# Crossing over the brick wall: Adapting the curriculum as a way out

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This study focuses on curriculum adaptation in Turkey where the school system is highly centralised, high schools are quite hierarchical, regional differences are intense, and a single, renewed curriculum is put into practice in all types of high schools that enrol students via high-stakes tests, unlike the Western context. Specifically, this multiple case study examines how and why five high school mathematics teachers in different types of Turkish rural high schools adapted the state-mandated curriculum. Interviews, observations, and documents were used to look for patterns and causes of adaptation. Findings revealed that although teachers do not disclose it in their plan, due to their lack of autonomy, they adapt the curriculum according to the perceived needs and attributes of students to cross over the 'brick wall' built by the Ministry of Education. Also, all the teachers use the same adaptation patterns that are 'omitting'; 'creating'; 'replacing'; 'changing the amount of time'; 'superficial teaching'; and 'using different sources/materials'. The reasons for adaptation and commonly used patterns are related to the perceived student profile, regulations, and nation-wide high-stakes tests. Consequently, suggestions are made to ensure curriculum does not end up as just written documents, and to prevent high-stakes tests from steering the instruction.

## Introduction

In many countries, after curriculum is determined at the national or state, regional/school level, teachers are expected to implement it effectively. However, teachers rarely implement curriculum materials precisely as written. Curriculum adaptation portrays the way that teachers 'tweak' the curriculum. 'Tweaking the curriculum defined by teachers are ways curriculum is perceived to be adapted to create a "good program" with "what works in the classroom and what doesn't".' (Meidl & Meidl, 2011, p.16).

From an international perspective, continents and countries differ in how they develop and carry out curriculum work and national policy (Hopmann, 2003). Some countries (still) have a prescriptive national curriculum (e.g. France, China, Singapore, Korea, and Japan) or are re-emphasising prescription (e.g. England). Others (like Finland, Estonia, Hungary, Scotland, United States, Netherlands, Russia, Australia, and Brazil) have a national core curriculum that can - and is expected to - be shaped at local, governing board or school levels (Kuiper & Berkvens, 2013). The variety observed among countries brings up diversity based on national context and cultural factors in curriculum implementation.

In the United States (USA), there has been an agreement on teacher characteristics and school settings that moderate curriculum implementations by determining the patterns of curricular adaptation (i.e. Burkhauser & Lesaux, 2017; Drake & Sherin, 2006). However, does it happen the same way in other countries, as well? Recent studies show that

philosophies and cultures affect the implemented curriculum in a complicated or indirect way (Lui & Leung, 2013; Pepin, Gueudet & Trouche, 2013). National cultural traditions and philosophies have strongly influenced teaching and learning.

In the USA, literature teachers' approaches to curriculum implementation have been categorised as curriculum fidelity, curriculum enactment and curriculum adaptation (Snyder, Bolin & Zumwalt, 1992). The fidelity approach reflects Tyler's classical model (Tyler, 1949) that specified objectives, content and means for achieving and assessing pre-determined learning outcomes. This 'transmission' model limits teacher autonomy and empowerment by limiting their role in curriculum decision-making processes. The second approach, curriculum enactment, sets curriculum as a process 'jointly created and jointly and individually experienced by students and teacher' (Snyder, et al., 1992, p.428). Curriculum change is a process of growth for teachers and students, a change in thinking and practice. Moreover, curriculum knowledge is ongoing constructions out of 'the enacted experiences that students and teachers create' rather than a product (Snyder, et.al. 1992, p.410). The last approach, curriculum adaptation, is defined as the applications where changes and adjustments are made within the institutions, along with the renewed curriculum (Marsh & Willis, 2007).

