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A Systematic Review of Teachers' Questioning in Turkey between 2000-2018[1]

2000-2018 arasında Türkiye'de Öğretmenlerin Soru Sorma Davranışlarının Sistematik Derlemesi

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Abstract: This study aimed at reviewing the research in Turkey to understand the current condition on teachers' questioning. Having examined the studies between 2000-2018 years, 37 studies were found to be eligible to include. Among these studies, 86% of them were in qualitative, 11% of them were in quantitative and 3% of them were in mixed methods scope. To generate the most common themes, content analysis was employed, and three themes were generated: Types of Questions, Cognitive Levels of Questions, and Use of Questioning Techniques. Accordingly, pre-service and in-service teachers generally asked closed-ended questions and the questions at the lowest thinking levels. Studies mostly covered the techniques related to the selection of students, wait time, providing feedback and correctives, prompting and cueing, redirecting and rephrasing the question, use of the body language and the voice. Regarding the findings, it is crucial to develop both pre-service and in-service teachers' skills on questioning.

Keywords: Teacher questioning, Types of questions, Cognitive level of questions, Questioning techniques

Öz: Bu çalışmada öğretmenlerin soru hazırlama ve sorgulama tekniklerini anlamak, soruları türleri ve bilişsel seviyeleri açısından değerlendirmek ve öğretmenlerin öğrenme ortamlarında uyguladıkları sorgulama tekniklerini belirlemek amacıyla 2000-2018 yılları arasında Türkiye'de yapılan 37 araştırma sistematik olarak incelenmiştir. İncelenen çalışmaların %86'sında nitel, %11'inde nicel, %3'ünde ise karma araştırma deseni kullanılmıştır. İçerik analizi neticesinde üç ortak tema oluşturulmuştur: Soru Türleri, Soruların Bilişsel Seviyesi ve Sorgulama Teknikleri. Öğretmen ve öğretmen adaylarının öncelikle kısa ve tek bir cevabı olan kapalı uçlu ve alt düzey düşünme seviyesindeki soruları sormayı tercih ettikleri görülmüştür. Öğretmenlerin kullandıkları sorgulama tekniklerine bakıldığında ise öğrencilerin seçimi, bekleme süresi, geribildirim ve düzeltme sağlama, ipucu verme, soruları başkalarına yöneltme ya da yeniden ifade etme, beden dili ve ses tonu kullanımı gibi çeşitli faktörlerin üzerinde durulmuştur. Elde edilen bulgular ışığında, öğretmen ve öğretmen adaylarının soru hazırlama, soru sorma ve sorgulama tekniklerini kullanımları açısından bilgi, beceri ve tutumlarının geliştirilmesi gerekmektedir.

Anahtar Sözcükler: Soru-yanıt tekniği, Soru çeşitleri, Soruların bilişsel seviyesi, Sorgulama teknikleri

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ÖZET

Araştırmanın amacı ve önemi

Soru sormanın ve çeşitli sorgulama teknikleri uygulamanın öğretimin etkililiğini artırmada önemli bir faktör olduğu bilinmektedir. Öte yandan, öğretmenlerin sordukları soruların çeşitleri ve bilişsel seviyeleri düşünüldüğünde kaliteli soru hazırlama ya da farklı sorgulama tekniklerinden yararlanmada yetersiz kaldıkları görülmektedir. Dolayısıyla, öğretmenlerin sınav ya da verilen herhangi bir metin için soru hazırlarken nelere dikkat ettiklerini anlamak ve öğrencilerine soru sorarken hangi tekniklerden yararlandıklarını ortaya çıkarmak için öncelikle ulusal bağlamda yapılacak çalışmalara ihtiyaç duyulmaktadır. Bu çalışmada, Türkiye'de öğretmenlerin soru hazırlama ve sorgulama tekniklerini anlamak, sorulan soruları türleri ve bilişsel seviyeleri açısından değerlendirmek ve öğretmenlerin öğrenme ortamlarında uyguladıkları sorgulama tekniklerini belirlemek amacıyla Türkiye'de yapılmış olan araştırmalar sistematik olarak incelenmiştir.

Yöntem

Bu çalışmada, 2000-2018 yılları arasında Türkiye'de öğretmenlerin soru hazırlama, sorma ve sorgulama teknikleri üzerinde yapılmış olan çalışmalar derlenmiştir. "Soru türleri", "soruların bilişsel seviyeleri", "soru sorma teknikleri", "öğretmen soruları" gibi anahtar sözcükler kullanılarak elektronik veritabanları aracılığıyla mevcut çalışmalara ulaşılmaya çalışılmıştır. Bu bağlamda, öğretmen ve öğretmen adaylarının soru hazırlama, soru sorma ve sınıflarında uyguladıkları sorgulama tekniklerini sınıf seviyesi ve alan farkı gözetmeksizin inceleyen 37 araştırma makalesi ya da tam metin bildiri incelenmiştir. Bu çalışmaların %86'sının nicel, %11'inin nitel, %3'ünün ise karma araştırma deseninde olduğu görülmektedir. Öğretmenlerin katılımcı olarak yer aldığı araştırmalar (*%73*) diğerlerine göre daha fazla olmakla birlikte sadece öğretmen adaylarının yer aldığı çalışmalar (*%*24) da mevcuttur. İncelenen bir çalışmada (*%*3) ise hem öğretmen hem de öğretmen adayları katılımcı olarak yer almıştır. Son olarak seçilen araştırma makalelerinin bulguları içerik analizi yöntemi ile analiz edilerek genel temalar belirlenmiştir.

