

The Effect of Formative Assessment on Students' Success

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Abstract

Assessment is an important part of teaching and learning process. Moreover, it is a dynamic process which changes continuously. Formative assessment is a part of the assessment process in general. This paper studies the effect of formative assessment in students' success. This study took place in the primary school Nuri Mazari, Struga, Macedonia. In the study participated 115 students who learn English as a foreign language. They are not the same grade, they are sixth, seventh, eighth and ninth grade students. The participants will be divided into two groups based on their gender. In order to see the effect of formative assessment, students' success before the application of formative assessment will be compared with their success after the application of formative assessment. After the first month, the teacher will take notes about the students' grades, which will be considered as initial data for this study, during the next two months, the teacher will apply the formative assessment. Then, the teacher will give them a final grade based on students' success during the application of formative assessment. The difference in students' grades before and after the study took place makes the effect of formative assessment more obvious. The data gathered in this study will be analyzed with SPSS program.

Keywords: formative assessment, students' success, English language, primary school

Introduction

The educational process is a huge process, which consists of many correlated parts. Teaching and learning process exists based on the harmony of its components. Assessment is one of those components, and it plays a crucial role in teaching and learning process in several ways. It is important for the teachers because it gives them a review of their students' understanding of the material that is taught, parts that are very well understood by the student, or those parts that seem to be more difficult for students and need to be practiced more, and also to give final. Besides this, student assessment is useful for the teachers as a feedback on their teaching, whether they have met their own expectations or not. Assessment is important also for students to see their progress, their strength or weakness in a particular topic, school subject, or learning in general. However, the assessment process is not important only for teachers and students that are directly involved in teaching and learning process every day but it is also important for students' parents. The way the teachers assess their students, by giving them written feedback, grades, or other different ways of assessing them are very useful for the students' parents because each of assessment forms used by the teacher gives the parents a view of their child's progress at school. Students' grades are useful statistical evidence for school authorities, educational inspectors and the government. Students' grades can also be used as a reference for the students' future education, or for their life after school, especially as an opportunity of getting better job positions. Therefore, teachers should be very careful when they assess their students and also when they choose the way they will assess their students because it should be apparent for student level and also for the purpose it is chosen to be used. Otherwise, it would directly reflect negative effect on students' success.

Literature Review

Since the educational process is a dynamic process that is changing continuously, assessment as a part of this process is changing, too. There are a lot of assessment methods that are applied in teaching and learning process. Many researchers are studying the effectiveness of assessment and there are a lot of books and articles written about methods of assessment, types of assessment, or assessment in general. "Assessment is the systematic collection of information about student learning, using the time, knowledge, experience, and resources available, in order to inform decisions that affect student learning" (Walvoord, 2010, p. 2). "The main aim of using assessment should be to support learning" (Black and Wiliam,

cited in: Gardner, 2012, p.11). Therefore the teachers should be very careful when they use assessment. As Garo (2013) claims that the assessment is a difficult part of teaching; moreover, it makes the teachers take a big responsibility when they give grades. The success that the students achieve in school helps them have strong self-esteem, as he says "success can lead to greater confidence in academic and social situations, instead of embarrassment" (Jensen, 2003, p. 3). According to Shermis & Di Vesta (2011) assessment should be viewed as an "intrinsic part" of teaching not as a "separate attachment" from teaching (p. 83). According to Weeden, Winter, & Broadfoot (2002) "Pupils identified three reasons for success in school – effort, ability and opportunity to learn" p. 51. "The term formative assessment does not have a tightly defined and widely accepted meaning" (Black and William 1998, as cited in: Berry, 2008: 49). "Formative assessment is a means of communication between teacher and student, guiding the teacher toward appropriate instructional decisions and providing encouraging feedback to the students" (Benjamin, 2008:9).

Methodology

The methodology that was used in this study was appropriate for the purpose of the study. The study took place during the English classes. In order to see the effect of the application of formative assessment in the students' success, the data were collected twice, first before the application of formative assessment and then after the application of formative assessment.

The aim of the study

The aim of this study is to test whether the formative assessment affects the students' success. Moreover, it aims to show if the formative assessment has a positive or negative effect on students' success. Furthermore, it will show the difference between boys and girls about their success at school.

Research questions

Students' success can be affected by many factors. There are a lot of factors outside the classroom that could affect the students' success; however, there are also a lot of factors in the classroom that could affect students' success, too. The way a teacher assesses their students could have a direct impact on students' success. Assessment in general, as well as, formative assessment in particular, could affect students' success. The research questions that arise here are given below:

Whether the use of formative assessment affect the students' success?

