

Investigation of the Perceived Causes of Pre-Service Physics Teachers' Problems Encountered in School Experience

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(Received: 04.02. 2015, Accepted: 27.05.2015)

Abstract

This study investigates a group of pre-service physics teachers' perceptions about the causes of problems in school experience through the attribution theory. The participants were thirteen pre-service physics teachers from a public university in Turkey. Data were collected through the interviews by requesting the participants to reflect their own problems encountered during school experience, and discuss the reasons for these problems. Audio-recorded interviews were transcribed and coded under six themes. The results revealed that (i) 1/3 of the attributions regarding the causes of problems in their school experience were internal, (ii) the internal and external attributions were mainly linked, and (iii) a limited number of attributions have an iterative relation with each other. Improvement of internal elements might be effective for preventing the external causes of the problems.

Keywords: Teacher education, pre-service physics teacher, attribution theory

Introduction

Teacher education is important to be able to train fully qualified and well-equipped teachers. The major goals of teacher education programs are both to provide the development of pre-service teachers' knowledge of content, pedagogy, and pedagogical content, and to foster their teaching skills in real classroom settings. Therefore, in the design of teacher education programs both theoretical and practical issues are considered. All teacher education programs require a practical part that can be referred to "school experience", "teaching practice", "student teaching", or "practicum." No matter what it is called, the common agreement is that the practical part has always been the fundamental and valuable part of teacher education programs (Beck & Kosnik, 2002; Bryan & Abell, 1999;  elik, 2008; Koerner, Rust, & Baumgartner, 2002; McIntyre, Byrd, & Foxx, 1996; Smith & Lev-Ari, 2005; Wilson, Floden, & Ferrini-Mundy, 2002).

Practicum is an important pedagogy for the professional development of pre-service

teachers before starting teaching profession. During the practicum, pre-service teachers spend a considerable amount of time with students and teachers in real classroom settings at schools (Koerner et al., 2002), and they take on several responsibilities for teaching alone in classrooms (Darling-Hammond, Hammerness, Grossman, Rust, & Shulman, 2005). It serves as an "initiator" for pre-service teachers to develop an image about teaching and learning and improve their own teaching skills. Moreover, the expected transfer of theoretical knowledge into real settings is brought into action because practicum provides an opportunity to pre-service teachers to apply and test their theoretical knowledge. Furthermore, practicum provides an environment for pre-service teachers to combine their pedagogical knowledge (PK), such as learning theories, classroom management, and assessment aspects, with their subject matter knowledge (SMK) for developing better pedagogical content knowledge (PCK). Therefore, practicum lays a bridge between theory and practice in learning of teaching (Çelik, 2008; Smith & Lev-Ari, 2005). In addition, practicum has a major influence on pre-service teachers' affective development, such as self-efficacy beliefs about being a teacher, what good teaching is (Ng, Nicholas, & Williams, 2010), and beliefs effective education (Özgün-Koca & Şen, 2006).

Pre-service Teachers' Concerns during School Experience

Many pre-service teachers consider the practical part of teacher education programs to be highly valuable and useful in their preparation for teaching (Broadbent, 1998). However, they also perceive that it is a challenging and stressful part of the program. Over the years, by using qualitative or quantitative methodologies, a lot of research focused on teacher candidates' concerns and the sources of their concerns emerged in their teaching practice (Broadbent, 1998; Çelik, 2008; Kyriacou & Stephens, 1999; Mau, 1997; Morton, Vesco, Williams, & Awender, 1997; Murray-Harvey, Silins, & Saebel, 1999; Murray-Harvey et al., 2000). The previous research displayed that pre-service teachers may have a wide range of concerns regarding their school experience such as (i) personal concerns, (ii) evaluation based concerns, (iii) teacher and teaching related concerns, (iv) concern for students, and (vi) classroom management related concerns (Çelik, 2008; Kyriacou & Stephens, 1999; Mau, 1997). In addition, these concerns may arise from the personality of teacher candidate, cooperating teacher, and/or university supervisor, school administration or peer-teacher candidates. Moreover, some of these research findings confirmed that even if the pre-service teachers' concerns emerged during their practicum show similarities, the degree of the concerns and the stress-generating level of these concerns can be different for each teacher candidate (Çelik, 2008; Mau, 1997; Murray-Harvey et al., 2000). Mau (1997) and Murray-Harvey et al. (2000) examined pre-service teachers' concerns during their school-based training. Whereas Mau's (1997) findings detected that the major concerns of teacher candidates were "maintaining class control", "responding to unmotivated students' needs", and "students with different levels of achievement", Murray-Harvey et al.'s (2000) findings revealed that the issues such as "having high expectations of their teaching performance, coping with teaching workload, and managing class and time" emerged as the most stressful concerns for teacher candidates. Furthermore, as a result of investigation of student teachers' concerns and stress during their practicum experience, Çelik (2008) found that while personal concerns (e.g., fear of failing practicum, using different methods, approaches and techniques, and having high expectations of their teaching practice) produced the highest level of stress for pre-service teachers, evaluation-based concerns (e.g., being observed by a supervisor and being insufficiently evaluated by a supervisor) led to the lowest level of stress. In addition, other concerns such as being observed by their peers, preparing detailed lesson plans, and helping students with emotional problems appeared at the medium level of stress.

