

Investigation of the Opinions of Science Teachers About Homework

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Received: January 24, 2020 Accepted: February 28, 2020 Online Published: March 10, 2020

doi:10.5539/jel.v9n2p232 URL: <https://doi.org/10.5539/jel.v9n2p232>

Abstract

Despite the restrictions and controversies in Turkey's educational system, the efficacy of the homework assignments on the student's development is indisputable. Besides, what needs to be discussed is what kind of assignments should be given to students, and how they should be evaluated. The aim of this study is to investigate the views of science teachers about homework assignments. The survey method was preferred for this study. A questionnaire was developed by the researchers, and 100 teachers were reached online and via social media. The data obtained from the study were evaluated through quantitative and qualitative analyses. This study shows that the majority of the teachers do not support banning homework, and they consider it as necessary. Teachers mostly assign homework assignments for repetition and reinforcement. Project assignments and research presentation assignments are the most commonly assigned types of homework. Teachers give homework to students which they can do mostly at home spending 0–1 hours together with their friends. According to the teachers, homework provides the most benefits for reinforcement, repetition and learning. In the study, it was found that the majority of the teachers did not use portfolios. According to the teachers participating in the study, the factors that mainly affect student motivation are concentration, reluctance and insufficient knowledge.

In order for students to develop their skills properly in the 21st century and be successful in international examinations such as TIMSS, their understanding of homework must also change to meet the requirements of the age.

Keywords: science education, teacher opinions, homework, survey

1. Introduction

Rapid and significant changes occur in today's world. Information experiences rapid changes, and facts and events are examined through multidimensional rather than one-dimensional ways. It becomes preferable to learn the ways of accessing information rather than storing it and accepting it as immutable. In this case, it is increasingly needed to educate people with the skills that allow them to access information (Kutlu et al., 2009). These changes in the community needs and the fact that the existing assessment system is away from reaching students' real evaluations also makes it necessary to apply new measurement and evaluation tools and methods (Bahar et al., 2008). Therefore, homework assignments given to students must meet the requirements of the century and the student's needs.

In the literature, homework is defined in multiple ways. According to Hong et al. (2000), homework is one of the teaching practices frequently used in educational institutions. Özer and Öcal (2012) defined homework as one of the most frequently used teaching methods by teachers. Barnes (2001) stated that homework is a common teaching strategy used by teachers all over the world. Cooper, Robinson and Patall (2006) defined homework as any task given by schoolteachers intended for students to work outside the school hours. According to another definition, homework assignments are exercises that are generally given to prepare students for the lesson, and mostly to repeat, expand and cover what is learned in the lesson in out-of-school times (Ergün & Özdaş, 1997). According to Yuladır and Doğan (2009), homework is all of the activities given according to the needs of students, to conduct research and examination, to better understand the subjects covered in the lessons or to channel them to work on a subject. According to Güneş (2014), homework is an important activity for students to develop their mental, emotional, physical and social skills and keep them for life.

When the historical process is analyzed, it is seen that homework is prominent in some periods and banned in some periods since it is accepted as redundant. In recent years, it has been deemed necessary to give performance-based homework and considered that homework contributes to students' academic success, helps develop various skills and provides lifelong learning (Güneş, 2014). Homework is applied in schools as a part of teaching. However, it is also a controversial topic. The benefits and harms of homework have been debated for a long time. How often and how many homework assignments will be given to students, how to evaluate them, how to give feedback to students about homework, etc. are all discussed in several studies. The importance given to homework increases or decreases in different time periods (EARGED, 2011).

Studies show that homework assignments have different effects in each teaching level (U.S. Department of Education, 2002). These effects are examined below as being positive or negative:

1.1 The Positive Effect of Homework

Babadoğan (1990) and Bayrakci (2007) stated that homework assignments help students develop positive attitude towards the lessons and to socialize. Additionally, there are studies stating that doing homework increases students' success (Glazer & Williams, 2001; Gündoğan-Özben, 2006; Kaplan, 2006). The study conducted by Cooper, Robinson and Patall (2006) stated that homework has a positive effect on success. As it may be seen, studies have revealed that homework increases students' academic success. At the same time, the increase in the amount of homework is said to increase students' success (Cooper, 2006; McMullen, 2007).

