

Science Teachers' Expectatitons from Parents: To What Degree Do Parents Think They Satisfy Such Expectations?

Abstract

This study aimed to determine teachers' expectations from parents for effective science teaching and reveal parents' beliefs on how much they satisfy such expectations. Face-to-face interviews were conducted with 5 science teachers in order to determine teachers' expectations from parents. "The Scale of Expectations from Parent (SEFP)" was developed by using the findings obtained from the interviews. It was a 5-point Likert-type scale made up of 21 items and including the scale of "parental support" and "sense of responsibility". The developed scale was delivered to the parents of the students of the teachers participating in the interview. The research results indicated that parents' levels of satisfying the expectations were a significant predictor of science achievement.

Keywords: *science education, teacher expectations, parental involvement*

Introduction

Progress in education can be achieved only if relevant stakeholders fulfill their responsibilities (Akbaba Altun, 2009). One of the most important stakeholders is parents. It goes without saying that the improvement of school-family relations and school culture will have positive effects on children (Brankovic, Rodic & Kostovic, 2012). School-family relationships should be dealt with in two dimensions: (1) home environment; (2) school environment (Wyrick & Rudasill, 2009). Moreover, all kinds of behaviors displayed by families outside of the classroom in

relation to the education of their children are addressed within the school-family relations (Souto-Manning & Swick, 2006).

Parental involvement is a major factor in forming pupils' school outcomes (Desforges & Abouchaar, 2003). Among these outcomes, the first one is academic achievement. Many studies revealed the relationship between parental involvement and academic achievement, and determined that parental involvement was a significant predictor of school achievement (Akbaba Altun, 2009; Hill & Tyson 2009; Kabapınar & Ataman, 2010; Keçeli Kaysılı, 2008; Jeynes, 2007; Şeker, 2009). According to the meta-analysis of Jeynes (2007), 52 studies carried out in urban areas showed that parental involvement had, in general, positive contributions to academic achievement.

Hill and Tyson (2009) investigated through meta-analysis the effect of parents on achievement within the context of the role of parents, school-parent relations, and parental involvement. Examining the results of 50 studies, the study investigated the relationship between parental involvement and academic achievement in three types of parental involvement: (1) *Home-based involvement*, (2) *School-based involvement*, and (3) *academic socialization*. *Home-based involvement* refers to talking with children about school, helping them do their homework, taking them to necessary field trips, and creating an appropriate learning environment at home. *School-based involvement* includes visiting school frequently, joining school meetings, and taking part in parent-teacher association activities voluntarily. *Academic socialization* includes communicating parental expectations from education and its value or utility, linking schoolwork to current events, fostering educational and occupational aspirations, discussing learning strategies with children, and making preparations and plans for the future (Hill & Tyson, 2009). Gonzalez-DeHass, Willems and Holbein (2005) investigated the impact of parental involvement on the motivational levels of students.

In brief, the importance of school-parent cooperation is highly valued and considered to be one of the crucial factors impacting on student achievement. In school curricula, the roles and responsibilities of parents are defined and their effectiveness in children's learning process is attempted to be increased. That has been featured more in the science curriculum along with changing and developing approaches. As stated in the literature review, although there were studies examining the expectations of parents from their children, there was no study focusing on the expectations of teachers from parents and to what degree parents satisfy such expectations.

The Role of Parents in Turkish Elementary Science Curriculum

The current science curriculum, implemented in Turkey in 2005, was based on the constructivist approach. It brought along alternative assessment and evaluation (e.g. formative assessment) techniques (Ministry of National Education, 2005). Performance assignments have an important position among the tools and techniques employed in alternative assessment. The performance assignments are regarded as an effective way of communicating with parents, they allow parents to get involved in the learning of their children, and help parents to understand the curriculum and follow the improvement of their children in relevant courses (Çiftçi, 2010).

