

Curriculum adaptation and fidelity: A qualitative study on elementary teachers' classroom practices

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The aim of this qualitative case study is to investigate the fidelity to prescribed instructional practices shown by teachers in elementary classrooms. This study, conducted during the 2016-2017 Spring Term, interviewed twenty 1st to 4th grade elementary classroom teachers with reference to the fidelity measures of adherence and adaptation. *NVIVO 11* software was used in data analysis. The results indicated that elementary teachers' fidelity to instructional strategies, methods, and techniques and patterns of adaptation varied according to teacher characteristics, student characteristics and context-based features. Most of the teachers stated that they used direct instruction and drama/roleplay, questioning, and play techniques and methods. Participant teachers said that they tried to use student-centred instruction in their classes, but dissonance existed between their applications and prescribed activities in the curriculum. Teachers felt hindrances to implementation included limited school facilities, lack of time, class sizes, inconsistency between their views on facilitating learning and the curriculum, and disapprobation of some prescribed activities. These reactions of teachers were sometimes based on disagreement with the prescribed curriculum rather than a misconception. This research aims to improve understanding of which instructional practices elementary teachers choose, and raise new questions about how and why teachers make changes to their practices.

Introduction

As long ago as 1958, Hurd stressed the importance of improving the quality of teaching and learning (Hurd, 1958). Since that time, there has been a transformation in classrooms from passive to active learning environments, with the aim of equipping students with lifelong cognitive skills such as critical thinking and problem solving (McCormick, Clark & Raines, 2015). As elsewhere, in Turkey, over the years the main focus of curriculum development has evolved from teacher-centred to student-centred approaches. In the 2004-2005 academic year, basic principles and approaches in elementary education programs changed dramatically in this regard, towards constructivism, active learning, student-centred learning, process-based assessment, analytic thinking, inquiry-based research skills, and achievements according to different student capabilities. Similar changes followed in the secondary education sector in the 2005-2006 academic year (Ministry of National Education in Turkey, 2009).

Teachers as implementers of the curriculum have a vital role in delivering and reflecting innovations in their classrooms. Teachers are not programmed machines for prescribed orders. Likewise, Ayers (1993) posited: "The learning environment is a complex, living reflection of a teacher's values" (p.50). Teachers at this point mainly steer their energy toward the question of how to organise their instruction most effectively in the direction the curriculum requires. What is learned by students might not be the same as that

intended by the designers. Learning experiences or teaching-learning processes are one of the main focuses of teacher training programs, because learning will take place in this dimension. One of the important factors in the effective implementation of teaching and learning activities is that the strategies, methods and techniques to be used are selected and applied in accordance with certain teaching principles. These principles are variously identified in different studies: engagement of learners, application, integration (Merrill, 2002); student background, small steps, feedback, independent practice, monitoring (Rosenshine, 2012); student needs, content organisation, affordability, harmony with real-life context and up-to-date information (Demirel, 2015). In light of these principles, appropriately selected and effectively applied teaching activities play an important role in providing quality learning experiences.

In the highly centralised education system of Turkey, the Ministry of National Education (MoNE) is responsible for almost all decision making process:

Compared with Europe and most of the world, Turkey's public schools have the least autonomy over resources, staff deployment (at the school), textbook selection, allocation of instructional time, and selection of programs offered (Vorkink, 2006, p. 17; as quoted by Öztürk, 2011, p.117).

In elementary school curricula, no methods or techniques were clearly suggested when MoNE (Ministry of National Education) elementary school curricula for various courses were investigated (for instance life sciences, information technology and software, visual arts courses), with the exception of the English language curriculum "drama method" suggestion at elementary level (MoNE, 2018, p.9). Indeed, this gives elementary teachers a kind of flexibility in deciding and choosing the right channels to access their students. At this point, it is also important to note that, in the Turkish education system, foreign language teaching commences at Grade 2 and the course is taught by a foreign language teacher in accordance with the relevant legislation.

Although there are no written official instructional methods and techniques in most of the courses in elementary level, Saygılı (2015) suggested different strategies, methods and techniques for different fields of elementary education in Turkey; for instance, models, question-and-answer sessions, experiments, and educational games in maths education; direct instruction, question-and-answer sessions, school trips, educational games, and projects for life sciences; the 5E model, problem and project-based learning, station technique, jigsaw, brainstorming, and six thinking hats for science education; drama, problem solving, educational games, discussion, inquiry for social sciences.

National literature indicates that most classroom teachers use direct instruction and question-and-answer sessions in their classrooms (Aykaç, 2011; Demir & Özden, 2013; Toptaş, 2012), and this is the case across disciplines: mathematics (Temizöz & Özgün-Koca, 2008); social studies (Çelikkaya & Kuş, 2009); geography (Öztürk, 2004); science and technology (İmrek, Hırça & Coşkun, 2012); and life sciences (Baştopçu, 2018). Baştopçu's (2018) study conducted with 1500 elementary school teachers in Turkey found that teachers mostly used problem solving method, and question and answer

technique, while case study method and six thinking hats were seldom used in classroom contexts.

Many years of research on “creating and maintaining [a] student-friendly learning environment” or “meeting the needs of diverse students” (Arends, Winitzky & Tannenbaum, 1998; Borich, 2011; Holt & Kysilka, 2006; Marzano, 2003; Moore, 2014; Morrison et al., 2010) have arrived at a common point: a single approach or strategy might not be effective for all learners, all the time, under all circumstances. That is why diversified or mixed applications and materials, used correctly and effectively, are of key importance to providing quality learning environments (Borich, 2011). Diversity in teaching environments can provide students with a better understanding of the lesson and foster a positive attitude towards the course (Seferoğlu, 2006; Tomlinson, 2014). To achieve such goals, organising the teaching-learning environment according to appropriate criteria plays a critical role. Well-designed instruction is important, but it is not enough for a complete conversion. In order to fully realise the innovations, fidelity in implementation is a necessity to reduce disparity.

Fidelity

Fidelity is defined as the degree to which teachers and program providers implement programs *as intended by the program developers* (Dane & Schneider, 1998, p. 240). It has been measured in the following ways: (1) adherence to the program; (2) dose; (3) quality of program delivery; (4) participant responsiveness; (5) program differentiation (Dane & Schneider, 1998; Dusenbury, Brannigan, Falco & Hansen, 2003); (6) monitoring of control/comparison conditions; (7) program reach (participation rates, program scope); and (8) adaptation (program modification, reinvention) (Durlak & DuPre, 2008, p. 329).

This study mainly investigates the *adherence* and *adaptation* elements from this list. For Dane and Schneider (1998) and Durlak and DuPre (2008), adherence is the extent to which implementation corresponds to the originally intended program, while adaptation relates to changes made to the original program during implementation. Dusenbury et al. (2003) argued that one of the strategies for assessing adherence is to have teachers self-report on their activities. In such a way, clues are obtained about “how individual teachers interact with, draw on, refer to, and are influenced by material resources designed to guide instruction” (Remillard, 2005, p. 212). Formal (written/planned) and enacted curriculum, that is, the curriculum in use (Ball & Cohen, 1996; Remillard, 2005) or prescribed curriculum and operational curriculum (Dusenbury et al. 2003; Posner, 2004), which are two differently handled terms in the literature, and there is always a disparity between them. In other words, teacher-proof curricula or “pure technologies”, as Dusenbury et al. (2003) argued, do not exist in real-life contexts. In the current study, I prefer to focus on the “enacted or operational curriculum”, in parallel with what Posner (2004) and Remillard (2005) suggested, since it avows an active role to teachers as “curriculum makers” (Craig, Ross, Conle & Richardson, 2008).

