*Corresponding author: Mehmet Sukru Bellibas, Department of Educational Sciences, Adiyaman University, College of Education, Room: 70, Adiyaman, Turkey
E-mails: msbellibas@gmail.com, mbellibas@adiyaman.edu.tr

TEACHER EDUCATION & DEVELOPMENT | RESEARCH ARTICLE

Teachers' perceptions of the quantity and quality of professional development activities in Turkey

Mehmet Sukru Bellibas[1]* and Emine Gumus[2]

Abstract: Professional development for teachers has been a substantial issue in contemporary educational research and policy. Yet, opportunities for professional development activities have been very limited in Turkey. In this study, we examined Turkish teachers' involvement in professional development activities by comparing their participation with the level of participation in top-performing countries in the Trends in International Mathematics and Science Study 2011, including Singapore, South Korea, Hong Kong, Taiwan, and Japan. Then, we also conducted face-to-face interviews with 13 Turkish mathematics and science teachers in order to explore their views about the current professional development opportunities for teachers in Turkey. The results of this study indicate that, when compared with teachers from Turkey, a larger proportion of teachers in the top-ranking countries participated in professional development activities in most of the sub-categories of professional

ABOUT THE AUTHORS

Mehmet Sukru Bellibas is currently working as an assistant professor in the Department of Educational Sciences at Adiyaman University, Turkey. He received his PhD in K-12 Educational Administration from College of Education, Michigan State University, East Lansing, MI, USA in 2014. His research interests include effective school leadership, school improvement, and equity and equality issues in education. He is particularly interested in the research of how different forms of professional development improve teachers' and principals' daily practices in schools. His works have been published in various international journals, including International Journal of Educational Research, International Journal of Leadership in Education, Educational Sciences: Theory Practice, and International Journal of Progressive Education.

Emine Gumus is an assistant professor of Eregli College of Education at Necmettin Erbakan University, Turkey. She received her PhD in Educational Administration from Ataturk University, Turkey. Her research interests are focused upon leadership, professional development of school principals and teachers, organizational climate. Dr. Gumus has published articles about executive leadership in school improvement networks, leadership approaches, achieving gender parity in primary school education, women's education and socioeconomic development, and professional development of school principals.

PUBLIC INTEREST STATEMENT

Educational researchers have provided evidence that teachers are a key school element for student learning. Their teaching performance in the classroom can determine how much a student will learn. Given this scientific fact, it is suggested that teachers should continuously engage in professional development activities to improve their teaching performance. In this study, the quality and quantity of professional development available to Turkish teachers were examined. This was done through two steps. First, Turkish teachers were compared with teachers of other nations whose students ranked top in international tests, in terms of their participation in professional development activities. Second, an interview has been done with several Turkish teachers to investigate how they perceive the quality of professional development available to them. This study indicated that both the quality and quantity of professional development activities that Turkish teachers engaged were very low.

development in both mathematics and science. In line with this finding, results of the qualitative analysis suggest that most of the teachers in Turkey are not happy with the quantity of professional development activities available to them. In addition, teachers believe that the quality of professional development provided to teachers is low in terms of its connection to the practice of teaching. This situation might hinder teachers' performance and negatively impact student achievement in Turkey.

Subjects: Continuing Professional Development; International & Comparative Education; Middle School Education

Keywords: professional development; teacher quality; TIMSS; Turkey

1. Introduction

There has been an extensive body of literature focused on the association between school factors and student achievement. Previous literature has come to the conclusion that school inputs can make a difference in student learning and achievement (Darling-Hammond, 2000; Hedges, Laine, & Greenwald, 1994; Johnson, Kraft, & Papay, 2012; Lee, Bryk, & Smith, 1993; Ronfeldt, Loeb, & Wyckoff, 2013). Moreover, in recent years, a significant number of studies have investigated the role of teachers in student achievement, and a vast majority of them revealed that there is an important linkage between teacher quality and student achievement (Egalite, Kisida, & Winters, 2015; Goldhaber, 2002; Hanushek & Rivkin, 2006; Marchand & Weber, 2014; Rowe, 2003; Sanders & Horn, 1998; Sanders & Rivers, 1996; Tucker, 2011). Accordingly, Barber and Mourshed (2007) concluded that "the quality of an education system cannot exceed the quality of its teachers" (p. 43).

The strong link between teacher quality and student achievement is now a well-accepted phenomenon, thanks to the results of many recent studies. Given this fact, current policy discussions on this matter have mostly focused on methods to measure and improve teacher quality. It is accepted that teacher quality is a complex idea, and that it is consequently difficult to identify high-quality teachers (Heck, 2007). Therefore, "how to improve teacher quality?" has become one of the central questions in both policy and academic research. One of the most common answers to this question is that teachers need to keep learning throughout their professional careers. An important way to assure teachers' continuous learning is to provide them with in-service professional development activities. It has been argued in the literature that providing effective professional development to teachers plays a key role in improving teacher quality, which eventually results in greater student achievement (Edge, Reynolds, & O'Toole, 2015; Hilton, Hilton, Dole, & Goos, 2015). According to Phillips (2008, p. 37), "professional development is critical for maintaining continuous improvement in teacher quality."

Despite the well-accepted impact of effective professional development activities on teacher quality and eventually on student achievement, this subject has not been given enough attention by policy-makers in Turkey. From a policy perspective, it is evident that the centralized structure of the country's Ministry of National Education (MoNE), which is substantially embedded in the execution of all educational issues, hinders the expansion of effective and sustainable professional development activities to teachers all around the country. Professional development in the Turkish context often refers to in-service training that is determined and provided by the Directorate of Teacher Training and Professional Development (Öğretmen Yetiştirme ve Geliştirme Genel Müdürlüğü), which operates within the hierarchy of the MoNE. The need for and type of professional development in the form of in-service training had been determined and provided solely at the national level until 1993. Due to substantial criticism regarding the limitations of a centrally organized training system, the MoNE allowed provincial branches to develop and conduct their own in-service training programs in 1994. Although this can be seen as an important step in terms of increasing the number and range of in-service training programs and initiatives that better aligned with teachers' needs, significant

concerns have been raised regarding the implementation process and the quality of professional development activities provided by local branches of the MoNE (Bayrakci, 2009).

