially in developing countries. The sample was comprised of 345 Iranian EFL students, who had used mobile phones. The instruments used to collect quantitative and qualitative data were questionnaires, in-depth semi-structured interviews, and non-participant observations. The findings show that despite students have positive attitudes towards mobile learning and the use of mobile devices for EFL learning, they mainly use them for non-academic purposes. In addition, the results indicate that most students prefer to use tablet PCs, smartphones and laptops for language learning.

The study conducted by [25] had the purpose to investigate elementary school students' perceptions toward using mobile devices in familiar situational contexts to improve their EFL writing skills. The authors used a quasi-experimental design. A total of 59 sixth-grade students from two separate EFL classes participated in this research; one class (28 students) was identified as the experimental group, and the other class (31 students) was assigned as the control group. Both groups did similar EFL writing activities, but they did not apply the same method. The first group used mobile devices to do assignments within specific and familiar subject environments; meanwhile, the control group used a paper-and-pen-based method to do the activities with picture support in the classroom. The results show that students in the experimental group perceived the designed activities to be fun. Besides, it was evident a significant difference in learning achievement between the two groups.

A study of students' perceptions regarding learning activities and a mobile learning system was proposed by [26] to develop their students' EFL listening and speaking skills. A survey, one-on-one semi-structured interviews, observations, pre-tests, and post-tests were the instruments administered to 33 fifth-grade elementary school students to collect data. Since none of them had previous language acquisition experience using mobile devices, they were trained to use the proposed learning system before working on any learning activities. Findings demonstrate that students were motivated to practice their EFL listening and speaking skills more when using a mobile learning system. The participants also showed positive perceptions of learning activities.

3 Methodology

3.1 Setting and participants

This study was conducted in a private university in the southern region of Ecuador whose students received EFL instruction for a period of 5 months. The participants were 82 adult learners (25 male and 57 female), who are English major on-site students. Five instructors were in charge of teaching five different courses to the aforementioned students.

3.2 Instruments

- A diagnostic questionnaire that consisted of 11 close-ended questions was applied to students.
- An observation sheet that included a checklist with comments was used throughout the research.
- A perceptions questionnaire, which consisted of a combination of 11 multiple-choice and open-ended questions, was applied.

3.3 Procedure

An action research approach along with a quantitative method were used to collect and analyze data in this study. In the first stage, a diagnostic questionnaire was administered in order to get information about the students' background knowledge on their technological skills. This information allowed us to determine that students had good skills at using mobile devices for academic purposes.

In the second stage of this research, the participants used 'Formative' on mobile devices to do different on-site activities aimed at involving students in active learning. These activities included essential aspects previously researched in terms of learners' engagement [27], motivation [28], efficiency [29], academic performance [30], participation [31], anxiety[32], and dynamic work [33]. Such aspects were the factors considered in the present study because they are aligned with the Ecuadorian context.

The activities in the second stage were done after explaining a topic and consisted of asking students to respond to multiple-choice questions, completion activities, true and false statements, and open questions in relation to the competences of each course. During this stage, a total of 40 observations were done using a pre-designed checklist to register how the implementation of 'Formative' contributed to students' active learning in the classroom. Each observation refers to one lesson that was taught for a period of one hour in which researchers participated as complete observers. In the third stage, a perceptions' questionnaire was applied (at the end of each course) with the purpose of determining the students' perceptions of the use of 'Formative' to enhance active learning.

Finally, it is important to remark that the questionnaires were piloted with 25 students in order to validate them. Thus, they fulfilled the reliability requirements,

obtaining a Cronbach's alpha of 0.71. The data gathered from the questionnaires and observation sheets were statistically processed.