In the literature, factors influencing teachers' practice are among the areas of interest in fidelity studies. A degree of adaptation is attributed to many factors, such as teachers' educational beliefs, course content, and student characteristics (Freeman & Porter, 1989; Fullan, 1991; Stodolsky, 1989); teachers' pedagogical content knowledge, perception of the curriculum (Botvin, 2004; Manouchehri & Goodman, 1998; Remillard, 2005); teacher thinking (Fullan, 2007); perceptions of students and tolerance for discomfort (Remillard, 2005); contextual factors (Botvin, 2004; Manouchehri & Goodman, 1998); teacher training and characteristics (Burkhauser & Lesaux, 2017; LaChausse, Clark & Chapple, 2014); teacher morale and burnout, classroom overcrowding, insufficient time, preparation for standardised testing (Botvin, 2004).

Discussing the factors affecting fidelity in the Turkish context, Gelmez-Burakgazi (2019) classified them as:

1. Characteristics of practitioners (teacher training, personal characteristics, program literacy, in-service training programs, attitude, etc.)
2. Characteristics of participants (personal characteristics, readiness, attitude, etc.)
3. Program-oriented features (program coverage, flexibility, duration, etc.)
4. Characteristics of stakeholders (support, attitude, etc.)
5. Contextual features (regional, social, economic, or cultural context, resource / infrastructure possibilities, school physical conditions, centralised education system, etc.).

Research shows that implementations with high levels of fidelity tend to be more effective than those with lower levels (Elliott & Mihalic, 2004; Gresham, Gansle & Noell, 1993). Moreover, there is a relationship between student achievement and fidelity (O'Donnell, 2008). To this end, teachers, as active participants in the teaching and learning process, have a vital mission.

The importance of fidelity with its proved effects is in one hand, however, teachers as the implementers of the curriculum adapt the curriculum by revising, replacing, limiting, truncating and/or adding instructional activities (Blakely et al., 1987). In other words, teachers never deliver lessons exactly as they are written (Dusenbury et al., 2005). Teachers need to have some autonomy over the curriculum across all systems with fidelity checking mechanisms to ensure quality. Discussing the awareness of this topic, Ringwalt et al. (2004) claimed "there is a growing awareness that teachers may be freely adapting classroom curricula" (p.376).

The purpose of the current study is to explore elementary teachers' uses of instructional strategies, methods and techniques, and the perceived effects of their applications in classes. This is a significant issue, because different uses of the curriculum may have different effects on student learning. The aim of the research is to make a significant contribution to the literature by reporting the adherence and the ways of adaptation of a curriculum in a highly centralised education system. Findings of the study are expected to provide information notably to teachers, teacher candidates and researchers about the which contemporary teaching activities Turkish teachers use in their classes, and how and

to what extent. In addition, this research is intended to cast light on ways that elementary teachers use to modify their instruction, and the perceived hindrances to making such modifications. Another motivation for this research is the limited number of studies so far on fidelity of implementation in the social sciences (Dane & Schneider, 1998; Dusenbury, Brannigan, Falco & Hansen, 2003) and the status of fidelity as a fairly new concept in national literature (Gelmez-Burakgazi, 2019).

Accordingly, the research questions for this study are:

1. What are the instructional strategies, methods and techniques that elementary teachers use in their classes?
2. What do elementary teachers report as the effects of their choices on the teaching-learning environment in elementary classrooms?
3. What are the reasons for teacher adaptation?

Method

Design

Qualitative research design is used in this study to measure classroom teachers' use of instructional strategies, methods and techniques, and the aims of their choices. The specific design employed in the study was multiple case study. Yin (2009) defined case study as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, when the boundaries between the phenomenon and context are not clearly evident" (p.18). The design enabled the researcher to understand the phenomenon of how and why classroom teachers use instructional strategies, methods and techniques, as prescribed in the curriculum, in their classrooms in depth. This understanding also encompassed important contextual conditions which is in harmony with the nature of case study design as articulated by Yin (2009).

Data collection tools

Data were collected through interviews and documents. A semi-structured interview form, developed by researcher, was used (Appendix 1). It was based on previous studies and related literature on fidelity, the teaching-learning environment, and instructional practices. The interview questions were reviewed by two experts, one from the Curriculum and Instruction department and the other from the Measurement and Evaluation department. In accordance with the review, two questions were eliminated and a sub-question was added. The interviews focused on the teacher's role in the classroom, teachers' practices in their daily classroom routines, the reason teachers chose their instructional strategies, methods and techniques, and obstacles to instruction (Appendix 1). During individual interviews, each 20-30 minutes long, the researcher encouraged participants, by means of probes and cues, to explain their ideas as broadly as possible.

Apart from interviews, document analysis was also used as a data collection technique. In this context, elementary school curricula were examined through the lens of teaching and

learning processes in order to understand the instructional strategies, methods and techniques they proposed.

Participants

Maximum variation sampling was used in order to recruit the participants. Participants consisted of 20 classroom teachers (14F; 6M), teaching 1st grade (8 teachers), 2nd grade (4 teachers), 3rd grade (4 teachers) and 4th grade (4 teachers) at 11 different public schools in the district of Ankara, Turkey, in the 2016-2017 school year. The teachers' age range was between 28 and 57. Class sizes varied from 18 to 45 in the 2016-2017 Fall semester. The school principals directed the researcher to classroom teachers who had volunteered to participate in the research. During short meetings with the teachers, the researcher introduced the study.

All teachers except the individual given the pseudonym P8 had graduated from relevant departments for their profession. P8 stated that she graduated from the Chemistry Department and then obtained her master's degree in analytical chemistry. P11 was the other teacher with a master's degree, in this case in the field of educational administration and planning. The teachers' professional experience ranged from 4 to 30 years. As Ajjawi and Higgs (2007) explained, "the advantages of this range of experience are the richness in the depth of data obtained and the multiple perspectives illuminating the phenomena" (p. 617). Table 1 in Appendix 2 presents demographic information.

Data collection procedures

Upon receiving the necessary permissions from Ethics Committee at the researcher's home university and the Ministry to conduct the study, the researcher visited the schools in the largest district of Ankara city. Interviews were arranged at convenient times for the researcher and teachers. All interviews were conducted in school contexts.

Data analysis

Content analysis was conducted as explained by Yin (1994): "examining, categorizing, tabulating, or otherwise recombining the evidence to address the initial propositions of a study" (Yin, 1994; p.102). Accordingly, transcripts were carefully read through several times, significant statements were chosen related to the investigated problems, categories and themes were defined and discussed. Through the aforementioned steps, data analysis was facilitated by *NVIVO 11* software. The interviews were transcribed by the researcher totalling 87 pages. Using data-driven (inductive) coding, the open coding lasted until data saturation, codes were continuously organised and themes and codes were formed. Forty-two nodes were gathered during the initial coding of transcripts. In the reduction process, these nodes were clustered into eight categories and two themes, namely: 1) instructional practices in the classrooms; and 2) factors affecting adaptation and reason for teacher adaptation.

