



THE EFFECT OF QUIZZING ON LEARNING AS A TOOL OF ASSESSMENT

DEĞERLENDİRME ARACI OLARAK QUIZ UYGULAMASININ ÖĞRENME ÜZERİNE ETKİSİ

Asst. Prof. Asım ARI

Eskisehir Osmangazi University, Faculty of Education, Eskisehir, TURKEY,
ari@ogu.edu.tr

Abstract

Assessment can not be distinguished from teaching process and effective assessment of learning contributes to teaching. Assessment for learning differs from assessment of learning and it can be a wonderful way of boosting students' learning level. The purpose of this study is to explore the effects of the quizzing before and after each lesson on student learning. This study uses experimental method. There is an experimental group and a control group. This study is conducted in courses of physics and English of 9th graders. Before the study, a pre-test was administrated. 9C is control group. 9A is an experimental group and, in this group, at the beginning and at the end of each lesson quizzes were conducted. Experiment continued for three weeks. A post test was employed in fourth week on experimental and control groups. No information is given to the students prior to this post test. For the purpose of data evaluation, mean and standard deviation are computed. The difference between pre tests and post tests are accepted as the effects of quizzing on learning. The significance of the difference between pre test and post tests were analyzed by t-tests. It is found out after the study that the effect of quizzing on learning is significant.

Key words: quizzing, testing, assessment, evaluation, learning, teaching,

Öz

Değerlendirme, öğrenme sürecinden ayrılmaz ve öğrenmenin etkili değerlendirilmesi öğretime katkı sağlar. Öğrenme için değerlendirme, öğrenmenin değerlendirilmesinden farklıdır ve bu, öğrencilerin öğrenme seviyesini artırmada mükemmel bir yol olabilir. Araştırmanın amacı, ders öncesinde ve sonrasında quiz uygulamanın öğrencilerin öğrendikleri üzerinde etkilerini araştırmaktır. Araştırmanın metodu deneyseldir. Deney ve kontrol grubu vardır. Bu araştırma fizik ve İngilizce derslerinde 9. sınıflarda yapılmıştır. Araştırma yapılmadan önce, ön-test uygulanmıştır. 9 C sınıfı kontrol grubudur. 9A sınıfı deney grubudur ve bu gruba her ders öncesinde ve sonrasında quiz uygulanmıştır. Uygulama üç hafta sürmüştür. Dördüncü hafta kontrol ve deney grubuna son-test uygulanmıştır. Ön-test ve son-test öncesinde öğrencilere hiçbir bilgi verilmemiştir. Verilerin değerlendirilmesi amacıyla ortalama ve standart sapma hesaplanmıştır. Ön-test ve son-test arasındaki farklılık quiz uygulamasının etkisi olarak kabul edilmiştir. Ön-test ve son-test arasındaki farklılığın anlamlılığı t-testi ile analiz edilmiştir. Araştırma sonunda quiz uygulamasının öğrenme üzerinde önemli derecede etkisinin olduğu bulunmuştur.

Anahtar kelimeler: quiz, test, değerlendirme, ölçme, öğrenme, öğretim

1. INTRODUCTION

The best educational practices use feedback in a continual process. The feedback loop consists of planning, teaching, assessment, analyzing, responding and adaptation. Classroom assessment techniques are quick and simple tools that help to gather feedback from students on their learning (Bilen, 1999; Rouseff-Baker & Holm, 2004; Erden, 1998). One of the most important factors in learning is usually the quality of the feedback on performance, and feedback, which is obtained by

assessment of learning, can be an important part of effective instruction. Efficient feedback usually provides motivation both students and teachers for instructional process (Eraut, 2004; Leahy et al, 2005; Gözütok, 2000). Assessment of student learning is one important key to teaching effectiveness, and if classroom assessments are of poor quality, then instruction can not be effective. Assessment can not be distinguished from teaching process and effective assessment of learning contributes to teaching. Assessment is to evaluate a child's knowledge and skills as a basis to help develop the next steps in learning. Evaluation is based on measurements and comparison with a standard or norm. There are several forms of assessment such as traditional written or oral assessment, multiple choice, portfolio, assessment by projects, by investigations, etc. and assessments should be valid and reliable. Assessment is necessary for teaching and learning process, but it must be part of a complete system (Stiggins, 1999; Vos, 2000; Wetzell, 2005; Kucukahmet, 2005).

