Creating learning paths through Symbaloo to facilitate formative assessment for efl learners

Creando rutas de aprendizaje a través de Symbaloo para facilitar la evaluación formativa para estudiantes de inglés como idioma extranjero

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ABSTRACT

Formative assessment is a necessary component not just in face-to-face classes, but also in the Virtual Learning Environment. More than expected, research exploratory regarding formative assessment specifically to improve English learning and teaching is necessary to be carried out. On the other hand, the COVID-19 pandemic has caused unprecedented educational changes in teaching and learning, and it has affected students' attitudes toward learning. This study reports the results of action research through quantitative instruments, pre-posttests, and pre-post surveys involving 25 Ecuadorian learners. This article addressed two research questions: 1. To what extent will learners improve their English skills after experiencing formative assessment through Symbaloo Learning Paths? 2. What are students' perspectives about experiencing formative assessment through the Symbaloo

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application to improve English skills? Findings have shown a significant improvement in learners' English skills, with a large effect size of d = 4.081229 and p .000 < 0.05. Also, the students' attitude toward learning changed positively. It is concluded that formative assessment through Symbaloo learning paths has the potential to enhance learner's performance and influences their motivation positively. Therefore, it is recommended the conduction of more studies about the implementation of learning paths through Symbaloo to facilitate formative assessment for EFL learners. These findings have implications for future studies with a focus on teaching.

Keywords: formative assessment, learning paths, motivation, symbaloo.

RESUMEN

La evaluación formativa es un componente necesario no solo en las clases presenciales, sino también en el Entorno Virtual de Aprendizaje. Es necesaria una investigación exploratoria sobre evaluación formativa específicamente para mejorar el aprendizaje y la enseñanza del inglés. Por otro lado, la pandemia de COVID-19 ha provocado cambios educativos sin precedentes en la enseñanza y el aprendizaje, y ha afectado las actitudes de los estudiantes hacia el aprendizaje. Este estudio reporta los resultados de la investigación-acción a través de instrumentos cuantitativos, pruebas pre-post y encuestas pre-post que involucraron a 25 estudiantes ecuatorianos. Este artículo abordó dos preguntas de investigación: 1. ¿En qué medida los estudiantes mejorarán sus habilidades en inglés después de experimentar una evaluación formativa a través de Symbaloo Learning Paths? 2. ¿Cuáles son las perspectivas de los estudiantes sobre la experiencia de la evaluación formativa a través de la aplicación Symbaloo para mejorar sus habilidades en inglés? Los resultados demostraron una mejora significativa en las habilidades de los estudiantes en inglés, d = 4.081229 y p .000 <0.05. Además, la actitud de los estudiantes hacia el aprendizaje cambió positivamente. Se concluye que la evaluación formativa a través de las rutas de aprendizaje de Symbaloo tiene el potencial de mejorar el desempeño del alumno e influye positivamente en su motivación. Por ende, se recomienda la realización de más estudios sobre la implementación de rutas de aprendizaje a través de Symbaloo para facilitar la evaluación formativa. Estos hallazgos tienen implicaciones para estudios futuros

con un enfoque en la enseñanza.

Palabras clave: *evaluación formativa, rutas de aprendizaje, motivación, symbaloo.*

INTRODUCTION

The term *formative* refers not to the assessment itself, but to the process that guides teachers during their instructional practice, using the pieces of evidence as opportunities to develop learning actions to ensure that learners progress toward the accomplishment of goals (Black, 2013; Dorn, 2010; Heritage, 2010). Prior researches have evidenced the positive influence of formative assessment in students although the formative practices varied greatly across the studies (Shana, Al Baki & Sara, 2020; Gan & Leung, 2019; Kingston & Nash, 2015, 2011). Also, some studies have suggested the use of technology in the enhancement of students learning through formative assessment processes (Shana, Al Baki & Sara, 2020; Elmahdi, Hattami & Fawzi, 2018; Mitten, T. Jacobbe & E. Jacobbe, 2017). According to the Australian Association of Mathematics Teachers (2016), excellent teachers are described as those who use a variety of assessment strategies to gather information and use the data to give feedback and apply changes and adaptations so that learners progress toward learning goals. Moreover, studies conducted in Manta and Babahoyo, in Ecuador, have reported that formative assessment is essential for the teaching-learning process. The studies considered it as a powerful weapon that enables teachers to provide dynamic activities, timely feedback, and get evidence to take actions in progress (Paredes, Posligua, Robles, Pihuave & Bermello, 2019; Ramos, 2016). Furthermore, technology tools were proved to help teachers collect and report the data obtained to make adjustments to the teaching instructions (Robinson, 2018). However, more exploration regarding formative assessment to enhance English language learning and teaching is necessary to be conducted.

