

## A Study of Prevalence and Problems of conducting Science Quizzes at Elementary Level

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### Abstract

Quizzes are used as significant tools for science learning, because these support science learning, facilitate assessment, help for the retention of information, provide timely feedback, identify misconceptions, prepare students for examinations, motivate learning, and help for the instructional adaptation. This research study aimed to investigate the prevalence and problems of conducting science quizzes at elementary level. Survey method was used for this study. The population of the study was all science teachers working at elementary level in public school of District Rawalpindi. 105 science teachers working during 2019 at elementary level in public school of tehsil Kallar Syedan, District Rawalpindi were the sample of this study. A self-developed questionnaire was used for data collection from the teachers. The finding of the study showed that most of the teachers do not conduct science quizzes. Only 37% teacher's conduct quizzes and out of these only 19% conduct quizzes weekly, however, 15% conduct oral quiz contest daily. The present research also revealed that most of the teachers do not conduct quizzes due to shortage of time, less resources to conduct quizzes, lack of training, discipline problem in overcrowded classes and work overload. It is recommended that workload of teachers may decrease and facilities must be provided to science teachers for conducting frequent quizzes. It will resultantly increase students' performance at end of course exam. The study do suggested that future researcher may take up the issue of prevalence of science quizzes at various others level as well.

**Keywords:** *Assessment, Quizzes Prevalence, Science Teaching, Science Learning*

## 1. Introduction

In a teaching learning process, quizzes have a very significance value. Educationists are of the view that quizzes are very useful tools that increase student learning and retention of course concepts and content. Regular quizzes enable students to recall the concepts and practice them for better understanding. Timely quizzes provide feedback to the students to improve their learning. Quizzes also have encouraging effects on the learning of students (Gholami, 2013). If quizzes are framed on the taught content, and are regularly planned, these may add a fulfillment of accomplishment and improve practice and consequently lead to students' achievement (Johnson & Kivinema, 2009). Quizzes can be carried out daily, on weekly basis or on monthly basis. These can be oral or written. There are many advantages of oral quiz competition. Quizzes are interesting, motivating, interactive and useful. Students make themselves ready for quiz and participate actively (Davi, 2014). Assessments help learners to find out what they need to improve. Most importantly, quizzes assist the teachers in using assessment to get better learning rather than just to evaluate it (Clymer & William, 2007).

Daily quizzes are an effective way to persuade students to go over the subject material. Another advantage of daily quizzes is that students are encouraged to go on practicing for the examination (Tanck, et al. 2013). Quizzes are supportive learning aids which facilitate students to achieve better score on course assessment (Kibble, 2007). As an example, a study in which students' perception was found out regarding major functions of unannounced quizzes (pop quizzes). The study showed both positive aspects to the pop quizzes. Pop quizzes encourage students to attend classes regularly and improves their academic performance on the positive side (Cicirello, 2009). Researchers acknowledged that the quizzes made the students practice and retain the content as it was exposed to them repeatedly (McDaniel, et al. 2011). There are several benefits of regular quizzing. Administration of quiz at the start of day can drift learners directly into the topic and provides quick review of previously learnt material. Regularly scheduled quizzes are a way of helping teachers to know if topics have to be taught again or not (Fries, 2009). To promote learning, it is necessary to involve learners and assess them. Thus, assessments are used to give feedback on material learned and to direct teaching. Quizzes are used to measure performance of an individual in a particular subject. As quizzes are associated with desired result, so a study was conducted to find out the prevalence of science quizzes at elementary level by using a survey method.

### 1.1 Rationale of the Study

In many science classes, attitude of science teachers towards quizzes is highly negative. Teachers merely focus on teaching and don't timely assess students which lead to lack of interest and as a result they show poor performance. In public schools, classes are overcrowded and teachers focus less on assessment. Resultantly, students are not motivated to learn. This study was conducted to explore prevalence of quizzes whether the quizzes are being conducted or not, to check the quiz frequency and to find out problems associated with administration of quizzes and to find out the reason of not administering quizzes frequently.