In spite of the low policy attention, a great number of research studies on teacher professional development have been conducted in Turkey. The existing literature on teacher professional development in Turkey focuses primarily on assessing the needs for various areas of professional development (Gultekin, Cubukcu, & Dal, 2010; Karasu, Aykut, & Yilmaz, 2014; Usun & Comert, 2003); examining teachers' and administrators' perceptions regarding the quality of professional development activities that they have received (Basturk, 2012; Bumen, 2005; Gonen & Kocakaya, 2006; Ucar & Ipek, 2006); developing new models for effective professional development (Cepni & Coruhlu, 2010); investigating the factors associated with teachers' participation in professional development activities (Gumus, 2013); and investigating the variation of participants' perceptions of professional development by context factors (Basturk, 2012; Gultekin et al., 2010; Karasolak, Tanriseven, & Konokman, 2013). The literature, however, is limited in the sense that it fails to provide an understanding of the extent to which Turkish teachers participate in professional development activities, when compared with teachers from the top-ranking countries in international student assessments, and what Turkish teachers actually think about the adequacy of professional development opportunities provided to them.

In this context, the purpose of the current study is to compare the amount of Turkish teachers' participation in professional development activities with the involvement of teachers from top-ranking countries according to the TIMSS (Trends in International Mathematics and Science Study) 2011 results, and then to examine teachers' views about the adequacy of current professional development opportunities in Turkey. Specific research questions that will be addressed in the study are:

(1) To what extent do Turkish mathematics and science teachers participate in professional development activities, in comparison with teachers from the top-ranking countries?

(2) What do Turkish mathematics and science teachers think about the adequacy of the professional development opportunities available to them?

2. Literature review

Professional development is a process of learning and growth in a person's professional life. In an educational setting, the professional development of teachers refers to the processes through which teachers enhance their knowledge, skills, and behaviors in a way that contributes to the academic success of all students (Ucar & Ipek, 2006). Professional development is seen as a critical process through which teachers can deepen their content knowledge and improve their instructional practices (Desimone, Porter, Garet, Yoon, & Birman, 2002). Therefore, the many previous studies in this area have discussed and provided suggestions for the implementation of effective professional development programs for teachers (e.g. Bayar, 2014; Birman, Desimone, Porter, & Garet, 2000; Desimone et al., 2002; Elmore & Burney, 1997; Guskey, 2003; Guskey & Yoon, 2009; Ingvarson, Meiers, & Beavis, 2005; Lee, 2005). For instance, Elmore and Burney (1997) provide a comprehensive definition of effective professional development for teachers. According to them, effective professional development is based on concrete classroom problems; helps teachers focus on real practice; provides teachers with chances to observe and discuss; fosters collaboration and teamwork among staff at the department, grade, and school levels; and involves deliberate assessment of and feedback on practices.

The main purpose of effective professional development is defined as improving the classroom practices of teachers (Desimone, 2009). Indeed, in many studies, effectiveness is determined by the impact that a professional development program exerts on teaching and learning (O'Dwyer et al., 2010). According to Desimone (2009), an effective professional development initiative should include several qualities: it should be both individual and school based, incorporate coaching, and embed teaching practices into the daily work of teachers. Similarly, when professional development focuses

on a certain instructional practice, in addition to fostering teacher collaboration and involving active learning opportunities and coherence, teacher adoption and use of that practice are highly likely (Desimone et al., 2002). Ingvarson et al. (2005) identify several qualities associated with high-impact professional development practices. Such practices focus on actual problems and learning needs of students; provide opportunities for teachers to focus collaboratively on student work; enable teachers to reflect on their practices; and create an environment where teachers can learn, test new teaching strategies, and receive feedback regarding the strengths and weaknesses of their practices.

It seems that the quality of professional development matters in terms of its impact on both teachers' practices and students' learning. However, planning and delivering high-quality professional development require the investment of substantial fiscal and human resources. Given the current emphasis on teacher and school accountability, there is unprecedented pressure on practitioners and policy-makers to prove that an investment in professional development improves both teaching effectiveness and student learning (Ingvarson et al., 2005). However, there has been limited research on the association between professional development and student achievement. Teachers' knowledge and their ability to transfer this knowledge to students are often seen as important mediators for the impact of teacher professional development on student achievement (Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). Therefore, the effects of professional development on student achievement were initially evaluated through that professional development's impact on teachers. For example, Loucks-Horsley and Matsumoto (1999) concluded through their research on teacher professional development that there is a significant relationship between high-quality professional development and improved teacher learning, which would lead to improved student achievement.

Few recent studies have also investigated the direct relationship between teacher professional development and student achievement, however. Darling-Hammond (2000) analyzed a large assessment data-set that spanned all 50 states of the USA, suggesting that teacher professional development, as one of the indicators of teacher quality, makes a significant and important difference in student achievement. Also, according to the results of the Council of Chief State School Officers (CCSSO) meta-analysis, Blank and Alas (2009) indicate that teacher professional development, especially in mathematics, has a positive effect on student achievement. Some studies have also focused on their impact of different types of professional development activities on student achievement. For instance, Huffman, Thomas, and Lawrenz (2003) investigated the relationship between various types of professional development—such as immersion, examining practice, curriculum development, curriculum implementation, and collaborative work—and student mathematics and science test scores. The study found that only curriculum development for mathematics teachers was significantly associated with improving student test scores. In a report, Yoon et al. (2007) examined nine rigorous studies scrutinizing the link between student learning and professional development, and concluded that "teachers who receive substantial professional development—an average of 49 h in the nine studies—can boost their students' achievement by about 21 percentile points." (p. iii)

3. Method
There are two mainstream research paradigms that dominate educational research; that is, a great proportion of researchers in education draw upon either qualitative or quantitative methods (Teddlie & Tashakkori, 2010). However, there are also a growing number of researchers who have increasingly been interested in the combination of some elements of both methods in order to generate more reliable, comprehensive, and extensive answers to their proposed questions (Johnson, Onwuegbuzie, & Turner, 2007). This type of research involves a *mixed method design*. In this study, the researchers believe that their proposed research questions can be answered thoroughly and extensively by employing a mixed method design.