The previous research on performance tasks demonstrates that the support, attitudes, and behaviors provided or displayed by parents during the performance of these tasks are important for education (Tüysüz, Karakuyu & Tatar, 2010). Parents are one of the implementers of science and technology curriculum. The curriculum even defines the roles to be played by parents as follows:

Parents may learn from the curriculum what their children are to learn in a particular grade as well as why they are to learn it. In this way, they may discuss their work with their children, communicate with the teachers of their children, and ask questions about the development of their children to these teachers (Ministry of National Education, 2005: s36).

In science education, the roles of parents in the teaching process are shaped by the expectations of teachers. In other words, the expectations of teachers determine the roles of parents. In this regard, the investigation into teachers' expectations from parents and the degree to which parents satisfy such expectations is significant for carrying out effective teaching.

Purpose of the Study

This study aimed to determine teachers' expectations from parents for effective science teaching and reveal parents' beliefs on how much they satisfy such expectations. In this respect, an attempt was made to answer the following sub-problems:

1. What do science teachers expect from parents?
2. According to parents, to what degree do they satisfy the expectations of science teachers?
3. Is there any relationship between the science achievement of students and their parents' beliefs on how much they satisfy science teachers' expectations?

4. Do parents' beliefs on how much they satisfy science teachers' expectations predict students' science achievements?
5. Do parents' beliefs on how much they satisfy science teachers' expectations vary by students' gender and grade levels?

Research Methodology

The study was carried out at two stages. First, an attempt was made to investigate science teachers' expectations of from parents. Semi-structured interviews were conducted with 5 science teachers working in various elementary schools in the Rize Province in Turkey. Science teachers were randomly selected from among voluntaries. Second, a scale based on the expectations of teachers was created and sent to 170 parents of the 6th, 7th, and 8th grade students of these teachers in order to reveal the parents' beliefs on how much they satisfy science teachers' expectations. 129 parents responded to the scale.

Research Results

Step 1: Investigating the Science Teachers' Expectations from Parents

In order to investigate science teachers' expectations from parents, an interview form was used including five open-ended questions. Feedback on these questions was received from three academicians specialized in the field of science education. The interview form was finalized in accordance with the recommendations of the experts. Interviews were recorded digitally and transcribed by the researcher.

The data obtained through the interviews were subjected to content analysis. Content analysis aims at bringing together similar data and arranging them within the framework of specific themes (Yıldırım & Şimşek 2006). In this regard, the interviews were analyzed as follows: themes associated with the research purpose were determined based on the answers given to each question. Participants emphasizing those themes were identified. Common views were indicated by determining the number of such participants.

The teachers' views were determined to be included in two categories through the interviews about the teachers' expectations from parents. These categories were named *parental support* and *sense of responsibility* through examination in terms of content.

The teachers had some common opinions. In the category of *sense of responsibility*, all of the teachers said that parents should participate in parents' meetings held in school. In addition, all of the teachers were of the opinion that parents should not do the science homework which their children had difficulty in doing, but they should help them only through directions and guiding. The statement of a science teacher on this subject is as follows:

...while most parents get information about their children by participating in parents' meetings, some are just indifferent in this matter...The inclusion of performance assignments in the curriculum has brought more responsibilities to parents. However, parents sometimes go beyond their responsibilities and regard the homework which is to be done by students normally as the homework to be done by themselves. We expect them to support students as much as necessary...

In the category of *parental support*, the teachers stated that they expected parents to supply the materials needed for performance assignments and not to consider these materials unnecessary. The statement of another science teacher on this subject is as follows:

When we are to give students performance assignments such as preparing a poster, creating a model, preparing a project, etc., we pay attention to the possibility of doing such assignments by using simple tools and materials. They are quite low cost materials, but parents sometimes do not want to supply even such materials...

Step 2: Revealing Parents' Beliefs on How Much They Satisfy Science Teachers' Expectations

In the presented study, the teachers' expectations from parents were divided into two themes: (1) *parental support*, (2) *sense of responsibility*. While *parental support* consisted of 17 items, *sense of responsibility* included 6 items. The items were also modified for the parent participants. For example, an item from teacher expectations "Parents should participate in parents' meetings at school" was converted into "I participate in parents' meetings at school". In this way, a draft form of *The Scale of Expectations from Parent (SEFP)* was created.