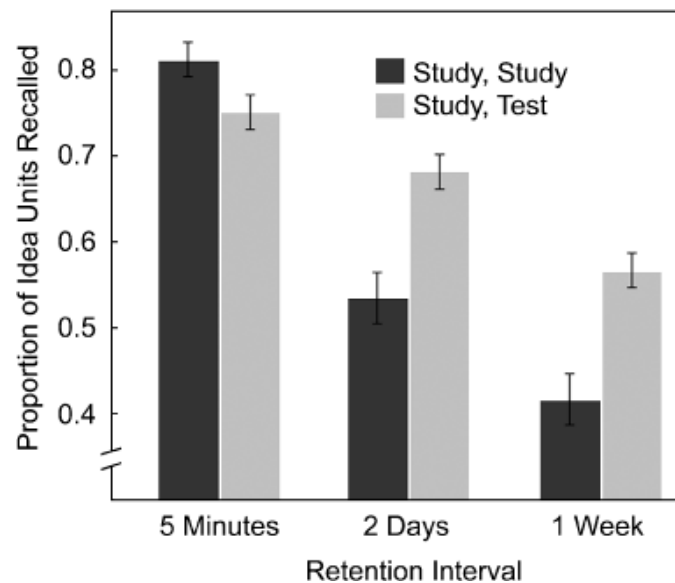
Although assessment of learning is one of the indispensable parts of learning process, also it is argued that assessment of learning has drawbacks such as grading practices tend to emphasize competition rather than personal improvement, and assessment feedback often has a negative impact, particularly on low-achieving students, who are led to believe that they lack "ability" and so are not able to learn (Black et al, 2004).

The traditional approach to assessment is that teacher tests students chiefly to determine what students know, and instructional approach is that testing which is usually considered device of assessment plays a pivotal role to help students' learning. Assessment for learning differs from assessment of learning and it can be a wonderful way of boosting students' learning level. While assessment of learning is designed primarily to serve the purposes of accountability, or of ranking, or of certifying competence, assessment for learning is any assessment for which the first priority in its design and practice is to serve the purpose of promoting students' learning. Although assessment *of* learning attempts to get a fix on what students know for the purposes of giving grades or evaluating schools, assessment *for* learning is always linked to the question "What is next instruction?". One aim of his assessment approach is to empower students to monitor their own progress toward clearly understood curricular goals (Black et al, 2004; Popham, 2006; Hargreaves, 2005).

Gosh (2006) told that an experiment found students who studied a short passage and took a recall test soon afterwards did better in a final retention test up to a week later than students who simply repeatedly studied the passage. Moreover, Gosh notified that "Testing has a powerful positive effect on future retention. If students are tested on material and successfully recall or recognize it, they will remember it better in the future than if they had not been tested." and "If you assess knowledge quite frequently, that in itself is a learning tool".

Roediger & Karpicke (2006) studied testing effect on long-term retention. If students are tested on material and successfully recall or recognize it, they will remember it better in the future than if they had not been tested.

Figure 1: Testing effect on long-term (future) retention.



Source: Roediger & Karpicke (2006)

In Figure 1 is shown that testing has a powerful positive effect on long-term (future) retention. It was wondered that whether are there similar effect of quizzing which is conducted before and after the lessons, and to search this effect of quizzing this study was designed.

2. METHOD

Purpose and sub purposes

The purpose of this study is to explore the effects of the quizzing before and after each lesson on student learning. Sub problems of the survey can be presented as follows:

- Is there any difference between the learning levels of students quizzing conducted at the beginning and at the end of each lesson and don't in course of English?
- Is there any difference between the learning levels of students quizzing conducted at the beginning and at the end of each lesson and don't in course of Physics?