Unlike the USA experience, it has been found that no Turkish study focuses specifically on curriculum adaptation. In the well-regarded study by Ko□ ar Altınyelken (2013), the patterns and reasons for adaptation were not investigated, even though there was in-depth explaining why teachers showed principled resistance to curriculum change. Tokgöz (2013) investigated how centralised curriculum is transformed in classrooms and found that the participating teachers did not reveal curriculum enactment approaches, whilst some tended to have curriculum fidelity and curriculum adaptation approaches. Thus, we think that the terminology which is categorised in the USA as curriculum enactment (Snyder, et.al. 1992) does not exist in Turkey. Tokgöz explained this finding with the centralised curriculum structure of Turkey's educational system by stating 'since teachers have no autonomy in developing the curriculum considering the school and class context in Turkey, it is not surprising that curriculum enactment approach did not come into the practice' (2013, p.197).

In spite of the large amount of research regarding implementation of mathematics curricular reform in general (e.g. Pepin et al. 2013; Lui & Leung, 2013; Xu, 2013), there is still a need for more knowledge concerning the adaptation of mathematics curriculum in different cultures, especially in highly centralised school systems. Teachers in countries with centralised education systems have a greater need for adaptation due to the fact that there is less tolerating of making changes to the curriculum. Hence, understanding how and why curriculum adaptations are made in countries with centralised educational systems becomes crucial. This study explores how and why mathematics teachers working at different types of high schools in Turkey make adaptations to the state-mandated curriculum. Anderson-Levitt (2008) stated that national and local cultures powerfully affect the enacted curriculum. Consequently, this study provides new patterns and reasons for adaptation in a highly centralised curriculum tradition as a producer of the collective perception of peoples and cultures.

The aim of this study, which has been the first one conducted in Turkey on this topic, is to explore the curriculum adaptation patterns of teachers on the basis of the high school mathematics curriculum renewed in 2013. The questions explored are as follows:

1. Why do mathematics teachers adapt the curriculum?
2. How do mathematics teachers adapt the curriculum?
3. How do teachers' curriculum adaptations differ across school types?

Identifying how teachers adapt the new curriculum to their own schools and classes might be beneficial for taking precautions to ensure that the changes made are not in vain, and for providing adaptation options for teachers. We expect that our findings will provide significant information to all stakeholders in the process, especially teachers. The (new) adaptation patterns and variations discovered in the study can be a guide for discussions of new curriculum in countries with centralised school systems. In addition, the implications of quite a hierarchical schooling and high stakes tests can provide a new perspective from the Eastern Mediterranean to curriculum studies. Inasmuch as Turkey is trying to be a Muslim, secular and democratic republic at the same time, it has a unique context by alternating between the East and the West. In light of these findings, curriculum scholars from different countries may develop a deeper and better understanding of why and how curricular adaptations are made in different cultures/contexts.

## Literature review

Brooks (1991) summarised the messages that state-mandated curriculum and tests gave years ago as follows: (1) curriculum development is not your responsibility; (2) testing drives instruction; (3) it's more important to cover materials than to learn it; (4) minimum competence is the desired outcome; (5) we don't trust you; (6) past effectiveness does not matter; and (7) more and sooner and quicker and tougher is better. Thus, there is a connection between curriculum control, teacher autonomy and curriculum adaptations (Bümen, 2019). From a governance perspective, when teacher autonomy decreases the curriculum is output based, external control of products is important (Hopmann, 2003) and teachers are expected to faithfully implement the curriculum (Westbury, 2000). At this point, curriculum adaptation or how it is adapted loses its significance. For instance, in Turkey, the school administration and the inspectors expect full implementation of the curriculum by the teachers and teachers have restricted autonomy in the determination of the content of the teaching activities (Öztürk, 2011). Therefore, the findings have a significant role in understanding the relations among curriculum control, teacher autonomy and curriculum adaptation in a local context.

Comparing two teachers who participated in Remillard's study (1999), it was found that they both read completely different parts of the textbook and read these parts for different purposes. Sherin and Drake (2009) documented the ways in which ten teachers read, evaluated, and adapted mathematics curriculum materials. They identified three distinct patterns in how teachers read materials: overview, attention to details and for both

(Drake & Sherin, 2009). Burkhauser & Lesaux (2017) compared six middle school English teachers' adaptations to curriculum materials. They found that all teachers adapted the curriculum, most often in response to either perceived student needs or district reform pressures. Besides, within classrooms, teachers' decisions about how to enact a curriculum may be influenced by students' instructional needs (Allen, Matthews, & Parsons, 2013). Teachers may be influenced by scheduling pressures or by the availability of professional supports at the school-level (Valencia et al., 2006). These studies reiterated the notion that teachers read curriculum materials differently, identified specific patterns in that reading, and found that patterns can change.

