ASSESSMENT AND EVALUATION TECHNIQUES BEING USED IN CLASSROOMS BY BIOLOGY TEACHERS

Selda Kılıç,[1] Baştürk Kaya,[1] Hakan Kurt[1]

[1]Selcuk University, A.K Education Faculty, Department of Natural Science Education, Konya, Turkey
seldakilic@selcuk.edu.tr
basturk@selcuk.edu.tr
hakankurt@selcuk.edu.tr

ABSTRACT

The aim of this study is to determine the opinions on implementation of the assessment and evaluation techniques being used in lessons by biology teachers working at secondary schools in Konya city .49 biology teachers that working at secondary schools in Konya city during the 2010-2011 Education attended to this study. Data were obtained by a survey of nine open ended questions. The data that obtained from the survey were solved by the descriptive analysis method . The data that obtained from the open ended questions were categorized independently of each other by three different researchers. Then the data in these categories were codified and the like-ones were combined by comparison. Thereafter, (f) frequency distributions were determined by analyzing these data and the percentages were calculated.Depending on the findings of the study, it is seen that most of the biology teacher candidates adopted the multiple choice test type in exams for determining the students' success and performance. It is understood that they mostly use the question and answer teaching method in determining the students' preliminary knowledge at the beginning of the lessons and determining how much they learned at the end of the lessons . It is seen that when giving a project paper ,they determine a criterion conformed with students' levels and demands and when giving a verbal grade , they mostly consider the students' performance in the classrom and their attendances to lesson.

Key Words: Biology teachers, Assessment and Evaluation, Secondary Education

INTRODUCTION

An efficient teacher's qualifications can be ranged as; having strong scholastic aptitude and content knowledge; adapting and improving himself vocationally: being able to use new teaching techniques and resources; motivating students to learn; developing an efficient teaching strategy intended for the presented topic; implementing the chosen developed teaching strategy in an efficient way; assessment; having knowledge about student's performance; having good relations with students; having a communication skill; being reliable; being explicit and cohere (Kurudayıoğlu et al, 2008).

One of the most important problems that met about using alternative assessment and evaluation methods is the assessment of students' studies. (performance projects, project homeworks, student reader file, exhibition, drama, etc…). All of the teachers that attended

to the study stated that they have difficulties in using criteria determination, scale preparation, and the scales taking part in teaching programme or teacher guidebooks to assess the students' studies like this. (Arslan et al, 2009.) The most known and commonly used method in assessment and evaluation at primary education, secondary education and higher education in Turkey, is written exams which are consisted of a limited number of questions, with free answers.(classic, open-ended, composition). It is known that this kind of exams have successful results in certain periods, lessons, parts, topics and levels of primary education, secondary education and higher education. But, it is not possible to have the same opinion for all lessons and topics. Because, the behaviour changes which are thought to be assessed according to lessons and topics may have differencies. Besides, as the criterias being used in assessing of the success increase too, depending on the number of the topics that are studied during the same education period or year increase. For this reason, assessing a lesson of which it's extent is expanding by one or a few questions, is getting more difficult. (Balcı 2002).

Assessing the student success in traditional methods is generally implemented in a way of focusing mainly on products independently of the education process; and for this reason, short- answered tests and written and oral exams are given importance. Assessment and evaluation in constructivist learning approach is the part of education process and it takes a part in all important points not only in the beginning and in the end of the education process. It needs more and various assessing tools or methods to be used as it focuses to the process, too when compared with the old approach. Assessment of student's performance with every points is possible with observing the student's behaviours in and out of the classroom; observing the performance during the process, assessing his/her interest and attitude, with making the student attend to the process and deal with the process in a broad way in addition to using the paper and pencil tests. As, teachers are used to the ones with the traditional qualifications, these may be preferred but it is possible to popularize the others by developing suitable tools related to the others and using in suitable times (Gelbal and Kelecioğlu, 2007).

A new programme, in which alternative assessment and evaluation approaches depending on constructivist learning theory will be used was aimed. For this reason, it is adviced to use alternative techniques such as performance assessment, mind map, constructed grid, word binding, posters, project, group and peer assessment in addition to the traditional assessment and evaluation techniques. (Şahin, 2008). Findings, showed that most of the teachers found themselves inadequate or missing in assessment and evaluation topic (Çakan, 2004).Çoruhlu et al (2008) showed in their study that the most used concepts by teachers are the student product files and the least used concepts are the structured grid and diagnostic tree.