3.1. Type of design

According to Creswell and Plano Clark (2007), there are three types of research designs that can be employed in a study that deploys mixed methods. These are *explanatory, exploratory,* and *transformative* designs. In this research, an explanatory design was adopted. An explanatory design typically starts with the quantitative method, in order to provide the larger picture of the phenomenon, and is followed by the qualitative method, which aims to provide in-depth information regarding the findings of the first step (Creswell & Plano Clark, 2007). Therefore, the present study starts with a quantitative method aiming to compare Turkey with a number of top-ranking countries in terms of the proportion of teachers participating in professional development activities. It then continues with a qualitative method in order to bring extensive data with regard to Turkish teachers' perceptions of the adequacy of professional development provided to them.

3.2. Quantitative data source

In order to answer the above research questions, the TIMSS data-set from the year 2011 was used. TIMSS, which includes student learning outcomes in mathematics and science for fourth- and eighth-grade students, is one of the most reliable large-scale data-sets on student achievement in this area. It is administered internationally by the International Association for the Evaluation of Educational Achievement (IEA). Starting from 1995, the TIMSS data have been gathered on a four-year cycle—in the years 1999, 2003, 2007, and 2011, respectively. The TIMSS 2011 data-set includes information for 608,641 students, 49,429 teachers, and 19,612 school principals from 63 countries across the world. Turkey participated in three of the TIMSS cycles, including those that were conducted in 1999, 2007 (with only eight graders), and lastly in 2011. The data-set is organized to provide information in regard to the characteristics of schools, curricula, instruction, lessons, teachers, and students, as well as students' performance in science and mathematics (IEA, 2013). The TIMSS 2011 has three levels of data-sets, including school, teacher, and student levels. The main sampling strategy for each country in this study involved determining a nationally representative student sample. The teacher sample was determined as those who taught the nationally representative sample of students. Due to the scope of the current study, only eighth-grade mathematics and science teacher data-sets were used from Turkey, Singapore, South Korea, Hong Kong, Taiwan, and Japan. The teacher sample for this study included 240 mathematics and 239 science teachers from Turkey, 330 mathematics and 330 science teachers from Singapore, 375 mathematics and 202 science teachers from South Korea, 148 mathematics and 124 science teachers from Hong Kong, 162 mathematics and 153 science teachers from Taiwan, and 181 mathematics and 151 science teachers from Japan.

3.3. Quantitative data analysis

In order to answer the first research question in this study, we utilized the online data analysis tool provided by the IEA. This question focuses on the difference between Turkey's and top-performing countries' mathematics and science teachers' participation in various sub-categories of professional development, including student needs, ICT integration, curriculum, assessment, pedagogy, content, and critical thinking. To answer this question, we determined and analyzed the percentage of teachers who participated in a given professional development sub-category for each country under the consideration of this study.

3.4. Qualitative source and sample

The qualitative data sample for this study was selected from middle schools of a province located in the southeastern part of Turkey. To construct a representative sample, schools were selected from both rural and urban areas of the province. Only middle schools were selected because the quantitative data-set for this study was also collected from teachers who taught eighth graders. There were four total Turkish schools included in this study: two schools that were located in a rural area, and another two located in urban area. We were able to reach all of the science and math teachers in those schools, except for one who was not available at the time of data collection. Demographic information for these recruited teachers is shown in Table 1.

cogent ·· education

Table 1. The demographics of the participants				
Teachers	**Gender**	**Subject major**	**Experience (Years)**	**Experience in current school (Years)**
T1	Female	Mathematics	11	4
T2	Male	Mathematics	12	4
T3	Female	Science	19	2
T4	Male	Science	37	5
T5	Male	Science	12	2
T6	Male	Science	5	3
T7	Female	Mathematics	2	2
T8	Male	Science	10	2
T9	Male	Mathematics	11	2
T10	Male	Mathematics	4	4
T11	Male	Science	7	1
T12	Male	Mathematics	5	1
T13	Male	Science	19	2

3.5. Qualitative data collection and analysis

Qualitative data for this study were collected through semi-structured interviews that were carried out face to face with research participants. The interviews included four open-ended questions aiming to reveal teachers' perceptions surrounding their need for professional development, and the quality and quantity of professional development activities available to them. The primary researcher made initial contact with the schools and explained the purpose of the study. Appointments for interviews were scheduled based on teachers' availability. Interviews were conducted individually with each teacher in a quiet location, selected by the teacher, in the school. All interviews were audio-recorded with the teacher's permission. Then, the recorded interviews were transcribed by one of the researchers. The transcribed data were analyzed separately by two researchers in order to ensure validity and reliability of findings. The process of data analysis included exploring codes and combining them into main themes. The main themes found by two researchers were compared and discussed, before final findings were determined based on the agreement of two researchers.

Table 2. The percentage of science teachers' participation in sub-categories of professional development						
Sub-categories	**Turkey (%)**	**Singapore (%)**	**South Korea (%)**	**Hong Kong (%)**	**Taiwan (%)**	**Japan (%)**
Student needs	21	45	26	45	45	25
ICT integration	35	70	31	40	69	34
Science assessment	26	65	44	51	40	32
Science curriculum	37	67	60	61	68	51
Science pedagogy	40	88	68	64	66	73
Science content	36	71	65	72	78	78

4. Findings
In this section, we start with the findings from the comparative quantitative data analysis, and then move on to the findings revealed through the analysis of the qualitative interview data.

4.1. Results of quantitative analysis
Table 2 demonstrates the percentage of science teachers' participation in the sub-dimension of professional development for Turkey, and for the top-ranking nations from the TIMSS.