On the other hand, some of the researchers focused on cross-cultural research while exploring teacher candidates' concerns in their teaching practice, and reported the similarities and differences regarding their concerns from different countries. Murray-Harvey et al. (1999), who investigated the concern of teacher candidates from Australia and Singapore, found that Singaporean teacher candidates' concern level was higher than Australian teacher candidates' concern level. However, they reported that the most and least concerns were mainly similar for teacher candidates in both countries. For example, coping with workload, being evaluated by their supervisors, managing class and time, and high expectations of their teaching were the most concerning events for teacher candidates in both countries; communication with the school principal, their cooperating teachers, and other teachers in schools and establishing a rapport with the pupils were the least concerning events. Similarly, Morton et al. (1997) explored the anxiety of teacher candidates in Canada and Great Britain, and their findings displayed that both Canadian and British teacher candidates were anxious mostly about evaluation.

Aim of the Study

The concerns and sources of the concerns of pre-service teachers that were examined so far have provided multiple benefits for improvement of their school experience. In addition, they have raised our awareness about the problems and perceived causes of the problems that can change with respect to pre-service teachers' perceptions, personality, and culture (Morton et al., 1997; Murray-Harvey et al., 1999). Therefore, providing new insights to the area about pre-service teachers' various kinds of concerns, conflicts, problems, and their sources deserves to continue being investigated.

In this study, we have focused on pre-service physics teachers' perceptions of the causes of problems in school experience through the attribution theory. The research questions addressed in this paper are as follows:

- (i) How do pre-service physics teachers perceive the causes of problems in school experience?
- (ii) What is the nature of pre-service physics teachers' attributions?
- (iii) How are the perceived causes related to each other?

We need to pay attention to what pre-service teachers say. Knowing what pre-service teachers attributed to the problems in school experience may be helpful in developing a better understanding of the complex nature of problems. Knowledge about the causes of problems may provide crucial information for the improvement of pre-service teachers' school experience. In addition, explained reasons reflect pre-service teachers' meta-cognitive inquiry about their PK and SMK. This explanation also might be useful for predicting the pre-service teachers' future performance. Therefore, this study will widen the existing body of knowledge regarding sources of pre-service teachers' problems encountered during their practicum by tracking their attributions about problems.

Theoretical Framework

Attribution means individuals' perception or inference of cause (Kelley & Michela, 1980); however, it is not a real cause of something, and for this reason it focuses on "perceived causes" (Försterling, 2001; Kelley & Michela, 1980; Weiner, 1974). *Attribution theory* is a theory about how common sense operates, and it is concerned with "why" questions (Försterling, 2001; Weiner, 1979). The analysis of causal explanations dates back to Aristotle's differentiation of various types of causes (Försterling, 2001). In daily life, human

beings generally seek a cause for the events that they experience, and try to identify the unknown factors affecting that event. Although Weiner (1979) explained the infinity of the causes of success and failure, in order to determine similarities and differences he mentioned the need for a causal taxonomy with four types of attributions such as ability, effort, task difficulty, and luck. Table 1 indicates these attributions in terms of stability and locus of control.

Table 1. Classification scheme for the perceived determinants

Stability	Locus of control	
	Internal	External
Stable	Ability	Task difficulty
Unstable	Effort	Luck

The table was taken from Weiner (1974, p. 52).

In the consideration of locus of control, the nature of attributions, such as internal or external, provides information about the feeling of self-esteem or shame; however, stability explains the expectation of similar performance in the future (Bar-Tal, 1978; Weiner, 1985). Identification of attributions is important since "causal thoughts give rise to meaningful actions"; for this reason, changing personal attributions has an effect on subsequent performances of individuals (Weiner, 2005).

Methodology

Research Design

The research design utilized in this study is qualitative. It draws on qualitative data to identify and explain pre-service physics teachers' perceptions of the causes of problems in school experience.

Participants and Context

In order to identify perceived causes of the problems and their relations with each other by a qualitative approach, we have focused on thirteen (7 males and 6 females) pre-service physics teachers. All participants were physics education students who would graduate in a year from the department of secondary science and mathematics education in a public university in Turkey. Their ages ranged from 22 to 27. In this study, participants were purposively selected and all of them voluntarily participated in this study.