METHODS AND PROCEDURES

Aim of the research

The Aims of this study are to determine which assessment and evaluation implementations do teachers working at different schools in Konya city use in classrooms and to reveal the differencies according to the methods they use. Also, to determine the missings and present what should be done to avoid this.

Model of the research

This study is made to determine the biology teachers' opinons on the assessment and evaluation topic. Within this scope, a survey of 9 open-ended questions that developed by researchers was implemented, to describe the assessment and evalation methods that biology teachers use in classrooms. With this, teachers' awareness, sensibility and their opinions about bringing solutions to the problems were tried to be measured. Questions as " which question types do you use? "which methods do you use to determine the pre-liminary knowledge of students at the beginning and at the end of the lesson? " Which criterias do you use when giving homeworks? were asked to teachers. Thus, which traditional and alternative assessment and evaluation methods are mainly used by the teachers, will be revealed.

Study Group

Study group is formed of 49 secondary education teachers working Konya city and it's counties during the 2010-2011 education year.

Collecting and analyzing the data

Data of the research were obtained by the answers of teachers given to 9 open-ended questions about the assessment and evaluation topic. The data that obtained from the open-ended questions were categorized independently of each other by three different researchers. Similar options in terms of content were collected in the same category according to the teachers descriptions. Then the data in these categories were codified and the like-ones were combined by comparison. Thereafter, (f) frequency distributions were determined by analyzing these data and percentages were calculated.

RESULTS

Findings, belonging to sub-problems related to assessment and evaluation methods that biology teachers use at classrooms were specified respectively.

Findings that intended for the "What kind of question do you use in exams?" question
Multiple-choice question type took the first place with %35 in the answers of teachers intended the " What kind of question do you use in exam? " question (Table 1). Filling gaps followed this with %20 and open-ended and true-false question types had the same ratio of %13. Ratio of diagrammatizing and completing the diagram question type was %9. It is understood from the obtained results that %2 of the teachers prefer to use the classic method of traditional question types; %1 prefer matching and %7 prefer the multidirectional testing (mixing all these types of questions)

Table 1. The answers of research group given to the "what kind of question do you use in exams? ", their frequencies and percentages

What kind of question do you use in exams?	f	%
Multiple-choice	35	35
Open-ended	13	13
Filling the gaps	20	20
Diagrammatizing ,completing the diagram	9	9
True-false	13	13
Classic question	2	2
Matching	1	1
All(multidirectional)	7	7

Findings that intended for the "Are the question types you use adequate to measure the students 'knowledge?"question

When the answers of teachers given to the "Are the question types you use adequate to measure the students'knowledge?"question were analyzed, %51 of them (near the half) said to be adequate (Table 2). %26 of them said to be partially adequate. Only the % 2 of the teachers said that the question types they use at exams are inadequate in measuring students' knowledge.

Table.2 The answers of research group given to the "Are the question types you use adequate to measure the students' knowledge?" question , their frequencies and percentages

Are the question types you use adequate to measure the students' knowledge?	f	%
Well adequate	10	21
Adequate	24	51
Partially adequate	12	26
Inadequate	1	2

Findings that intended for the "Which criterias do you use to determine the students' pre-liminary knowledge about the topic at the beginning of the lesson ?" question

When the answers of teachers given to the "Which criterias do you use to determine the students' pre-liminary knowledge about the topic at the beginning of the lesson ?" were examined, it is seen that %63,3 (more than half) , use question and answer method. The

ratio of the ones, that try to determine the students' pre-liminary knowledge at the beginning of the lesson by repeating the previous topics, is %15 . % 8,4 of the teachers embrace the method of relating to the daily life (case study). Completing diagrams with %5; multiple-choice test with %3,3; attention getting with % 3,3 and brain storming with %1,7 follows these (Table3).

Table 3. The answers of research group given to the "Which criterias do you use to determine the students' pre-liminary knowledge about the topic at the beginning of the lesson ?" question, their frequencies and percentages

Which criterias do you use to determine the students' pre-liminary knowledge about the topic at the beginning of the lesson ?	f	%
Question and answer method	38	63,3
Multiple-choice test	2	3,3
Brain storm	1	1,7
Relating to the daily life (case study)	5	8,4
Completing the diagram, interpreting the diagram	3	5
Motivation	2	3,3
Repetition of the passed topics	9	15

Findings that intended for the "Which assessment and evaluation method do you use to determine how much students learnt at the end of the lesson ?" question

%42 of the teachers said that they use the question and answer method when they were asked the "Which assessment and evaluation method do you use to determine how much students learnt at the end of the lesson ?" question. %12 of the teachers preferred question type with short answers while %15 of the teacher group preferred multiple-choice question type. Assessment question with %8 follows this. The ones that said, to be using the exemplifying the topic, trails tests, completing the diagram or showing the parts had the same ratio of %3 (Table 4). It is seen that teachers answered as converse panel, formative test and discussion method with the same ratio of %2 .The ratio of ones that said true-false, written exam , metaphor , etc … is %8.