According to Table 2, only 21% of Turkish science teachers participated in professional development that focused on student needs, meaning that 79% of them did not participate in any professional development activity related to student needs in the last two years. In fact, Turkish science teachers are ranked last in the list of high-achieving countries for all sub-categories of professional development, except for ICT integration. Unlike other sub-categories, Turkish teachers' participation in ICT integration (with a proportion of 35%) is higher than South Korea (31%) and Japan (34%). Singapore (70%) and Taiwan (69%) are two top countries in terms of teachers' participation in ICT integration. In addition, 88% of teachers in Singapore took part in science pedagogy professional development, while the participation of this type of professional development is only 40% for teachers in Turkey. Teachers from Taiwan and Japan are at the top of the list, with a 78% participation rate in professional development activity that focuses on science content. Hong Kong and Singapore follow Taiwan with a 72 and 71% rate of participation, respectively.

Table 3 demonstrates the percentage of mathematics teachers' participation in the sub-dimensions of professional development, for both Turkey and the top-ranking nations from the TIMSS.

According to Table 3, just like science teachers, mathematics teachers in Turkey are ranked last in the list of high-achieving countries in all sub-categories of professional development, except for ICT integration. Turkish teachers' participation in ICT integration (with a proportion of 29%) is higher than South Korea (27%) and Japan (23%). Teachers from Singapore are at the top of the list with 79% participation in professional development activities that focus on mathematics pedagogy. Japan follows Singapore with a 70% teacher participation rate. Compared with all other categories of professional development, Turkish teachers' participation in math pedagogy is the highest, yet only 41% of teachers in the sample reported receiving this type of training. Only 17% of Turkish mathematics teachers participated in professional development activity related to student needs,

Table 3. The percentage of mathematics teachers' participation in sub-categories of professional development

Sub-categories	Turkey (%)	Singapore (%)	South Korea (%)	Hong Kong (%)	Taiwan (%)	Japan (%)
Student needs	17	45	30	46	40	48
ICT integration	29	68	27	51	71	23
Mathematics assessment	26	58	46	63	42	26
Mathematics curriculum	31	55	53	71	67	41
Mathematics pedagogy	41	79	61	63	61	70
Mathematics content	30	67	51	70	73	65
Critical thinking	31	48	32	49	33	33

as opposed to 48% of teachers in Japan and 46% in Hong Kong. In terms of professional

development related to critical thinking, about half of the teachers from Singapore and Hong Kong took part in such activities. Teacher participation in critical thinking professional development was relatively lower in other countries, and the lowest in Turkey.

4.2. Results of qualitative analysis

The teachers who participated in this study were asked about the professional development opportunities they had experienced, as well as the opportunities specifically provided by the MoNE and their opinions about these activities, particularly in areas in which they felt they needed more training in order to serve better as a teacher. According to the responses of the teachers interviewed, their opinions were categorized under three themes.

4.2.1. Professional development activities experienced by the teachers

The participating teachers were asked about the professional development opportunities that they had experienced. When their responses were examined, the most common professional development activities indicated by teachers involved using technology and websites. Most of the teachers (T1, T2, T4, T6, T7, T9, T10, T11, T12, and T13) stated that being able to use computers and having access to the Internet provided important contributions to their professional development. The teachers identified the most beneficial aspects of using the Internet as being aware of the most recent instructional strategies and techniques used effectively in classrooms, having information about different types of questions used as part of measurement and evaluation in schools, and being a part of professional teacher groups created on social media. T7, who has had two years of experience in the profession, expressed that she gained significant insight and experience using the Internet as a primary source for her professional development. According to her:

> Since I have been working as a teacher for only two years, I feel that there is a lot more about the profession I have to learn. In order to improve my knowledge, teaching, and instructional skills, I follow some internet websites about teaching mathematics. By doing this, I try to gather information about the recent improvements and changes in instruction, teaching strategies and methods used in schools in order to be a good teacher.

Four participants (T2, T9, T11, and T12) specifically indicated that teacher groups on social media, especially those on Facebook, had a significant positive influence on their professional development. T9 expresses his opinions about these groups as follows:

> Teaching mathematics requires a teacher to continuously improve himself/herself and adopt new methods since the knowledge is continuously changing. Therefore, I am a member of mathematics teacher group on Facebook. In this group, we discuss about the problems we encounter in our classrooms, the most appropriate techniques used in teaching the math instruction, how to deal with students who have different levels of academic performance, which strategies to use in order to deal with these differences, etc. Also, when I meet with new teachers, I sometimes realize my deficiencies as a teacher and try hard to improve my teaching and instructional skills and knowledge.

T6 and T13 also stated that using the website "Education Information Network (EBA)," which is provided by MoNE, helped them significantly during their careers as teachers. As a science and technology teacher, T13 shares his experiences with EBA as follows:

> I generally use EBA as a part of my professional development. On this website, we are provided with the teaching methods and strategies. There are demonstrations about the most common examples of experiments we use in our classrooms. I watch these videos and learn how to do experiments in a safe way with the limited materials in my school.

Six (T1, T7, T8, T9, T11, and T12) out of the 13 participants emphasized the importance of informal meetings with teachers from their subject area. These participants indicated that having a chance to meet with the teachers from their own subject area contributed to their profession as a teacher in

terms of both instruction and pedagogy. T1 made the following remarks while talking about their experiences:

> As a part of my professional development, I usually meet with my friends who are mathematics teachers informally when I have some problems about my students or the instructional activities. I try to benefit from their experiences. When we come together, we usually share our ideas about the teaching methods and strategies we are using in our classrooms, we help each other in solving specific school related problems and give advice.

According to the findings of this study, surprisingly only two participants (T3 and T5) mentioned the in-service trainings provided by the MoNE as being beneficial for their professional development. The rest of the participants did not share any experiences with these kinds of opportunities. In spite of the fact that the MoNE introduces in-service trainings as important professional development activities for teachers, unfortunately the teachers mostly emphasize their own efforts when they talk about their professional development experiences. T3's opinions concerning this matter are as follows:

> In order to improve my teaching skills and knowledge, I try to participate in in-service trainings, courses or conferences provided by the provincial education directorate (local branch of MoNE). I participated in several this kinds of activities about teacher motivation, changes in the instruction, using materials in the science laboratories, and doing experiments in safe laboratories. They help me keep on the track with my students.