In Turkey, physics teacher education program is a four-year program held in the faculty of education. Pre-service teachers take the physics courses required for SMK, and pedagogy courses for their PK and PCK. Within this period, two practicum courses are compulsory for pre-service teachers. They first take the course called "School Experience in Science and Mathematics Education." This course mainly focuses on observation of cooperating teachers and high school students, and learning the issues regarding school administration. In addition, pre-service teachers are provided teaching practice in classrooms. After this course, the second practicum course is "Practice Teaching in Science and Mathematics Education", which is mainly based on teaching physics by using the knowledge gained in physics and pedagogy courses. Over these two courses, pre-service teachers are expected to spend almost 120 hours in their practicum schools. This study is conducted with participants who have

already completed the first part of the practicum but are still experiencing the practice teaching part.

Data Collection

Data of this study were collected through semi-structured interviews. The aim of the interview was to elicit pre-service physics teachers' perceptions of the causes of problems in school experience in detail. Interview protocol was composed of five problem categories determined in the light of previous research (Çelik, 2008; Kyriacou & Stephens, 1999; Mau, 1997; Murray-Harvey et al., 2000; Orr, Thompson, & Thompson, 1999). In order to ensure validity and clarity, the interview questions were examined and checked by two external researchers whose majors were science education. Then, they were revised by considering their feedback regarding content and grammar.

The interviews initially started by requesting pre-service physics teachers' reflections about the problems encountered in school experience. Then, they explained the perceived causes and effects of these problems, and the techniques fixing these problems. Each interview lasted almost 50 minutes and was audio-recorded.

Data Analysis

Due to the nature of qualitative data, the analysis was based on coding, categorizing, and investigating emerging themes. The inductive approach was used to analyse the qualitative data. Therefore, data analysis began with the transcription of audio-recorded interviews. Then, in the light of previous research (Çelik, 2008; Kyriacou & Stephens, 1999; Mau, 1997; Murray-Harvey et al., 1999), we constructed a pre-code list focusing the problem categories. Feedback, guidance, support, classroom management, attitude, not being regarded as a teacher, heavy workload, and feeling stress were some examples of codes involved in the pre-code list. Through this code list, authors independently carried out the initial analysis. Then, the authors discussed the codes and categories. Then, new codes, such as self-confidence, SMK, the location of the practice school, internalization of the teaching profession, and role model were added to the pre-code list. Furthermore, some of the codes conveying similar meanings were combined and renamed during the coding process. Finally, the data were coded by means of the final code list. During the analysis, the unit of analysis was determined as the group of sentences that maintains a meaning. For this reason, each meaningful chunk, which is composed of sentences, was coded with the same code only once in spite of including more sentences referring to the same code. In addition, each chunk was coded with only one type of code determined by considering the mutual exclusiveness of the codes in the code list. After the identification of the perceived causes using the final code list, the nature of the perceived causes of the problems was examined through the attribution theory. Finally, a map displaying the relationship among the perceived causes of the problems was constructed qualitatively.

There was no restriction in pre-service physics teachers' attributions. That means, if pre-service teachers perceived different causes for each problem, they could attribute more than one cause to each problem category; if they did not perceive any cause, they could not have to state a cause to that problem. Accordingly, the perceived cause of those problems stated by each pre-service teacher was assigned and counted for each problem category. Then, the frequency of attributions for each problem category was determined.

Validity, Reliability, and Ethical Issues

In order to ensure inter-coding agreement, each author coded the sample of data separately. After the authors held several meetings to compare and discuss on coding, 82%

agreement was obtained at first. Finally, the authors discussed emerging disagreements until obtaining full consensus.

Additionally, the main issues for the ethics were considered in the study, meaning, the aim of the study was explained to participants (Fraenkel & Wallen, 2000, p.43). Their consent was obtained. It was explained that they could leave the study if they preferred. In addition, there would be no harmful element for the participants. Finally, it was ensured that the participants' personal information and data would be kept in secret.

Results

The findings revealed that pre-service teachers made 127 attributions for the causes of problems for six categories, which are attributions for: (i) pre-service teachers' themselves, (ii) cooperating teachers at high schools, (iii) coordinating supervisors at universities, (iv) high school administration (i.e. principal or vice-principal), (v) high school students, and (vi) physical facilities (i.e. laboratory) at high schools. Figure 1 presents the frequency of attributions for each category.