Model

This study is experimental study. There is an experimental group and a control group.

Data collection

This study is conducted in courses of physics and English of 9th graders. Courses of physics and English are chosen because their teachers are volunteered to join the study.

Teachers were informed before the study and experiment start. During the study, in both groups, teachers instructed students similar to each other. The only difference is to have quizzes in the beginning and at the end of the each lesson in experimental group.

Selection of experimental and control groups were chosen randomly. Before the study, a pre-test was administrated. 9C is control group. 9A is an experimental group and, in this group, at the beginning and at the end of each lesson quizzes were conducted. Experiment continued for three weeks. A post test was administrated in fourth week on experimental and control groups. No information is given to the students prior to this post test. During the intervention there was no information exchanged between experimental and control groups so that effects of the quizzing on learning are identified.

Experiment model of English

<i>Groups</i>	<i>pre test</i>	<i>experiment</i>	<i>post test</i>
G ₁ (9A) experimental group	O _{1.1}	X	O _{1.2}
G ₂ (9C) control group	O _{2.1}		O _{2.2}

G₁ (9A): at the beginning and at the end of each lesson quizzes were conducted

G₂ (9C): quizzes were not conducted

O_{1.1} - O_{2.1}: pre test of English

X: experiment continued for three weeks

O_{1.2} - O_{2.2}: post test of English

Experiment model of physics

<i>Groups</i>	<i>pre test</i>	<i>experiment</i>	<i>post test</i>
G ₁ (9A) experimental group	O _{3.1}	X	O _{3.2}
G ₂ (9C) control group	O _{4.1}		O _{4.2}

G₁ (9A): at the beginning and at the end of each lesson quizzes were conducted

G₂ (9C): quizzes were not conducted

O_{3.1} - O_{4.1}: pre test of physics

X: experiment continued for three weeks

O_{3.2} - O_{4.2}: post test of physics

The most equal groups were chosen according to their previous term averages of physics and English courses (9A, and 9C). The experimental group and control group was randomly selected from these classes and pre test conducted them. The results of pre test of English and Physics course are presented in the following.

Table 1: The results of pre test of control and experimental groups

Courses	Groups	N	Mean of Pre test	Std. Deviation
English	Experimental group	20	52.60	13.78
	Control group	20	57.85	17.20
Physics	Experimental group	20	36.85	18.53
	Control group	20	39.95	10.93

Data analysis

Findings were loaded on computer and statistical analysis is made by using SPSS. For the purpose of data evaluation, mean and standard deviation are computed. The difference between pre tests and post tests are accepted as the effects of quizzing on learning. The significance of the difference between pre test and post tests were analyzed by t-tests. Significance level accepted as 0,05.

3. FINDINGS

Findings of effects of the quizzes on the learning in the courses of physics and English are presented as follows.

Findings for the Course of English

The result of t-test of pre test and post test of experimental group (quizzes at the beginning and at the end) of English course is presented in the following.

Table 2. The t-test result of pre test and post test of experimental group of English course

	N	Mean	Std. Deviation	Difference*	t	df	p
Pre test	20	52.60	13.78	6.65	-2.627	19	.017
Post test	20	59.25	12.49				

* Difference: Post test - Pre test

According to t-test result, in English course, means of the pre test and post test of the experimental group significantly different [$t_{(19)} = -2.627, p < 0.05$]. The mean of the pre test is 52.60 and the mean of post test is 59.25. The difference between pre and post tests is 6.65.

Findings of the control group of English course are presented in the following.

Table 3. The t-test result of pre test and post test of control group of English course

	N	Mean	Std. Deviation	Difference*	t	df	p
Pre test	20	57.85	17.20	2.10	-.758	19	.458
Post test	20	59.95	19.22				

* Difference: Post test - Pre test

According to the t-test results, between means of pre and post tests of the control group of English course, there is no significant difference found [$t_{(19)} = -.758$, $p > 0.05$]. The mean of the pre test is 57.85 and the mean of post test is 59.95. The difference between pre and post tests is 2.10.