When Turkish studies are considered, it becomes apparent that there is no study on curriculum adaptation and the relevant studies have not gone beyond collecting teachers' responses to the curriculum (Çetin, 2012; Kaya, Çetin & Yıldırım, 2012; Ko□ ar Altınyelken, 2013; Tokgöz, 2013). Although these studies explain the obstacles met in implementing curriculum, they fail to indicate how teachers adapt it according to school, region or class and what the teachers' patterns of adaptation are.

The levels of autonomy of schools and teachers in Turkey are very low (Öztürk, 2011; 2012; Tokgöz, 2013), many accountability practices were below satisfactory levels (Bülbül & Demirpolat, 2014), and the quality difference among schools may be very large (Ministry of Development [MoD], 2014). '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.14). Therefore, it can be said that teachers are faced with a responsibility for rendering the curriculum appropriate to local needs.

Besides, the outcomes or impacts of the renewed curriculum are rarely made public by the Ministry of National Education (MoNE); and another renewal process is often carried out without sufficiently providing rationale. For instance, the mathematics curriculum discussed in this study has been renewed four times since 2005. At this point, the question 'how is the curriculum implemented?' arises. The studies show that renewing curricula does not guarantee the renewal of class and teacher behaviours (e. g. Ko□ ar Altınyelken, 2013; Çelik, 2012; Öztürk, 2012). Therefore, understanding how teachers adapt to the new curriculum also becomes crucial.

The new mathematics curriculum that MoNE put into practice in 2013 was prepared to be implemented in all six types of high schools (MoNE, 2013). However, these types of high schools are quite hierarchical in terms of students, teachers, parents and success (Polat, 2014). Therefore, centralisation has been causing high school mathematics curriculum to fail to answer to the needs of different types of high schools and students. When this situation becomes combined with the nation-wide high stakes tests conducted at grades 8 and 12, the implementation of this curriculum tends to become chaotic.

## Method

### Study context

The high school mathematics curriculum discussed in this study has last been revised in 2013. The data collection for this study was made during the second year of implementation. When the 9th-grade mathematics curriculum (MoNE, 2013) is examined, only learning domains, units, objectives assigned to each topic and timing can be seen. Objectives for each topic are stated in detail. No examples have been provided in terms of activities pertaining to learning and teaching processes, source/materials, or alternative measurement techniques. Therefore, the adaptation processes of teachers have only been observable within the specified extent (objectives and content).

MoNE does not prepare teacher guidebooks for high schools as it does for middle schools. Therefore, as stated in the directives laid out by MoNE in 2005, for subjects that do not have a guidebook, teachers are supposed to prepare and implement lesson plans. Since the teachers who took part in this study had not prepared daily plans, only yearly plans have been available for analysis.

The cases are four different types of high school (pseudonyms used): the Anatolian High School (AHS), the Vocational School of Health (VSH), the Vocational High School (VHS) and the Multi-Program High School (MPHS). While VSH trains qualified health personnel, VHS is the high school where education fields like computer, electrical, mechanical technologies and furniture decoration are provided. MPHS are those that also include child development, sick/elderly care, special education and mapping departments. Students are placed into all of these high schools according to their scores on national high stakes tests. The high school that receives the students with the highest scores and the one that has the highest rate of students to be placed at universities later on is AHS, with VSH, VHS and lastly MPHS following. The AHS was the largest school, with over 22 classes, 43 teachers and 580 students. The second one, VSH, had 13 classes, 28 teachers and 430 students. Although the academic success of students in this school is not as high as the AHS, they have been considered the most successful one among vocational high schools. VHS comes third with 14 classes, 34 teachers and 261 students. Student ability varied and their academic competence was lower than AHS and VSH. Finally, MPHS had the lowest student profile among the cases, with 19 classes, 35 teachers and 350 students. Although there was a sharp contrast between the four schools in size, background, academic standard of students and availability of resources, all adopted the national standard mathematics curriculum. While the multiple case study could not be projected statistically to represent all schools in Turkey, the four rural schools selected might nevertheless be taken as indicative of how the mathematics curriculum is adapted in the central Aegean region of Anatolia.