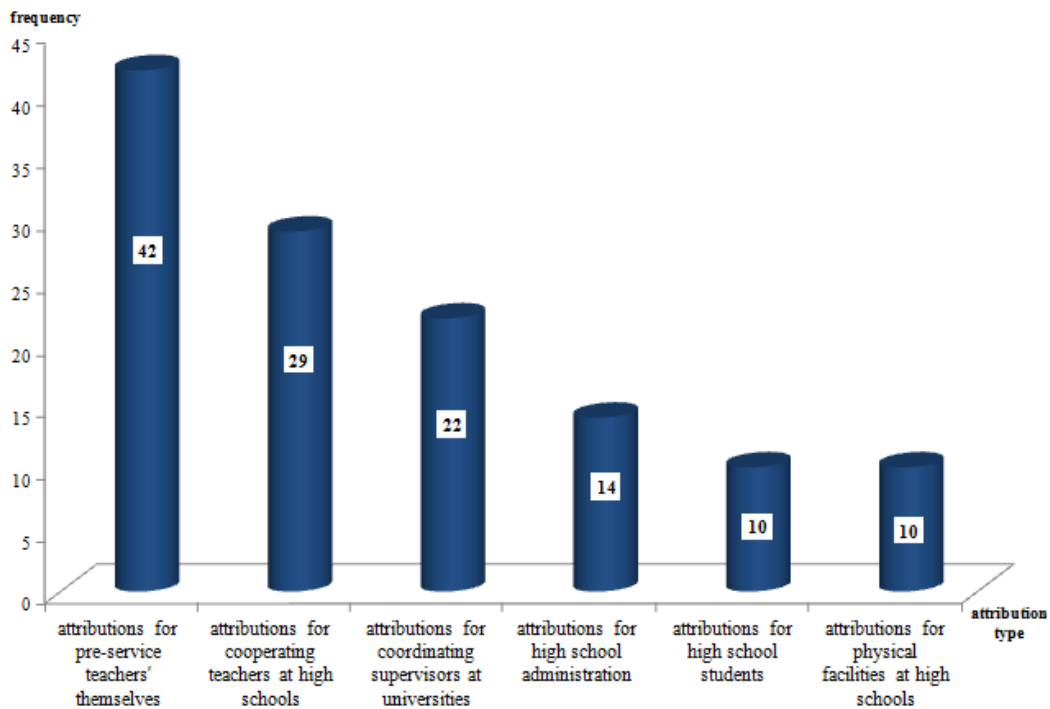


Figure 1. The problem categories and the numbers of perceived causes for these problems

As presented in Figure 1, among 127 attributions 42 of them were about pre-service physics teachers' themselves. That is, 1/3 of the attributions were internal, which were primarily attributing the causes to personal elements. Table 2 presents the nature and number of attributions for each problem category, and the number of pre-service teachers who attributed.

Table 2. Perceived causes of the problems encountered in school experience

Nature of Attribution	Problem Category	Attribution	# of pre-service teachers who attributed	# of attribution
Internal Attribution	Pre-service teachers' themselves	¹ Not internalizing being a teacher	13	42
		² Lack of SMK	12	
		¹ Anxiety and excitement	7	
		¹ Lack of self confidence	4	
		⁰ Lack of PK	4	
		³ Lack of classroom management ability	2	
External Attribution	Cooperating teachers at high schools	⁰ Not being a good model	11	29
		² Having negative attitudes	6	
		³ Anxiety of cooperating teachers	5	
		¹ Giving limited feedback about practice and support	4	
		¹ Lack of guidance	3	
	Coordinating supervisors at universities	⁰ Giving limited feedback about practice and support	13	22
		⁰ Lack of guidance	9	
	High school administration	¹ Not providing convenient physical environment	9	14
		² Not being regarded as a teacher	5	
	High schools students	¹ Students' disrespectful behaviors	2	10
² Not being regarded as a teacher		6		
¹ Not studying on given tasks		2		
Physical facilities at high schools	⁰ Location of the practicum school	3	10	
	⁰ Insufficient instructional materials to teach physics	7		

The numbers indicate the followings: 0=isolated cause, 1=ordinary cause, 2=central cause and 3=core cause.

Internal Attributions

As presented in Table 2, the data revealed that "not internalizing being a teacher" was the major cause of the problem in this category. All pre-service teachers attributed their concern to not internalizing being a teacher. The following two excerpts illustrate their attributions:

**Hande (F):* When we arrive at the high school, we [pre-service physics teachers] are mainly like a guest, not as a teacher. We just consider school practice as an immediate task, so we do our work as soon as possible. I think, this is a great problem... This is... Umm... Not internalizing being a teacher is the most problematic issue as the cause of the problem about myself. Therefore, we consider school practice just as a task to be completed in the program. For this reason, it is silly to say that the problems originate from high school. I think, we cannot internalize this job...

İlke (F): Umm... I don't feel like [I am] a real teacher yet. We [pre-service physics teachers] do not internalize the teaching profession with what we learn theoretically in the courses, so we need to do more practice about teaching at practicum...