In the presented study, the content validity technique proposed by Lawshe (1975) was employed for ensuring the validity of the scale. According to this technique, a newly drafted scale needs the approval of experts in the field. In Lawshe's technique, at least 5 experts are required (Wilson, Pan & Schumsky, 2012; Lawshe,

1975). In the presented study, 5 faculty members, 4 of whom were specialized in the field of science education and 1 of whom was specialized in the field of educational sciences, expressed their opinions. The critical content validity ratio for each item is 0.99 according to 5 experts (Wilson, Pan & Schumsky, 2012; Veneziano & Hooper 1997). The content validity ratios of 2 items were found to be below 0.99. Thus, these items were removed from the scale. The remaining 21 items were found to have a content validity ratio of 1.00.

The experts also controlled and approved the item categorization (*parental support* and *sense of responsibility*) of the scale. The final version of the form was designed as a 5-point Likert-type scale (1: never, 2: rarely, 3: sometimes, 4: often, and 5: always). Reverse coding was conducted for the negative items included in the scale for statistical analysis. Cronbach's Alpha reliability coefficients were found to be 0.79 for the entire scale, 0.61 for the sub-scale of *parental support*, and 0.79 for the sub-scale of *sense of responsibility*.

The Results Concerning the Parents' Answers to the SEFP

Table 1 presents descriptive statistics of the data obtained from parents. It can be seen from Table 1 the mean scores of the parents in all *sense of responsibility* items range from 2.61 to 4.39. The item "I take care that my child delivers the homework timely" was found to have the highest mean score. The item "I talk with

Table 1. The results of the parents' answers to the SEFP

	Items	N	\bar{x}	SS
Sense of responsibility	28-I take care that my child delivers homework timely.	129	4.39	0.9
	15-I learn the marks which my child receives from projects and performance assignments.	129	4.12	1.18
	27-I tell my child that importance should be attached to order and arrangement, besides the lesson function, in project assignments.	129	4.07	1.24
	19-I understand the fields of interest of my child by looking at his/her willingness to do various assignments, and I encourage him/her in such fields.	129	4.02	1.08
	32-I participate in parents' meetings at school.	129	3.91	1.2
	12-I encourage my child to be creative in project assignments in the science course.	129	3.85	1.08
	21-I do the science homework which my child has difficulty in doing.	129	3.55	1.56

Sense of responsibility (cd)	24- I help my child to seek advice of his/her teacher when s/ he has difficulty in the process of doing homework.	129	3.42	1.3
	25-I inform my child of the necessity of the science and technology homework given.	129	3.39	1.21
	8-I help my child only by guiding and directing him while s/ he is doing homework.	129	3.3	1.15
	23-I know the stages of the assignments given for which I am responsible.	129	3.26	1.31
	13-I help my child associate science homework with daily life.	129	3.12	1.34
	9-I cannot help my child duly as I do not have content knowledge required for the science course.	129	3.11	1.36
	29-I follow the subjects covered in the science and technology course.	129	3.1	1.2
	31- I talk with my child' teacher when my child has difficulty in any subject in the science and technology course.	129	2.61	1.35
Parental support	6-I supply the materials necessary for the application-based homework of my child.	129	4.53	0.89
	20-Since I think that the materials used by my child while doing his/her assignments are unnecessary, I do not want to buy them.	129	3.64	1.58
	16-I make more contribution to the science course assignments about which the teacher requests caution.	129	3.63	1.31
	26-I consider projects assignments too costly.	129	3.46	1.45
	10-Since I find experimental assignments dangerous, I do not deem it suitable to do such assignments in the house.	129	3.26	1.48
	14- I take my child to the requested places when an assignment requiring trip and observation is given.	129	3.18	1.44

the teacher of my child when my child has difficulty in any subject in the science and technology course” was found to have the lowest mean score in this category. Thus, it may be argued that the parents believed that they satisfied the expectations of the teachers in the category of sense of responsibility.