Findings of the differences (post test - pre test) of control and experimental groups of English course are presented in the following.

Table 4: The independent samples t-test result of differences (post test - pre test) of control and experimental groups of English course

	<i>N</i>	<i>Mean of Differences</i>	<i>Std. Deviation</i>	<i>t</i>	<i>df</i>	<i>p</i>
Experimental group	20	6.65	11.32	1.212	38	.233
Control group	20	2.10	12.39			

According to the independent samples t-test results, between means of differences (pre - post tests) of the control and experimental groups of English course, there is no significant difference found [$t_{(38)} = 1.212$, $p > 0.05$]. But, the mean of differences of experimental group is higher than the mean of differences of control group. Consequently, we can say that quizzing conducted at the beginning and at the end of each lesson is useful for learning.

Findings for the Course of Physics

The result of t-test of pre test and post test of experimental group (quizzes at the beginning and at the end) of physics course is presented in the following.

Table 5. The t-test result of pre test and post test of experimental group of physics course

	<i>N</i>	<i>Mean</i>	<i>Std. Deviation</i>	<i>Difference*</i>	<i>t</i>	<i>df</i>	<i>p</i>
Pre test	20	36.85	18.53	12.65	-2.351	19	.030
Post test	20	49.50	24.93				

* *Difference*: Post test - Pre test

According to t-test result of physics course, means of the pre test and post test of the experimental group significantly different [$t_{(19)} = -2.351$, $p < 0.05$]. The mean of the pre test is 36.85 and the mean of post test is 49.50. The difference between pre and post tests is 12.65.

The t-test result of pre test and post test of control group of physics course is presented in the following.

Table 6. The t-test result of pre test and post test of control group of physics course

	N	Mean	Std. Deviation	Difference*	t	df	p
Pre test	20	39.95	10,92	2.90	-.684	19	.502
Post test	20	42.85	18.62				

* Difference: Post test - Pre test

According to the t-test results, between means of pre and post tests of the control group of physics course, there is no significant difference found [$t_{(19)} = -.684$, $p > 0.05$]. The mean of the pre test is 39.95 and the mean of post test is 42.85. The difference between pre and post tests is 2.90.

Findings of the differences (post test - pre test) of control and experimental groups of physics course are presented in the following.

Table 7. The independent samples t-test result of differences (post test - pre test) of control and experimental groups of physics course

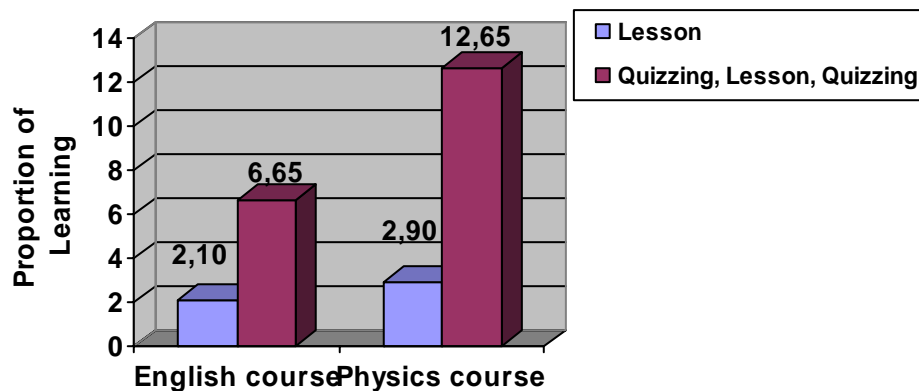
	N	Mean of Differences	Std. Deviation	t	df	p
Experimental group	20	12.65	24.06	1.423	38	.163
Control group	20	2.90	118.97			

According to the independent samples t-test results, between means of differences (pre - post tests) of the control and experimental groups of physics course, there is no significant difference found [$t_{(38)} = 1.423$, $p > 0.05$]. But, the mean of differences of experimental group is higher than the mean of differences of control group. Consequently, we can say that quizzing conducted at the beginning and at the end of each lesson is useful for learning.