Pre-service teachers also indicated that they were not sure about being a physics teacher in the future, and so they did not enjoy going to schools for practicum. In addition, twelve of pre-service teachers emphasized that their deficiency in their physics knowledge was a cause. As the following excerpts illustrated, pre-service teachers felt deficiency in their physics knowledge, particularly when they were teaching in real classrooms. The perceptions of them revealed that feeling this deficiency was also observed mainly as a central cause for "lack of self-confidence" and "anxiety and excitement" in practicum classrooms. Excluding one student, who attributed to SMK as an ordinary cause, eleven students attributed to lack of SMK as the cause of "affective" issues. While four pre-service teachers explained that their lack of SMK created a lack of self-confidence; seven of them stated that it increased their anxiety and excitement when they were in practicum classrooms. The following excerpts indicated that how attributions to "excitement and anxiety" and "self-confidence" were related to their lack of SMK. In the following excerpts, while Hasan indicated his excitement and anxiety resulted from his fragile knowledge of physics, Hande stated her lack of self-confidence resulted from her deficient physics knowledge.

Hasan (M): At first, as a teacher candidate, I was excited and a bit anxious. Because I believe that my physics knowledge was not sufficient to be a teacher. I especially feel a deficiency in my understanding of the physics concepts triggered this anxiety in the classes. We [pre-service physics teachers] are afraid of the spontaneous questions coming from students since they sometimes ask difficult questions...

Hande (F): Umm... For example, when I teach a physics concept in the class in the school practice, I am afraid of interesting questions which are spontaneously asked by students. Because students consider that we [pre-service physics teachers] are real physics teachers, and they wait for the answers to their questions. Whatever I know up to now and how much I study, I feel a lack of self-confidence about my physics knowledge as a teacher in the class...

As expressed in the excerpts, pre-service teachers stated they felt the responsibility of giving satisfying answers to students' questions. Therefore, they were afraid of not answering students' emerging questions and felt guilt when they could not answer them.

Pre-service teachers' last two internal attributions were "lack of PK" and "lack of classroom management ability." The data showed that the lack of PK was an isolated cause; that is, this attribution of pre-service teachers was not related to any of the causes in this category. On the other hand, the lack of classroom management ability was a core cause for "not being regarded as a teacher" by high school students. The excerpt below shows the reflection of a teacher candidate about why classroom management is difficult at practicum.

Ceren (F): In one of the cases, the teacher left control of the class to the teacher candidates. At first, as teachers of the class, we shot at students, because we were so surprised, we could not keep the control. At that time I got that what I learned about classroom management did not work in real classrooms...

In fact, the pre-service teacher's this reflection also presented the evidence that she had a difficulty in using their theoretical knowledge in practice.

External Attributions

In contrast to internal causes, pre-service teachers revealed another type of perceptions, which we call "external", emerging from the environment during practicum period. One of the external attributions of pre-service physics teachers were about cooperating teachers at high schools. Attributed causes of the problem about cooperating teachers were classified into five categories: (i) not being a good model for pre-service teachers, (ii) having negative attitudes towards pre-service teachers, (iii) anxiety of cooperating teachers, (iv) giving limited support and feedback about practice, and (v) lack of guidance. Pre-service physics teachers mainly explained that their cooperating teachers were not good models for them in and out of the classes. The following excerpt reflects how a pre-service teacher perceived the misbehaviour of her cooperating teacher as a cause of a problem she met in practicum.

Hande (F): For example...Umm... For once, when I was at school I observed a teacher with some misbehaviour about the job and then I told myself that I do not want to be a teacher because that teacher was doing his job carelessly...

Teacher candidates explained that they also observed that type of behaviour regarding the use of instructional methods. Moreover, the other dominant cause attributed by pre-service teachers was the cooperating teacher's negative attitudes towards them. On the other hand, pre-service teachers mostly complained about that their cooperating teachers' impression about not wanting to see them in their classrooms by kindly saying that "if you want, you may not come to class to observe me!" In the data analysis "having negative attitudes" was identified as a central cause for limited feedback and guidance. Moreover, "anxiety of cooperating teachers" was identified as the core cause for cooperating teachers' negative attitudes.

Ilke (F): In the first day of our school experience, one of the teachers has told us that she does not want to work with intern teachers. Then she repeated it many times. Teachers are very uncomfortable because we [pre-service physics teachers] observe them and make a report about them. We feel they are so anxious when we observe them and report what they do...

Another cause is about insufficient feedback and support from cooperating teachers. Most of the pre-service teachers presented significant evidence of their desire for feedback. This evidence comes in the form of attributions to absence of feedback.

Arda (M): To be honest, we [pre-service physics teachers] cannot get feedback about what is correct or not. Actually, I believe that I teach the topic well in the class; however, I need feedback indicating my deficiencies. Teachers do not give effective feedback. Actually, I would like to get some feedback like "you should develop yourself in terms of..."

In fact, pre-service teachers explained that they wanted to find more time to teach in classrooms. In addition, they requested that their cooperating teachers should revise their teaching and increase their confidence to teach in a class. Moreover, pre-service teachers expressed that they did not want only to be evaluated at the end of their school experience period, but rather that they wanted to learn from their mistakes during this period. In addition, pre-service teachers stated that observing cooperating teachers and class activity alone were not enough in order to develop the competencies and skills that they need for professional development.