4.2.2. The professional development opportunities provided for teachers by MoNE

When the participants were asked about the professional development opportunities provided for teachers by the Ministry of National Education, six (T5, T6, T8, T9, T10, and T13) participants stated that they were aware of these centrally organized professional development activities. However, these participants mostly stated that they were informed about these kinds of activities at the beginning of the semester, but they barely had a chance to participate in them. T9 explained his opinions as follows:

> As teachers, we have a website designed for teacher activities by the Ministry of National Education. Through this website, we can apply for the centrally organized in-service trainings for teachers. However, I did not have any chance to participate in one of these programs. There are not sufficient opportunities in number. These trainings are performed in limited cities and accept a limited number of participants.

Consistent with this statement, several teachers complained about the limited number of centrally organized in-service trainings provided by the MoNE, as well as the limited number of participants being accepted for those trainings:

> At the beginning of every semester, the teachers are given forms to fill out according to the professional development needs. There exist so many options in many subject areas such as teaching methods and techniques, content knowledge, classroom management, discipline, etc. You are asked to choose and apply for the trainings you want. However, it is well-known that the numbers of these activities are very low, while the teachers who apply to participate in these trainings is high. I did not any chance to participate in any of them (T13).

> Every summer, in several selected cities such as Mersin, Yalova, Rize, etc., there has been some in-service training for teacher professional development. Participating in these trainings is based on voluntariness. These trainings are very low in number. I participated in one of these trainings only one time and it was about environmental consciousness, which was related to my subject area (science and technology teacher). My friends always complain about not having a chance to participate in these trainings, even if they apply for them insistently (T8).

On the contrary, 1 (T5) out of the 13 participants shared his positive opinions about the centrally organized in-service trainings, the quality of the instructors, and the appropriateness of the topics discussed in these trainings related to his teaching practices. T5 explained the positive aspects of these trainings and their benefits to his professional development and learning as follows:

> I participated in centrally organized in-service trainings many times. I believe that these trainings are more effective than the local ones. There are a variety of topics that you can choose from according to your interests or needs in these trainings. Also, you can benefit from the instructors who are experts in their field. The Ministry of National Education covers all my expenses including travel, hotel expenses, etc. As a last point, the trainings last long, you participate in these national trainings for a whole week and you have a chance of making practices.

Interestingly, 5 (T1, T2, T3, T4, T11) out of the 13 teachers shared their experiences and opinions about conferences provided by local branches of the MoNE, but did not speak at all about the centrally organized in-service trainings provided by the MoNE. This poses a question about whether or not these teachers are well informed about these centrally organized training opportunities. The participants who responded to the question in this way mostly emphasized the benefits of one particular "training for using smart boards" in relation to their professional development. The opinions of several participants pertaining to this matter are given below:

> The provincial education directorate follows the recent developments and change in the education system and provides related trainings, courses or conferences about them. For example, at the beginning of this semester, we were provided with a smart board training and we learned how to use smart board practically. The training lasted one week and we had a chance to make practices under the supervision of the instructor. It really helped me in my daily use of the smart board in my class (T1).

> Recently, I participated in training about using smart boards. It was very helpful for me, it was practical and lasted five work days. I felt myself very comfortable during the training, the instructor was an expert in his field. He did not narrate knowledge to us, he gave a chance us to practice in order to make us use the smart boards more confidently (T2).

On the other hand, several participants (T4, T9, and T11) shared their critiques about these trainings. Participants who specified that local trainings, courses, or conferences were unnecessary pursuits stated the following:

> I believe that the local trainings are not effective and sufficient enough. These trainings are planned as 3–4 h long or it is completed in a day. There is not a follow-up mechanism which investigates whether the training, course or conference work for the teachers in their classroom practices. The instructors are trained for 1–2 days and then they train us, so I do not believe that they are experts in their field (T4).

> The local trainings are sufficient in quantity in my opinion, but not in quality. In these trainings, the instructor makes a presentation or sometimes narrates theoretical knowledge. They do not include practical knowledge than we can use in our crowded classrooms. The instructor generally does not have the background information about our students and parents and cannot provide us with helpful hints that we can use to enhance our students' learning and success (T11).

> We participate in local trainings or conferences since they are compulsory. The provincial education directorate makes us be ready at these trainings or conferences whether or not they are related to our subject area or instructional needs. I, personally, participate in these trainings and sometimes sleep or do other things rather than listening to the instructor when the topic discussed does not attract me (T9).

4.2.3. Areas where the teachers need more training

The teachers who participated in this study were asked about the areas in which they needed more training in order to serve better as a teacher. Teachers' responses are mainly focused on pedagogy, integration of technology in education, classroom management, and measurement and evaluation. It is a remarkable result that the entirety of participants who took part in the study stated that they were not in need of any training in their respective subject areas. It was observed that these teachers feel confident in terms of their content knowledge. However, six participants (T1, T4, T7, T8, T11, and T12) indicated that they needed training, whether central or local, which focused on pedagogy. These participants emphasized that they wanted to have more knowledge about students' inner world and be more aware of their problems and needs. Several participants shared similar opinions, which are presented below:

> I graduated from College of Education and I got pedagogy related courses, however, I sometimes have problem with the students because I do not know how to approach them. If I behave them in a friendly way, they believe that they can do whatever they want in the class. On the other hand, if I shout a lot and do not let them be relaxed in the class, they tend to be shy in the class and do not answer my questions even if they have knowledge about them. I believe that I need more information about students' psychology (T1).

> As a teacher, I believe that pedagogy is very important for us. We have to know well our students, their strengths and weaknesses, their problems, developmental stages, and needs. By this way, we can enhance their skills and learning (T4).

> We, as teachers, have to be good at pedagogy. I believe that it is more important than teaching the content knowledge well. A teacher should communicate with the students well. Otherwise, you cannot teach a word to them. The more they love and respect you, the more they learn. Also, the classes I teach are really crowded. The number of the students in each class is over than 40. Therefore, it becomes very hard to deal with all of the students. It would be helpful if we gain knowledge about how to manage the classrooms effectively (T8).