### **1.2 Statement of Problem**

In Pakistan, education system is mostly teacher centered. The teaching is mostly done through lecture method. Most of the time of science teachers is spent in delivering science content. In the teacher centered approach, there is no room for the continuous improvement of the learner and teachers don't focus on students' assessment (Shah & Rahat 2014). The learning of science students is assessed at the end of term. Resultantly, students are not motivated for learning and they are not informed timely about their progress and weaknesses. Lectures are not sufficient for learning science. So, there is a need of assessment for learning which can involve students and improve their learning. According to researchers, quizzes are one of many ways that motivates students towards learning. Quizzes are not being used frequently for science learning in the schools. Therefore, the present study found out the prevalence and problems of conducting science quizzes at elementary level in public sector schools of Rawalpindi, Pakistan.

### **1.3 Objectives of the Study**

Research was intended to achieve following objectives:

1. To find out types of science quizzes being conducted by science teachers at elementary level.
2. To find out frequency of science quizzes being conducted by science teachers at elementary level.
3. To find out problems encountered by science teachers while conducting quizzes.

### **1.4 Research Question**

1. Which types of quizzes are preferred by science teacher?
2. What is the most common frequency of conducting quizzes?
3. Which problems teachers face regarding quizzes?
4. What are the reasons given by science teachers for not conducting quizzes?

### **1.5 Significance of Study**

The findings of this research will help science teachers how much they are concerned with learning of their science students. The findings of the study will be helpful for stakeholders to make provisions of opportunities so that science teachers can assess students learning timely. It will also highlight problems of teachers regarding quizzes. Resultantly, learning of science students will be improved. The results of the study will be helpful for the students to retain their interests resulting in better understanding of science concepts. The science students will be motivated and they will put more emphasis on problem solving through quizzes; as a result their performance at the end of course exam will be improved.

## 2. Review of Related Literature

It is imperative to assess the progress of learning in the students during the teaching process. Quizzes are one of many ways to assess students. Quizzes are an important technique to gauge the impact of teaching at various stages of the learning process. First use of the word “Quiz” can be spotted back to 18th century and by mid-19th century it had gained the current meaning of tests. Various studies have been conducted to confirm the efficacy of this technique and its different methodologies in educational field. Quizzes can be advantageous in numerous ways. First of all, quizzes provide the motivation for learners to attend class regularly. In a study, the effect of random quizzes was examined on student attendance in an undergraduate course on the psychology of learning. The results pointed out that student attendance improved by 10 percent when the quizzes were in place (Wilder, 2001). A study proved effectiveness of regular quizzes on Iranian EFL learner’ s understanding and creation of English idioms. 120 male and female students were divided into four groups. The students who were included in the study, were language learners. Quizzes were given once a week to one group, the second group received biweekly quizzes, third group received one quiz in 30 days and last group was given no quizzes during teaching period. The results showed that regular quizzes lead to notable result on the understanding and creation of idioms. This study also proved that quizzes given twice a week were the most effective quizzing rate both in understanding and creation of idioms (Zarei, 2015). In a study, it was observed that weekly quizzes improved test scores of students in the midterm and final term examinations (Masoumeh, et al. 2017). A researcher in his study observed that in order to make the most of classroom learning, quizzes should be conducted most often and early (Glenn, 2007). Posselt et al (2022) found that student’s learning outcomes can also be strengthened through quizzes. A study which was conducted to enquire the effect of quiz frequency on course performance. 183 participants were included in this research. They were separated into five groups. Each group was taught by the similar method but quiz frequency was different for each group. First group was not given quiz, second group was asked to take one term exam, third group was given quiz once per month, and fourth group received bimonthly quizzes whereas last group had quizzes on weekly basis. The study revealed that students of those groups attended classes on a regular basis, who were given weekly and bimonthly quizzes. Thus, a positive relationship was found between quiz frequency and class attendance. More frequently conducted quizzes notably raised class attendance. Study also showed that frequent quizzes also increased class performance (Zarei, 2008; Ahmed & Hashash, 2022).

In another study, an online daily testing was introduced to two huge university classes. Researchers examined improvements in academic performance and there was decrease in achievement gaps between upper and lower middle-class students in academic performance. Experimental group took daily online quizzes and they were provided with personalized and quick feedback whereas traditional class did not take any quiz. Experimental class outperformed on final achievement test (Pennebaker, Gosling, & Ferrel, 2013). Another study showed that daily quizzes enhanced students’ performance in anatomy course. The results strongly bear the idea of using quizzes as a mean to persuade and observe progress of students. Daily quizzes lead to good

outcome as compared to weekly quizzes. The mass of students showed better academic progress. A decrease in exam anxiety was also observed. Quizzes served as great means for student instructor communication (Poljicanin, et al. 2009). If the quizzes are announced beforehand, these provide the students a chance to study in advance and thus they learn more (Azorlosa & Renner, 2006).