The mean scores of the parents in all the items included in the category of *parental support* varied between 4.53 and 3.18. The item “I supply the materials necessary for the application-based homework of my child” was found to have the highest mean. The item “I take my child to the requested places when an assignment requiring trip and observation is given” was found to have the lowest mean in this category. Thus, it may be argued that the parents believed that they satisfied the teachers’ expectations in the category of *parental support*, too.

Simple correlation analysis was made between the students' most recent period science course grades and the sub-scales of the SEFP in order to determine the relationship between the parents' levels of satisfying the expectations and the science achievement of the students (cf., Table 2). A low positive significant relationship was found between *sense of responsibility* and *science achievement* ($r = .200$; $p < 0.05$), and between *parental support* and *science achievement* ($r = .211$; $p < 0.01$).

Table 2. Correlations between science achievement and the sub-scales of the SEFP

	1.	2.	3.
1. Science Achievement	1	.200*	.211*
2. Sense of Responsibility		1	.369**
3. Parental Support			1

* $p < 0.05$ ** $p < 0.01$ (N=129)

Multiple regression analysis was made in order to determine whether the students' science achievement could be predicted by looking at the parents' levels of satisfying the expectations. Table 3 presents the analysis results.

Table 3. Summary of regression analysis for parents' levels of satisfying the expectations predicting science achievement

Levels of satisfying the expectations	B	Std Error	β	t	p
Constant	1.840	.577		3.187	.002
Parental Support	.042	.025	.159	1.718	.088
Sense of Responsibility	.015	.010	.141	1.516	.132

$R = .249$ $R^2 = .062$ $F_{2,126} = 4.153$ $p = .018$

Table 3 shows that the students' science achievement can be predicted by looking at the parents' levels of satisfying the expectations of the science teachers ($R = .249$; $F_{(2,126)} = 4.153$; $p = .018$). In addition, it was seen that the parental support scores ($t = 1.718$; $p = .088$) or sense of responsibility scores ($t = 1.516$; $p = .132$) did not have any statistically significant effect on science achievement individually. Thus, the regression equation is as follows:

Science Achievement = 1.840 + 0.042* Parental support + .015* Sense of responsibility

Two-way ANOVA was conducted for two sub-scales of the SEFP separately to determine whether the students' gender and grades had any effect on the parents'

levels of satisfying the expectations. Table 4 presents the results of the two-way ANOVA where parental support is regarded as a dependent variable.

Table 4. Two-way ANOVA results regarding the sub-scale of parental support

Source of variance	Sum of square	df	Mean of square	F	P	Eta square
Grade	90.130	2	45.065	32.875	.030	.970
Gender	9.266	1	9.266	5.925	.103	.689
Grade*Gender	2.742	2	1.371	.088	.915	.001
Error	1906.463	123	15.500			

According to Table 4, the students' gender did not have any effect on the parents' satisfying the expectations in the dimension of parental support ($F = 5.925$; $p = .103$), while the students' grades had a statistically significant effect on the parents' satisfying the expectations in the same dimension ($F = 32.875$; $p = .030$; $\eta^2 = 0.970$). High effect size (97%) was detected for the grade variable. However, grade and gender, collectively, did not have any significant effect on the dimension of parental support. The post hoc test (LSD) was conducted in order to determine the grades between which the above-mentioned significant difference emerged. It was found out that the sixth grade parents' levels of satisfying the expectations in the dimension of parental support (Mean = 22.1) were found to be significantly higher than those of the eighth grade parents (Mean = 20.2). No statistical difference was found between the views of the seventh grade parents and those of others. In other words, the parents of the sixth grade students satisfied the expectations of the science and technology teachers concerning parental support more in comparison to the parents of the eighth grade students.

Two-way ANOVA was conducted to determine whether the students' gender and grades had any effect on the parents' levels of satisfying the expectations in the sub-scale of *sense of responsibility*. Table 5 presents the related analysis results.