As a second point, six participants (T1, T2, T6, T9, T10, and T11) emphasized the importance of integrating technology in education. Moreover, T10 and T11 indicated that training on technology integration should be provided with an emphasis on their particular subject area. They believed that the trainings should focus on how teachers could use the technology when teaching science or math. Some of the opinions of the participants related to this matter are given below:

> Integrating technology in the education should be very important for us. We should improve ourselves in this matter. Change is inevitable. As teachers, we sometimes tend to stick to our teaching methods and techniques and do not want to change them with a new and maybe effective one because it takes time and effort. We choose the easy way. However, continuous learning is an important part of our professional development and technology is one of the most helpful in this context (T2).

> We live in a digital age and technology is used commonly in order to make our lives easier. I believe that consistently, technology makes the learning easier in schools. It helps the teacher to enhance their teaching with visual content. I am not good at using technology in my classroom and I think that there should be more opportunities for us in order to learn how to integrate technology in our learning and teaching (T9).

Two participants, T10 and T11, also stated that they had smart boards which were placed in their classrooms to visualize teaching and learning; however, they could not use them since they did not have any special training or course to teach them how.

5. Discussion and conclusion

The purpose of this study was to investigate the adequacy of professional development activities provided to Turkish teachers: first, by comparing the amount of Turkish teachers' participation in professional development activities with that of teachers from top-ranking countries according to

the TIMSS 2011 results; and second, by gathering and analyzing teachers' own perceptions on the adequacy of current professional development opportunities for teachers in Turkey. First, the quantitative analysis comparing Turkey with the top-five performing nations of the TIMSS provides considerable information on the state of Turkish teacher professional development in relation to teacher professional development in other nations, as well as triggers important questions regarding the quantity of professional development opportunities for teachers in Turkey. The results show that Turkey is ranked last in almost all sub-categories for both mathematics and science, in terms of the percentage of teachers who participate in professional development. Compared to other nations including Japan, South Korea, Taiwan, Singapore, and Hong Kong, the rate of participation among Turkish teachers is considerably low. An important question for policy-makers is why Turkish teachers are less involved in professional development activities than their global peers.

One reason why not so many teachers are involved in professional development could be related to the availability of these kinds of programs. Existing literature shows that the number of professional development activities in Turkey is relatively small, given the large population of teachers in the country (Gonen & Kocakaya, 2006; Karasolak et al., 2013). The participants in the qualitative component of this study also consistently emphasized that the professional development opportunities available to them were very few, especially the ones provided centrally by the MoNE. According to our qualitative data, some teachers persistently applied for the centrally organized professional development activities for years, but typically were not accepted and could not get a chance to participate in these trainings most of the time. Thus, many of the participants ultimately gave up on applying for such activities.

There are also concerns related to the content of professional development activities. Some professional development opportunities exist for teachers at both the local and state levels. However, when the content of these professional development activities is investigated, it is seen that most activities are organized around topics that do not focus on a specific subject matter or content area. This implies that a mathematics or science teacher, for instance, would have difficulty identifying a professional development activity with a particular focus on mathematics content, pedagogy, or assessment among the programs offered by the MoNE (Ozoglu, 2010). Most of the participants in this study identified their needs as specifically centered on pedagogy, identifying student needs, and integrating technology into their teaching practices, but they also complained about the availability of specific professional development programs on these subjects.

Another reason for teachers' low involvement in professional development activities could be poor program quality, and consequently the belief that their participation is a waste of time. The qualitative component of this study also supports this notion, especially in regard to the locally organized activities. Many of the participants expressed that professional development activities provided by local branches of the MoNE are mostly very short and disconnected from their actual teaching practice. Therefore, this situation discouraged teachers from attending more professional development programs sponsored by the MoNE, instead seeking help from their peers using their local networks or social media. Previous studies that focused on Turkish teachers' perceptions of existing professional development activities are also aligned with our finding on this issue. Several studies concluded that a large number of teachers were dissatisfied with the quality of in-service training available to them, irrespective of their gender, major, and level of experience (Karasolak et al., 2013; Ucar & Ipek, 2006). According to Gokbulut (2006), the planning process for professional development activities does not include an analysis of the needs of personnel. Furthermore, the process is not organized in a way that enables participants to evaluate and provide feedback regarding the quality of professional development activities, and is also impaired by the scarcity of necessary materials and unprofessional manner of trainers. All of these problems associated with the quality of professional development in Turkey may discourage teachers from attending professional development activities at a variety of levels.

Educational researchers appear to have reached a consensus regarding what constitutes an effective professional development program, which is defined by its impact on teachers' instructional change toward betterment, and consequently improvement, in student learning. According to those researchers, effective professional development is continuous; focuses on actual classroom applications; enables teachers to perform, receive feedback, observe, and reflect; provides an environment for collaboration; and involves reform-type activities (Desimone et al., 2002; Elmore & Burney, 1997; Guskey, 2003; Guskey & Yoon, 2009; Ingvarson et al., 2005; Lee, 2005). In Turkey, however, activities for teacher development mostly involve traditional types of professional development, such as seminars and conferences (Ozoglu, 2010). Such activities are usually held in locations outside of schools and do not enable teachers to engage in actual classroom practices while learning. As consistently expressed by the participants of this study, teachers are generally passive listeners to an expert professor or government officer who gives a lecture regarding his or her area of expertise. In these cases, teachers are not given the opportunity to observe, practice, or receive feedback. There are also only a few chances for teachers to collaborate, besides getting acquainted with teachers from other schools in the area. Taking into account all of these issues, it is clear that the change in Turkish teachers' instructional practice as a result of professional development activities will be limited, given these constraints.