The quizzes can be administered on daily or weekly basis. Daily quizzes may face an initial resistance or disapproval from students but they tend to realize that these help in their learning. An Associate Professor working in University of Houston used to conduct weekly online test technique and arrived at the conclusion that these tests motivated the students and helped them to attain better results (Sporer, 2001). Another study exposed that students who were given regular quizzes do better than those who experienced no quizzes. Quizzes make easy learning and enhanced the achievement of the students. Discussion helped to make clear the conceptual errors of the students after taking quiz. The classroom quiz enhanced the students' achievement by regularizing their studies. Through regular and appropriate feedback, students came to know concerning their lacking areas and their misconceptions associated to the topics. It is also observed during the class discussion that when students made mistakes in the quiz, they listened the following discussions more carefully. It is logical to bring to a close that quizzes do have an important impact on exam performance (Shafiq & Siddiquah, 2011). Quizzes are supportive learning aids which facilitate students to achieve better score on course assessment (Kibble, 2007). A study was carried out to investigate whether the quizzes had an encouraging or discouraging effect on teachers and students. Study showed that quizzes had some disadvantages such as narrowing curriculum and rising student or teacher stress (Yildirim, 2010). A lot of time is consumed in making, conducting, marking quizzes and reporting quizzes result.

Frequent quizzes also lead to a number of issues. Conducting and scoring quizzes are really time taking and it may take away the class time from efficient teaching (Marshall, 2007).

### **3. Methodology**

It was a quantitative research design. Survey method was used to investigate prevalence of science quizzes at Elementary level. The research "A Study of Prevalence of Science Quizzes at Elementary Level" was delimited to science teachers working at elementary level 2019 of tehsil Kallar Syedan district Rawalpindi Punjab, province. The research was delimited to only one tehsil due to lack of time and limited resources.

#### ***3.1 Population and Sample of the Study***

All science teachers working during 2019 at elementary level in public school of District Rawalpindi were the population of this study. There are seven tehsils in district Rawalpindi. One tehsil was selected as a convenient sampling. There were 105 science teachers working during 2019 at elementary level in public school of tehsil Kallar Syedan, District Rawalpindi (schools.punjab.gov.pk). Data were collected from all science teachers of this tehsil working at elementary level.

### 3.2 Research Instruments and Tools

A questionnaire about prevalence of science quizzes at elementary level was developed by the researcher. In Prevalence, types of quizzes (announced, unannounced and oral quiz contest), frequency of conducting quizzes (daily, weekly, biweekly, monthly, bimonthly), problems faced by teachers regarding quizzes, and reasons for not conducting quizzes were found out. Respondent had to select one option amongst daily, weekly, biweekly, monthly, bimonthly, not at all and others. There were two open ended statement regarding to explore reasons for not conducting quizzes and problems faced by science teachers for quizzes. The research instrument was distributed personally to the teachers by the researcher. As the researchers intended to test pre-defined hypotheses, quantitative research was employed. Many studies in this area have also used the same research method (Wighting et al., 2008; Stewart et al., 2010; Malik & Akkaya, 2021). This study adapted a five-point Likert-type academic motivation scale (AMS) originally developed by Bozanoğlu (Bozanoğlu, 2004). The adapted scale has 20 items. Five questions about demographic and educational information were also added for the current study.

*Table 1. Developmental Framework of Questionnaire Designed for Science Teachers*

<b>Sr. No:</b>	<b>Questionnaire Item No./ Constructs</b>	<b>Sources</b>
1	1,3,5,7	(Azorlosa & Renner, 2006), (Kamuchi, 2007). (Talsenia, Barot, Chaudhari & Patel, 2015).
2	2,4,6,8	(Sporer, 2001), (Poljicanin, Caric, Vilovic, Kosta, Guic, Aljinovic & Grkovic, 2009). (Collier, Carol, Nichols, & Edmondson, 2016), (Masoumeh, Shams & Sadeghi 2017). (Ghulami, 2013). (Zarei, 2015)
3	9, 10	(Yildirim, 2010), (Marshall, 2007)

Face validity and the content validity of the research instrument were done by experts of faculty of Education of Allama Iqbal Open University Islamabad. Many items were deleted as per experts' guidance. Reliability of research instrument was measured by pilot testing. There are seven tehsils in District Rawalpindi. Pilot testing was done on science teachers of tehsil Gujar Khan of district Rawalpindi. For reliability, internal consistency was assured during pilot testing.