Gedik, Altıntaş and Kaya (2018) stated that homework is among the factors affecting students' success in science. In their study, students stated that the homework given to them should prepare them for examinations. A study by Kaya and Kaya (2018) drew attention to the relationship between homework and students' science achievement. The researchers stated that the homework should be done in 30–60 minutes and given less frequently. They suggested that not assigning any homework or assigning homework continuously had a negative effect on science achievement. It shows that giving homework improves the performance of low-performing students or students attending low-performing schools. Thus, giving more homework may help bridge the gap in success between high- and low-performing students. In particular, it is stated that applying policies to increase the time students spend on their homework and the amount of homework are likely to increase the performance of low performing students and schools (McMullen, 2007). Another study (Yuladır & Doğan, 2009) stated that homework contributes to the academic and social development of students. It is also known that homework helps connect old learning and new learning. According to learning theories, homework is one of the activities that provide active learning (Temel, 1989; Yıldırım et al., 2000). Homework plays an important role for the learning process in achieving goals. Homework is an effective method to teach students how to develop a scientific thinking and access to information resources, how to gain problem solving skills and how to establish cause and effect relationships (Yapıcı, 1995; Gür, 2003; Yıldırım et al., 2000). Sullivan and Sequeira (1996) suggested that homework indicates that students can improve their working skills and critical thinking skills and that learning can also occur out of school. It is emphasized that homework is an important tool for developing responsibility and acts as a bridge between the school and the family (Güneş, 2014).

As it may be seen from the aforementioned studies, homework positively affects students' attitudes, achievements and social development.

1.2 Negative Effect of Homework

Various sources mention limitations of homework and, in some cases, their harm besides the benefits of homework assignments. According to Pope (2014), it is not guaranteed that students will learn well by doing homework, will like to do homework and will benefit from it. It was stated that students do homework to get higher grades. The researcher's wide-ranging research resulted in the conclusion that too much homework affects students badly, even causing physical discomfort and isolating them from life. They found that, even in high-achieving schools, doing more than 2 hours of homework on the high school level causes conditions such as stress and physical ailments, sleep disturbances, depression and getting away from social activities. Additionally, it was concluded that excessive homework does not facilitate learning and reduces self-confidence even in older students. There seems to be a paradox in this regard. Kohn (2006) stated that students feel homework as pressure, and it steals from sleep and development of other social skills.

Yuladır and Doğan (2009) stated problems in students' homework performances in the science class, and students did not show the needed attention to homework. The study conducted by Demirbaş (2011) with teachers working in rural areas determined that they experienced trouble in homework assignments. It was revealed that teachers thought negatively about homework due to societal conditions. In a study conducted by Ersoy and Anagün, it was seen that science teachers expressed some problems such as internet usage related to homework,

parents' indifference to homework and differing participation levels to group homework assignments (2009). In the research conducted by Balbağ et al. with science teachers, negligence and inattention of students about doing homework were reported among problems (2016).

A comprehensive research in Turkey found that homework assignments have both positive and negative effects on students' attitudes towards schools, teachers and courses. Research stated that the quality of the homework assignments and the teacher's attitudes are the main determinants of this. As a result, the way that homework affects the student depends on the teachers (Demirbaş, 2011).

In this study, it was aimed to reach findings that would be used to reveal the views of science teachers about homework and contribute to the solution of homework-related problems.

2. Method

2.1 Model of the Study

The survey model was applied in this study. Studies conducted on larger groups compared to other types of studies, in which the opinions of the participants about a subject or features such as interest, skill, ability and attitude are determined, are called survey studies (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2011). Karasar (2013) stated that survey models are research approaches that aim to describe a situation as it is, whether it had existed in the past or still exists (Karasar, 2013, p. 81). This study was a survey study since the data obtained reflected the opinions of teachers.

2.2 Participant (Subject) Characteristics

Science teachers constituted the sample of the study. Readily accessible convenience sampling, which is one of the purposive sampling methods, was used in determining the participants. The demographic characteristics of the teachers who participated in the study are presented in Table 1 below.