Bulgular

İçerik analizi sonucunda 1) Soru Çeşitleri, 2) Soruların Bilişsel Seviyeleri ve 3) Kullanılan Sorgulama Teknikleri olmak üzere üç tema elde edilmiştir. Bu bağlamda, öğretmen ve öğretmen adaylarının öncelikle kısa ve tek bir cevabı olan kapalı uçlu soruları açık uçlu sorulara daha fazla tercih ettikleri görülmektedir. Hazırlanan ve sorulan sorular bilişsel seviyeleri açısından incelendiğinde soruların herhangi bir konu alanı gözetmeksizin çoğunlukla Bloom taksonomisinin alt düzey düşünme seviyesinde oldukları; üst düzey düşünme seviyesinde ise çok az sayıda soru sorulduğu ve hazırlandığı görülmektedir. Öğretmen ve öğretmen adayları orijinal Bloom taksonomisinin yanında yenilenmiş Bloom taksonomisi ya da farklı bilişsel sınıflandırmalardan yararlanmaktadır. Öte yandan, öğretmenlerin sınıfta soru sorarken kullandıkları tekniklere bakıldığında ise öğrencilerin seçimi, bekleme süresi, geribildirim ve düzeltme sağlama, ipucu verme, soruları başkalarına yöneltme ya da yeniden ifade etme, beden dili ve ses tonu kullanımı gibi çeşitli faktörlerin üzerinde durulmuştur. Buna rağmen, öğretmen ve öğretmen adayları sorgulama tekniklerini kullanımları açısından değerlendirildiğinde yeterliklerinin istenilen düzeyde olmadığı görülmüştür.

Tartışma ve Sonuç

Elde edilen bulgular ışığında, öğretmen ve öğretmen adaylarının soru hazırlama, soru sorma ve sorgulama tekniklerini kullanımları açısından bilgi, beceri ve tutumlarının geliştirilmesi

gerekmektedir. Bu kapsamda, hizmet öncesi ve hizmet içi eğitimlerin yeniden değerlendirilmesi ve düzenlenmesi önerilmektedir. Eğitim Fakültelerinde özellikle staj derslerinde yürütülen öğretmenlik uygulamaları ve mikro öğretim aktiviteleri kapsamında öğretmen adaylarının öğrendikleri teorik bilgiyi pratiğe çevirmeleri büyük önem kazanmaktadır. Öte yandan, öğretmenler için hizmet-içi eğitim kapsamında Eğitim Fakülteleri ile işbirliği içerisinde soru hazırlama ve soru sorma tekniklerinin nasıl kullanılabileceğini uygulamalarla anlatan çeşitli çalıştaylar ya da benzer aktiviteler düzenlenebilir.

INTRODUCTION

Throughout the history, questioning is at the centre of teaching and learning process for teachers. Effective questioning, in fact, contributes the development of curiosity, creativity and reflective thinking skills of students. Students' engagement toward the task might also be kept high with the help of teachers' questioning.

The constitutive definition of question by Cambridge English Dictionary (2018) is given as "a sentence or phrase used to find out information", so the main goal of questioning is eliciting the unknown. Starting with Socratic Method, questioning has been continuously used in learning settings. In Socratic Method, called as Elenchus (Murphy, Wilkinson & Soter, 2011), the questioner asks a primary question and the responder gives an answer to this question. Following the response, the questioner asks a series of follow-up questions to foster the thinking process and encourage the responder to generate ideas regarding his previous knowledge (Chin, 2007; Murphy et al., 2011). Similarly, Aristotle's artistic proofs and St. Aquinas's scholasticism were used in the history as an example of open-ended talks between the questioner and the responder in which the individuals were prompted by questions and the arguments for and against were generated to foster people's academic reasoning (Murphy, et al., 2011).

Today while asking questions, teachers generally try to understand students' reasoning over the topic (Toni & Parse, 2013), enhance the interaction with students (Toni & Parse, 2013), take students' attention and increase their motivation toward the lesson (Caram & Davis, 2005; Graesser & Olde, 2003), promote critical and metacognitive thinking skills and conceptual understanding of students (Cotton, 1988; Graesser & Olde, 2003), make a summary of the previous and the current class (Cotton, 1988), assess the learners and evaluate the effectiveness of the instruction (Cotton, 1988; McCarthy, Sithole, McCarthy, Cho & Gyan, 2016). Therefore, questioning is a dynamic process among teachers and students that both agents will have an indispensable opportunity to improve themselves in the long run.

The characteristics of the questions and the questioning skills of teachers were contended to be one of the important factors for effective questioning (Çakmak, 2009). Considering the former one, there are distinct question types that are used for different instructional purposes. These are: closed-ended, open-ended, convergent, divergent, simple, elaborating, summarizing, affective, probing, rhetorical, attention focusing, action, problem-posing, and comparison (Blosser, 1991; Chin, 2004; Cotton, 1988; Elsgeest, 1988). Among these categories, closed-ended questions might be given as the most employed ones in classrooms (Albergaria-Almeida, 2010; Lee & Kinzie, 2012; Meachain, Vukelich & Buell, 2014; Ong, Eugene Hart, & Chen, 2016; Rido, 2017). For this question type, retention of basic facts is addressed through reaching a short and correct answer. Open-ended questions, on the other hand, intend to foster problem solving, creative and critical thinking skills of students as the major goal of these questions is to trigger discussions and make students defend their opinion by comparing their own values and standards rather than reaching a single answer (Chin, 2004; Graesser & Person, 1994). Therefore, open-ended questions are portrayed to be more thought provoking than the closed-ended ones.

In this perspective, the cognitive level of the questions is inevitably concerned in majority of studies. Herein, Bloom's taxonomy is taken into consideration to classify the cognitive level of questions. According to this taxonomy, questions are categorized into knowledge, comprehension, application, analysis, synthesis and evaluation levels (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956). Corresponding to this taxonomy, students list and recall the information for knowledge level. Short answer and multiple-choice questions are often used to assess their knowledge in this level (Adams, 2015). For comprehension level questions, on the other hand, students are expected to alter the form of the information and interpret it accordingly (Lee & Kinzie, 2012; Vogler, 2005); in other words, they are expected to paraphrase the information they receive, make a comparison among the similar elements and categorize them. By doing so, the obtained knowledge might be easily imbedded in their existing schemas (Adams, 2015). As the novelty of the knowledge, process or the skills cannot be considered in these levels, these two types of questions address lower cognitive thinking level. The following levels, on the other hand, refer higher cognitive thinking levels. To elaborate, students are encouraged to use the current