4   Results

With respect to the 40 observations, there were seven factors that were subject to monitoring in the classroom. Figure 1 shows these factors along with the corresponding percentages.
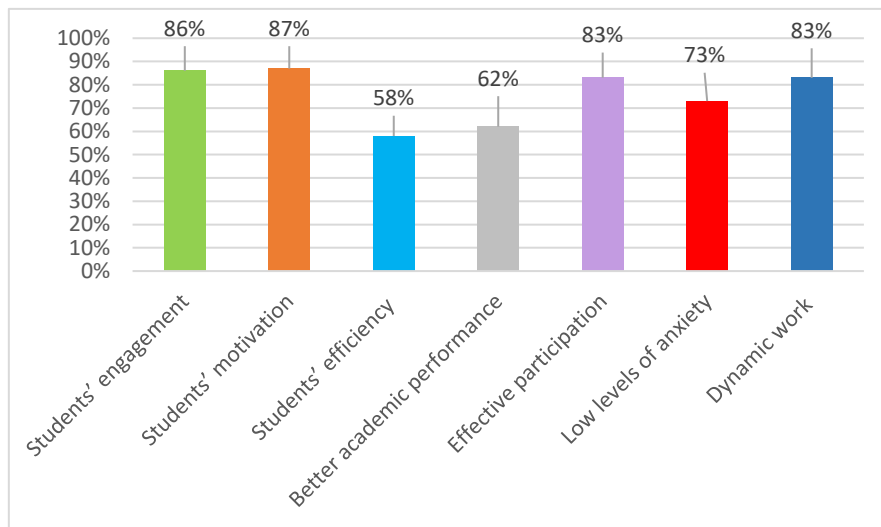

Fig. 1. Factors that contribute to students' active learning

In regards to students' beliefs on the use of 'Formative' as a tool for enhancing active learning through mobile devices, table 1 displays the percentages which were obtained after applying the perceptions'questionnaire.

Table 1. Students' perceptions of the use of 'Formative'

Statements	Strongly agree	Agree	Neither	Disagree	Strongly disagree
'Formative' was useful to develop the competences of the course.	42.43%	39.50%	12.00%	3.06%	3.00%
'Formative' helped me to get directly involved in the activities of the course.	42.00%	30.72%	18.00%	9.27%	0.00%
My interest in learning increased due to the use of 'Formative'.	36.00%	27.63%	24.36%	12.00%	0.00%
'Formative' allowed me to be involved in effective 'Formative' evaluation.	39.30%	41.32%	9.00%	10.80%	0.00%
The use of 'Formative' motivated my participation in class.	36.00%	33.69%	18.30%	12.00%	0.00%
The use of 'Formative' increased my attention in-class activities.	35.36%	36.34%	15.00%	12.00%	3.30%
'Formative' allowed me to work dynamically.	45.40%	27.32%	15.05%	9.22%	3.00%
'Formative' allowed me to show what I learned in the subject.	54.55%	24.00%	15.39%	3.06%	3.00%
Access to 'Formative' was easy through mobile devices.	39.09%	45.75%	9.11%	3.00%	3.03%
'Formative' reduced my anxiety level when taking exams.	45.35%	21.49%	18.00%	9.15%	6.00%

5   Discussion

Based on the data gathered from the observations (Figure 1), the main factors that contributed to involve students in active learning when using 'Formative' on mobile devices were motivation, engagement, participation, dynamic work, and reduction in students' anxiety. We will discuss these factors as follows.

Students' motivation was the factor that showed the highest percentage. It seemed to be low when they started using 'Formative' on mobile devices; this was the result of students' lack of previous contact with this type of tool. Nevertheless, as students used the tool more frequently, they felt more motivated.

Engagement was another influential factor during the observation process. Even though at the beginning of the second stage students were not very committed in using the tool, after a few weeks, they began to understand the use of 'Formative', which allowed them to be more engaged with the activities planned by their teachers. At the end of the process, students showed that they were very much engaged because their participation positively increased.

Dynamic work and participation were other factors observed in activities aimed at enhancing active learning through the use of 'Formative'. In fact, when learners performed the activities at the beginning of the observation process, they were reluctant to get involved in the tasks planned by the teachers. Learners were not very confident when using this tool on mobile devices. A few weeks later, it was observed that students were more willing to participate.