Additional, technology has the potential to increase motivation, to facilitate learners and teachers to go throughout the evaluation process, and to influence positively in learners' performance (Onodipe & Ayadi, 2020; Chou, 2017). Similarly, Elmahid, Hattami & Fawzi (2018), stated that "Integrating technology into the learning setting is the road to motivate and encourage students to learn… paved with their passion for technology and digital

tools". Many findings have evidenced the impact of the use of technological tools to facilitate formative assessment, with significant results in high stakes examination scores in comparison with those obtained from students who did not use the technology. The tools used were Plickers, Kahoot, and Padlet (Kent, 2019; Nadeem, 2019; Iwamoto, Hargis, Taitano & Vuong, 2017). However, there was not literature regarding the use of Symbaloo Learning Paths. Therefore, a study about Symbaloo learning paths is also needed to be conducted.

Symbaloo Learning Paths is an interactive gameboard-style virtual lessons platform that enables teachers to build pathways for learners in such a way they can learn at their own speed. This platform also empowers to personalize the learning experience and provide a nice formative assessment environment. Black (2013) pointed that "formative assessment-oriented lessons comprise five components: (1) clear aims; (2) planning activities; (3) interaction; (4) review of the learning; (5) summing up". The design of Symbaloo Learning Paths is easily aligned with the progress of the five previous components. Also, the platform can include resources such as videos, images, application of additional tools, such as Kahoot, EducaPlay, Padlet, among others, that can be incorporated to create activities and guide learners to achieve the transfer goal (Symbaloo, nd.).

On the other hand, Education has changed dramatically since the COVID-19 pandemic. The current situation has provoked not just to Ecuador, but to countries around the world to adapt their classes into a Virtual Learning Environment. With this sudden change, many institutions have tried to adapt to this new reality implementing technological tools that solidify new knowledge enhancing learning. Many findings have evidenced the importance of instructors world-wide to quickly adapt. They have suggested the application of some teaching methods that involve technology-use and the guidance to learners to think critically as principal authors of learning (Barry, D & Kanematsu, 2020; Grantmakers for Education, 2020; Ichsan et al., 2020; Yao, Rao, Jiang, Xiong, 2020). Not less importantly, the COVID-19 pandemic has triggered a series of educational issues. One of them is the negative attitude of learners toward learning and their low motivation. Therefore, some studies have contributed to providing some strategies that engage learners, hence, to raise the average learning level of students (Crosby, Howell & Thomas, 2020;

Zayapragassarazan, 2020). The studies suggested the use of engaging technological tools and activities designed in such a way that promotes learners' motivation and commitment to animate each other.

After analyzing these issues, been acknowledge of the necessity of the learning methodology shift, and identifying a tool that facilitates formative assessment, this study applied a preliminary survey to 25 students from the Technical University of Babahoyo to know if learners were acquainted with the term *formative* and the use of *Symbaloo Learning Paths*. The results showed that only ten learners knew what formative assessment was, just three of them had heard about this tool, however, none of them had already used it. The survey confirmed previous studies and the little literature of the application of this tool. Also, most participants showed negative attitudes toward learning English through a new technological tool, 55% of them thought it was complex, 35% were neutral and just 10% consider it as not complex.

Therefore, given the need to guarantee students a personal learning experience into a virtual learning environment, and being aware that the learning path design should facilitate teachers to keep track of the formative assessment process, the aim of this study emerged. Also, learners' attitudes toward using a technology tool in their learning process were negative. Then, the present research aims to create learning paths through Symbaloo as a strategy to facilitate the formative assessment process.