To ensure trustworthiness, the researcher transparently described the research process with sufficient details and took steps to demonstrate that findings emerged from the data

(see Table 1 and results section; using pseudonyms such as P1, P2, P3; quotations from participants, etc.). The researcher often supported the findings with representative quotes to reflect the participants' voice as articulated by Creswell (2013). The quotations were translated into English by the author and then reviewed by a language expert in a proof reading phase. All processes were reviewed and discussed with a disinterested PhD graduate from the department of Curriculum and Instruction. Peer debriefing was used to discuss the themes and categories in such a way as to increase internal validity.

Results

Instructional practices in the classrooms

Most of the teachers in the study emphasised their role as facilitators in classroom activities. Further, teachers in the study believed that hands-on activities and experimental learning activities were essential for a better teaching-learning environment. P1 explains how she manages instructional activities in the classroom:

I often use hands-on activities in my classroom. I prefer to be a guide to discovering information rather than giving information directly to students. (P1)

In line with this, elementary teachers in the study preferred student-centred instruction in their classes. However, a dissonance existed between what they believed and what they did in practice. P13, for instance, explained:

I wish it were different. Again teacher-centred, we are the leading part and students are just behind. There are many different methods and techniques that we can introduce in our classes, but I dare say as teachers we take the easy way out, teacher-centred. (P13)

P15, who believed in the importance of active learning environments in the interview, then came up with a totally different idea:

One of the methods that I refer to most often is direct instruction, as it is with every teacher, but I prefer to use other methods and techniques as much as possible and as soon as possible. According to the course, I have tried many methods and techniques, but if you ask which one you use the most, I like to use question and answer to the students to prevent boredom. (P15)

Elementary teachers in the study stated that they tried to engage students in solving real-world problems (P2, P4, P5, P7, P16), guided student practice (all teachers), motivated students (P4, P20) and organised lesson content from known to unknown (P2, P3, P4, P5, P6, P8, P10), simple to complex (P5), or concrete to abstract (P5, P11, P19). Analysis indicated that real life-oriented content organisation (P2, P4, P5, P7, P16) was another approach teachers favoured. P5 explained how she organised classroom activities:

I believe that there are certain things that I consider during teaching. The things I care most about are student readiness, existing knowledge, and beginning activities. Because I think that these three things are important in terms of linking existing information with

the new. You can better discover how you will give students new knowledge when you analyse student readiness and existing knowledge. And once I do that, I feel like student learning is being facilitated.

Highlighting the “whole child”, P6 believed that “a happy child can better learn”. Therefore, in the classroom she tried to add fun elements to the learning environment:

These are small kids. I believe the same is true for older kids. If they are happy, they learn better. To make them happy, I use activities that have the potential to capture their interest in the classroom. I observe they are more motivated and interested this way. They love it, they become happy and I see they learn better in this way.

The results showed that instructional strategies were least mentioned among classroom practices (P3). Elementary teachers mostly cited direct instruction (P5, P7, P11, P17) and drama/role play (P1, P2, P4, P6, P7, P10, P12, P13, P14, P15, P16), and question-and-answer technique (P5, P8, P10, P11, P14, P15, P16, P19) in their classes. Among the other instructional practices mentioned were brainstorming (P8, P15), demonstration (P15, P19), case study (P13, P14), school trips (P16, P19), play (P13) and problem solving (P16). P1 illustrated how she uses role-plays in her class:

For example, while I was teaching vowels and consonants in a Turkish class, children pretended to be a letter and I assigned a duty to them. I believe drama activities like that make learning more permanent. Students are also pleased to handle the content in this way. This is how we process our lessons.

When compulsory courses (1st to 4th grades) are examined in the elementary program (life sciences, mathematics, Turkish, play), it is suggested that the teaching and learning environment should be enriched through the use of various techniques and methods. Elementary teachers in the study also liked the idea of varying their instructional practices; their classroom environments, however, only allowed limited activities. Although teachers believed in the importance of enriching the teaching and learning environment, in real-life contexts they failed to apply this. In contrast to P1, P4, P6, P10, and P18, who diversified their instructional practices, most of the teachers were still following traditional instruction methods. P5 explained that she stuck mainly to direct instruction and question-and-answer techniques in her class. She explained:

As they are in the first class, we are going through a little bit more narration now. While I teach letters, I have to be on the front panel but afterwards I show something as an example. I mostly find myself using the direct instruction method because it is the first grade.

Again contrary to the program's approach to the organisation of teaching and learning environments, this study provides evidence that teachers continue to carry out their courses using traditional methods. In other words, the teachers use their own adaptation in choosing and applying appropriate techniques and methods, and these do not match with the curriculum.

Some of the elementary teachers in the study had misconceptions about their roles in the classroom. For instance, P11 believed his role to be “passive” in the classroom. Another example came from P1, who mentioned from “learning by doing” as “learning by doing teaching method”. Teachers were still up on their thrones, with a mission to “teach” students. Another teacher, P19, said that she believed teachers should be guides in the classroom, and expected just to sit there. However, in the 1st-4th grade elementary programs, a teacher’s role as guide and facilitator is highlighted in the curriculum. Teachers are not given a “sitting role” in the classroom; rather, they must be active observers, motivators, facilitators and guides in the learning process.

For some teachers, divergence of their roles in the classroom might be due to “disagreement” rather than “misconception”. In the curricula, the role of teachers is defined as that of facilitators; however, some of the teachers criticised this prescribed role, on the grounds that they had limited time, crowded classes (P4, P8), curriculum density, and lack of physical conditions (P3, P4, P16) required to facilitate the activities.

Another disagreement related to content and prescribed activities in the curricula. P7 made the following criticism:

It says in the exercise: ‘Make a slogan about the environment’. The child already does not the meaning of a slogan. The child does not know what to do. What does a slogan mean? You are trying to clarify it. The textbooks and exercises have many unlinked, empty points.

P4 mentioned physical conditions: “I could use play but I can’t, because neither our classroom nor the school garden has enough area” while P2 complained about the limited time available to cover the many subjects:

We need to follow the units, and we have only half an hour for each lesson. The last ten minutes students already start to count down to the break. How many activities can I do?
[laughs aloud] (P2)

Underlining the importance of play at early childhood, for P13 students learn better with play: “By play, we try to make activities that will take the attention of children. Learning becomes more permanent. Because they play with enthusiasm.”.

Factors affecting fidelity and reasons for teacher adaptation

In this section, the harmony between theory and practice was assessed by means of interviews and elementary curricula. Elementary teachers reported various perceptions of the instructional practices prescribed in the curricula, with elements that both supported and hindered the fidelity of implementation. We know little so far about how and when teachers adapt implementation. Stodolsky and Grossman (2000) said that all adaptations are not equal. Teachers adapt implementation for different reasons, in different ways and to different degrees. One of the main focuses of the current research was to clarify the reasons behind teacher adaptation.

Results indicated that elementary teachers' use of instructional practices varied for a number of reasons. These reasons included teacher characteristics (such as pedagogical content knowledge), student characteristics (age, student interest, student readiness etc.) (P1, P2, P3, P4, P5, P6, P7, P8, P10, P13, P14, P15, P16, P17, P18, P19, P20), context-based factors (culture, class size, school facilities [laboratory, library, classroom space, equipment, materials], etc.) (P3, P4, P5, P6, P8, P11, P13, P14, P16) and content-based features (P7, P8, P19, P20).