This study has important implications for policy, practice, and future research as it addresses issues of both quantity and quality in the professional development provided to teachers. Given the research findings, priority should be given to improving teachers' skills in enhancing the quality of their practices through extending availability of professional development activities in areas including, but not limited to , pedagogy, student needs, and integrating technology into education for both mathematics and science teachers. However, the substantial concerns regarding the quality of professional development available to teachers cannot be ignored either. Given that the effectiveness of professional development is evaluated by its impact on teaching and learning, quality should be at the center of discussions on this matter. Therefore, it is pertinent to suggest that the current policies and practices of professional development for teachers in Turkey should be revised in a way that aligns with contemporary approaches. Prevailing traditional professional development formats, such as seminars and conferences, should be replaced by more modern methods that promote interaction and collaboration among teachers through coaching, networking, mentoring, and study groups. In addition, the MoNE may provide formal coaching and mentoring opportunities for teachers through which they can benefit from the expertise of more experienced teachers either locally or nationally. The local authorities might also create networks of teachers, who will help their colleagues review their teaching strategies and methods; discuss issues related to students, teaching, curriculum, or parents; and share their solutions to similar problems. Providing teachers with the opportunity of meeting regularly during the school year could help facilitate the creation of these networks. Teachers also could be encouraged by the school administration to engage in collaborative research within their school community. It is also very important to develop the content of professional development activities in consultation with teachers, based on their self-reported needs with regard to instructional practices.

There are also some limitations of the current study and therefore important areas for future research. First, this study does not provide insight into the effectiveness of certain professional development activities. Therefore, more research is needed to reveal the best practices of particular professional development activities for teachers in order to enhance student learning. Researchers could also comparatively examine the effects of both traditional and contemporary professional development activities on teachers' classroom practices and student success in Turkey. Second, the participants involved in the qualitative section of this study were selected from only four schools in one province. This might generate questions about both the quantity and quality of professional development activities available to teachers in other Turkish schools. Therefore, there is a need for additional studies investigating teachers' perceptions of professional development activities across different parts of the country. The number of participants in the qualitative section of this study might be considered relatively low and selected teachers from only one province. Future studies

cogent ·· education

might recruit teachers from different regions of the country to obtain a more representative sample. Finally, the qualitative data include only data from the Turkish context, and is therefore unable to offer a comparison between the perceptions of Turkish teachers and those of the top-achieving countries of the TIMSS 2011, unlike the quantitative data-set. Therefore, more detailed investigations on teachers' professional development activities in these top-ranking countries should also be conducted in order to provide different models for a more effective professional development system, both in Turkey and beyond.

Author details
Mehmet Sukru Bellibas[1]
E-mails: msbellibas@gmail.com, mbellibas@adiyaman.edu.tr
Emine Gumus[2]
E-mail: egumus@konya.edu.tr
[1] Department of Educational Sciences, Adiyaman University, College of Education, Room: 70, Adiyaman, Turkey.
[2] Department of Educational Sciences, Necmettin Erbakan University, Eregli College of Education, Konya, Turkey.

Citation information
Cite this article as: Teachers' perceptions of the quantity and quality of professional development activities in Turkey, Mehmet Sukru Bellibas & Emine Gumus, *Cogent Education* (2016), 3: 1172950.

References
Barber, M., & Mourshed, M. (2007). *How the world's best-performing school systems come out on top*. London: McKinsey.
Basturk, R. (2012). Investigation of elementary school teachers'perceptions and expectation about in-service education. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 42*, 96–107.
Bayar, A. (2014). The components of effective professional development activities in terms of teachers' perspective. *International Online Journal of Educational Sciences, 6*, 319–327. http://dx.doi.org/10.15345/iojes.2014.00.000
Bayrakci, M. (2009). In-Service teacher training in Japan and Turkey: A comparative analysis of institutions and practices. *Australian Journal of Teacher Education, 34*, 10–22.
Birman, B. F., Desimone, L., Porter, A. C., & Garet, M. S. (2000). Designing professional development that works. *Educational leadership, 57*, 28–33.
Blank, R. K., & Alas, N. D. (2009). *Effects of teacher professional development on gains in student achievement. How meta-analysis provides scientific evidence useful to education leaders*. Washington, DC: Council of Chief State School Officers.
Bumen, N. (2005). Teachers'opinion about the new primary education curricula and the example of preparatory workshop for practice. *Ege Eğitim Dergisi, 6*, 21–57.
Cepni, S., & Coruhlu, T. S. (2010). Reflection of an in-service education course program including alternative measurement and assessment techniques on instruction. *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi, 28*, 117–128.
Creswell, J. W., & Plano Clark, V. L. (2007). *Designing and conducting mixed methods research*. Thousand Oaks, CA: Sage.
Darling-Hammond, L. (2000). *Teacher quality and student achievement: A review of state policy evidence*. University of Washington: Center for the Study of Teaching and Policy. Retrieved October 10, 2015, from http://depts. washington.edu/ctpmail/PDFs/LDH_1999.pdf
Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational Researcher, 38*, 181–199. doi:10.3102/001318 9X08331140
Desimone, L. M., Porter, A. C., Garet, M. S., Yoon, K. S., & Birman, B. F. (2002). Effects of professional development on teachers' instruction: Results from a three-year longitudinal study. *Educational Evaluation and Policy Analysis, 24*, 81–112. doi:10.3102/01623737024002081
Edge, K., Reynolds, R., & O'Toole, M. (2015). Contextual complexity: The professional learning experiences of seven classroom teachers when engaged in "quality teaching". *Cogent Education, 2*, 1–15.
Egalite, A. J., Kisida, B., & Winters, M. A. (2015). Representation in the classroom: The effect of own-race teachers on student achievement. *Economics of Education Review, 45*, 44–52. http://dx.doi.org/10.1016/j.econedurev.2015.01.007
Elmore, R. F., & Burney, D. (1997). *Investing in teacher learning: Staff development and instructional improvement in community school district# 2, New York City*. New York, NY: National Commission on Teaching & America's Future, Teacher College.
Gokbulut, B. (2006). *Planning web-based in-service training* (Unpublished master's thesis). Ankara: Gazi University.
Goldhaber, D. (2002). The mystery of good teaching: Surveying the evidence on student achievement and teachers' characteristics. *Education Next, 2*, 50–55.
Gonen, S., & Kocakaya, S. (2006). An evaluation of high school physics teachers'opinions about inservice-education. *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi, 19*, 37–44.
Gultekin, M., Cubukcu, Z., & Dal, S. (2010). In-service training needs of the primary school teachers regarding education teaching. *Selçuk Üniversitesi Ahmet Keleşoğlu Eğitim Fakültesi Dergisi, 29*, 131–152.
Gumus, S. (2013). The effects of teacher- and school-level factors on teachers participation in professional development activities: The role of principal leadership. *Journal of International Education Research, (JIER), 9*, 371–380. http://dx.doi.org/10.19030/jier.v9i4
Guskey, T. R. (2003). What makes professional development effective? *Phi Delta Kappan, 84*, 748–750. doi:10.1177/003172170308401007
Guskey, T. R., & Yoon, K. S. (2009). What works in professional development? *Phi Delta Kappan, 90*, 495–500. doi:10.1177/003172170909000709
Hanushek, E. A., & Rivkin, S. G. (2006). Teacher quality. In E. A. Hanushek & F. Welch (Eds.), *Handbook of the economics of education* (Vol. 2, pp. 1051–1078). Amsterdam: North Holland.
Heck, R. H. (2007). Examining the relationship between teacher quality as an organizational property of schools and students' achievement and growth rates. *Educational Administration Quarterly, 43*, 399–432. http://dx.doi.org/10.1177/0013161X07306452
Hedges, L. V., Laine, R. D., & Greenwald, R. (1994). An exchange: Part I: Does money matter? A meta-analysis of studies of the effects of differential school inputs on student outcomes. *Educational Researcher, 23*, 5–14. http://dx.doi.org/10.3102/0013189X023003005
Hilton, A., Hilton, G., Dole, S., & Goos, M. (2015). School leaders as participants in teachers' professional development: The impact on teachers' and school leaders' professional growth. *Australian Journal of*