Hence, the following research questions were addressed:

- To what extent will learners improve their English skills after experiencing formative assessment through Symbaloo Learning Paths?

- What are students' perspectives about experiencing formative assessment through the Symbaloo application to improve English skills?

METHODOLOGY

Research questions

1. To what extent will learners improve their English skills after experiencing formative assessment through Symbaloo Learning Paths?

2. What are students' perspectives about experiencing formative assessment through the Symbaloo application to improve English skills?

Design and methodology

In this section, the researchers present the instruments and processes that conducted the action research, describing the variables, sample, instrument, procedures, and statistical analysis. This study has the following variables: Formative assessment through Learning Paths in Symbaloo and English skills improvement in students

Sample

From a forty-students' total population, one group of 25 students from the third level was chosen randomly. This experimental group had 25 Ecuadorian students, male and female are mixed. All participants have access to technology from home. The students are currently studying at the public University Technical of Babahoyo in CENID. According to the Common European Framework of Reference for Languages, they have an A1 level. Modules from the university last 2 months, so the treatment was 3 hours per week, having a total of 24 hours.

Table **1.** *Demographic information*

Gender	Age	Formative knowledge	Symbaloo knowledge
Male 30%	17-22 80%	Yes 40%	Yes 12%
Female 70%	23-26 15%	No 60%	No 88%
	27-30 5%		

Source: The authors

As illustrated in table 1, most of the sample are female and are between 17 and 22 years old, 60% of the participants know what formative assessment is and just the 12% have heard about the application Symbaloo, but they have not used it.

Instruments

A demographic survey was made by the researchers, it contains nominal data such as gender, yes-no questions, and open-ended questions; ordinal data like the knowledge they had about formative assessment and Symbaloo tool. This instrument had 13 items in total.

The researchers developed a pre and posttest. Tests were the same for the pre-test and post-test, but the items were changed and presented in a different order, and scenarios regarding writing and speaking. The test has 22 items, 10 items for reading, 10 for listening, 1 writing and 1 speaking, each skill was evaluated out of 10, it means the complete test was out of 40 points. To validate this instrument, it was revised by several colleagues, specialized on teaching English as a foreign language.

A pre-post survey (quantitative) was used. This survey contains 13 ordinal items classified in: totally disagree, disagree, neutral, agree and totally agree; with two final open questions. The 13 items were analyzed as the following: totally disagree (1), disagree (2), neutral (3), agree (4) and totally agree (5). The reliability of the survey was tested through Cronbach alpha, which was 0.895. It means the instrument reliability is high. The two final open questions were classified into three components: complex, neutral, and not complex, regarding students´ perspectives about the formative assessment through Symbaloo.

Gathering data

Twenty-five students filled out the pre-test and post-test, and the perceptions survey. After, the information was coded and registered in an excel spreadsheet, and finally, the spreadsheet was imported into the SPSS application.

Analyzing data

For the first research question we constructed a descriptive statistic table of the scores gotten in pre-test and post-test for the experimental group, standard deviation, minimum-maximum, so we could compare the scores´ tendency before and after the treatment, either with the total score and for each skill. Additionally, we calculated related sample t-test in SPSS for comparing pre-test and post-test means in the experimental group. In this same chart, the P-value that represents the statistical significance in which it should be ≤ 0,05 to be a significant sample, namely, it was not rare by chance; was also important to conclude the study.

At the end we calculated the effect size for the pre-test and post-test means of the experimental group, by applying the following formula:

Effect size= (mean of the experimental group) – (mean of the control group) / Pooled deviation standard.

After, we made the interpretation according to the Cohen´s d value, to verify if the effect size is small, intermediate, or large.

For the second research question, we measured Cronbach Alpha for the pre-post surveys reliability. After, we developed some descriptive statistics for the pre-survey and post-survey in order to compare the means of the constructors. Moreover, we classified the final two open questions in complex, neutral and not complex according to students´ perceptions and these results were converted in percentage to analyze how students´ perspectives changed after the intervention.