Table 1. Frequency distributions related to the teachers' demographic characteristics (N = 100)

Variable	Group	f
Gender	Female	83
	Male	17
Age	21–25	26
	26–30	44
	31–35	19
	36–40 and above	11
Education level	Undergraduate	66
	Graduate/PhD	34
Faculty	Faculty of Education	96
	Faculty of Arts and Sciences	4
Graduated department	Science	91
	Other	9
Number of students	24 and below	43
	25–34	32
	35 and above	25

2.3 Data Collection Tool

A questionnaire developed by the researchers called "Examination of the views of science teachers about homework" was used. In the questionnaire form, there were 22 open-ended and closed-ended questions to collect the teachers' demographic information and views about homework. With these questions, the necessity of homework, types of homework, place where the homework will be done, time allocated to homework, people who participate in doing homework, benefits of homework, homework and student motivation, evaluation of homework and contribution to final grades were investigated. In the process of developing the questionnaire, firstly, the literature was reviewed by the researchers, and a question pool was created. The perceivability of the questions by the participants was then examined by a pilot study. The questionnaire was finalized after the necessary arrangements. The questionnaire applied via Google Forms was sent to the participants via e-mail and social media on the internet and was collected in 2 months.

2.4 Analysis of the Data

Descriptive and content analysis methods were used to analyze the data obtained from the questionnaire.

Percentage (%) and frequency (f) techniques were used to describe the demographic information and the data obtained from the closed-ended questions. To analyze the rest of the questionnaire, the content analysis method was used. The general process in content analysis follows gathering data which are similar within the frameworks of certain concepts and themes and organizing and interpreting them in a way that the reader can understand (Yıldırım & Şimşek, 2013). With content analysis, two experts coded the data obtained from the opinions of science teachers about homework by determining themes, and frequencies (f) were calculated. The reliability of the data was calculated with the formula $[\text{Agreement} / (\text{Agreement} + \text{Disagreement})] \times 100$ proposed by Miles and Huberman (1994). In the study, the percentage of agreement in coding was calculated as 85% using this formula. According to Yıldırım and Şimşek (2013), when the agreement percentage in a reliability calculation is 70%, the reliability percentage is considered to be reached. Therefore, the values obtained indicated that the coding reliability of the researchers was sufficient.

3. Results

According to the data obtained from the opinions of the teachers who participated in the study about homework, 8 themes, namely “the necessity of the homework”, “the types and characteristics of the homework”, “the place where the homework is done”, “the time allocated to the homework”, “the people who do the homework together”, “the benefits of the homework”, “the evaluation of the homework”, “homework and motivation”, were created and are presented below.

3.1 The Necessity of the Homework

Table 2. Teachers' views on the necessity of the homework

The necessity of the homework	f
Necessary	94
Unnecessary	6
	100

In Table 2, it is seen that the majority of the teachers (f = 94) assumed homework to be necessary. When the teachers were asked to explain the rationale of their views on the necessity of homework, they made the explanations shown in Table 3.

Table 3. Rationales on the necessity of homework

Rationales of the teachers who consider homework necessary	f	Rationales of the teachers who consider homework unnecessary	f
Repeating for reinforcement	53	May differ by the topic	1
For research purposes	7	It has little effect on students' achievements	1
Individual learning	10	Not necessary for every course and topic	1
Motivation	4	Must be based on student request	1
Responsibility	5	Cause student to be tired	1
Permanent learning	10	It is not effective in gains, it is an extra burden to the student	1
Insufficient lesson hours	2		
Preparation for the lesson, preliminary knowledge	3		
Total	94		6

Table 3 shows that the teachers who considered homework necessary (f = 53) mostly gave homework for reinforcement purposes.

Table 4. Teachers' views on removal of homework in new programs\

Teachers' views on removal of homework in new programs		f	%
Should not be removed	Should not be removed	58	83
	Should not be removed but should not be too much	25	
	Should be removed	9	9
	Undecided	8	8
Total		100	100

Table 4 shows that the majority of the teachers ($f = 83$) thought that homework should not be removed from the program.

3.2 The Types and Characteristics of the Homework

Table 5. The types of the homework given to the students

The types of the homework given to the students	f	%
Projects	75	14
Research and presentation homework assignments	68	13
Worksheets	63	12
Homework assignments from the textbook	63	12
Test solving	61	12
In-class assignments	58	11
Experiments, observations, etc.	51	10
Extracurricular homework assignments	34	7
Selected products file (portfolios)	24	5
Homework assignments for reading and writing	23	4
Total	520*	100

Note. *Frequency of teacher expressions.