knowledge, principles and skills, in novel situations for application level questions. They are expected to break down the knowledge into its components or analyse the components of a process and make reasoning over it for analysis level questions. For synthesis level questions, students construct new knowledge, propose new solutions to a problem or produce a novel product based on what they already know. Lastly, they judge the ideas with respect to some predetermined standards or values for evaluation level questions (Adams, 2015; Chin, 2004; Lee & Kinzie, 2012; Vogler, 2005). To overview, Bloom's taxonomy has a hierarchical structure which requires the accomplishment of the prerequisites of the prior level to reach the subsequent level (Krathwohl, 2002). The linear structure of the taxonomy and the necessity to complete each prior level to attain further levels were the most salient critics brought to this taxonomy (Bümen, 2006). Therefore, there was a need to make some revisions on the original taxonomy. In this regard, Bloom's taxonomy was revised by Anderson and his colleagues (2001) to correct the deficiencies of the original one and adapt the original taxonomy corresponding to the contemporary changes in the world related to the learning, instruction, measurement and evaluation. The changes shortly were about the name and the hierarchical order for some of the categories in the revised taxonomy. Besides, the revised taxonomy was re-shaped into two-dimensional framework. These are "Knowledge" and "Cognitive Processes" dimensions. "Knowledge" dimension had four sub-categories within: Factual, Conceptual, Procedural and Metacognitive Knowledge. Factual knowledge incorporates the basic facts related to a discipline while conceptual knowledge considers reciprocal relation among basic elements of a larger structure such as the knowledge of principles, theories, models and generalizations. Procedural knowledge addresses the methodology of how to do something while metacognitive knowledge is about the knowledge of one's own cognition (Krathwohl, 2002). "Cognitive Process" dimension, on the other hand, resembles the original framework but the name of the first two sub-categories was changed to "remember" and "understand". Rather than using the noun form to name the other categories, verb form was decided to be used as "apply", "analyse", "evaluate" and "create" corresponding to teachers' use in education. In addition, the "create" category was placed into the highest cognitive thinking level (Krathwohl, 2002). Contrary to the original taxonomy, the focus was on the sub-categories rather than the main categories and the revised taxonomy was more flexible regarding the linear structure of the original one (Bümen, 2006). Additionally, considering the original and the revised versions, closed-ended questions are categorized into lower cognitive thinking level whereas, open-ended ones are classified into higher cognitive thinking level.

Dettmer's taxonomy, on the other hand, has some common points with Bloom's taxonomy. Including Basic, Applied and Ideational Learning stages, each stage has some other phases within for cognitive domain. Accordingly, "know" and "comprehend" are classified in the Basic Learning stage addressing low-road transfer of learning while "apply", "analysis" and "evaluate" are categorized in Applied (Interventional) Learning stage referring high-road learning stage, and finally "synthesize", "imagine" and "create" are the phases of Ideational Learning stage considering learners' desires (Dettmer, 2006). In this sense, the low and high-road learning stages are in a close relationship with Bloom's taxonomy of learning.

In the literature, the cognitive level of questions was examined for different grade levels and for different subject areas (Diaz, Whitacre, Esquierdo & Ruiz-Escalante, 2013; Kawanaka & Stigler, 1999; Larson &Lovelace, 2013; Sahin &Kulm, 2008; Tan, 2007; Toni &Parse, 2013; Yip, 2004). In Diaz et al. (2013)'s study, pre-service math and language art teachers' questions were analyzed regarding original Bloom's taxonomy. Accordingly, majority of the questions were at knowledge, comprehension and application levels. Toni and Parse (2013) also analyzed the cognitive level of questions at high and junior high school English classes with respect to Bloom's taxonomy as well. According to the results, teachers mostly asked inference (27%) and comprehension level (22%) questions while the questions at synthesis and analysis levels were asked the least compared to other levels. Similar to Toni and Parse (2013)'s study, one of the aims of Tan (2007)'s study was to reveal which kind of questions are asked in Chinese university level English classes. Accordingly, most of the teacher-iniated questions (87%) were at lower cognitive thinking level. Having examined the cognitive level of questions at university level science classes regarding the revised version of Bloom's taxonomy, Larson and Lovelace (2013) reported that 78.2% of

questions were at remember or understand levels wheras only 4.7% of the questions were at evaluation and creation levels. Yip (2004) also examined the questions posed by biology teachers at high school level after completing a programme to promote teachers' questioning skills at science classes. The findings pointed out the high percentage of lower-order level questions (35.1%) compared to questions at higher-order level (25.4%). In another research, Sahin and Kulm (2008) studied on the use of teacher questioning at middle school mathematics classes. Teachers tended to ask more factual questions to assess students' procedural and factual knowledge than the probing and guiding questions regardless of the employed teaching strategy, so the level of questions posed by mathematics teachers were mostly at lower cognitive thinking level. There are also cross-cultural studies to compare teachers' questioning practices across different cultures. In this regard, Kawanaka and Stigler (1999) examined teachers' use of questions at middle school mathematics classrooms at three different cultures. Accordingly, the higher cognitive thinking level questions were seemed to be posed less than lower cognitive thinking questions in Germany, Japan and the USA. Generally, there should be a balance when asking both lower and higher order questions (Şevik, 2005). Therefore, the adopted instructional method has a considerable impact on teachers' questioning practices. For instance, in traditional classroom settings teachers are more likely to ask closed-ended questions. However, teachers' questioning is generally shaped by students' responses to clarify and extend their ideas in inquiry settings (Kawalkar & Vijapurkar, 2013). Besides, students are encouraged to take their responsibility of their own learning by evaluating their responses, so open-ended questions are asked more than the closed ones to improve students' higher order thinking skills in inquiry settings (Smart & Marshall, 2013).

Although the type of the question tends to change based on the adopted instructional method, there are several questioning techniques suggested to be implemented in each learning setting to improve the instruction efficiency such as prompting, probing and cueing students, repeating and re-directing the questions, providing feedback, correctives, and sufficient wait time, using follow-up, leading and student-specific questioning (Bond, 2007; McCarthy et al. 2016; Rido; 2017; Wangru, 2016; Wilen &Clegg, 1986). In addition to these, Tri Ragawanti (2009) discussed three main student selection procedures: selection of volunteer students, use of pre-arranged format and random selection of students. Among those criteria, pre-arranged format might be risky in terms of resulting in trouble and boredom in the classroom as students are called according to name order in the attendance list or those who are sitting in the front row are selected to respond the question. Therefore, teachers should provide a balance while selecting volunteer and non-volunteer students (Wangru, 2016; Wilen & Clegg, 1986) to keep whole class being attentive.