RESULTS

The results of the study are presented according to the research questions. The first research question*: To what extent will learners improve their English skills after experiencing a formative assessment through the Symbaloo Learning Path?* The results are shown in Tables 2, 3, 4 and 5.

Table 2. Paired sample statistics

		Mean	N	Standard Deviation	Mean standard error
Par 1	Reading	4.480	25	1.159	.232
	Reading	7.880	25	1.054	.211
Par 2	Writing	4.680	25	1.215	.243
	Writing	8.120	25	1.092	.218
Par 3	Listening	4.720	25	1.308	.262
	Listening	8.080	25	1.077	.215
Par 4	Speaking	3.920	25	1.077	.215
	Speaking	7.360	25	1.075	.215

Source: The authors

The data given in Table 2 shows the improvement after the intervention in each skill; raising an average of 3 points on each one. In the reading skill was an upgrade from 4.48 to

7.88, in the writing skill there was an increment from 4.68 to 8.12, also in the listening, the students performed better from 4.72 to 8.08 and finally in the speaking from 3.92 to 7.36.

Moreover, the T-test paired sample in Table 3 shows the mean differences between each skill in the pre-test and post-test (-3 in average) within the 95% confidence interval. This demonstrates that the means are different. To corroborate that the means are statistically different the T values are also shown in the table. The T value is the result of the division between the mean difference and the standard error mean. Furthermore, the P-value is .000 < 0.05 which means that the differences between the means are significant in relation to before and after the intervention, it was not rare by chance.

*Table **3.** T-test of paired samples*

| | | | | | 95% confidence interval of the difference | | t | gl | Sig. (bilateral) |
		Mean	Std. Deviation	Standard error mean	Lower	Higher			
Par 1	Reading - Reading	-3.400	.577	.115	-3.638	-3.161	-29.445	24	.000
Par 2	Writing - Writing	-3.440	.768	.153	-3.757	-3.122	-22.392	24	.000
Par 3	Listening - Listening	-3.360	.907	.181	-3.734	-2.985	-18.515	24	.000
Par 4	Speaking - Speaking	-3.440	.768	.153	-3.757	-3.122	-22.392	24	.000

Source: The authors

To corroborate the impact of the innovation and the effect size, we compared through a T-test of paired samples the pre-tests and post-tests total scores of the experimental group in the study. As it is shown in Tables 4 and 5.

***Table 4.** Paired sample statistics*

		Mean	N	Standard Deviation	Mean standard error
Par 1	Total score	17.800	25	3.785	.757
	Total score	31.440	25	2.829	.565

Source: The authors

The data given in Table 4 shows the general improvement after the intervention in the experimental group (17.80-31.44); raising 13.64 points.

***Table 5.** T-test of paired sample*

		Paired differences							
		Mean	Std. Deviation	Standard error mean	95% confidence interval of the difference		t	gl	Sig. (bilateral)
					Lower	Higher			
Par 1	Total - Total	-13.640	2.119	.423	-14.514	-12.765	-32.186	24	.000

Source: The authors

Additionally, the T-test paired sample in Table 5 shows the mean difference (-13.64) within the 95% confidence interval between -14.5147 and -12.7653. This corroborates that the means are different. To corroborate that the means are statistically different the T value (-32.186) is shown in the table. Finally, the P-value is .000 < 0.05 which means that the difference between the means is significant in relation to before and after the intervention,

it was not rare by chance. The effect size is 4.081229, which means the intervention had a big impact and it can be replicated to other studies.

The second research question: *What are students' perspectives about experiencing formative assessment through the Symbaloo application to improve English skills?* It is shown in Tables 6 and 7.