Table 4. The answers of research group given to the "Which assessment and evaluation method do you use to determine how much students learnt at the end of the lesson?" question, their frequencies and percentages

Which assessment and evaluation method do you use to determine how much students learnt at the end of the lesson ?	f	%
Question and answer	25	42
Converse panel	1	2
Exemplifying the topic	2	3
Trails tests	2	3
Formative test	1	2
Multiple-choice question	9	15
Short answered question	7	12
completing the diagram and showing the parts	2	3
Assessment question	5	8
Discussion (Students asking questions to each other)	1	2
True-false, Written exam, Metaphor, Forming a concept map, lettingg them interpret	5	8

Findings that intended for the "What things do you pay attention to when giving project work to the students ?" question

%28 of the teachers said that they pay attention to the conformance with the students' levels when they were asked the "What things do you pay attention when giving a project work to the students ?" question (Table 5). The ratio of the teachers that said to be paying attention to the project to be up-to-date is %19 , while the ratio of the ones that said they pay attention to the conformance with the students' interests and demands is %20.The ones that said, it should be easy to reach information and the ones that said it should direct students to research have the same ratio (%9) . Being conformed with the students' interests and demands is represented by %5 , the ones that said it should be possible to use materials is represented by %3 while the others are represented by %7.

Table 5. The answers of research group given to the "What things do you pay attention to when giving a project work to the students?" question, their frequencies and percentages

What things do you pay attention to when giving a project work to the students ?	f	%
Conformity with the student's level	16	28
Being up-to-date	11	19
Resources to be easily reached and abundant (easily reaching to the information	5	9
Topic being convenient to research (should direct to research)	5	9
Being available to use materials	2	3
Conformity with the students' interests and demands	12	20
Student's skill	3	5
Other	4	7

Findings that intended for the "What things do you pay attention to when giving a performance work to the students?" question

Most of the teachers (%31) said that it should be conformed with the students' levels while %21 said that it should be conformed with the students' skills and %17 said that it should be conformed with the students' interests (Table 6) It is seen that % 11 of the teachers regard it to be up-to-date ; %10 of them regard it to be at the level of student that they can do it on their own; %6 of them regard topics that help developing the students' creativity, when giving a work. The ones that said topics should be intended for being researched, are %2 and the ones, that give opinion as students should choose the topic on their own ,are again %2.

Table 6. The answers of research group given to the "What things do you pay attention to when giving a performance work to the students?" question, their frequencies and percentages

What things do you pay attention to when giving a performance work to the students?	f	%
Students' skills (abilities)	11	21
Conformity with their levels (developments)	16	31
Being up-to-date	6	11
Student's interest	9	17
Being at the level of student that he can do it on his own (should	5	10

contribute on his own		
Student choosing on his own among the limited topics	1	2
To topics that will help developing their creativity (which will enable their creative thinking)	3	6
Topics intended for researching	1	2

Findings that intended for the "Which criterias do you use when giving daily homeworks to the students?" question

Teachers answered the "Which criterias do you use when giving daily homeworks to the students?" question as followings. The ones, that said homeworks should not be very long , are represented with a ratio of %42. It is followed by the ones, that said it should be repetition of the taught lesson , with a ratio of %28 ; and the ones ,that said it should be a preparation to the new topics , have a ratio of %12. Some teachers regard that homework should be at a level that students may be able to do on their owns. The ratio of these is %5. A ratio of %4 finds it inappropriate to give daily homework , while the ratio of %2 gives homeworks with choosing the topics that may be releated to the daily life (Table 7).