Considering after questioning phase, providing a sufficient pause after posing a question (wait time I) and after a student response (wait time II) was deemed to be essential strategy in teachers' questioning (Rowe, 1986). The frequency, length and the quality of responses were stated to have been increased as the wait time was increased by few seconds (Gall, 1984; Rowe, 1986). Therefore, teachers should give minimum three seconds so that students will be able to re-think and re-formulate their answers (Chin, 2004; Naz, Khan, Khan, Daraz & Mujtaba, 2013). However, in the literature, the allocated average time was less than three seconds for wait time I and II (Albergaria-Almedia, 2010; Larson&Lovelace, 2013; Mauigoa-Tekene, 2006; Wangru, 2016). In addition to sufficient wait time, probing and follow-up questions might be used to comprehensively evaluate students' both correct and incorrect responses (McCarthy et al. 2016). Besides, the unanswered questions might be rephrased to eliminate student confusion; providing verbal cues (Wilen &Clegg, 1986), giving positive feedback and error correction might be utilized to facilitate student and teacher communication (Sun, 2012).

Even though various questioning techniques were mentioned to be used to improve the instruction efficiency, teachers are criticized to lack necessary questioning skills (Vogler, 2005). Therefore, there is a need to explore the current trend in teachers' questioning in national context beforehand. In this regard, this study aims at reviewing the research on teachers' questioning in Turkey through examining what types and cognitive levels of questions are posed and what questioning techniques are used by teachers in Turkish educational settings.

METHOD

Data Sources

A comprehensive literature review was done by examining the studies directly or indirectly related to teachers' questioning in Turkey conducted between 2000 and 2018 years through electronic databases described in Figure 1. The keywords were "teacher questioning", "classroom questioning", "questioning skills", "question types", "cognitive levels of questions", and "questioning techniques" with their Turkish counterparts. Regarding the inclusion and exclusion criteria, 37 studies were found to be eligible to explore teachers' questioning practices in Turkey. Data reduction chart of this systematic review is given in Figure 1.