Rather the effect that formative assessment have in students' success is positive or negative?

Is there a significant difference of the students' success before and after the application of the formative assessment?

Is there a statistical difference between the mean of the students' success based on their gender before the application of the formative assessment?

Participants

In this study participated primary school students, who study English as a foreign language. In total, there were 115 students who participated in this study. They were not the same age; sixth, seventh, eighth and ninth grade students were part of this study.

Groups

Since this study aims to test whether there is a difference between boys and girls about their success, students were divided into two groups based on their gender. In total, there were 52 boys and 63 girls.

Results

The program SPSS was used to show the results of the data gathered for this study. The table below shows the results of the students' success before the application of formative assessment

Student' success before the application of formative assessment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not satisfied	40	34.8	34.8	34.8
	Satisfied	29	25.2	25.2	60.0
	Good	17	14.8	14.8	74.8
	Very good	20	17.4	17.4	92.2
	Excellent	9	7.8	7.8	100.0
	Total	115	100.0	100.0	

Table# 1 descriptive statistics about the frequency of the students' success before the application of formative assessment

The table above show that there were 115 students who participated in this study. The 34.8 % of the participants had the lowest grades. The success of 25.2 % of the participants was *satisfied*, 14.8% of the participants had gotten *good success*, the success of 17.4% was *very good* and the smallest group of participants, only 7.8% of the participants had the highest grades.

Students' Success after the application of the formative assessment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not satisfied	19	16.5	16.5	16.5
	Satisfied	41	35.7	35.7	52.2
	Good	17	14.8	14.8	67.0
	Very good	17	14.8	14.8	81.7
	Excellent	21	18.3	18.3	100.0
	Total	115	100.0	100.0	

Table# 2 descriptive statistics about the frequency of the students' success after the application of formative assessment

The figure above shows the total number of the participated, 115 students. 16.5 % of them were students who have got the lowest grade. *Satisfied* was the success of the biggest group of the participants. 35.7% of the participants were part of this group. The success 14.8% of the participants was *good*. There were also 14.8 % of the total number whose success was *very good*. 18.3% has got the highest grades.

Participants' gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Girls	63	54.8	54.8	54.8
	Boys	52	45.2	45.2	100.0
	Total	115	100.0	100.0	

Table# 3 descriptive statistics about participants' gender

The table above shows that 63 out of 115 participants, or 54.8% of the total number were girls and 52 or 45.2% of the participants were boys.

Analyzes

The statistical program SPSS was used to analyze the results of the study. This program has different tests that can be used to analyze the results based on the types of the data that are gathered for the study. The tests that were used for this study were Wilcoxon test, Paired sample *t* test and Independent sample *t* test.

The use of Wilcoxon test

Wilcoxon test was used to analyze the results of the mean of the students' success before and after the formative assessment took place and to compare the mean of the students' success in both cases.

<i>Ranks</i>		<i>N</i>	<i>Mean Rank</i>	<i>Sum of Ranks</i>
<i>Students' success</i>	<i>Negative Ranks</i>	1 ^a	27.00	27.00
<i>after the application of</i>	<i>Positive Ranks</i>	52 ^b	27.00	1404.00
<i>the formative</i>	<i>Ties</i>	62 ^c		
<i>assessment -</i>	<i>Total</i>	115		
<i>Students' success</i>				
<i>before the application</i>				
<i>of the formative</i>				
<i>assessment</i>				

a. Students' success after the application of the formative assessment < Students' success before the application of the formative assessment

b Students' success after the application of the formative assessment > Students' success before the application of the formative assessment

c. Students' success after the application of the formative assessment = Students' success before the application of the formative assessment

Table # 4 Wilcoxon test – Students' ranks based on their success before and after the usage of formative assessment.

The table above gives the total number of participants who participated in this study, there were 115 participants in total. Just 1 out of 115 participants of the study had negative ranks, it means that just one student had a better grade before the application of formative assessment than after the application of formative assessment. However, 52 out of 115 students had had positive ranks, it means that 52 students had lower grades at the beginning of the study in comparison with their own grades after the application of formative assessment. Furthermore, 62 out of 115 students had the same grades before and after the application of formative assessment.

Test Statistics^a

	<i>Students' success after the application of the formative assessment - Students' success before the application of the formative assessment</i>
<i>Z</i>	-7.005 ^b
<i>Asymp. Sig. (2-tailed)</i>	.000

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Table # 5Statistical data based on the Wilcoxon test -Z

The hypothesis that is tested is called the null hypothesis

Ho: there is no difference in the mean of the students' success before and after the application of the formative assessment.