Second, pre-service physics teachers made attributions to coordinating supervisors at universities, and focused on two issues: (i) giving limited feedback about practice and support, and (ii) lack of guidance. Pre-service physics teachers generally thought that their supervisors did not ascribe enough value to teaching practice courses. The excerpt below shows that pre-service teachers' supervisors do not give them critical feedback to improve their experience in practicum.

Ceren (F): We [pre-service physics teachers] are doing a lot of activities during school experience; however, we do not get any feedback from the supervisors about our mistakes. In our first school experience period, we did too much homework; however we only learnt about the grade of these activities at the end of school experience. There is something wrong here, because I do not know whether I am on the right track or not in this teacher education process...

Some of the pre-service teachers also complained about their supervisors did not follow their development at practicum school at all. These pre-service teachers expressed that their supervisors did not observe and evaluate the way they taught the physics subject. The following excerpt reflects one pre-service teacher's perception about the cause of the problem of coordinating supervisors at universities.

Mert (M): Umm... In my first school experience, we [pre-service physics teachers] just talked about the following questions: Is there any problem about schools, teachers? Do you follow the teachers' classes and write a report about the activities? Do you obey the rule at high schools? etc. at the school experience course at university. That means, as pre-service teachers we did not get enough guidance about our experience in the classes by supervisors at the program...

Moreover, pre-service teachers expressed supervisors' neutral approach to them and not having any type of attitude (either positive or negative) towards the teaching practice courses. In addition, they perceived that their supervisors considered practicum course just as an ordinary course in the teacher education program.

Third, pre-service physics teachers stated fourteen attributions regarding high school administration. The dominant one was that high school administration did not provide pre-service teachers with efficient physical environment to prepare class materials, to relax in the breaks, to work with teachers, etc. One of the pre-service teachers explained his thoughts about how they needed a common office as follows:

Tuna (M): For example, we [pre-service physics teachers] cannot have a rest in the teachers' room in the breaks. Moving through the corridors is forbidden. To be able to have a rest in the breaks is a great problem for us...

Particularly, as illustrated in the following excerpt, pre-service teachers indicated that not giving permission to be in the teachers' room in their break was their other major problem. Furthermore, the other attribution for this problem category was "not being regarded as a teacher" by high school administration. They mentioned that they were regarded as a student rather than regarded as a teacher by school administration.

Arda (M): The school administration does not pay attention to pre-service teachers. For example, in one of our meetings, we [pre-service physics teachers] requested help from administrators; however they told us they had too much work to do, so they could not help us...

Five of the pre-service teachers reported that the perception of not being given an authority as a teacher was a central cause for another attribution, which is "not providing convenient physical environment." Therefore, pre-service teachers remained in conflict about their roles whether they were teachers or students. They had concerns that they did not know how they should act in practicum schools.

Fourth, pre-service physics teachers stated that they also were not being regarded as a teacher by high school students. According to them, high school students who show "disrespectful behavior" to pre-service teachers and who do "not studying on the given tasks" caused this issue. One of the excerpts illustrates this issue as follows:

Gizem (F): When we [pre-service physics teachers] are doing activities in the class, we cannot provide an effective classroom environment. The students do not respect us and they do not listen to us, and do not consider what we teach. Sometimes they are kidding us. This is not pleasurable...

The teacher candidates also associated "not being regarded as a teacher" with classroom management. That means, the perception of a lack of classroom management ability is a core cause for "not being regarded as a teacher" by high school students. Due to this, high school students talked among themselves while pre-service teachers were teaching or implementing an activity and teacher candidates had difficulty in managing the classroom and enforcing discipline. This caused that pre-service physics teachers could not internalize being a teacher. In addition, in a limited number of the explanations, some evidence was found that "disrespectful behavior of students" and "not doing the given tasks" also caused pre-service physics teachers' loose of classroom control. In this way, in spite of the lack of classroom management ability as a core, this evidence indicated an iterative relation among the attributions.

The last problem category is about the physical facilities of high schools. Pre-service physics teachers attributed problems to "the location of the practicum school" and "insufficient instructional materials to teach physics." They expressed their concern regarding the location of the practicum school, which created problems regarding travelling. For example, pre-service teachers reflected that because the location of their practicum schools was quite far away from their university, they spent too much time to go and back to the practicum school. In addition, they indicated that they usually were unwilling to go the schools because the travelling was time consuming and tiring. Moreover, pre-service physics teachers indicated

that there were insufficient instructional materials and media such as a computer, projector, or smart board to teach physics in their practicum classes.