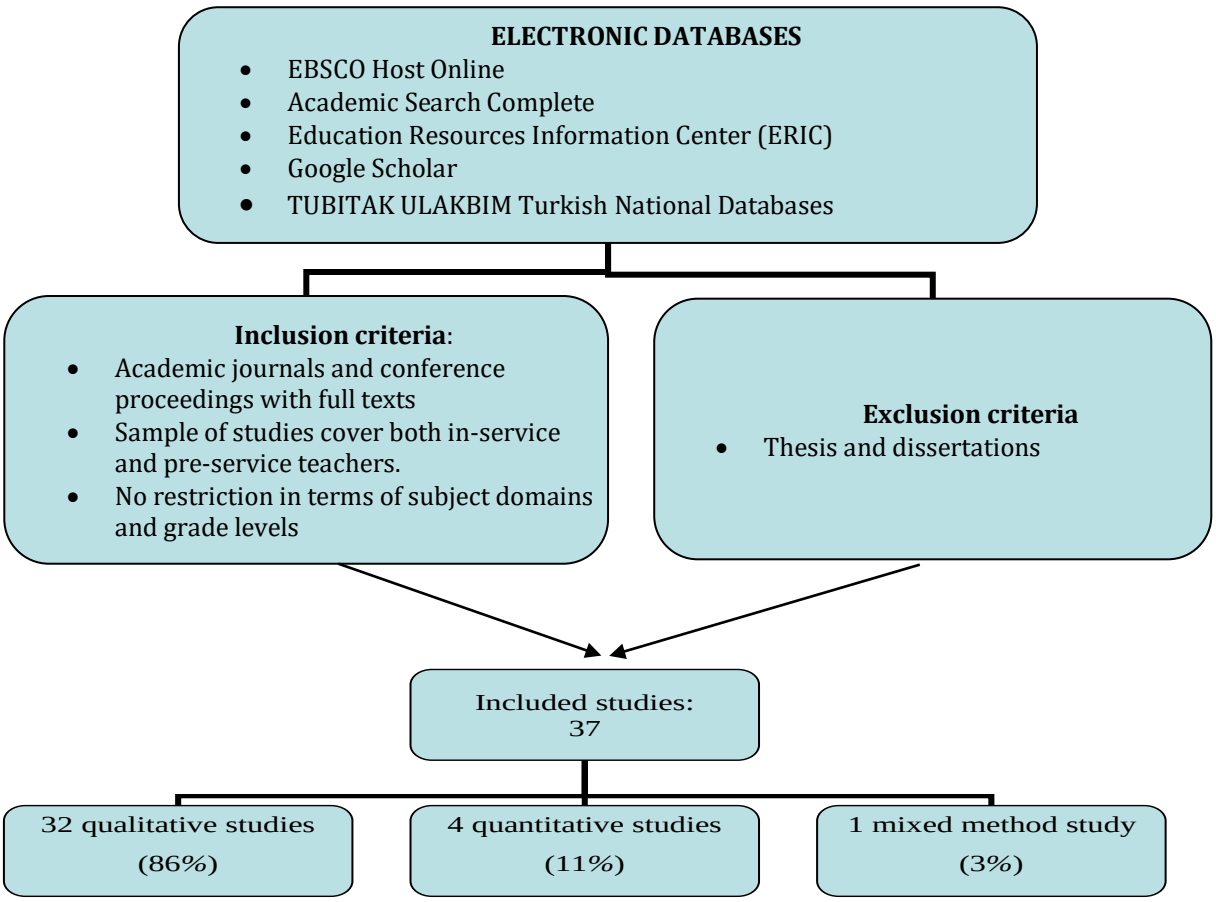

Figure 1. *Data reduction chart for systematic review*

Data Analysis

Among the selected studies, the participants were mostly in-service teachers (*f*=27; 73 %) but there were also pre-service teachers (*f*=9; 24 %), and both in-service and pre-service teachers participated in one study (*f*=1; 3 %). The subject area of the teacher or teacher candidates was also examined. Some of the studies focused on more than one subject area, so each one was considered simultenously. Accordingly, most of the reviewed studies addressed the questioning practices of Science and Technology (*f*= 12; 27%), Turkish (*f*=10; 22%), and Social Studies teachers and teacher candidates (*f*=8;18%), respectively. Furthermore, questioning practices of History (*f*=1; 2%), Geography (*f*=1; 2%) and Vocational Courses (*f*=1; 2%) teachers or teacher candidates constituted the smallest portion among the reviewed studies (see Appendix A). For qualitative studies, purposeful and convenience sampling was often used to select the participants and the data were collected through observations, semi-structured interviews, and documents of written examinations. Besides, descriptive, content and document analysis were the main data

analysis methods. On the other hand, there was paucity of information about the sampling procedure for quantitative studies. The data were mainly collected by questionnaires, and descriptive and inferential statistics were utilized for data analysis. For this systematic review, content analysis (Yıldırım & Şimşek, 2016) was employed to uncover the specific themes upon considering findings of the selected studies. The studies were reviewed based on predetermined criteria to elicit teachers' questioning practices in Turkish educational settings. In this regard, the common themes were extractected and categorized together. Accordingly, three main themes were generated and entitled as 1) Types of Questions, 2) Cognitive Levels of Questions, and 3) Use of Questioning Techniques. Besides, some of the reviewed studies having multiple goals regarding these themes, so they were classified into more than one theme. The reviewed studies regarding the employed research design, the sample, data collection and analysis methods were explained in Appendix A.

RESULTS

For the current systematic review study, a total of 37 research studies were reviewed based on the predetermined criteria to understand teachers' questioning in Turkish educational settings. Considering the subject area of the participants, the questioning patterns of Science and Technology (27%) and Turkish (22%) teachers or teacher candidates were mostly studied in the national literature. However, the questioning practices of teachers or teacher candidates for other subject areas were scarcely examined. Besides, the subject area of the participants was not specified in one study (2%). The generated themes from the selected studies are described in Table 1.

Table 1. *Themes Generated from the Selected Studies*

Theme	Study	*f*	%
Types of Questions	Bay (2016); Bay & Alisinanoğlu (2013); Evran Acar &Kılıç (2011); Doğanay & Güzel Yüce (2009); Gündüz (2009); Hamiloğlu &Temiz (2012); Korkmaz (2009); Öztürk-Samur & Soydan (2013); Yaylı (2009)	9	20
Cognitive Level of Questions	Akpınar (2003); Akpınar & Ergin (2004); Akyol, Yıldırım, Ateş, & Çetinkaya (2013); Aslan (2011); Aydemir & Çiftçi (2008); Ayvacı & Türkdoğan, 2010; Ayvacı & Şahin (2009); Bay (2016); Baysen (2006); Bektaş &Şahin (2007); Çalışkan (2011); Çintaş & Yıldız (2015); Çolak & Demircioğlu (2010); Erdoğan (2017); Eyüp (2012); Büyükalan Filiz (2009); Göçer (2011); Göçer (2016); Güfta & Zorbaz (2008); Gündüz (2009); Kavruk & Çeçen (2013); Koray, Altunçekiç, & Yaman (2005); Cansüngü Koray & Yaman (2002); Özcan & Akcan (2010); Öztürk-Samur & Soydan (2013); Şanlı & Pınar (2017); Tanık & Saraçoğlu (2011); Yeşil (2008a); Yeşil (2008b); Yılmaz & Gazel (2017)	30	67
Use of questioning techniques	Baysen, Soylu, & Baysen (2003); Bektaş & Şahin (2007); Büyükalan Filiz (2009); Korkmaz (2009); Yeşil (2008a); Yeşil (2008b)	6	13

Types of Questions

Employed question structure in Turkish classrooms seemed to be parallel to each other for the reviewed studies. Accordingly, in-service and pre-service teachers were in a tendency of asking closed-ended questions or questions having already established and simple answers (Bay & Alisinanoğlu, 2013; Korkmaz, 2009; Öztürk-Samur & Soydan, 2013; Yaylı, 2009). Nonetheless, the findings of Bay (2016)'s study which compared the structure of the questions asked by pre-service teachers contradicted with the common tendency toward the high use of closed-ended questions against open-ended ones.

Except from the open-ended and closed ended scheme, some other studies also focused on different question types (Evran, Acar, & Kılıç, 2011; Doğanay, Güzel, & Yüce, 2009; Hamiloğlu & Temiz, 2012). In Evran et al. (2011)'s study, the questions posed by in-service teachers during teaching and learning process were arranged as lesson and extracurricular questions. Considering lesson questions, teachers mostly asked questions addressing intellectual operation ability while motivation and reasoning questions were used less in classroom settings. Besides, teachers mostly preferred criticism or warning and information seeking questions about a personal situation in extracurricular questions category.

Hamiloğlu and Temiz (2012), on the other hand, examined the daily practices of teachers regarding the use of question types in a primary English as a foreign language (EFL) class. Accordingly, yes/no, short answer/retrieval style, display, referential, non-retrieval and imaginative questions were listed as the questions which were explicitly asked by teachers. In this context, the frequency of yes/no and short answer questions outnumbered the other types. In addition to this classification, the researchers also seek for the basic goals of the questions and examined them accordingly. In this regard, convergent questions which aims at recalling the knowledge was the most preferred one in the classrooms; however, divergent questions which are in line with the open-ended question scheme due to their nature and the function in classroom dialogues were asked less than the convergent ones. Lastly, procedural questions which are generally utilized for classroom management were the least preferred one. Corresponding to these findings, convergent questions were posed more than the cognitive memory, divergent and evaluative questions in Doğanay and Güzel-Yüce (2010)'s study.

For this study, not only the questions posed in classrooms but also the exam questions were also analysed. Lacking the research on question types for written examinations, multiple-choice questions having one correct answer and essay type questions entailing thought provoking answers within were mostly preferred in science and technology courses for middle school level (Gündüz, 2009).