Table 5 shows that the teachers mostly gave project assignments (14%). Then, they gave research and presentation (13%), textbook (12%), worksheets (12%) and test solving (12%) assignments.

Table 6. Status of giving students a performance assignment

Status of giving students a performance assignment	f
Gives a performance assignment	65
Does not give a performance assignment	35
	100

Table 6 shows that the majority of the teachers ($f = 65$) gave performance assignments to their students.

Table 7. Ensuring the online resource reliability of research papers

Ensuring the reliability of online resources		f	Total
The online resource reliability is being checked	I am offering the online resource addresses	38	73
	I am asking for bibliography	23	
	Asking for various resources	11	
	Data check	1	14
	Does no check resources	14	
	Does not allow internet resources	13	
		100	100

It may be seen in Table 7 that the majority of the teachers ($f = 73$) provided the reliability of the online addresses of resources of research assignments.

3.3 The Place Where the Homework is Done

Table 8. The place where the student will do the homework

The place where the student will do the homework	f	%
At home	89	35
In class	48	19
Unstructured environment	42	17
Online	36	14
Out-of-school institutions and organizations	33	13
Other	4	2
Total	252*	100

Note. *Frequency of teacher expressions.

Table 8 shows that the teachers gave homework to the students that they will do mostly at home (35%).

3.4 The Time Allocated to the Homework

Table 9. Time given to do homework

Time given to do homework	f	%
0–1 hours	76	53
1–2 hours	30	21
2 hours and more	5	4
in a long period	32	22
Total	143*	100

Note. *Frequency of teacher expressions.

Table 9 shows that the teachers gave homework to the students to do between 0 hours and 1 hour at most (53%). Then, they gave homework that the students would do in a long period (22%) and in 1-2 hours (21%).

3.5 The People Who Do the Homework Together

Table 10. The people who the students do the homework together

The people who the students do the homework together	f	%
Friends	85	34
By oneself	74	29
Family	52	21
Specialists or other persons relevant to the subject	35	14
Other	4	2
Total	250*	100

Note. *Frequency of teacher expressions.

Table 10 shows that the teachers mostly gave homework to students that they would do together with their friends (34%). Then, they gave homework that the students would do alone, together with their families and by specialists or people relevant to the subject.

3.6 The Benefits of the Homework

Table 11. The benefits of the homework

The benefits of the homework	f	%
Reinforcement	34	27
Repeating	30	23
Learning	30	23
Responsibility	13	10
Research	6	5
Motivation	7	6
Personal development	7	6
Total	127*	100

Note. *Frequency of teacher expressions.

Table 11 shows that homework provided benefits such as reinforcement (27%), repetition (23%) and learning (23%) according to the participants.

3.7 The Evaluation of the Homework

Table 12. The way teachers evaluate the homework assignments and the reasons for not evaluating them

Evaluating homework assignments	Rationale	Yes	Total
Evaluates	By rubric	37	94
	In details	20	
	According to the answers	15	
	Giving plus or minus	10	
	Quickly	9	
	No comment	3	
Not evaluating	To make it fun	1	6
	Unnecessary	1	
	Workload is increasing	1	
	No comment	3	
		100	

Table 12 shows that the teachers participating in the research were asked whether they evaluated their homework, and 94 of them stated that they did, while 6 stated they did not. When asked about the rationale for these opinions, they gave different answers shown in Table 12.

Table 13. Whether or not to use and evaluate a selected works file (portfolio)

		f	Total
Usage and evaluation of a selected works file (portfolio)	By rubric	20	33
	According to presentation	3	
	Seldom	3	
	According to their development	2	
	No comment	5	
Not using a selected works file (portfolio)	Not using	67	67
		100	100

Table 13 shows that most of the teachers ($f = 67$) did not use a portfolio. Of the teachers using portfolios ($f = 33$), 20 teachers evaluated homework with rubrics.

Table 14. Checking of the homework, evaluation and their contribution to the class scores

	Yes	No	Total
Checking of the homework	99	1	100
Evaluating the homework	95	5	100
Using rubrics while evaluating homework assignments	71	29	100
Developing rubric for homework	63	37	100
Contribution of the homework to the school report	82	18	100

Table 14 shows that 99 teachers checked homework assignments, and 95 teachers evaluated them. 71 teachers used rubrics while evaluating homework assignments, and 62 teachers developed rubrics themselves. 82 teachers stated that homework contributed to the final school report.