Student characteristics were one of the main elements influencing teacher fidelity. In this study, elementary teachers highlighted student age, interest and readiness. In the data analysis, all these categories came under the "student characteristic" theme. P3 explained in the following way:

Because I think that these three things are important in terms of linking new information with the old. You can better discover the level of readiness of students and then find out what their old learning is and how to give them new knowledge or to their levels. And once I do that, I think that learning becomes easier.

On this point, P17 used a chain metaphor in student learning.

Students' readiness and qualified background knowledge are like links in a chain which are connected to each other. If one is broken, we cannot go further and problems emerges.

Along the same lines as P3 and P17, P5 explained that the main ground on which she based her instructional practices was student levels, because the levels of individual learning, the intelligence and the personalities of students can be very different. For P8, student differences even existed depending on whether students had pre-school education.

Context-based factors also influenced teachers' fidelity. Teachers felt hindrances to implementation, including limited school facilities (laboratory, library, classroom space, equipment, materials, etc.), limited time, class sizes, inconsistency between their own views on facilitating student learning and what was prescribed in the curriculum, and disapprobation of some of the prescribed activities. For P3, double-shift schooling was a disadvantage when it came to using different materials in the classroom. She explained this in the following way: "In fact, we want to use a lot of different materials, but because it is a double-shift school, you cannot see the material that you put in the class the next day". Class size was another obstacle. The teachers participating in the study were all aware of students' needs; however, large class sizes affected instruction. From P4:

Our class size is over the Turkey average. I got used to it [being] pretty crowded, luckily the average is below the district average. I know each student with individual interest. For example, when I give homework, if I go to check their homework, my class is already over, so there are deficiencies in this subject. Because the class is crowded, I cannot consider the levels of interest too much. For example, one student understands

from a picture, another student listens, another student understands by living. But I cannot do any of these things for 43 students. For this reason, I try to explain what students can understand in general, at least making the instruction in an active way [encouraging them] to participate in class activities and motivating them by giving them the sense of success where they are successful.

In parallel with P4, P17 criticised the large class sizes he had. He further explained that he mainly used direct instruction in his class due to the large class size.

Teachers' pedagogical knowledge was another result of the study which also points to curriculum literacy, or "illiteracy". One of the most surprising results was that teachers in the study did not refer to the formal curriculum except for P6, P10, and P14. Textbooks were also mostly applied documents for some teachers (e.g. P10, P14) while P9 criticised textbook-based instruction as it was limiting the organisation of the teaching and learning environment and not helping effective learning. Further, when teachers were asked about the principles on which they grounded their instruction, or strategies, methods, and techniques, P2, P6, and P8 needed further explanation of the concepts. These teachers had 10, 12 and 37 years experience in teaching respectively. On this point, the seniority of the teachers who responded was noticeable. The other teachers did not want to discuss their existing knowledge, but they had serious misconceptions about the concepts.

On the other hand, some of the teachers complained about the content load and prescribed activities in the curricula. Time limitation was a hinder in implementing the formal content and teachers admitted that they sometimes changed (P7, P8, P19, P20), partially applied (P7, P8) or omitted (P19, P20) some content.

Every classroom had a unique atmosphere. Teachers had some strategies to solve the problems they met in their unique classrooms. For instance, P4 mentioned that they did not have a smart board in her classroom. She said they used their personal computers instead to have the benefits of videos in the educational environment. For P8, class size was a problem. She explained she used a U-shaped seating plan to make a more interactive space. However, for P4 the class size was an unmanageable problem when it came to instruction. During our interview, she said she wanted to have a class with a U shape, similar to those in colleges. She illustrated her strategies for dealing with this problem in the following quotation:

I am trying to use visual stimuli; in this case, trying to make use of presentations, trying to make use of videos. If I see that they [the students] are bored of watching videos, I say 'so let's turn it off'. 'Let's write a bit, let me explain a little bit, I'll tell you a story, listen to it, let's play a game about it'. Their attention span is short because they focus on something for a while and they get bored of it easily. (...) We can do something together with the materials that we bring. Group work is a little hard to do. So sometimes I try to work in a group, but it is a bit difficult because it is very difficult to create that group in the class, they are hard to fit in order. That's it. Sometimes we play in a role play, the children sometimes play a game, sometimes they play a drama, like a sketch, or tell a story; for example, if a plant grows, the plants are presented to the peers in the class. (P4)

In contrast to P4, P8 and P17, for P9 large class size was not a problem at all, as he instructed classes of 40-50 students during his 20-year teaching career. One unexpected result of the study was the discovery of materials made by the elementary teachers themselves (P5, P8) alongside other common materials such as an abacus or beans in the class.

As a material, I am doing [it] myself to reinforce the subject. When I feel like the kids would learn something better by means of different materials, at that moment I am making the material myself. For example, let's say I teach the letters in the alphabet. I'm preparing something like a bingo game. At the beginning, we are putting a pouch here [and] we are trying to read the word on the bingo card in front of the word. In such a way, students develop attention to such materials, as I am using the materials to teach the figures again. We even use dough to build letters and numbers (P5).

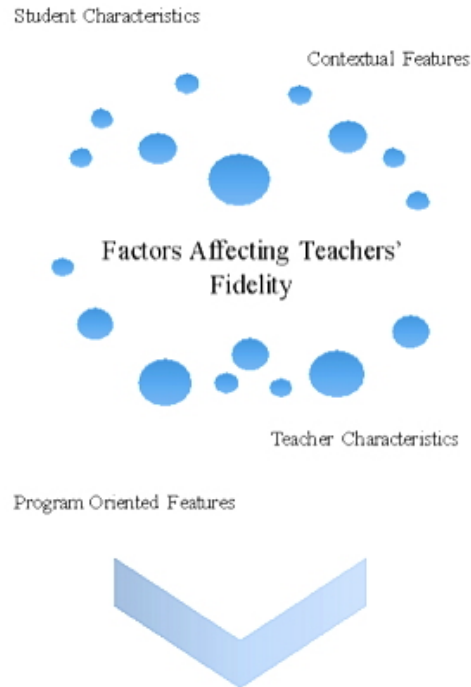
Figure 1 indicates teachers' instructional practices with fidelity affecting factors. (See next page.)

Discussion

There exists a reciprocal relationship between adaptation and fidelity. Sustainable curriculum decisions require some qualified adaptation over the curriculum all around the world with fidelity checking mechanisms to ensure quality. Given the fact that Turkey has a highly centralised education system, the degree of adaptation possible in the classroom is limited. Centralisation forces teachers to obey a prescribed curriculum, and the curriculum control policy in Turkey is strict. "However, teachers rarely implement curriculum materials precisely as written". (Yazıcılar & Bümen, 2019, p.583). Successful implementation depends on a program which is executed almost as it was designed. While the main focus of this research is fidelity, the researcher does not intend to neglect the importance of teacher's own modifications and adaptations of the curriculum. As observed by Remillard (2005), "While examining how teachers understand and use particular features of curriculum materials is certainly valuable, the evidence suggests that a written curriculum cannot fully capture or represent teaching" (p.236). It is known that a difference always exist between 'prescribed curriculum' and 'operational curriculum', as defined by Posner (2004) and Dusenbury et al. (2003). Research shows there is a "lack of fidelity in the implementation of school programs" (Dusenbury et al., 2003, p. 239), and the current study also supports this claim. All teachers had made several adaptations in the instructional practices they used.