Table 7. The answers of research group given to the "Which criterias do you use when giving daily homeworks to the students?" question , their frequencies and percentages

Which criterias do you use when giving daily homeworks to the students?	f	%
Should be conformed with the student level	4	7
Should not be too long (should not take much time), should summarize the topic	24	42
Should be a repetitation of the current day's lesson (should support the taught topic)	16	28
Should be a preparation for the new lessons	7	12
Should be at a level that they could do it on their own	3	5
Topics that they can relate with the daily life should have a priority	1	2
I do not find giving daly homeworks (i do not give all the way)	2	4

Findings that intended for the question"If you give oral grade to your students, which criterias do you use ?" question

Teachers' answers to the "If you give oral grade to your students, which criterias do you use ?" question were the students' performance and attendance to the lesson with a ratio of

%33 and how the students answered their questions with a ratio of %26 (Table 8). %21 of the teachers regard the students' general attitudes and behaviours while %8 of them said that they assess according to the observations they do at lessons during the period. While the ratio of the ones that regard the students' preparation to the lessons is %6 ; the ratio of the ones that assess the students' knowledge and oral expressions as a measure is %6, too.

Table 8. The answers of research group given to the "If you give oral grade to your students, which criterias do you use?" question , their frequencies and percentages

If you give oral grade to your students, which criterias do you use?	f	%
According to his success at the oral exam regarding his general attitude (attitude wih his/her friends in classroom	13	21
How the student answered my questions (whether expressed accurately or not)	16	26
According to his/her knowledge and oral expressions	4	6
According to the observations that i did at the end of the period (to the efforts that he/she made in lessons during the period)	5	8
According to his/her performance and attendance in lesson	21	33
According to the student's attendance to the lesson as prepared	4	6

Findings that intended for the question "How do you measure the diagram, graphics, map, etc… knowledge of your students?" question

The answer to the "How do you measure the diagram, graphics, map, etc… knowledge of your students?" question is as the followings. Diagrammatizing, completing diagram, showing the parts and filling the gaps as %41, interpreting a diagram, map and graphic as %21. Also; %18 of the teachers said that they assess by asking test questions with diagrams and graphics. %6 of the teachers assess by giving performance Works, %2 of them assess by using concept maps and %2 of them assess by giving oral grades (Table 9).

Table 9. The answers of research group given to the "How do you measure the diagram, graphics, map, etc… knowledge of your students?" question, their frequencies and percentages

How do you measure the diagram, graphics, map, etc… knowledge of your students?	f	%
By doing oral exams	1	2
Interpreting a given diagram, interpreting map and graphics	11	21
Diagrammatizing, completing a diagram, showing the parts, filling the gaps	21	41
By giving performance Works	3	6
By making them solve test questions with diagrams and graphics	9	18
By implementing a concept map	1	2
No answer	5	10

CONCLUSION

According to the findings, it was determined that teachers use the multiple-choice question type with a ratio of % 35 and use classic question type with a ratio of %2. It can be said that teachers rarely prefer alternative measurement tools. Most of the biology teachers (%51) said that the question types they use are adequate in assessment and evaluation and some (%26) said that the question types they use are partially adequate. It was determined that biology teachers use question and answer method to determine the students' pre-liminary knowledge about the topic with a ratio of %63.3 and use question and answer method to measure how much the students learnt at the end of the lesson with a ratio of %42. According to the findings it was seen that biology teachers working at secondary education schools prefer the alternative assessment and evaluation methods, fewer.

Gelbal ve Kelecioğlu (2007) stated at the study, that they made on 242 class teachers and branch teachers, that teachers use traditional assessment methods, which they see themselves more adequate, to determine the students' success and the main problems they met in using the assessment tools are the crowded classsroms and inadequate time. Also, they stated that teachers need education in using and preparing the alternative assessment techniques.

Arslan, Avcı and İyibil (2008) analyzed the books used in the part of " Planning and assessment in education "at KTÜ Education Faculty and then implemented the survey, that developed by researchers, to the physics teacher candidates (38 person). They specified that reference books are not adequate in using alternative assessment and evaluation methods, and stated that teacher candidates left tradional assessment and evaluation approach for alternative assessment and evaluation methods; but they do not have adequate knowledge about these methods.

At their study named as "Trabzon örneği", Çoruhlu, Er Nas and Çepni (2009) stated the problems that science and technology teachers meet at using alternative assessment and evaluation techniques as: Teachers does not leave using traditional assessment and evaluation techniques in the lessons and try to adapt the traditional assessment and evulation techniques to the new programme and they have a missing knowledge about new tecniques.

Ekinci and Köksal (2011) aimed to develop a scale that used to measure the adequency levels of primary school science and technology and mathematics teachers about the assessment and evaluation methods and to determine the adequency perceptions of teachers about this methods. The study showed that the adequency of teachers about the assessment and evaluation methods form 4 sizes and these are (1) New, (2) Intending to determine the students' conceptual skill, (3) Intending for the students' themselves and (4) Adequacies in the traditional assessment and evaluation methods; and showed that the sizes they see themselves adequate are 4., 1., 3., 2., factors, respectively.