### Participating teachers

Since the aim of the study was to examine in detail the variations among teachers in their curriculum adaptation in different types of high schools in rural areas, multiple case study

was chosen as the reseach design. The study group consisted of five volunteers who were mathematics teachers teaching ninth grade in AHS, VHS, VSH and MPHS in E□me district of the province of U□ak (Table 1).

Table 1: Demographic profiles of sample teachers

| Teachers* | Years of teaching | Gender | Type of school** |
|---|---|---|---|
| Adem | 4 | Male | MPHS |
| Bulut | 15 | Male | AHS |
| Canan | 5 | Female | MPHS |
| Deniz | 35 | Male | VHS |
| Ege | 2 | Female | VSH |

* Pseudonyms

** MPHS: Multi-Program High School; AHS: Anatolian High School; VHS: Vocational High School; VSH: Vocational School of Health (pseudonyms were created by the authors)

## Data sources

We used multiple measures to look for evidence of adaptations and why teachers made adaptations.

## Teacher interviews

Since it was surmised during the informal interviews made before data collection that participant teachers improvised the adaptations, in order to provide awareness, interviews were made before observations. After the interview form template was revised by the second author, who has conducted many qualitative studies, it was tested by four pilot interviews. After the first three, adjustments were made to the order of questions, and the number of questions was reduced. Detailed information about the interview form is provided in Appendix 1. Interviews were conducted and recorded in Turkish and then transcribed. Each teacher participated in a 25-40 minute interview during the spring semester of the 2014-2015 academic year. Each teacher was interviewed once, during the teachers' free time in the teachers' room or in an empty classroom. No interviews were made during break times or the lunch hour.

## Observations

In order for the observation form to be put together, first, the literature (Drake & Sherin, 2006; Meidl & Meidl, 2011; Öztürk, 2012; Sherin & Drake, 2004; 2009; Remillard, 1999; 2005) was thoroughly studied, the aim and scope of the observation specified. A flexible code list was prepared for the possible variables that might be observed within the specified scope. After the draft form was revised by the second author, who has previous observation experience, it was tested in two teachers' classrooms. Following the pilot observation, missing points were amended and the second observation made. Taking into account the events of the pilot observations, the observation form was finalised (see Appendix 2). Before observations started, the first author explained the general aim of

observation to the teachers, and the teachers explained to their students. Observations were realised in a nonparticipant style (Bogdan & Biklen, 1992; Creswell, 2014).

During the observations, along with the observation form, the yearly plan of the teachers was also used (see Appendix 3a, 3b). The subject, objectives and timing specified in the plan for that week were noted on the observation form. This way, it was rendered possible for the planned and the implemented to be reflected on the form. Since observations through video recording are perceived as inspections by Turkish teachers, they are rarely agreed to. As the teachers in this study have also stated their unease about video recording, there was only note-taking. Each participant teacher was observed for a total of four hours.

### Documents

Before observations, with the permission of the participant teachers, their yearly plans and unit meeting minutes (see Appendix 4a, 4b, 4c) were acquired. As mentioned above, yearly plans are prepared based on the mathematics curriculum. The unit meeting minutes are official documents that reflect the decisions made by the teachers after getting together at the beginning of the academic year to specify their planning and principles regarding the implementation of the curriculum. The decisions stated in this document make the teachers' implementation process official. These documents have been used to identify possible curriculum adaptations not specified in the yearly plans.