First of all, analysis indicated that most of the adaptations teachers made were intentional. Teachers in the study supported meaningful adaptation as articulated by Schwille et al. (1983). The quality of these adaptations might be further investigated through "professional discretion" lenses in line with what Boote (2007) suggested. The factors affecting program adherence and adaptations in this research were mainly connected with characteristics of teachers, characteristics of participants, program-oriented features, and contextual features, as discussed by Gelmez-Burakgazi (2019).

Teacher characteristics was an important element affecting reasons behind teacher adaptation. In this research, teacher experience was not a decisive element in the patterns of adaptation, in contrast to Burkhauser and Lesaux's (2017) study. Data from recent research have demonstrated the relationship between teacher characteristics and teacher training (LaChausse, Clark & Chapple, 2014). In their research, LaChausse, Clark and Chapple (2014) discussed the effect of a new model of comprehensive teacher training



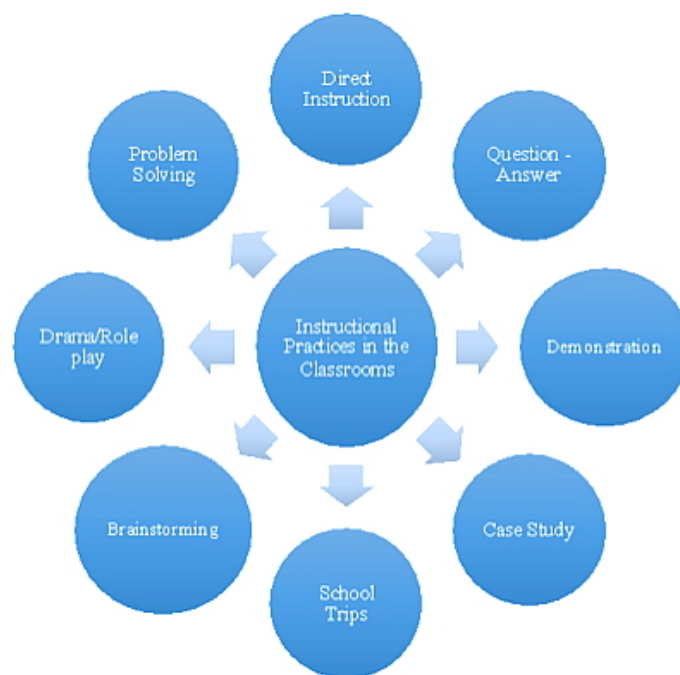


Figure 1: Teachers' instructional practices under the effect of several factors and support for implementing a program with fidelity and quality. In this relationship, teacher characteristics can be enhanced during teacher training.

Teachers in this study were illiterate about strategies, methods and techniques. Many teachers in the study needed further explanation on the meaning of instructional practices, regardless of their professional experience or academic background. During the interviews, it was clear that they confused the different concepts and sometimes had difficulty in naming them correctly. Moreover, teachers had misconceptions about their roles in the classroom. Indeed, several studies indicated the link between teacher training and quality in teaching and learning environment (eg. Wolf & Peele, 2019). Fullan (1993) stated "it is the teachers who are responsible for passing on the changes through their teaching to their students". If teachers do not thoroughly know and internalise the curriculum approach, philosophy, and principles, they cannot reflect them.

Surprisingly, teachers' reactions were sometimes based on disagreement with the prescribed curriculum rather than a misconception. Here, this result was directly underlining teacher beliefs. Likewise the literature says, beliefs affect teaching and learning processes (Kagan, 1992; Pajares, 1992). Teachers' beliefs in the effectiveness of a program have also tended to increase their fidelity (Little, Sussman, Sun & Rohrbach, 2013).

Program-oriented features were another point that mattered to teachers' fidelity. Although teachers are often forced to meet academic and policy responsibilities in Turkey's

centralised education system, content features, class sizes and time were among the mostly cited elements affecting fidelity in this research, as Botvin (2004) also noted.

Student differences were one of the fundamental factors influencing teachers' choices in the area of instructional activities. This finding was also confirming previous studies (Burkhauser & Lesaux, 2017; Gelmez-Burakgazi, 2019; Yazıcılar & Bümen, 2019). Considerable research on this subject has shown that the more teachers monitor student differences, the better they are able to meet the needs of students in an enhanced learning environment (Arends, 2014; Biggs, 1999; Felder & Brent, 2005). For Biggs (1999), "the teacher's job is then to organize the teaching/learning context so that all students are more likely to use the higher order learning processes" (p.57). With this aim, the elementary teachers included in this study gave importance to practice and hands-on activities in their classes. As Chase and Simon (1973) stressed, "practice is the major independent variable in the acquisition of skill" (p. 279). Moreover, teachers in this study believed in the importance of student-centred activities guided by teachers in their classrooms. This approach is in line with what Demirel (2015) and Rosenshine (2012) suggested among principles of instruction: "Student-centred activities, student needs, guiding students and independent practice." Teachers in this study were not, however, able to make use of a wide array of instructional practices. In other words, teachers believed but could not practice, for some reasons, that could be further investigated in future studies.

In addition to student differences, contextual features were among the most criticised aspects. Limited facilities might also be considered a factor decreasing the likelihood of the curriculum being implemented with fidelity. Some of the schools in the study even had no computers or laboratories. Lacks such as these were one of the perceived hurdles for elementary teachers choosing appropriate methods or techniques in their classes.

Elementary teachers believed in the importance of rich instructional practices in classroom environments, in accord with findings by Kerkez et al. (2015) and Borich (2011). However, the teachers failed to engage in these practices in the real world. In other words, elementary teachers in this study seemed to apply limited methods and techniques in their "one-size-fits- all" classrooms. One of the most interesting findings was that not one of the teachers mentioned mind maps, projects or cooperative learning. School trips were only mentioned once. On the other hand, almost all courses at the elementary level supported these activities, particularly when it came to subjects like the life sciences (Aykaç, 2011). Elementary teachers in the study mostly used direct instruction and question-and-answer techniques, in line with the findings of previous studies (Aykaç, 2011; Demir & Özden, 2013; Toptaş, 2012). Unlike the other studies, however, participant teachers here used role play and drama in their classrooms. This finding was also not supporting Baştopçu's (2018) report that elementary teachers mostly used problem solving method, and question and answer technique in their classrooms. However, Toptaş (2007) discussed educational role plays enabling students to participate in a more active way. Conversely, the direct instruction method resulted in limited achievement in students' learning (Toptaş, 2007). Play was another educational activity in

junior primary (Jay & Knaus, 2018), however only a few teachers referred to games or play in educational environments.

Well-organised instruction is usually profitable in several ways: time, effort, cost; and as stated by Ornstein and Hunkins (2017), “effective implementation does not occur without serious planning” (p.282). However, none of the teachers in this study mentioned using plans (daily, unit, year, etc.) or teacher guide books in designing their classes. Several instructional practices are discussed in the teacher guide books. Only a few teachers mentioned reading the curriculum.

Conclusion

To sum up, the central finding of this study was a lack of fidelity in the implementation of school programs, as was concluded also by Dusenbury et al. (2003). The nature and degree of adaptation depended on the various factors discussed above.

The results of this study indicate that well-organised and grounded pre-service and in-service training are important. To begin with pre-service elementary teacher education, currently, there is no curriculum specific course in elementary teacher education program (HEC, 2018), but in *General Competencies for Teaching Profession* (HEC, 2016) there are several curriculum specific competencies (e.g. She/he has a good knowledge of the curriculum and pedagogical content knowledge of her/his subject area). It is important to note that teachers should be educated through their curriculum which underlines the importance of the curriculum based courses (curriculum development, curriculum evaluation, curriculum literacy etc.). These courses should be enriched with various practicum opportunities to provide “curriculum maker” teachers who understand the nature of the curriculum, components, different approaches to curriculum, planning and organisation of their instruction, and so on.