Another relevant factor observed was reduction in students' anxiety. In the first lessons using 'Formative', learners showed high levels of anxiety, especially when responding to questions regarding the content of the course. This happened because they were used to learning and demonstrating their knowledge through traditional resources. On the other hand, after using the tool in the next lessons, it was evident that students' levels of anxiety substantially decreased due to the characteristics of 'Formative'.

Regarding EFL students' perceptions on using 'Formative' as a tool for enhancing active learning through mobile devices (Table 1), students believed that 'Formative' helped them acquire the competences of the subjects because the majority (81.93%) strongly agreed and agreed with this statement. In this respect, [27] highlights that the use of technology increases students' engagement to collaboratively interact in the learning process.

When students were asked if the use of 'Formative' had motivated their participation in class activities, 71.70% strongly agreed and agreed. These results show that 'Formative' is an excellent tool to encourage students' motivation and participation. Regarding this aspect, [28] affirm that, in the field of education, mobile device applications create a better learning environment for students and enhance their learning motivation.

Students' opinions revealed that 'Formative' allowed them to be directly involved in the class activities; thus, it can be evidenced that they strongly agreed (42%) and agreed (30.72%) with this fact. On this basis, the majority of students perceived that the tool helped them to get directly involved with the activities proposed in the subjects. Similarly, regarding the increase of student's interest to learn the subjects, most participants (63.63%) strongly agreed and agreed, which shows that 'Formative' had a

positive impact on students' interest. Certainly, mobile learning helps students change their role from passive to active learning; thus, learners voluntarily take part in the learning process [31] Furthermore,[33] assert that technology transforms the "passive learning" role traditionally played by students into active "agents" who have autonomous control over their learning.

As for students' perceptions on the evaluation process, most of them strongly agreed and agreed (80.62%) that this tool is effective for 'Formative' assessment. In addition, 66.84% of students strongly agreed and agreed on the use of 'Formative' to reduce their level of anxiety when taking exams. These results indicate that most participants perceived this tool as very useful for evaluation purposes along with reducing students' anxiety. In this regard, [32] claims that the use of technology in class creates a positive social environment and reduces anxiety.

Finally, with respect to students' perceptions on learners' attention, dynamic work, easy access to 'Formative', and the effectiveness of this tool for demonstrating knowledge, 71.7% asserted that it helped them to be attentive in class activities, 72.72% strongly agreed and agreed that it promotes dynamic work, 78.55 % perceived 'Formative' as an effective tool to demonstrate their knowledge, and 84.84% strongly agreed and agreed that the access to 'Formative' was easy through mobile devices.

6   Conclusions and Implications

When using 'Formative' on mobile devices, motivation, engagement, participation, dynamic work, and reduction in students' anxiety constitute the most relevant factors that contributed to involve them in active learning. It is evident that good planning, teachers' training for using technology, the methodology used, and technological infrastructure are essential conditions that favor the aforementioned factors. It is important to remark that the use of 'Formative' substantially reduces students' levels of anxiety and allows them to have better performance when taking exams. Thus, this tool is effective for 'Formative' assessment.

'Formative' is an easy-to-access tool that enhances active learning through mobile devices. In this regard, students believe that this tool helps them acquire the competences they need, and allows them to get directly involved in the class activities to demonstrate their knowledge. Additionally, students' perceptions indicate that 'Formative' has a positive impact on their interest because this tool helps them become active learners who voluntarily take part of the learning process. Therefore, this tool encourages learners' participation and motivation.

The participants of this study belonged to different courses of an English program and had heterogeneous characteristics. For this reason, it was difficult to obtain a control and experimental group, so an action-research approach was applied. Further studies could use an experimental design to obtain more accurate results regarding the effectiveness of this tool. In addition, students' anxiety and motivation considering specific language skills need to be investigated by using 'Formative' or any other related tool.

7 Acknowledgment

8 References

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