Cognitive Levels of Questions

There are much more studies focusing on the cognitive level of questions during teaching and learning process (Ayvacı & Şahin, 2009; Baysen, 2006; Bektaş & Şahin, 2007;Büyükalan Filiz, 2009; Öztürk-Samur & Soydan, 2013; Yeşil, 2008a; Yeşil 2008b), in written examinations (Akpınar, 2003; Akpınar & Ergin, 2004; Ayvacı & Türkdoğan, 2010; Ayvacı & Şahin, 2009; Çintaş & Yıldız, 2015; Çolak & Demircioğlu, 2010; Göçer, 2011; Göçer, 2016; Gündüz, 2009; Kavruk & Çeçen, 2013; Tanık & Saraçoğlu, 2011; Şanlı & Pınar, 2017) and for given texts (Akyol, Yıldırım, Ateş, & Çetinkaya, 2013; Aslan, 2011; Aydemir & Çiftçi, 2008; Erdoğan, 2017; Eyüp, 2012; Güfta & Zorbaz, 2008; Koray, Altunçekiç, & Yaman, 2005). To determine the cognitive thinking level of the questions, original Bloom's taxonomy was mainly taken into consideration (Akpınar, 2003; Akpınar & Ergin, 2004; Akyol et al., 2013; Aslan, 2011; Aydemir & Çiftçi, 2008; Bay, 2016; Baysen, 2006; Büyükalan Filiz, 2009; Çolak & Demircioğlu, 2010; Eyüp, 2012; Göçer, 2011; Güfta & Zorbaz, 2008; Gündüz, 2009; Kavruk & Çeçen, 2013; Koray et al., 2005) while some of the studies also utilized revised version of Bloom's taxonomy (Ayvacı & Türkdoğan, 2010; Çintaş & Yıldız, 2015; Erdoğan, 2017; Tanık & Saraçoğlu, 2011; Şanlı & Pınar, 2017) or different taxonomies (Göçer, 2016).

According to the findings of many studies, in-class questions were mainly at knowledge/remember (Ayvacı & Şahin, 2009; Bay, 2016; Yılmaz & Gazel, 2017; Öztürk-Samur & Soydan, 2013), comprehension/understand (Yılmaz & Gazel, 2017) and application level (Baysen, 2006) regardless of the underlying taxonomy. Similarly, teacher and teacher candidates tend to prepare questions at knowledge, comprehension and application levels for written examinations (Ayvacı & Şahin, 2007; Çalışkan, 2011; Çolak & Demircioğlu, 2010; Güfta & Zorbaz, 2008; Gündüz, 2009; Cansüngü Koray & Yaman, 2002; Özcan &Akcan, 2010; Tanık & Saraçoğlu, 2011) and for given texts (Akyol et al., 2013; Aydemir & Çiftçi, 2008; Erdoğan, 2017; Eyüp, 2012; Koray et al., 005). Therefore, it might be concluded that teachers and teacher candidates rarely ask or prepare higher order thinking level questions unless any program to improve their questioning skills were implemented (Aslan, 2011; Büyükalan Filiz, 2009).

Except from Bloom's taxonomy, Göçer (2016) examined the cognitive level of the questions asked by teachers in Turkish written examinations regarding Dettmer's taxonomy. For this study, majority of exam questions of teachers were at "know" and "comprehend" phases of Basic Learning stage corresponding to lower thinking level regarding Bloom's taxonomy.

Nonetheless, some studies did not mention about the employed taxonomy to determine the cognitive level of the questions (Bektaş & Şahin, 2007; Yeşil, 2008a, Yeşil 2008b). In Bektaş and Şahin (2007)'s study, teachers mainly asked factual/recall questions during social studies course, so the use of lower thinking level questions had a higher proportion than higher thinking level questions. On the other hand, Yeşil (2008a, 2008b) studied with pre and in-service teachers to determine the cognitive quality of their questions for social studies course as well. The findings pointed out the use of a high amount of memorization questions at lower thinking level and the questions were generally selected from textbooks indicating their lack of originality.

Use of Questioning Techniques

The use of questioning techniques in classrooms were also examined in some of the studies (Baysen, Soylu, & Baysen, 2013; Bektaş & Şahin, 2007; Büyükalan Filiz, 2009; Korkmaz, 2009; Yeşil 2008a; Yeşil 2008b). Selection of students, wait time, providing feedback and correctives, prompting and cueing, redirecting and rephrasing the question, use of the body language and the voice were scrutinized in those studies.

The findings pointed out different conclusions for the selection of the students. While in-service teachers tended to select males, successful students and the ones sitting at the front side of classroom in Bektaş and Şahin (2007)'s study, voluntary students were selected to respond to the questions or the questions were directed to whole class to provide a balance among all students for majority of the pre-service teachers in Korkmaz (2009)'s study.

Other questioning techniques were also emphasized in the reviewed studies. Accordingly, students were generally given verbal reinforcement or incentives based on their correct responses (Korkmaz, 2009), clues or prompts were also given, or redirection of the questions were ensured based on students' incorrect responses (Korkmaz, 2009). It was also noticed that, some of the teachers in those studies give insufficient and incomprehensible feedback and correctives (Korkmaz, 2009; Yeşil 2008b) or had problems in redirecting the questions and providing reinforcement for students who asked higher order thinking questions (Yeşil 2008a; Yeşil 2008b).

Wait time was examined in many studies as well (Baysen et al., 2003; Bektaş & Şahin, 2007; Büyükalan Filiz, 2009; Korkmaz, 2009; Yeşil 2008a; Yeşil 2008b). Although the importance of wait time was discussed, the duration for pausing was not clearly mentioned in majority of them (Bektaş & Şahin, 2007; Büyükalan Filiz, 2009; Korkmaz, 2009; Yeşil 2008a; Yeşil 2008b). Among those, Baysen et al. (2003) focused on the positive impact of the increase of wait time on students' engagement level, the frequency of students' questions, the length of responses, and the communication of students with teachers.