Secondly, when designing in-service teacher training—and this is what the author means by ‘grounded’ in the earlier sentences—elementary teachers’ needs should be inquired about, as was discussed by Ornstein and Hunkins (2017). Next, those needs should be addressed, perhaps alongside some unmentioned but modern and active practices that can enrich and support teacher practices. As McLeod, Fisher and Hoover (2003) commented, teachers are themselves responsible for deciding on appropriate materials and strategies for advancing their instruction. Micro-teaching might be an effective practical method in both contexts for obtaining greater benefits and feedback. Theory is better mastered when persons practice it. LaChausse, Clark and Chapple (2014) argued this in the following way:

... the literature on teacher training suggests that teachers can learn about the program theory, key content, and mechanics of delivery during face-to-face workshops, but mastery of the skills and comfort required for teaching is achieved only when teachers have opportunities for practice, followed by feedback on the practice. (p.56)

It is important to note that, by means of in-service teacher training the author does not refer to “one-shot” teacher training events. These may be limited in addressing teachers’

facilitation skills compared with a consistent and comprehensive professional development program (LaChausse, Clark & Chapple, 2014). In such programs, teachers should become well-informed about the philosophical and pedagogical underpinnings of the curriculum, the logic behind curriculum change (if any) to meet teacher beliefs, and teacher knowledge and skills. Teachers who participate in such professional development had a tendency to adapt their instruction (Stodolsky & Grossman, 2000).

In suggested follow-ups for in-service teacher training programs, teacher fidelity might also be measured and followed. In order to do that, new-era mobile apps might be used in classroom contexts (e.g. Law, Dutt & Neihart, 2019).

Curriculum evaluation and development processes are highlighted again within the findings of this research. In order to prevent "teacher disagreement", strengthen the role of the curriculum, and enhance teaching and learning, curriculum should be designed in such a way as to provide teachers with detailed instructional practices.

This study contributes further support to the importance of implementation fidelity in a global context. As this is still a recent concept in national literature, both pre-service and in-service teacher education programs should allocate a place to this subject, especially in a country like Turkey with a centralised education system. Teaching is an ever changing profession, always requiring renewal. Both teachers and teacher candidates should be open to following and meeting the needs of a changing world.

With regard to future research, factors affecting teachers' fidelity could be further explored using mixed methods research designs, including observation, teacher diaries and interviews to complement quantitative surveys.

References

- Ajjawi, R. & Higgs, J. (2007). Using hermeneutic phenomenology to investigate how experienced practitioners learn to communicate clinical reasoning. *The Qualitative Report*, 12(4), 612-638. <http://www.nova.edu/ssss/QR/QR12-4/ajjawi.pdf>
- Arends, R., Winitzky, N. & Tannenbaum, M. D. (1998). *Exploring teaching*. NY: McGraw-Hill.
- Arends, R. (2014). *Learning to teach*. NY: McGraw-Hill.
- Aykaç, N. (2011). Hayat bilgisi öğretim programında kullanılan yöntem ve tekniklerin öğretmen görüşlerine göre değerlendirilmesi (Sinop ili örneği). [Teachers' views on the evaluation of the methods and techniques used in life sciences curriculum (Case of Sinop)]. *Kastamonu Education Journal*, 19(1), 113-126. <https://dergipark.org.tr/en/download/article-file/817550>
- Baştopçu, G. (2018). Sınıf öğretmenlerinin eleştirel düşünme becerisini kazandırmaya yönelik uyguladıkları yöntem, teknik ve etkinliklerin kullanımının incelenmesi [*The analysis of methods, techniques and activities used by elementary school teachers' intended to acquire critical thinking ability.*] Unpublished Masters thesis, Gaziantep University, Turkey.

- Biggs, J. (1999). What the student does: Teaching for enhanced learning. *Higher Education Research & Development*, 18(1), 57-75. <https://doi.org/10.1080/0729436990180105>
- Blakely, C. H., Mayer, J. P., Gottschalk, R. G., Schmitt, N., Davidson, W. S., Roitman, D. B. & Emshoff, J. G. (1987). The fidelity-adaptation debate: Implications for the implementation of public sector social programs. *American Journal of Community Psychology*, 15(3), 253-268. https://link.springer.com/chapter/10.1007/978-1-4419-8646-7_10
- Boote, D. N. (2006). Teachers' professional discretion and the curricula. *Teachers and Teaching: Theory and practice*, 12(4), 461-478. <https://doi.org/10.1080/13450600600644319>
- Borich, G. D. (2011). *Effective teaching methods: Research-based practice*. NY: Pearson Education. [9th ed.] <https://www.pearson.com/us/higher-education/program/Borich-Effective-Teaching-Methods-Research-Based-Practice-Enhanced-Pearson-e-Text-with-Loose-Leaf-Version-Access-Card-Package-9th-Edition/PGM14957.html>
- Botvin, G. J. (2004). Advancing prevention science and practice: Challenges, critical issues, and future directions. *Prevention Science*, 5(1), 69-72. <https://doi.org/10.1023/B:PREV.0000013984.83251.8b>
- Burkhauser, M. A. & Lesaux, N. K. (2017). Exercising a bounded autonomy: Novice and experienced teachers' adaptations to curriculum materials in an age of accountability. *Journal of Curriculum Studies*, 49(3), 291-312. <https://doi.org/10.1080/00220272.2015.1088065>
- Çelikkaya, T. & Kuş, Z. (2009). Sosyal bilgiler öğretmenlerinin kullandıkları yöntem ve teknikler [Instructional methods and techniques used by social sciences teachers]. *Uludağ University Journal of Education Faculty*, 22(2). <http://openaccess.ahievran.edu.tr/xmlui/handle/20.500.12513/131#sthash.Oto3TLdZ.dpbs>
- Chase, W. G. & Simon, H. A. (1973). The mind's eye in chess. In W. G. Chase (Ed.), *Visual information processing*. (pp.215-281). NY: Academic Press. <https://doi.org/10.1016/B978-0-12-170150-5.50011-1>
- Colaizzi, P. (1978). Psychological research as a phenomenologist views it. In R. Valle, S. & M. King (Eds), *Existential phenomenological alternatives for psychology*. Open University Press: New York.
- Craig, C. J., Ross, V., Conle, C. & Richardson, V. (2008). Cultivating the image of teachers as curriculum makers. In F. M. Connelly, M. F. He & J. Phillion (Eds), *The SAGE handbook of curriculum and instruction*. SAGE Publications. (pp. 282-305) <https://doi.org/10.4135/9781412976572.n14>
- Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks, CA: Sage.
- Dane, A. V. & Schneider, B. H. (1998). Program integrity in primary and early secondary prevention: Are implementation effects out of control? *Clinical Psychology Review*, 18(1), 23-45. [https://doi.org/10.1016/S0272-7358\(97\)00043-3](https://doi.org/10.1016/S0272-7358(97)00043-3)
- Demirel, Ö. (2015). Eğitimde program geliştirme: Kuramdan uygulamaya. [*Curriculum development in education: From theory to practice*.] Ankara: PegemA.
- Demir, S. & Özden, S. (2013). Sınıf öğretmenlerinin öğretimsel stratejilere yöntemlere ve tekniklere ilişkin görüşleri: Hayat bilgisi dersine yönelik tanılayıcı bir çalışma. [Views of elementary school teachers on the instructional strategies, methods, and techniques: A diagnostic study on life sciences course.] *Pamukkale University Institute of Social Sciences*