Table 6. Pre-post surveys´ means

Items	Pre-survey means	Post-survey means
Tp1	2	5
Tp2	2	4
Tp3	3	1
Tp4	2	5
Tp5	4	2
Tp6	3	5
Tp7	3	5
Tp8	3	5
Tp9	2	4
Tp10	1	5
Tp11	1	5
Tp12	1	4
Tp13	1	4

Source: The authors

In table 6, the means of the pre and post surveys are shown for each item. The survey had 13 items in which students expressed some thoughts in the following way: totally disagree (1), disagree (2), neutral (3), agree (4), and totally agree (5). Results were positive since students reflected the changed from disagreeing to totally agree regarding Symbaloo management and perspective, also about the importance of formative assessment, and how this formative assessment through Symbaloo helped them to improve their skills. In items 3 and 5 the statements were "I think Symbaloo is stressful" and "I think formative

assessment is not important" correspondingly, so students passed from neutral to totally disagree in item 3; and from agreeing to disagreeing in item 5.

Table 7. *Comparison of the percentages of students' perspectives*

Pre-survey			Post survey		
Learning English through Symbaloo			Learning English through Symbaloo		
Complex	Neutral	Not complex	Complex	Neutral	Not complex
55%	35%	10%	25%	30%	45%
14 Ss	9Ss	2Ss	6Ss	8Ss	11Ss

Source: The authors

Table 7 shows how students changed their perspectives about learning English through Symbaloo. In the pre-survey open questions 55% of the students thought it was a complex matter but then it decreased to 25% in the same open questions of the post survey. Furthermore, in the pre-survey 35% of the participants remained neutral but in the post-survey it decreased to 30%. Finally, only 10% of the students perceived it as not complex in the pre-survey, but then 45% in the post survey. In general, students changed their perspectives in a positive position after the intervention. Students also expressed how the formative assessment showed them their learning process in a more transparent way so they could make corrections on time and due to this they performed a better summative assessment.

DISCUSSION

Regarding the extent to which learners improve their English skills after experiencing formative assessment through Symbaloo Learning Paths, the present findings evidenced the essential role of the innovation. Tables 2 and 3 reported the improvement in each one of the four English skills. They showed a rise in the average of 3 marks each one and a significative difference between the means of the pretest and posttests ($T = -29.445, -22.392, -18.515, -22.392$; $P\ 000 < 0.05$). Hence, a general improvement is proved, with p .000 < 0.05 and d = 4.081229 as it is shown in Tables 4 and 5. It demonstrated that the application of the intervention was essential and contributed to the English learning process. Recent findings presented similar results. They have evidenced the positive effect

of the formative assessment process to enhance the students' performance in learning (Shana, Al Baki & Sara, 2020; Gan & Leung, 2019; Kingston & Nash, 2015, 2011). The results are also aligned to the findings from researches that used technology as a formative assessment tool (Shana, Al Baki & Sara, 2020; Elmahdi, Hattami & Fawzi, 2018; Mitten, T. Jacobbe & E. Jacobbe, 2017). Therefore, the positive effect of the application in the intervention can be replicated to other studies and contribute to this field of study.

Regarding know what the students' perspectives are about experiencing formative assessment through the Symbaloo application to improve English skills, results showed a positive change in their attitude toward learning English through Symbaloo learning paths for most of the participants. Thirty percent of learners considered it neutral and forty-five percent of them considered it as not complex. These findings coincided with the results of some studies (Onodipe & Ayadi, 2020; Elmahid, Hattami & Fawzi, 2018; Chou, 2017). These researches advocated for the use of technology to increase learners' motivation, hence generate a positive attitude into learning. Thirty percent of learners remained neutral about learning English through Symbalo and 45% of them regarded it as not complex.

CONCLUSION

The implementation of formative assessment through Symbaloo learning paths is not a totally new concept; it has been successfully used in education world. Symbaloo learning paths use game elements and game design techniques to empower and engage learners with motivational skills towards learning approach and sustained relaxed atmosphere. Symbaloo learning paths have also been found to fortify the teaching and learning experience in the 21st century as it helps learners to be motivated towards learning because of the positive and immediate feedback they get from the game.

In this study, the implementation of formative assessment through Symbaloo learning paths incorporated gamification techniques as a source of motivation to learners was developed. This application was equipped with necessary game functions for English learners.

Experimental results revealed that the implementation of formative assessment through Symbaloo learning paths have significantly enhanced learner´s English abilities and promoted learning interests. More significantly, the system facilitated a seamless mobile

learning environment for English learning without constraints of time or place imposed by classroom learning.

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