Lastly, both pre and in-service teachers' attitude toward students after posing a question was viewed (Bektaş & Şahin, 2007; Korkmaz, 2009; Yeşil, 2008a; Yeşil 2008b). Accordingly, teachers attentively listened their students through making eye contact (Bektaş & Şahin, 2007). They successfully managed the classroom while listening students' responses through preventing distractive behaviour of other students (Korkmaz, 2009) and effectively used their tone of voice and body language (Yeşil 2008a; Yeşil 2008b).

DISCUSSION and CONCLUSION

Questioning and preparing high quality questions are essential aspects of teaching and learning process. For effective questioning, it is important to be cognizant of the lesson objectives, the content and the sufficient knowledge about measurement and evaluation (Çolak & Demircioğlu, 2010). However, there are still problems on preparing quality questions and questioning skills. In this perspective, this study attempted to provide an understanding about the current trend in teachers' questioning in Turkey. The reviewed studies mostly uncovered the

questioning practices of Science and Technology, Turkish and Social Studies teachers. However, the studies examining teachers' questioning at Mathematics and English classes seemed to be less which contradicts with the international literature (Diaz et al., 2013; Jiang, 2014; Kawanaka &Stigler, 1999; Sahin & Kulm, 2008; Tan, 2007; Toni &Parse, 2013). Therefore, there is a need to study questioning patterns of teachers or teacher candidates for these subject areas as well.

Upon considering the findings, three main themes were obtained: Types of Questions, Cognitive Level of Questions and the Use of the Questioning Techniques. Accordingly, teachers and teacher candidates usually asked closed-ended or convergent and the questions at lower-thinking level regardless of any taxonomy unless any program or training was implemented. This finding was in line with the international literature (Meachain Vukelich & Buell, 2014; Lee & Kinzie, 2012; Tan, 2007; Yip, 2004). Although lower order questions provide a summary of basic facts and concepts, higher order questions are invaluable for the inquiry process. However, posing only lower or higher order questions at a class time is destructive for a well-functioning learning setting. Chin (2004) referred the frustrating nature of posing too many higher order questions on students' minds as students would be unable to organize their thoughts throughout the lesson and they would most probably experience pressure under the existence of high challenge in classrooms. Besides, asking too many lower-order questions would not challenge students' minds at all, so students would not go beyond their capacities to build new knowledge, and thereby, there should be a balance between higher and lower thinking level questions.

Teachers' reactions to students' responses in terms of giving appropriate feedback and correctives, rephrasing and redirecting the questions, providing a sufficient pause after posing a question to increase the frequency and the quality of students' responses, the discouraging manner of teachers to promote students' responses were some of the encountered problems while accounting the questioning skills of teachers corresponding to the findings of many studies (Albergaria-Almeida, 2010; Jiang, 2014; Lee& Kinzie, 2012; Mauigoa-Tekene, 2006). The current problems on questioning might be related to several factors including teachers' readiness toward the content area (Smart & Marshall, 2013), the shortfalls in teacher education programs and in-service trainings in terms of providing questioning skills for teachers and teacher candidates. As the quality questions promote students' engagement to the class, the questions need to be pre-planned regarding the objectives of the relevant subject (Bektaş & Şahin, 2007).

Akyol et al. (2013); Yeşil (2008a, 2008b) and Yılmaz and Gazel (2017) underline the cruciality of teacher education programs on gaining effective questioning skills for teacher candidates. In this regard, teacher education programs might be re-considered in terms of evaluating whether the programs and the courses provide necessary knowledge, skills and attitude toward questioning. However, the courses should not only does address the theory but also practice might be encompassed. For this aim, the practicum courses or field experiences might be an opportunity for teacher candidates to develop their competencies through turning their skills into practice (Bektaş & Şahin, 2007; Sahin, 2013). In addition, micro teaching activities might be utilized to improve questioning skills of pre-service teachers who will have the opportunity of watching their teaching and noticing their mistakes about this issue. Furthermore, the measurement and evaluation courses might emphasize how to prepare quality questions, and pre-service teachers should be provided professional environments in which they comprehensibly practice on question formation at different levels of thinking (Çolak & Demircioğlu, 2010; Sahin, 2013; Tanık & Saraçoğlu, 2011).

In-service trainings might also be re-considered to provide an opportunity for teachers to improve their skills on questioning and preparing quality questions (Akyol et al, 2013; Çolak & Demircioğlu, 2010; Yeşil 2008a; Yeşil, 2008b; Yılmaz & Gazel, 2017). Having collaboratively worked with the academicians, in-service trainings or workshops might provide information about the recent changes on questioning and offer opportunities to gain knowledge and necessary skills on how to write different types of questions at both higher and lower thinking-level. Videotaping the classes might also be utilized for in-service teachers to be able to watch their own classes for multiple times after the class hours, so they might easily grasp the possible mistakes they do about questioning (Sahin, 2013). Furthermore, colleague evaluation might be effective to realize which techniques are employed during teaching processes; in other words, teachers might

observe their colleagues' classes and give them feedback about the employed questioning techniques (Sahin, 2013).

In this systematic review, the current trend on teachers' questioning was attempted to be understood by looking at the types of questions and their cognitive levels, and the questioning techniques employed by pre-service and in-service teachers to draw a more accurate conclusion about teachers' questioning mostly at elementary, middle and high school levels. For this aim, the sample of the identified studies covered teachers and teacher candidates; however, the following studies might focus on faculty staff and their use and question formation in higher education contexts that might better lend themselves to understand questioning in Turkish educational settings.

Akyol (2001), Çeçen and Kurnaz (2015) and Sarar-Kuzu (2013) studied the questions in textbooks. Along with the findings, there is a need to explore whether the questions at textbooks are appropriately prepared regarding any cognitive thinking level classification and contribute to the development of reasoning, critical, creative and reflective thinking skills of students.

Upon considering teacher-student discourse, on the other hand, teachers' questions demand a large amount of time during teaching process. However, students' questions might also be taken in consideration while thinking about teacher-student interaction in classroom settings (Korkmaz &Yeşil, 2010). Therefore, the further research might focus on students' questions with respect to types and their cognitive thinking level as well.