- Journal*, 14, 59-75.
http://www.journalagent.com/pausbed/pdfs/PAUSBED_6_14_59_75.pdf
- Durlak, J. A. & DuPre, E. P. (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation. *American Journal of Community Psychology*, 41, 327-350.
<https://doi.org/10.1007/s10464-008-9165-0>
- Dusenbury, L., Brannigan, R., Falco, M. & Hansen, W. B. (2003). A review of research on fidelity of implementation: Implications for drug abuse prevention in school settings. *Health Education Research*, 18(2), 237-256. <https://doi.org/10.1093/her/18.2.237>
- Elliott, D. S. & Mihalic, S. (2004). Issues in disseminating and replicating effective prevention programs. *Prevention Science*, 5(1), 47-53.
<https://doi.org/10.1023/B:PREV.0000013981.28071.52>
- Felder, R. M. & Brent, R. (2005). Understanding student differences. *Journal of Engineering Education*, 94(1), 57-72. <https://doi.org/10.1002/j.2168-9830.2005.tb00829.x>
- Freeman, D. J. & Porter, A. C. (1989). Do textbooks dictate the content of mathematics instruction in elementary schools? *American Educational Research Journal*, 26(3), 403-421.
<https://doi.org/10.3102/00028312026003403>
- Fullan, M. (1993). *Change forces: Probing the depth of educational reform*. London: Palmer Press.
- Fullan, M. (2007). *The new meaning of educational change* (4th ed.). New York: Teachers College Press.
- Gelmez-Burakgazi, S. (2019a). Programa bağlılık: Kara kutuyu aralamak [Curriculum fidelity: Opening the black box]. *Baskent University Journal of Education*, 6(2), 236-249.
<http://buje.baskent.edu.tr/index.php/buje/article/view/189/141>
- Gresham, F. M., Gansle, K. A. & Noell, G. H. (1993). Treatment integrity in applied behavior analysis with children. *Journal of Applied Behavior Analysis*, 26(2), 257-263.
<https://doi.org/10.1901/jaba.1993.26-257>
- HEC (2016). *General competencies for teaching profession*.
http://oygm.meb.gov.tr/meb_iys_dosyalar/2018_06/29111119_TeachersGeneralCompetencies.pdf
- HEC (2018). *Elementary teacher education program*.
https://www.yok.gov.tr/Documents/Kurumsal/egitim_ogretim_dairesi/Yeni-Ogretmen-Yetistirme-Lisans-Programlari/Sinif_Ogretmenligi_Lisans_Programi09042019.pdf
- Holt, L. C. & Kysilka, M. L. (2006). *Instructional patterns: Strategies for maximizing student learning*. NY: SAGE. <https://au.sagepub.com/en-gb/oc/instructional-patterns/book225932>
- Hurd, P. D. (1958). Science literacy: Its meaning for American schools. *Educational Leadership*, 16(1), 13-16, 52.
http://www.ascd.org/ASCD/pdf/journals/ed_lead/el_195810_hurd.pdf
- Jay, J. A. & Knaus, M. (2018). Embedding play-based learning into junior primary (Year 1 and 2) curriculum in WA. *Australian Journal of Teacher Education*, 43(1).
<https://doi.org/10.14221/ajte.2018v43n1.7>
- LaChausse, R. G., Clark, K. R. & Chapple, S. (2014). Beyond teacher training: The critical role of professional development in maintaining curriculum fidelity. *Journal of Adolescent Health*, 54(3), S53-S58. <https://doi.org/10.1016/j.jadohealth.2013.12.029>
- Law, G. C., Dutt, A. & Neihart, M. (2019). Increasing intervention fidelity among special education teachers for autism intervention: A pilot study of utilizing a mobile-app-

- enabled training program. *Research in Autism Spectrum Disorders*, 67, 101411.
<https://doi.org/10.1016/j.rasd.2019.101411>
- Little, M. A., Sussman, S., Sun, P. & Rohrbach, L. A. (2013). The effects of implementation fidelity in the Towards No Drug Abuse dissemination trial. *Health Education*, 113(4), 281-296. <https://doi.org/10.1108/09654281311329231>
- Manouchehri, A. & Goodman, T. (1998). Mathematics curriculum reform and teachers: Understanding the connections. *The Journal of Educational Research*, 92(1), 27-41.
<https://doi.org/10.1080/00220679809597573>
- Marzano, R. J. (2003). *What works in schools: Translating research into action*. NY: ASCD.
<http://www.ascd.org/publications/books/102271.aspx>
- McCormick, N. J., Clark, L. M. & Raines, J. M. (2015). Engaging students in critical thinking and problem solving: A brief review of the literature. *Journal of Studies in Education*, 5(4), 100-113.
<http://www.macrothink.org/journal/index.php/jse/article/viewFile/8249/6802>
- McLeod, J., Fisher, J. & Hoover, G. (2003). *The key elements of classroom management: Managing time and space, student behavior, and instructional strategies*. NY: ASCD.
<http://www.ascd.org/Publications/Books/Overview/The-Key-Elements-of-Classroom-Management.aspx>
- Merrill, M. D. (2002). First principles of instruction. *Educational Technology Research and Development*, 50(3), 43-59. <https://doi.org/10.1007/BF02505024>
- Moore, K. D. (2014). *Effective instructional strategies: From theory to practice*. NY: SAGE.
<https://au.sagepub.com/en-gb/oc/effective-instructional-strategies/book241098>
- MoNE (2018). *English language curriculum*.
<http://mufredat.meb.gov.tr/ProgramDetay.aspx?PID=327>
- Morrison, G. R., Ross, S. M., Kemp, J. E. & Kalman, H. (2010). *Designing effective instruction*. NY: John Wiley & Sons. [8th ed.] <https://www.wiley.com/en-au/Designing+Effective+Instruction,+8th+Edition-p-9781119465935>
- National Research Council (1997). *Science teaching reconsidered: A handbook*. Washington DC: National Academies Press.
<https://www.nap.edu/catalog/5287/science-teaching-reconsidered-a-handbook>
- O'Donnell, C. L. (2008). Defining, conceptualizing, and measuring fidelity of implementation and its relationship to outcomes in K-12 curriculum intervention research. *Review of Educational Research*, 78(1), 33-84.
<https://doi.org/10.3102/0034654307313793>
- Ornstein, A. C. & Hunkins, F. P. (2017). *Curriculum: Foundations, principles and issues* (7th ed.). Pearson Education Limited: USA.
http://kefad.ahievran.edu.tr/InstitutionArchiveFiles/f44778c7-ad4a-e711-80ef-00224d68272d/d1a3a581-af4a-e711-80ef-00224d68272d/Cilt5Sayi2/JKEF_5_2_2004_75_83.pdf
- Öztürk, Ç. (2004). Ortaöğretim coğrafya öğretmenlerinin öğretim yöntem ve teknikleri kullanabilme yeterlilikleri [The qualifications of secondary school geography teachers' use of instructional methods and techniques].. *Abi Evran University Kırşehir Journal of Educational Studies*, 5(2).
http://kefad.ahievran.edu.tr/InstitutionArchiveFiles/f44778c7-ad4a-e711-80ef-00224d68272d/d1a3a581-af4a-e711-80ef-00224d68272d/Cilt5Sayi2/JKEF_5_2_2004_75_83.pdf