### 3.3 Data Analysis

For the analysis of data, Statistical Package for Social Sciences (SPSS) had been used to analyze the data in the form of frequency and percentage.

Table 2. Administration of Quizzes

Conducting quizzes	Frequency	Percent
Yes	39	37.1
No	66	62.9
Total	105	100.0

Table 2 shows the prevalence of quizzes. 37.1% of teachers conduct quizzes whereas 62.9% teachers do not conduct quizzes. This indicates that most of the teachers do not conduct quizzes.

Table 3. Frequency of Administering Quizzes

Conducting quizzes	Frequency	Percent
Daily	8	7.6
Weekly	20	19.0
Biweekly	4	3.8
Monthly	5	4.8
Others	2	1.9
Total	39	37.1
Teachers who don't conduct quizzes	66	62.9
Total	105	100.0

As the table 2 shows that only 37.1% of teachers conduct quizzes. However, table 3 shows its breakup. Table 3 shows that out of 37.1% teachers who conduct quizzes, only 7.6% teachers conduct quizzes daily, 19.0% conduct weekly, 3.8% biweekly, 4.8% monthly and 1.9% teachers conduct quizzes in others schedule. From this table, it can be inferred that amongst 37.1% teachers who conduct quizzes, most of them prefer to conduct quizzes weekly.

Table 4. Administration of Oral Quiz Contest

Conducting oral quiz contest	Frequency	Percent
Yes	35	33.3
No	70	66.7
Total	105	100.0

Table 4 indicates that 33.3% of teachers conduct oral quiz contest whereas 66.7% do not conduct oral quiz contest. It is obvious from this table that most of the teachers do not conduct oral quiz contests.

Table 5. Frequency of Administering Oral Quiz Contest

Conducting quizzes (oral quiz contest)	Frequency	Percent
Daily	16	15.23
Weekly	4	3.8
Biweekly	4	3.8
Monthly	7	6.7
Others	4	3.8
Total	35	33.3
Teachers who don't conduct oral quiz contest	70	66.7
Total	105	100.0

Table 5 indicates that amongst teachers who conduct oral quiz contest, 15.2% teachers conduct quizzes daily, 3.8% conduct weekly, 3.8% biweekly, 6.7% monthly and 3.8% teachers conduct quizzes in another schedule. However, 66.7% of teachers did not conduct oral quiz contest. This analysis clearly shows that the teachers who conduct oral quiz contests, they conduct it daily.

Table 6. Reasons for not Conducting Quizzes

Reasons	Frequency	Percent
Focus on covering course content	24	22.9
Time shortage	16	15.2
Overcrowded classes, focus on covering syllabus, lack of time	21	20.0
Heavy workload	21	20.0
Busy schedule, lack of training	15	14.3
Lack of training, lack of time	8	7.6
Total	105	100.0

Table 6 shows the reasons given by teachers for not conducting quizzes. The focus of 22.9% teachers was to cover course content. While 15.2% teachers did not conduct quizzes due to shortage of time. Furthermore, 20.0% of teachers were of the view that classes were overcrowded so it was difficult to administer quizzes. Their focus was on covering syllabus and they had a lack of time. It is also surprising to see that 20.0 % didn't conduct quizzes due to heavy workload, 14.3% did not conduct quiz due to busy schedule and lack of training and 7.6% teachers could not conduct quiz due to lack of training and lack of time. Therefore, it is obvious from this table that most of the teachers who didn't conduct quizzes, their focus is on covering course content.



Table 7. Problems Faced by Teachers Regarding Quizzes

Problems	Frequency	Percent
Heavy workload, lack of time	61	58.1
Lack of students' interest	5	4.8
Lack of training, busy schedule	20	19.0
Lack of resources, short time	3	2.9
Overcrowded classrooms, lack of time, lack of parents attention	15	14.3
Cover a limited course	1	1.0
Total	105	100.0

Table 7 shows the problems faced by teaching regarding quizzes. It shows that 58.1% teachers face the problem of heavy workload and lack of time, 4.8% face lack of students' interest, 19% feel that they need training and have busy schedule, 2.9% face the problem of lack of resources and short time, 14.3% face the discipline problem in overcrowded classes, lack of time and lack of parent's attention and 1.0% teachers don't conduct quizzes as they cover a limited course. It can be inferred from this table that most of the teachers believed they face heavy workload and lack of time is the major problem of not conducting quizzes.