4. CONCLUSION AND DISCUSSION

According to the survey, effect of quizzes on learning can be summarized in Figure 2.

Figure 2. Effect of quizzing on learning



In English course the difference between pre tests and post tests in experimental group 6.65 points, while the difference between pre tests and post tests in control group is 2.10 points. Student's points who have conducted quizzes at the beginning and at the end of each lesson is tree times higher than the other.

In physics course the difference between pre tests and post tests in experimental group 12.65 points, while the difference between pre tests and post tests in control group is 2.90 points. Student's score who have conducted quizzes at the beginning and at the end of each lesson is approximately four times higher then the other.

In English and physics course, students' learning levels have the highest rate of increase in groups which quizzes were conducted at the beginning and at the end of each lesson, and have the lowest rate of increase in group which quizzes were not conducted. Thus we can say that it is found out after the study that the effect of quizzing on learning is significant.

Roediger & Karpicke's (2006) study show that testing has a powerful positive effect on long-term (future) retention. It is found similar effect of quizzing which is conducted before and after the lessons, and to search this effect of quizzing this study was designed. When quizzes are conducted at the beginning of each lesson, students can aware of what they will learn, and also they gain motivation for instruction. So they are prepared so as effective teaching. When quizzes conducted at the end of each lesson, effective feedback can be given to students for their performances, and they can revise what they learn.

REFERENCES

- Black, P.; Harrison, C.; Lee, C.; Marshall, B.; Wiliam, D. (2004) Inside the Black Box: Assessment for Learning in the Classroom. *Phi Delta Kappan*, September, 9-22.
- Bilen, M. (1999) Plandan Uygulamaya Öğretim (Teaching from Planning to Practice). Ankara: Anı.
- Eraut, M. (2004) A Wider Perspective on Assessment. *Medical Education*, 38, 803-804.
- Erden, M. (1998) Öğretmenlik Mesleğine Giriş (Introduction to Teacher Profession). İstanbul: Alkım.
- Gosch, E. (2006) Tests Help What's Learnt Stay Learnt, *The Australian*, July 18, pg.6.
- Gözütok, D. (2000) *Öğretmenliğimi Geliştiriyorum (I Progress my Preceptorship)*, Ankara: Siyasal Kitapevi.
- Hargreaves, E. (2005) Assessment for Learning? Thinking Outside the (Black) Box. *Cambridge Journal of Education*, Vol. 35, No. 2, 213-224.
- Küçükahmet, L. (2005) *Öğretimde Planlama ve Değerlendirme (Planning and Assessment in Teaching)*, Ankara: Nobel Yay.
- Leahy, S.; Lyon, C.; Thompson, M.; Wiliam, D. (2005) Assessment Minute, Day by Day. *Educational Leadership*, November, 19-24.

- Popham, W. J. (2006) Assessment for Learning: An Endangered Species?. *Educational Leadership*, February, 82-83.
- Roediger, H. L. & Karpicke, J. D. (2006) Test-Enhanced Learning, Taking Memory Tests Improves Long-Term Retention. *Psychological Science*, Volume 17, Number 3, 249-255.
- Rouseff-Baker, F. & Holm, A. (2004) Engaging Faculty and Students in Classroom Assessment of Learning, *New Directions For Community Colleges*, 126, 29-42.
- Stiggins, R. J. (1999) Barriers to Effective Student Assessments. *The Education Digest*, February, 25-30.
- Vos, H. (2000) How to Assess for Improvement of Learning. *European Journal of Engineering Education*, Vol. 25, No. 3, 227-233.
- Wetzel, J. (2005) Assessment is a Process not an End Result. *Illinois Music Educator*, Fall, 64-65.