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Appendix A. Reviewed Studies

Publication	Research Design	Sample	Subject area	Data Collection Method	Data Analysis Method	Themes Obtained
Akpınar (2003)	Qualitative	In-service	Geography	Written examination quest.	Document analysis	Cognitive Level of Questions
Akpınar & Ergin (2004)	Qualitative	In-service	Science and Technology	Written examination quest.	Document analysis	Cognitive Level of Questions
Akyol, Yıldırım, Ateş & Çetinkaya (2013)	Qualitative	In-service	Turkish	Questionnaire	Descriptive analysis	Cognitive Level of Questions
Aslan (2011)	Quantitative	Pre-service	Turkish Literature	Writing quest. for given texts	Inferential analysis; Content analysis	Cognitive Level of Questions
Aydemir & Çiftçi (2008)	Qualitative	Pre-service	Turkish Literature	Writing quest. for given texts	Descriptive analysis	Cognitive Level of Questions
Ayvacı & Türkdoğan (2010)	Qualitative	In-service	Science and Technology	Written examination quest.	Document analysis	Cognitive Level of Questions
Ayvacı & Şahin (2009)	Qualitative	In-service	Science and Technology	Written examination quest.	Document analysis	Cognitive Level of Questions
Bay (2016)	Qualitative	Pre-service	Pre-school courses&activities	Question writing form	Descriptive analysis	Types of Questions
Bay & Alisinanoğlu (2013)	Qualitative	In-service	Pre-school courses&activities	Observations	Inferential analysis; Content analysis	Types of Questions
Baysen (2006)	Qualitative	In-service	Life studies, Turkish, Mathematics, Science	Observations, Interviews	Descriptive analysis; Content analysis	Cognitive Level of Questions
Baysen, Soylu, & Baysen, (2003)	Qualitative	In-service	Life studies, Turkish, Mathematics, Science	Observation	Descriptive analysis	Types of Questions
Bektaş, & Şahin (2007)	Qualitative	In-service	Social Studies	Semi-structured interviews, Observations	Descriptive analysis	Use of questioning techniques
Büyükalan Filiz (2009)	Quantitative	In-service	Social Studies	Observation	Inferential analysis	Cognitive Level of Questions, Use of questioning techniques
Çalışkan (2011)	Qualitative	In-service	Social Studies	Question investigation form	Descriptive analysis	Cognitive Level of Questions
Çintaş & Yıldız (2015)	Qualitative	In-service	Social Studies	Written examination questions	Document analysis	Cognitive Level of Questions
Çolak & Demircioğlu (2010)	Qualitative	In-service	History	Written examination quest.	Document analysis	Cognitive Level of Questions
Doğanay & Güzel Yüce (2010)	Qualitative	In-service	Science, Social Studies, Mathematics	Observation	Descriptive analysis; Content analysis	Types of Questions
Erdoğan (2017)	Qualitative	In-service and their students	Turkish	Comprehension Test; Semi-structured interviews	Descriptive analysis; Content analysis	Cognitive Level of Questions

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Publication	Research Design	Sample	Subject area	Data Collection Method	Data Analysis Method	Themes Obtained
Evran Acar & Kılıç (2011)	Qualitative	In-service	Vocational courses	Observations, Semi-structured interviews	Descriptive analysis; Content analysis	Types of Questions
Eyüp (2012)	Qualitative	Pre-service	Turkish	Writing questions for a written text	Document analysis	Cognitive Level of Questions
Göçer (2011)	Qualitative	In-service	Turkish	Written examination quest.	Document analysis	Cognitive Level of Questions
Göçer (2016)	Qualitative	In-service	Turkish	Written examination quest.	Document analysis	Cognitive Level of Questions
Güfta & Zorbaz (2008)	Qualitative	In-service	Turkish	Written examination quest.	Document analysis	Cognitive Level of Questions
Gündüz (2009)	Qualitative	In-service	Science and Technology	Written examination quest.	Descriptive analysis; Content analysis	Types of Questions; Cognitive Level of Questions
Hamiloğlu, & Temiz, (2012)	Mixed	In-service and pre-service	English	Observations	Descriptive analysis	Types of Questions
Kavruk & Çeçen (2013)	Qualitative	In-service	Turkish	Written examination quest.	Document analysis	Cognitive Level of Questions
Cansüngü Koray & Yaman (2002)	Qualitative	In-service	Science and Technology	Written examination quest.	Document analysis	Cognitive Level of Questions
Koray, Altunçekiç &Yaman (2005)	Qualitative	Pre-service	Science and Technology	Writing questions for a written text	Descriptive analysis	Cognitive Level of Questions
Korkmaz (2009)	Qualitative	Pre-service	Science and Technology	Observations, Questionnaire	Descriptive analysis; Content analysis	Types of Questions; Use of Questioning Techniques
Özcan &Akcan (2010)	Qualitative	Pre-service	Not specified	Writing questions for a given unit	Document analysis	Cognitive Level of Questions
Öztürk-Samur & Soydan (2013)	Qualitative	In-service	Science and Technology	Observations	Descriptive analysis; Content analysis	Types of Questions; Cognitive Level of Questions
Tanık & Saraçoğlu (2011)	Qualitative	In-service	Preschool courses&act.	Written examination quest.	Descriptive analysis	Cognitive Level of Questions
Şanlı & Pınar (2017)	Qualitative	In-service	Science and Technology	Written examination questions	Descriptive analysis; Content analysis	Cognitive Level of Questions
Yaylı (2009)	Qualitative	Pre-service	Turkish	Observations, Questionnaire	Content analysis	Types of Questions
Yeşil (2008a)	Quantitative	Pre-service	Social studies	Observations and evaluation form	Descriptive and inferential analysis	Cognitive Level of Questions; Use of Questioning Techniques
Yeşil (2008b)	Quantitative	In-service	Social studies	Observations and evaluation form	Descriptive and inferential analysis	Cognitive Level of Questions; Use of Questioning Techniques
Yılmaz & Gazel (2017)	Qualitative	In-service	Social studies	Question Investigation Form, Semi-structured interviews	Descriptive analysis	Cognitive Level of questions