### Data analyses

The analysis of the qualitative data was done at the end of the study, after the whole data set was obtained, as suggested by Bogdan & Biklen (1992). In the first step, voice records, interview notes and observation notes were transcribed, and interview notes were coded. In the coding process, points not present in the literature were noted and draft codes obtained. During the coding of observation notes, all adaptations from each lesson were identified by comparing with the written description of the lesson outlined in the teachers' yearly plan prepared according to the curriculum. Coding began by assigning names that matched the code list obtained from the literature. Thus initial codes reflected the literature suggestions (Drake & Sherin, 2006; Sherin & Drake, 2004) matters with respect to the teachers' patterns of adaptations (e.g. omit, create and replace). Additionally, new codes that did not fit into any of these three categories were discovered upon the examination of the interview and observation notes (e.g. changing the amount of time, superficial teaching and using different sources/materials). Also, the first author looked for evidence of teachers' rationales for making adaptations.

In the final step, to determine the internal validity of the study, the first author triangulated the data (Creswell, 2014; Yin, 2003), looking for evidence across multiple methods including interview notes, observation notes and documents. In this step, the first author mostly examined the participant teachers following the plans, and teachers' decisions reflected in their instruction process, by comparing data obtained from documents and observations. For analysis of the third research question, adaptation

differences between school types were examined based on findings from documents and observations. The second author checked whole themes, codes and sub-codes in terms of research questions. In order to avoid ethical problems, participants were given names beginning with A, B, C, D and E. Moreover, the names of the participating schools have been anonymised, only the school types being specified.

In order to ensure the external validity and external reliability of the study, detailed notifications were made at every stage of the study. In the method section, model of the study, the study group and its features, how data collection tools were developed and implemented, how data collection and analysis processes were carried out and the stages involved were explained in detail. In addition, as Creswell (2014) emphasised, the more experience there is of participants in their environments, the more valid and correct the findings will be. In the case of this study, the time period occupied was close to four months.

## Findings

### RQ1: Why do mathematics teachers adapt the curriculum?

According to the participant teachers, an increasing difference between what is anticipated in the curriculum and their own teaching process is inevitable, and the major factor giving rise to this difference is an incompatibility between perceived student profile and the content. The content of the yearly plans prepared by the teachers is almost completely transferred from the curriculum. Even though the yearly plans laid out in line with the curriculum are subject to variations during the teaching process, these changes are not put in writing on the plans. Teachers attribute the reason for this practice to the compulsory regulations and inspection. The teachers, who claim that this situation restricts teacher autonomy and prevents the adaptations from being put into writing, have been implementing one curriculum on paper, and a different one in practice. Although the participant teachers have avoided putting these adaptations in the written plan, in practice, they have not neglected their school or student profiles.

### RQ2: How do mathematics teachers adapt the curriculum?

The study of 'patterns of adaptation' has revealed six main types. These are 'omitting', 'creating', 'replacing', 'covering superficially', 'using different sources/materials', and 'changing the allocated time'.

*Omitting*
All participant teachers maintain that all the subjects included in the curriculum must be taught. Yet, in light of the data obtained through interviews and observations, it has been discovered that the 'omitting' adaptation pattern manifests sometimes as 'omitting objectives' and sometimes as 'omitting content':

> …of course I am supposed to teach them as parabolic graphs but I am not going to go into detail only to confuse them. Because there is no background. If I

> spend time on that, then I cannot give these kids what they really need to learn. As I believe that they will be difficult for students, I just omit them myself. (Interview recording, Adem)

The use of the omitting pattern by teachers stems from the fact that the prior knowledge of students is insufficient for the topics included in the curriculum. Therefore, participant teachers have put the topics in the curriculum through a sifting process based on high stakes tests. For the topics not included in these tests, the tendency of teachers was toward 'omitting'.

*Creating*

The second adaptation pattern looked into is 'creating', which essentially implies 'creating content'. This is due to the fact that, as a result of examination of participant teachers' creating patterns, it has been found that they only resort to this pattern in terms of content. Since they do not form any new objectives other than the ones already included in the curriculum, the adaptation pattern of creating objectives is not being used. As no activity sample or material is presented in the curriculum, lessons usually take place in a question and answer model.