Ceren (F): We [pre-service physics teachers] cannot observe how the technological media can be used in a classroom setting... In addition, the science laboratory is not used by teachers. For example, once, we wanted to do an activity in the laboratory. However, there were almost no materials. In fact, we had difficulty in finding the location of the laboratory in the school. When we asked students about doing experiments in the laboratory, they told us they had never been there. That was a very interesting experience for us because it was one of the best schools...

Pre-service teachers also reflected that high school teachers have never used technology and laboratory material, and they had lack of knowledge about how to use them to teach physics.

Relations among Attributions

Pre-service physics teachers' attributions and the relations among them explaining the causes of problems in practicum are presented in Figure 2.

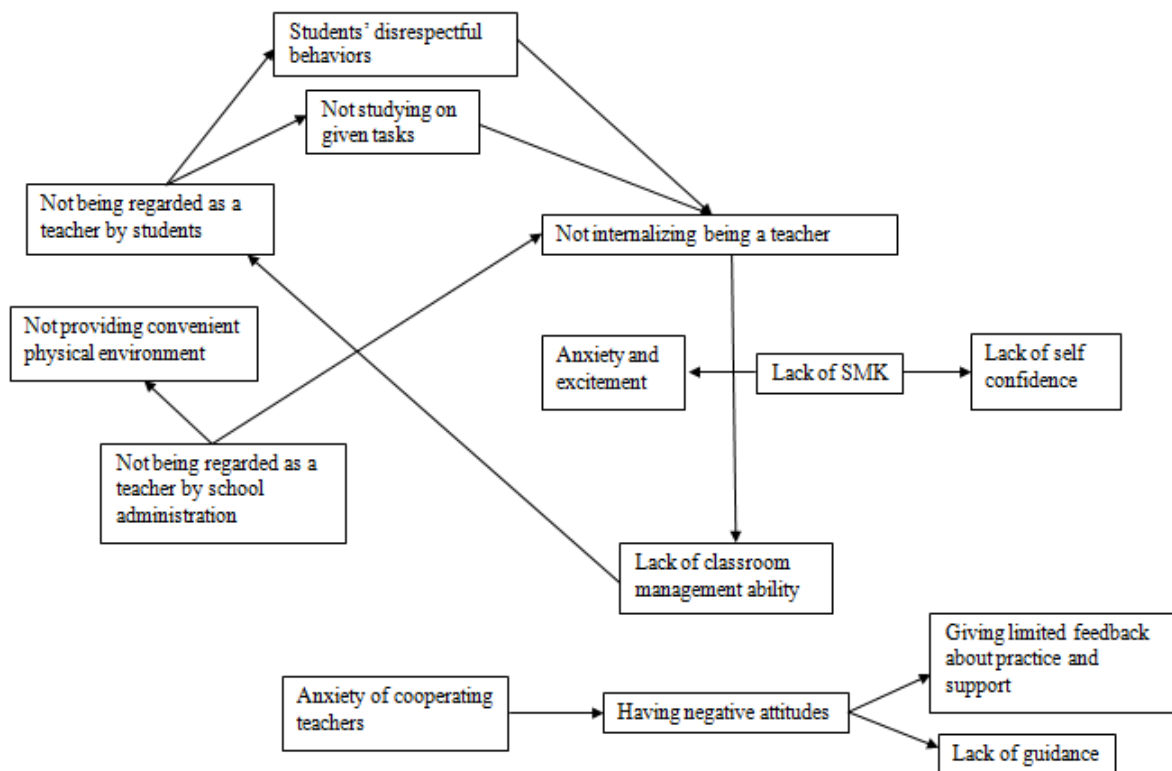


Figure 2. Map of the relations among the perceived causes of the problems in school experience

As shown in Figure 2, the most connected attributions were pre-service teachers' themselves (internal), students at high school (external), and high school administration (external). All of the pre-service teachers explained "not internalizing being a teacher" as major for their personal attributions. The iterative relationship triggered the classroom management, not being regarding as real teachers by high school students, students' disrespectful behaviors, and not being done the given tasks by them.

On the other hand, the attributions about coordinating supervisors and physical facilities at high schools did not exist in the map. In addition, pre-service physics teachers did not link the perceived causes of the problems about cooperating teachers at high schools with other problem categories although they made a large number of attributions for this problem category.

Conclusion and Discussion

As noted earlier, the concerns or problems of pre-service teachers were in the interest of a lot of research (e.g., Çelik, 2008; Kyriacou & Stephens, 1999; Mau, 1997; Murray-Harvey et al., 1999; Orr et al., 1999). As a part of our research, we also touched on pre-service physics teachers' problems during their first school experience. The findings regarding the problems faced by pre-service physics teachers are in line with other studies. For example, as Çelik (2008), Kyriacou and Stephens (1999), Mau (1997) and Murray-Harvey et al. (1999) reported, the findings of the study revealed that pre-service physics teachers had problems about not being regarded as real teacher, high school students' distributive behavior and getting insufficient feedback from their cooperating teacher and coordinating supervisors.