Teacher Education, 40, 104–125.

Huffman, D., Thomas, K., & Lawrenz, F. (2003). Relationship between professional development, teachers' instructional practices, and the achievement of students in science and mathematics. *School Science and Mathematics, 103*, 378–387. doi:10.1111/j.1949-8594.2003.tb18123.x

IEA. (2013). *TIMSS 2011 user guide for the international database*. Boston, MA: TIMSS & PIRLS International Study Center.

Ingvarson, L., Meiers, M., & Beavis, A. (2005). Factors affecting the impact of professional development programs on teachers' knowledge, practice, student outcomes & efficacy. *Education Policy Analysis Archives, 13*(10), 1–26. doi:10.14507/epaa.v13n10.2005

Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research, 1*, 112–133. http://dx.doi.org/10.1177/1558689806298224

Johnson, S. M., Kraft, M. A., & Papay, J. P. (2012). How context matters in high-need schools: The effects of teachers' working conditions on their professional satisfaction and their students' achievement. *Teachers College Record, 114*(10), 1–39.

Karasolak, K., Tanriseven, I., & Konokman, G. Y. (2013). Determining teachers'attitude toward in-service education activities. *Kastamonu Eğitim Dergisi, 21*, 997–1010.

Karasu, N., Aykut, C., & Yilmaz, B. (2014). Determination of in-service training needs of teachers with intellectual disabilities. *Özel Eğitim Dergisi, 15*, 41–53.

Lee, H. J. (2005). Developing a professional development program model based on teachers' needs. *Professional educator, 27*, 39–49.

Lee, V. E., Bryk, A. S., & Smith, J. B. (1993). The organization of effective secondary schools. *Review of Research in Education, 19*, 171–267.

Loucks-Horsley, S., & Matsumoto, C. (1999). Research on professional development for teachers of mathematics and science: The state of the scene. *School Science and Mathematics, 99*, 258–271. http://dx.doi.org/10.1111/ssm.1999.99.issue-5

Marchand, J., & Weber, J. (2014). *The labor market and school finance effects of the Texas shale boom on teacher quality and student achievement* (Working Paper No. 2015-15). Edmonton: Department of Economics, University of Alberta.

O'Dwyer, L., Masters, J., Dash, S., Kramer, R., Humez, A., & Russel, M. (2010). *E-Learning for educators effects of online professional development on teachers and their students: Executive summary of four randomized trials*. Chestnut Hill, MA: Technology and Assessment Study Collaborative, Lynch School of Education, Boston College.

Ozoglu, M. (2010, February). *Problems of the teacher training system in Turkey*. Ankara: Foundation for Political, Economic and Social Research.

Phillips, P. (2008). Professional development as a critical component of continuing teacher quality. *Australian Journal of Teacher Education, 33*, 37–45.

Ronfeldt, M., Loeb, S., & Wyckoff, J. (2013). How teacher turnover harms student achievement. *American Educational Research Journal, 50*, 4–36. http://dx.doi.org/10.3102/0002831212463813

Rowe, K. (2003). *The importance of teacher quality as a key determinant of students' experiences and outcomes of schooling*. Retrieved December 15, 2012, from http://research.acer.edu.au/research_conference_2003/3

Sanders, W. L., & Horn, S. P. (1998). Research findings from the Tennessee value-added assessment system (TVAAS) database: Implications for educational evaluation and research. *Journal of Personnel Evaluation in Education, 12*, 247–256. http://dx.doi.org/10.1023/A:1008067210518

Sanders, W. L., & Rivers, J. (1996). *Cumulative and residual effects of teachers on future student academic achievement*. Knoxville, TN: University of Tennessee Value Added Research and Assessment Center.

Teddlie, C., & Tashakkori, A. (2010). Overview of contemporary issues in mixed methods research. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (2nd ed, pp. 1–41). Thousand Oaks, CA: Sage.

Tucker, M. S. (2011). How the top performers got there: Analysis and synthesis. In M. S. Tucker (Ed.), *Surpassing Shanghai: An agenda for American education built on the world's leading systems* (pp. 169–210). Cambridge, MA: Harvard Education Press.

Ucar, R., & Ipek, C. (2006). The views of primary schools administrators and teachers about in-service training programs in the Turkish educational system. *Yüzüncü Yıl Üniversitesi Eğitim Fakültesi Dergisi, 3*, 34–53.

Usun, S., & Comert, D. (2003). The identification of pre-school teachers' needs for in-service training. *Gazi Üniversitesi Eğitim Fakültesi Dergisi, 23*, 125–138.

Yoon, K. S., Duncan, T., Lee, S. W.-Y., Scarloss, B., & Shapley, K. (2007). *Reviewing the evidence on how teacher professional development affects student achievement*. Washington, DC: US Department of Education.