3.8 Homework and Motivation

Table 15. Situations that affect student motivation in doing homework

Situations that affect student motivation in doing homework	f	%
Concentration	70	26
Reluctance	63	23
Insufficient knowledge	62	22
The ability to be organized	33	12
Fear	29	11
Financial difficulties	17	6
	274*	100

Note. *Frequency of teacher expressions.

Table 15 shows that the most effective factor on student motivation was concentration (26%). Reluctance (23%) and insufficient knowledge (22%) followed it.

4. Discussion

The survey method was used in this study to investigate the opinions of science teachers about homework. The opinions of 100 teachers who participated the survey were analyzed in quantitative and qualitative terms.

The main findings of study were as follows: while there were teachers who found it unnecessary to give homework assignments, the great majority of the teachers did not support removal of homework and thought that homework assignments are useful and necessary. The teachers mostly assigned homework for repetition and reinforcement purposes. Most of the teachers gave project assignments and research presentations as homework assignments. The teachers give online research homework and ensured the resource reliability. The science teachers who participated in the study gave homework to students which they could do mostly at home spending 0–1 hour(s) together with their friends. According to the teachers, homework provides the most benefits for reinforcement, repetition and individual learning. In the research, it was found that the majority of the teachers did not use portfolios. The teachers evaluated the homework assignments with rubrics, and these evaluations contribute to the report score. The situations that affected student motivation were concentration, reluctance and insufficient information.

In the study conducted by Ergün and Duman (1998) on the same topic, it was stated that teachers considered students should do homework. In the research carried out by Ersoy and Anagün (2009), it was reported that science teachers gave homework for the purposes of preparation for the lesson, repeating and reinforcement and developing awareness of responsibility. Gedik, Altıntaş and Kaya (2018) stated that the homework is one of the factors affecting students' success in Science. In their study, they suggested that the homework to be given to the students should help them be prepared for examinations. While homework assignments aiming at examination success are preferred as being profitable in terms of motivation, Delaney (2017) stated that this preference causes ignoring of the actual benefits of research. In a study by Kaya and Kaya (2018), the relationship between homework and students' science achievement was examined. The researchers stated that homework should be done in a way that can be completed in 30–60 minutes and be given less frequently. Giving no homework or giving assignments permanently has a negative effect on achievement in science courses. In a study conducted by Özdemir (2015), it was noted that there is a significant positive relationship between the time allocated for homework and school burnout. It was stated that homework provides students with practical skills and time management skills (Ekici, 2014). It may be stated that the results of our research were in parallel with some of these studies.

In the literature, researchers provided different opinions about how homework should be given. According to Sallee and Rigler (2008), the homework should not be compulsory, routinized and should be aimed at achieving a specific goal. Other researchers (Çetinkaya, 1992; Hong et al., 2000; Gür, 2003; Hizmetçi, 2007; Ersoy & Anagün, 2009) stated that knowing the homework styles and assigning homework accordingly affect the success of the student. Since assigning homework assignments according to the individual differences of students may contribute to the development of the students, these issues should be considered seriously.

The Education System is also in confusion on the issue of homework in Turkey. In 2006, a change was made in the regulation of primary schools, and performance assignments were defined (Official Gazette, 2006). This definition was changed in 2007 to performance tasks (Official Gazette, 2007). According to this definition, it is seen that performance tasks are not the work done at home, they are studies conducted under teacher guidance (Demirbaş, 2011). Performance tasks are activities that provide students with problem instances they may encounter in real life and require high-level mental skills. However, homework and performance tasks have different purposes. While homework assignments aim to repeat and reinforce what students learn in the lesson, performance tasks aim to use this learned information in their life and reach new information (Demirbaş, 2011). In accordance with the constructivist approach in the science curriculum in Turkey, it would be more beneficial to use performance tasks.

In line with the results obtained from this study, it may be stated that the understanding of homework should change in the 21st century with changing curricula and developing technology. It is recommended to give homework that will contribute to students' success and development and will help develop research and responsibility awareness instead of forcing them.

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