And an alternative hypothesis raise as a result of null hypothesis

Ha: there is a difference in the mean of the students' success before and after the application of the formative assessment.

Form the statistical data given above it is seen that $Z=-7.005$ based on a negative rank, and the p- value, $p=.000$.If $p < .05$ the null hypothesis is rejected. In this case $0 < 0.05$ so the null hypothesis that there is no difference in the mean of the students' success before and after the application of the formative assessment is rejected. The null hypothesis is rejected.

The use of paired sample t test

The paired sample t test was used to test the effect of formative assessment on the students'success, it was done by comparing the means of students' success before and after the study took place.

The research question:

Is there a significant difference of the students' success before and after the application of the formative assessment?

Null Hypothesis:

Ho: the mean of the students' success before the application of the formative assessment = the mean of the students' success after the application of the formative assessment.

So, there is no statistical difference of the students' success before and after the application of the formative assessment.

The alternative hypothesis:

Ha: the mean of the students' success before the application of the formative assessment \neq the mean of the students' success after the application of the formative assessment.

So, there is exist statistical differences of the students' success before and after the application of the formative assessment.

The independent variable is the time form the beginning to the end of the study, after the application of the formative assessment.

The dependent variable: students success in both cases, before and after the application of the formative assessment.

<i>Paired Samples Statistics</i>					
		<i>Mean</i>	<i>N</i>	<i>Std. Deviation</i>	<i>Std. Error Mean</i>
<i>Pair 1</i>	<i>Students' success before the application of the formative assessment</i>	2.3826	115	1.32839	.12387
	<i>Students' success after the application of the formative assessment</i>	2.8261	115	1.37178	.12792

Table# 6 the mean of students' success before and after the application of the formative assessment

The table above shows that the mean of the students' success before the application of the formative assessment was 2.38 and the mean of the students' success after the application of the formative assessment was 2.82

<i>Paired Samples Correlations</i>			
	<i>N</i>	<i>Correlation</i>	<i>Sig.</i>

Pair 1	Students' success before the application of the formative assessment & Students' success after the application of the formative assessment	115	.927	.000
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Table# 7 the correlation between students' success before and after the application of the formative assessment

The table above shows that the correlation is positive 0.92, it means that the students who had high grades before the application of formative assessment had also high grades after the application of the formative assessment.

Paired Samples Test

Pair	Students' success before the application of the formative assessment - Students' success after the application of the formative assessment	Paired Differences		Std. Error Mean	95% Confidence Interval of the Difference		T	df	Sig. (2-tailed)
		Mean	Std. Deviation		Lower	Upper			

Table# 8 the difference of the means, standard deviation and p-value

The table above shows the difference of the means that is -443 and standard deviation 0,51, t=-9,21 with interval of df=114 and the p-value (sig.2 tailed), p=0. If $0 < 0.05$ the null hypothesis is rejected, in this case $p = 0$. So, there is a difference in the students' success before and after the application of the formative assessment.

The use of Independent sample t test

A factor that could affect students' success could be their gender. To see whether there exists a difference on students' success between boy and girls were used the Independent sample t test to analyze the data that was collected for this study.

The research question:

Is there a statistical difference between the mean of the students' success based on their gender before the application of the formative assessment?

The null hypothesis, H_0 : the mean of boys' success before the application of the formative assessment = the mean of girls' success before the application of the formative assessment.

So, there is no difference between the means of the students' success based on their gender.

An alternative hypothesis raise based on the null hypothesis

H_a : the mean of boys' success before the application of the formative assessment \neq the mean of girls' success before the application of the formative assessment.

So, there exists a difference between the means of the students' success based on their gender.

Group Statistics

	Participants' gender	N	Mean	Std. Deviation	Std. Error Mean
Students' success before the application of the formative assessment	Girls	63	2.6667	1.33199	.16781
	Boys	52	2.0385	1.25185	.17360

Table # 9 the mean of students' success before and after the application of formative assessment

The table above shows that the mean of the girls' success was 2.66 and the mean of the boys' success was 2.03, so it was not the same. So, at the beginning, before the application of formative assessment, the mean of girls' success was higher than the mean of boys' success. To see if the difference is statistically significant will be analyzed the results given in the table below.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Students' success before the application of the formative assessment	Equal variances assumed	2.009	.159	2.586	113	.011	.62821	.24290	.14698	1.10943
	Equal variances not assumed			2.602	111.069	.011	.62821	.24145	.14976	1.10665

Table# 10 the table of T test data

The table above shows F test 2.009 and the p value for this F test, $p = 0.15$. If $p > 0.05$ equal variances assumed. In this case, since the coefficient of the statistical significance for this test is $0.15 > 0.05$ equal variances assumed and the results of the first row are used. So the t test is 2.58 and the coefficient of the statistical differences for the t test is $p = 0.01$

If the $p < 0.05$ the null is rejected

In this case $0.01 < 0.05$, so the null hypothesis that the mean of boys and girls' success is the same is rejected, so their means are statistically different.