Table 5. Two-way ANOVA results regarding the sub-scale of sense of responsibility

Source of variance	Sum of Square	df	Mean of Square	F	p	Eta square
Grade	751.229	2	375.615	4.491	.182	.818
Gender	.004	1	.004	.000	.995	.000
Grade*Gender	167.281	2	83.640	.867	.423	.014
Error	11868.931	123	96.495			

According to Table 5, gender ($F = .000$; $p = .995$), grade ($F = 4.491$; $p = .182$), and gender and grade collectively ($F = .867$; $p = .423$) did not have any statistically significant effect on the parents' levels of satisfying the expectations in the dimension of sense of responsibility. In other words, the gender or grades of the students did not affect their parents' levels of satisfying the expectations of the teachers regarding the sense of responsibility.

Discussion and Conclusions

The study firstly attempted to determine science teachers' expectations from parents in accordance with the research questions. Based on the interviews conducted, the expectations from parents were seen to be distributed in two dimensions: "parental support" and "sense of responsibility". The examination of the views contained in the dimension of "parental support" showed that the teachers expected the parents to be sensitive to the project-performance assignments of their children in particular, supply tools and equipment, and provide parental support when necessary. On the other hand, the examination of the views contained in the dimension of "sense of responsibility" showed that the teachers' expectations were mostly about following the assignments, participation in parents' meetings, guidance, encouraging creativity, providing necessary support in project-performance tasks, and keeping communication with teacher open. The views contained in this dimension were generally about the parents' being aware of their responsibilities and roles. It is possible to say that the teachers' expectations indicated in the presented study are congruent with the parents' roles emphasized in the science curriculum (Ministry of National Education, 2005). In addition, the teachers' expectations from the parents were in parallel with the types of parental involvement included in the literature.

At the second stage of the study, an attempt was made to determine the views of the parents by means of the scale developed based on the teachers' views. According to the average values of the items contained in the dimension of "sense of responsibility", the parents thought that they sufficiently satisfied the expectations of the teachers on the subjects of following the assignments, participation in parents' meetings, guidance, encouraging creativity, providing necessary support in project-performance assignments, and keeping communication with the teachers. A similar result is observed in the dimension of "parental support". The research findings reveal that the parents thought they provided adequate parental support for project-performance assignments.

According to the results of the simple correlation analysis aimed at determining the relationship between the parents' levels of satisfying the expectations and the students' science achievement, there was a low positive significant relationship between science achievement and both dimensions of the SEFP. In other words, when the parents do what they are supposed to do within the scope of the science education of their children, the students' science achievement is improved.

According to the results of the multiple regression analysis aimed at determining whether the students' science and technology achievement could be predicted by looking at the parents' levels of satisfying the expectations, the parents' levels of satisfying the expectations (in both sub-scales of the SEFP collectively) explained 6.2% of the variation in science achievement ($R^2=.062$). This result shows that the satisfaction of expectations by parents in the categories of sense of responsibility and parental support has a direct, though low, effect on the science achievement of students.

The presented study also made an attempt to determine whether gender and grade had any effect on parents' levels of satisfying the expectations. The results of the analysis about the dimension of parental support indicated that the students' gender did not influence the parents' levels of satisfying the expectations. In other words, the parents of both female and male students believed that they provided enough parental support. However, the parents' views about parental support varied significantly by the grades of the students. The analysis results showed that the variation was between the 6th and 8th grade students and in favor of the 6th grade students. That is to say, the parents of the 6th grade students considered themselves more adequate in the dimension of parental support in comparison to the parents of the 8th grade students. The science curriculum (Ministry of National Education, 2005) shows that there is nothing to increase or decrease expectations from parents on the basis of grades. Especially performance-project assignments are included in all grades. That indicates that the variation observed in the study does not result from the curriculum. However, the fact that the central examination conducted for the 8th grade students' transition to secondary education in Turkey (SBS) may have caused the support of the parents for education to focus on this examination rather than student activities.

Today, the focal point of modern curricula is the student. Teachers and parents, on the other hand, are the most important stakeholders of effective teaching. The presented study revealed the parental roles defined by the teachers for effective science education, and provided the parents with an opportunity to evaluate the degree to which they fulfilled the requirements of such roles. In addition, it was

seen once again that parental roles were of vital importance for the attainability and quality of the learning output which performance tasks were aimed at.