- Öztürk, İ.H. (2011). Curriculum reform and teacher autonomy in Turkey: The case of the history teaching. *International Journal of Instruction*, 4(2), 113-128.
<https://files.eric.ed.gov/fulltext/ED522675.pdf>
- Posner, G. J. (2004). *Analyzing the curriculum*. Boston: McGraw Hill.
- Remillard, J. T. (2005). Examining key concepts in research on teachers' use of mathematics curricula. *Review of Educational Research*, 75(2), 211-246.
<https://doi.org/10.3102/00346543075002211>
- Ringwalt, C. L., Ennett, S., Johnson, R., Rohrbach, L. A., Simons-Rudolph, A., Vincus, A. & Thorne, J. (2003). Factors associated with fidelity to substance use prevention curriculum guides in the nation's middle schools. *Health Education and Behavior*, 30(3), 375-391. <https://doi.org/10.1177/1090198103030003010>
- Rosenshine, B. (2012). Principles of instruction: Research-based strategies that all teachers should know. *American Educator*, 36(1), 12-19, 39.
<https://www.aft.org/sites/default/files/periodicals/Rosenshine.pdf>
- Saygılı, G. (2015). İlkokulda kullanılan strateji, yöntem ve teknikler [*Strategies, methods and techniques in the primary education*]. Ankara: Pegem Academy.
- Schwille, J., Porter, A., Belli, G., Floden, R., Freeman, D., Knappen, L., ... & Schmidt, W. (1983). Teachers as policy brokers in the content of elementary school mathematics. In L. S. Shulman & G. Sykes (Eds.), *Handbook of teaching and policy*, 370-391. New York: Longman.
- Seferoğlu, G. (2006). Teacher candidates' reflections on some components of a pre-service English teacher education program in Turkey. *Journal of Education for Teaching*, 32(4), 369-378. <https://doi.org/10.1080/02607470600981953>
- Şimşek, H., Hırça, N. & Coşkun, S. (2012). İlköğretim fen ve teknoloji öğretmenlerinin öğretim yöntem ve tekniklerini tercih ve uygulama düzeyleri: Şanlıurfa ili örneği [Primary science and technology teachers' selection of using teaching methods and techniques and the levels of their applications]. *Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 9(18), 249-268.
<https://dergipark.org.tr/en/pub/mkusbed/issue/19552/208334>
- Stodolsky, S. S. (1989). Is teaching really by the book? In P. Jackson & S. Haroutunian-Gordon (Eds), *From Socrates to software: The teachers as text and the text as teacher*, pp.159-184. Chicago: University of Chicago Press.
- Stodolsky, S. S. & Grossman, P. L. (2000). Changing students, changing teaching. *Teachers College Record*, 102(1), 125-172.
<https://www.tcrecord.org/Content.asp?ContentId=10443>
- Temizöz, Y. & Özgün-Koca, S. A. (2008). Matematik öğretmenlerinin kullandıkları öğretim yöntemleri ve buluş yoluyla öğrenme yaklaşımı konusundaki görüşleri [The instructional methods that mathematics teachers use and their perceptions on the discovery approach]. *Eğitim ve Bilim*, 33(149), 89-103.
<http://egitimvebilim.ted.org.tr/index.php/EB/article/view/643/115>
- Toptaş, V. (2007). *İlköğretim matematik dersi (1-5) öğretim programında yer alan 1. sınıf geometri öğrenme alanı öğrenme-öğretme sürecinin incelenmesi [The examination of learning-teaching process of the first grade geometry learning field as indicated in the elementary mathematics (1-5) curriculum]*. Unpublished PhD Dissertation, Gazi University, Ankara.

- Toptaş, V. (2012). Elementary school teachers' opinions on instructional methods used in mathematics classes. *Education and Science*, 37(166), 116-128.
<https://pdfs.semanticscholar.org/dc6c/fec19da69fcbec73e067d7db40d5c64fd95c.pdf>
- Vorkink, A. (2006). Education reform and employment: Remarks delivered at Istanbul Chamber of Commerce. [viewed at <http://go.worldbank.org/TPKEOECXI0>; not found 4 June 2020; see Öztürk, 2011]
- Wolf, S. & Peele, M. E. (2019). Examining sustained impacts of two teacher professional development programs on professional well-being and classroom practices. *Teaching and Teacher Education*, 86, 102873. <https://doi.org/10.1016/j.tate.2019.07.003>
- Yazıcılar, Ü. & Bümen, N. T. (2019). Crossing over the brick wall: Adapting the curriculum as a way out. *Issues in Educational Research*, 29(2), 503-609.
<http://www.iier.org.au/iier29/yazicilar.pdf>
- Yin, R. K. (2009). *Case study research: Design and methods* (4th ed.). Thousand Oaks, CA: SAGE.

Appendix 1: Interview form

Dear Teacher,

I would like to interview with you about your instruction, uses of instructional strategies, methods and techniques, and the perceived effects of your applications in classes. I would like to record the interview with your permission. You have the right to withdraw from the interview at any time. We can delete the record as you wish. The interview will last around 20-30 minutes. I will not use your own name or identity while reporting the results and this interview will be only used for scientific purposes. Do you have any questions? If you are ready, let's begin the interview.

Part 1: Demographic data

Could you please tell me about your:

Teaching experience (how many years have you been teaching?);

Educational background;

School / student profile (e.g. SES, school facilities etc.);

Grade level you already teach;

Class size.

Part 2

1. How do you plan your instruction?
 - 1.1. What kind of educational activities do you use in your classes?
 - 1.2. What kind of educational materials do you use in your classes?
2. What instructional strategies, methods and techniques do you use in your classes? Why do you use them? Do you think is there any alternative way to better the instruction? Why do you think so?
3. How would you like to be taught a subject you first encountered?
 Prompt:

- a. Planning
 - b. Organisation
 - c. Assessment
- 3.1. Why do you think so?
4. Is there anything you would like to add?

Thank you for your time and consideration.

Appendix 2: Demographic profiles of the teacher participants

	Age	Gender	Grade	Educ. background	Years experience
P1	28	F	4	FE	5
P2	49	F	1	FE	28
P3	36	F	1	FE	13
P4	28	F	4	FE	8
P5	35	F	1	FE	13
P6	50	F	2	FE	29
P7	46	F	2	FE	22
P8	42	F	1	FAS	20
P9	57	M	4	FE	38
P10	48	F	3	FE	30
P11	38	M	3	FE	16
P12	43	F	1	FE	22
P13	47	F	1	FE	22
P14	36	F	1	FE	13
P15	39	F	1	FE	17
P16	50	M	4	FE	24
P17	29	M	2	FE	3
P18	47	F	3	FE	21
P19	50	M	2	FEAS	32
P20	34	M	3	FE	12

Notes: FE: Faculty of Education

FAS: Faculty of Arts and Sciences

FEAS: Faculty of Economics and Administrative Sciences

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Please cite as: Gelmez Burakgazi, S. (2020). Curriculum adaptation and fidelity: A qualitative study on elementary teachers' classroom practices. *Issues in Educational Research*, 30(3), 920-942. <http://www.iier.org.au/iier30/gelmez-burakgazi.pdf>