The use of t test after the application of formative assessment

To see if there exists a difference between the mean of boys and girls' success before and after the application of formative assessment the same test was used also to analyze the students' success after the application of the formative assessment.

The research question:

Is there a statistical difference between the mean of the students' success based on their gender after the application of formative assessment?

The null hypothesis, H_0 : the mean of boys' success after the application of the formative assessment = the mean of girls' success after the application of the formative assessment.

So, there is no difference between the means of the students' success based on their gender after the application of the formative assessment.

An alternative hypothesis raise based on the null hypothesis

Ha: the mean of boys' success after the application of the formative assessment \neq the mean of girls' success after the application of the formative assessment.

So, there exists a difference between the means of the students' success based on their gender.

Group Statistics

	Gjinia e pjesëmarrësve	N	Mean	Std. Deviation	Std. Error Mean
Students' success after the application of the formative assessment	vajzë	63	3.1746	1.36239	.17165
	djalë	52	2.4038	1.27202	.17640

Table # 11 the mean of students' success before and after the application of formative assessment

The table above shows that the mean of the girls' success was 3.17 and the mean of the boys' success was 2.40, so it was not the same. So, after the application of formative assessment, the mean of girls' success was higher than the mean of boys' success. To see if the difference is statistically significant will be analyzing the results given in the table below.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means			95% Confidence Interval of the Difference			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Students' success after the application of the formative assessment	Equal variances assumed	1.315	.254	3.111	113	.002	.77076	.24776	.27990	1.26161
	Equal variances not assumed			3.132	111.255	.002	.77076	.24613	.28305	1.25846

Table# 12 the table of T test data

The table above shows F test 1.31 and the p value of this F test, $p = 0.25$. If $p > 0.05$ equal variances assumed. In this case, since the coefficient of the statistical significance for this test is $0.25 > 0.05$ equal variances assumed and the results of the first row are used. So the t test is 3.11 and the coefficient of the statistical differences for the t test is $p = 0.02$

If the $p < 0.05$ the null is rejected

In this case $0.02 < 0.05$, so the null hypothesis that the mean of boys and girls' success after the application of formative assessment is the same is rejected, so their means are statistically different.

So in both cases, before and after the application of formative assessment the mean of boys and girls' success was different.

Conclusion

The comparison of students' success before and after the application of formative assessment was used to make it more obvious the effect of formative assessment in students' success. Three types of statistical tests were used to analyze the results of the data that were gathered for this study. Based on the Wilcoxon test formative assessment had a positive effect on students' success because just one of the student had better grades before than after the application of formative

assessment, there were 62 students who had the same grade in both cases, they did not get higher grades but they neither get lower grades. Students who got the highest grade before and after the application of formative assessment were part of this group as well, it means that these students, had no chance to get higher grades after the application of the formative assessment because the grade that they had at the beginning of the study was the highest grade. The application of formative assessment had a positive effect for 52 students, who after the application of formative assessment got higher grades that they had before the application of formative assessment. So, there was a difference the mean of students' success before and after the application of the formative assessment. Based on the Paired sample t test the correlation between the students' success before and after the application of formative assessment was positive, but the mean of the students' success before and after the application of formative assessment was different. Moreover, the p value = 0 rejects the null hypothesis, so there is a difference in the students' success before and after the application of the formative assessment. Based on the application of the independent sample t test the null hypothesis that the mean of boys and girls' success is the same is rejected, so their means are statistically different both before and after the application of formative assessment.

Suggestions and Recommendations

Formative assessment is just one type of assessment there are other types of assessment as well that could affect the students' success. The same methodology can be used to study the effect of other types of assessment or the effect of assessment in general on students' success. The same methodology can also be used also for similar studies in other school subject, English language is just one of the school subject. Studies in other school subjects might give different results.

Limitations

This study took place just in one primary school. If in the study had participated students from other schools, or also other cities, the results might have been different in comparison with the results of the study. So, a limitation of this study might be the number of the participants

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