#### 4. Discussion

Quizzes are valuable tools in science learning because they facilitate assessment, support active learning, aid in information retention, provide formative feedback, prepare students for exams, motivate learning, and guide instructional adaptation. However, the findings of this study revealed that most of the science working in public sector schools do not conduct quizzes frequently. The study showed that the teachers who conduct quizzes prefer administering quizzes weekly. This finding is in line with other researches. As many researches proved that if quizzes should be conducted weekly, it will lead to improved results (Collier, Carol, Nichols, & Edmondson, 2016; Masoumeh et al; 2017). One main reason behind preference of weekly quizzes may be credited to class attendance; weekly quizzes make students' to attend class regularly. It can also be helpful to provide feedback for the improvement of students' learning. Quizzes are also helpful for the teachers so that they can adapt their teaching strategies accordingly. Quizzes also make students accountable of their own learning process so that they can gauge their progress with time. Studies have shown that a positive relationship exists between regular quizzing and class attendance (Kamuchi, 2007). Teachers who are conducting quizzes shared their problems. Despite of knowing the facts that quizzes are helpful for the students learning this study showed the teachers face problems to conduct the quizzes either daily, weekly, or monthly. According to the teachers the large number of classes is the main hindrance to conducting the quizzes. Moreover, teachers could not find time to conduct the queries due to shortage of time. Teachers were also of the view that this practice as a lot of time is consumed in preparing, administering, and marking of quizzes. This

finding is in line with the finding of study conducted by Marshall, 2007. Another reason of not conducting quizzes in time is the resource constraints as many teachers like essential resources to implement quizzes effectively. It might also be due to the reason that teachers lack pedagogical training gaps to improve their Instruction. Literature also reveals that one of the reasons of not conducting quizzes in the schools is the resistance to change as teachers feel comfortable with established teaching methods and they are afraid of disrupting their learning environment due to the conduct of quizzes. An interesting finding from the literature reveals that sometimes institutional policies also hinder the frequent quizzing for learning. That might be the case with this study as this study was conducted in public sector schools which have a specific schedule to conduct classes and complete the coursework.

## **5. Findings**

1. Among 105 teachers, 66 teachers do not conduct quizzes.
2. Among teachers, who conduct quizzes, whether announced or unannounced, teachers conduct quizzes on a weekly basis.
3. Most of teachers do not conduct oral quiz contests. The teachers who conduct quiz contests, they conduct on a daily basis.
4. Teachers prefer to written quizzes as compared to oral quiz contests.
5. Teachers told reasons for not conducting quizzes as their main focus is on covering course content, shortage of time, high strength, busy schedule and they also don't have training regarding quiz administration.
6. Teachers face the problems of heavy workload, time management issue, lack of students' interest in quizzes, lack of training, busy schedule, class management issue in overcrowded classrooms, lack of resources, and lack of parents' cooperation.

## **6. Conclusion**

There is less prevalence of quizzes in the classes at elementary level. The present research also highlighted the problems teachers encountered while conducting quizzes like shortage of time, less resources to conduct quizzes, lack of training, discipline problem in overcrowded classes and work overload. Due to these reasons, quizzes are not frequently used in public schools. Researchers concluded that by conducting weekly short quizzes teachers can stimulate their students studying during the course rather than rote learning the night before the exam. It is hoped that by integrating this important component with teaching will play a significant role in our classroom prospectus.

## **7. Recommendations**

1. Awareness must be given to the teachers for the benefits of quizzes.
2. Resources must be provided to the teachers so that they can effectively implement the quizzes in the classes. Higher authorities may provide teachers resources so that they can conduct quizzes easily.

3. Teachers must receive training to improve their pedagogical methods including the use of quizzes. Professional development opportunities can be varied and not all teachers may have the chance to get it. Therefore, all teachers must be given the training to use latest tools to develop and administer the quizzes in the classes.
4. Teachers must choose the student-centered teaching approaches.
5. Institutional policies must be flexible so that teachers can find time and opportunity to conduct the quizzes.
6. Quizzes can also be used to foster motivation and facilitate science learning.
7. Teachers' workload may be reduced so that they can get time for the preparation and administration of quizzes.

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