Anderson (1998) claimed that shifting from the traditional assessment techniques to the alternative assessment techniques needs time and big theoric changes.

Çakan (2004), stated that most of the teachers find themselves inadequate; but the primary school teachers find themselves more adequade than the secondary shool teachers according to his study that implemented to 504 primary and secondary school teachers.

Also, secondary school teachers prefer written exams, while the primary school teachers mostly use multiple-choice tests.

Teachers using the traditional assessment and evaluation methods form a parallelism with the examined studies. Also, it was determined that teachers define a criteria conformed with the students' levels and demands when giving project works to the students, and it was determined that teachers mostly regard the attendance of student to the lesson and performance in the classroom when giving a verbal grade.

Suggessions that can be brought to this study are ;

1) Teachers should be informed about alternative assessment evaluation techniques in addition to new teaching techniques.

2) Alternative assessment and evaluation techniques should have a wide space in assessment and evaluation lessons at Education Faculty.

3) Student population in classrooms should show a parallelism with the usability of alternative assessment tools.

REFERENCES

Anderson, R. (1998). Why talk about different ways to grade? The shift from traditional assessment to alternative assessment, *New Directions for Teaching and Learning*, 74, (5-15).

Arslan, A., S., Kaymakçı, Y., D., Arslan, S., (2009), Alternatif Ölçme-Değerlendirme Etkinliklerinde Karşılaşılan Problemler: Fen Ve Teknoloji Öğretmenleri Örneği, *Ondokuz Mayıs Üniversitesi Eğitim Fakültesi Dergisi,* 28, 1-12.

Arslan, A., S., Avcı, N., İyibil, Ü. (2008). Fizik Öğretmen Adaylarının Alternatif Ölçme – Değerlendirme Yöntemlerini Algılama Düzeyleri, *D.Ü.Ziya Gökalp Eğitim Fakültesi Dergisi,* 11, 115-128.

Balcı, A., (2002), Coğrafya Eğitiminde Ölçme ve Değerlendirme Üzerine Bir Örnek Çalışma, *Marmara Coğrafya Dergisi* , Sayı: 5, 135-152.

Çakan, M., (2004), Öğretmenlerin Ölçme-Değerlendirme Uygulamaları ve Yeterlik

Düzeyleri: İlk ve Ortaöğretim, *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Dergisi*, 37(82): 99- 114.

Çoruhlu, T. Ş., Nas S.E., Çepni, S., (2008), Fen ve Teknoloji Öğretmenleri İçin Alternatif Ölçme ve Değerlendirme Tekniklerine Yönelik Bir Hizmet İçi Eğitim Programından Yansımalar: Trabzon Örneği, *Necatibey Eğitim Fakültesi Elektronik Fen ve Matematik Eğitimi Dergisi*, 2(2): 1–22.

Çoruhlu, T. Ş., Nas S.E., Çepni, S., (2009). Fen ve Teknoloji Öğretmenlerinin Alternatif Ölçme ve Değerlendirme Tekniklerini Kullanmada Karşılaştıkları Problemler: Trabzon Örneği, *Yüzüncü Yıl Üniversitesi Eğitim Fakültesi Dergis*i, 6(1):122-141.

Ekinci, Y. H., Köksal E.A. (2011). İlköğretim Fen ve Matematik Öğretmenleri İçin Ölçme ve Değerlendirme Yeterlilikleri Ölçeğinin Geliştirilmesi, *Kastamonu Eğitim Dergisi*, 19(1):167-184.

Gelbal, S., Kelecioğlu, H., (2007), Öğretmenlerin Ölçme ve Değerlendirme Yöntemleri Hakkındaki Yeterlik Algıları ve Karşılaştıkları Sorunlar, *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 33: 135-145.

Kurudayıoğlu, M., Şahin, Ç., Çelik, G., (2008), Türkiye'de Uygulanan Türk Edebiyatı Programı'ndaki Ölçme ve Değerlendirme Boyutu Uygulamasının Değerlendirilmesi: Bir Durum Çalışması, *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi*, 9(2):91-101.

Sahin, Ç., (2008), Evaluation of the Assessment and Evaluation of the Primary School Program in Turkey: A Case Study, *World Applied Sciences Journal*, 3(2):206.214.