However, unlike the previous research, our primary focus was to investigate pre-service physics teachers' perceived causes of the problems encountered during their practicum, and to highlight the relationship between their problems as well as perceived causes of their problems. Our data revealed pre-service physics teachers' attributions had internal or external nature. As Bar-Tal (1978) indicated, internal attributions enable people to feel maximum pride and self-esteem/shame. Our findings initially indicated that perceived causes of the pre-service teachers' problems were mostly related to themselves that was internal. This finding can be interpreted in relation to Çelik's (2008) finding, who reported that personal concerns created higher level of stress for pre-service teachers. As Çelik (2008) found, the findings of this study showed that personal problems led to high anxiety and excitement and low self-confidence for pre-service physics teachers. Identification of pre-service physics teachers' personal attributions (e.g. lack of SMK, lack of classroom management ability, etc.) is important for understanding their meta-cognitive awareness. Furthermore, when they are aware of the causes of their problems, pre-service teachers can keep them under control. With this perception of control, they may revise or eliminate the problems by themselves. For example, as our data revealed, although pre-service physics teachers completed all their major physics courses, they still felt the lack of their physics knowledge for teaching. Therefore, their lack of physics knowledge causes pre-service teachers to experience anxiety when they are in real classroom settings, and decreases their self-confidence when they are teaching in these settings. This type of inquiry might be helpful to predict the future performance (Bar-Tal, 1978; Weiner, 1985, 2005).

Second, our findings revealed that pre-service teachers made external attributions. The data showed that pre-service teachers mostly attributed to their cooperating teachers and university supervisors. This finding can be associated with the fact that pre-service teachers' getting insufficient support and feedback from their cooperating teachers and supervisors during their practicum although they needed both support and feedback. No doubt, as other researchers (e.g., Koerner et al., 2002) reported, whereas cooperating teachers have a significant effect on pre-service teachers' developing teaching image, learning, and improving their own teaching skills in classrooms, university supervisors have an influence on their professional development in the academic settings.

On the other hand, pre-service teachers' attributions regarding school administration and high school students explicitly bring out that how cooperating teachers, school administration, and high school students treat pre-service teachers has a major influence on pre-service teachers' affective development on self-efficacy beliefs about being a teacher (Ng et al., 2010). This level influence is why pre-service teachers should be provided more active roles during their school experience by giving more opportunity to teach in real classrooms and they should be treated as a "real teacher" rather than a "student" during this experience.

Third, we found that pre-service teachers' internal and external attributions were not exactly independent of each other. There are the links among their attributions, and the internal and external causes are in interaction with each other. The relationship among perceived causes of problems is manifested as: (i) isolated, (ii) ordinary, (iii) central, and (iv) core. In addition, our data displayed that internal causes are triggered by external causes. For instance, students' and high school administration's approach to the pre-service teachers not as a teacher but as a guest in the class can be considered problematic attributions triggering pre-service physics teachers' internalizing the job, because pre-service teachers explained that they felt conflicted about their behavior at schools, both in and out of the classrooms, and their motivation was negatively influenced. This finding indicates that improvement of internal elements might prevent the external causes of the problems. In this way the problems can be fixed by teachers themselves.

It is quite important to nurture and well-equipped teachers in terms of emotional and interpersonal abilities. Thus, as teacher educators, the identification of what these problems are, and how these problems and their reasons are perceived by pre-service teachers are very important in order to take precautions to decrease their concerns, and to help pre-service teachers most effectively. Investigating these issues is important because these problems may not only affect pre-service teachers' ongoing practicum but also their beliefs and ideas about teaching in the future. Due to their perceptions, pre-service teachers may feel some guilt about themselves or worries about the system, and they might negatively reflect this feeling onto their future teaching life.

The above findings have several educational implications for practice of pre-service teachers. The findings of this study particularly inform university supervisors and cooperating teachers about the causes of the pre-service teachers' problems encountered during their practicum. In this study, pre-service teachers' both internal and external attributions confirm the importance of communication between cooperating teachers, university supervisors, school administration and pre-service teachers. Moreover, pre-service physics teachers' attributions give clue that cooperating teachers' and university supervisors' effective guidance can play an important role in reducing concerns of pre-service teachers. Therefore, this study suggests that the interaction should be improved, and a considerable amount of feedback and support should be given to pre-service physics teachers. The cooperating teachers should also give them opportunities to learn from them. Moreover, university supervisors should work closely with both cooperating teachers and pre-service teachers, and they should visit schools regularly. Furthermore, school administration should treat pre-service teachers as a member of school and help them feel part of school.

Appendix

**The names of all pre-service teachers are pseudonyms and the letters (F=female, M=male) in the parenthesis reflect their gender.*

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