In sum, the findings of this study differ from the earlier studies by revealing information, specifically about science teaching, that parents' levels of satisfying the expectations influenced the academic achievement of students in science teaching. Parents' awareness may be raised in order to improve parents' levels of satisfying the expectations. Since parents' levels of satisfying the expectations vary by the grades of students, parents' awareness may be raised to ensure that they fulfill the requirements of their roles concerning providing parental support throughout the education of their children.

References

- Akbaba Altun, S. (2009). An investigation of teachers', parents', and students' opinions on elementary students' academic failure. *Elementary Education Online*, 8(2), 567–586.
- Brankovic, N., Rodic, V., & Kostovic, S. (2012). Determination of indicators of school culture in primary school. *The New Educational Review*, 29(3), 45–55.
- Çelenk, S. (2003). The prerequisite for school success: Home-school cooperation. *Elementary Education-Online*, 2(2), 28–34.
- Çiftçi, S. (2010). The opinions of the teachers in upper primary classes concerning the student performance tasks. *Elementary Education Online*, 9(3), 934–951.
- Desforges, C., & Abouchar, A. (2003). *The impact of parental involvement, parental support and family education on pupil achievements and adjustment: A literature review* (Vol. 433). Research report.
- Gonzalez-DeHass, A.R., Willems, P.P., & Holbein, M.F.D. (2005). Examining the relationship between parental involvement and student motivation. *Educational Psychology Review*, 17(2).
- Hill, N.E., & Tyson, D.F. (2009). Parental involvement in middle school: a meta-analytic assessment of the strategies that promote achievement. *Developmental Psychology*, 45(3), 740.
- Jeynes, W.H. (2007). The relationship between parental involvement and urban secondary school student academic achievement a meta-analysis. *Urban Education*, 42(1), 82–110.
- Keçeli-Kaysılı, B. (2008). Parental involvement to increase the academic achievement. *Ankara University Faculty of Educational Sciences Journal of Special Education*, 9(1), 69–83.

- Lawshe, C.H. (1975). A quantitative approach to content validity. *Personnel Psychology* 28, 563–57
- Ministry of National Education (2005). National Science Curriculum, Ankara, Turkey.
- Özbaş, M., & Badavan, Y. (2009). The school-family relationship duties that primary school administrators actually perform and are supposed to perform. *Education and Science*, 34, 154.
- Souto-Manning, M., & Swick, K. (2006). Teachers' beliefs about parent and family involvement: rethinking our family involvement paradigm. *Early Childhood Education Journal*, 34(2), 187–193.
- Şeker, M. (2009). An Investigation on the Relation between the Success of Fifth Class Students' on Performance Works and the Rate of Their Family Support on Educational–Teaching Works, Unpublished Master Thesis, Çukurova University, Adana, Turkey.
- Kabapınar, Y., & Ataman, M. (2010). Teachers' viewpoints on the measurement and evaluation methods used in the primary social studies courses (4–5 th grades). *Elementary Education Online*, 9(2), 776–791.
- İpek, C. (2011). The effects of parent's educational involvement, school attitudes and some family related factors on the primary school students' national level assessment test scores. *Journal of Pegem Education and Teaching*, 1(2), 69–79.
- Tüysüz, C., Karakuyu, Y., & Tatar, E. (2010) Opinions of students' parents about performance task in science and technology class. *Necatibey Faculty of Education Electronic Journal of Science and Mathematics Education*, 4(1), 108–122.
- Veneziano, L., & Hooper J. (1997). A method for quantifying content validity of health-related questionnaires, *American Journal of Health Behavior*, 21(1).
- Wilson, F.R., Pan, W., & Schumsky, D.A. (2012). Recalculation of the critical values for Lawshe's content validity ratio. *Measurement and Evaluation in Counseling and Development*, 45(3), 197–210.
- Wyrick, A.J., & Rudasill, K.M. (2009). Parent involvement as a predictor of teacher-child relationship quality in third grade. *Early Education and Development*, 20(5), 845–864.
- Yıldırım, A & Şimşek, H. (2006). Qualitative research methods in Social Sciences (6th Edition) Seçkin Yayıncılık, Ankara, 99–252.