The data obtained through interviews and observations reveal that participant teachers use the 'creating content' adaptation pattern in two ways. The first is 'in-depth teaching' where teachers 'add content' to enhance the skills and enrich the learning of the students, and the second is 're-teaching', where the teachers have to supplement for students' lacking prior knowledge.

> … Students could not solve the equation in the question. At the end of the question the need to find the square root of a number which was not a whole number rose. Students got confused. The teacher stopped to explain the square roots. He could not help but supplement insufficient knowledge of students. Students said that they wanted to solve one more example and the teacher obliged. (Observation record, 06.04.2015, Deniz)

> … in the case of equations, when for example, something is inevitably missing, you cannot just omit that and continue because the kid will not understand. They have trouble with + and – signs in equations and operation steps or with exponential numbers... there are problems, for example, with sets; I have to [re]cover them. (Interview recording, Bulut)

> After the exam, general mistakes will be identified and by providing preparatory exercises on failed topics, re-teaching will be ensured. (Unit meeting minutes, 19.09.2014, Adem)

Teachers also consider the needs of students as well as the level of prior knowledge. At this point, high stakes tests are considered. Therefore, in order both to make their teaching more efficient and to present different types of questions on the content, they tend to use 'in-depth teaching' more often.

> Let's look at the question on the board. This is a question from previous university exams, she said, and wrote another question on the board. She formed the question by modelling edge relation and absolute value. She explained the relationship between the two. (Observation recording, 28.04.2015, Ege)

*Replacing*

Teachers believe that the order of topics in the curriculum can be altered to enable students to achieve more efficient learning, and they tend to exhibit flexibility on this matter. This has caused participant teachers to use the 'replacing' adaptation pattern. Even though they use this pattern, they do not relay this on their plans; they cite the topics in the order specified in the curriculum. During the lessons, teachers have made some impromptu changes in response to students' wishes and changed the order of the objectives. Among the observed teachers, only Ege has changed the order of learning domains. Believing that the order specified in the curriculum would cause him to lose time while teaching mathematical concepts and that this would lead to misconceptions, Ege has re-ordered the learning domains. He believes that this way, the lessons will be more productive for the students.

*Covering superficially*

With the 'superficial covering' adaptation pattern, teachers lighten the subject according to their level of prior knowledge and prefer to solve problems that are less complex. In other words, the rationale behind the use of this pattern is the students' insufficient prior knowledge.

> For some topics, especially those that are complex and difficult to understand, due to the level of students, I make some changes in the types of problems that I solve. We cannot solve too difficult problems in these classes. Just enough to provide the basics… for example, I have solved 20 examples for the Pythagorean theorem but only one example for the exterior angle bisector theorem, just to make sure that they have it in their notebooks. (Interview recording, Canan)

Some of the participating teachers, especially Adem, Bulut and Canan, believed that no matter how much they teach the topics suggested in the curriculum, the students will not learn. Therefore, it has been found that instead of omitting a certain topic, objective or learning domain suggested in the curriculum, teachers choose to simplify said components according to the lower level of the student profile. Teachers, deeming topics not included in high stakes tests unnecessary and insignificant, tend to allocate less time for these topics than suggested in the curriculum, and hence the yearly plans, and just cover these points superficially.

*Using different sources/materials*

In Turkey, MoNE has started to prepare course books, workbooks and teacher guidebooks issued free to elementary schools in 2003, and to secondary schools in 2006. According to the circular issued in 2014 (MoNE, 2014), use of any extra sources/materials outside those distributed by the MoNE has been prohibited. The 9th-grade mathematics

book is also prepared by the MoNE and sent to every type of school. However, teachers have not been using the book suggested by the MoNE, instead turning to different sources. This has led to the creation of another adaptation pattern other than those mentioned in the literature: omit, create and replace, either to use different material other than the one suggested in the curriculum, or to make learning more efficient by teachers who believe that the sources suggested by the MoNE are insufficient.

> Actually, I think that the books distributed by the MoNE are insufficient in terms of exercises. And of course we have a fact as the university exam [high stakes tests]. It is impossible to make do with the exercises in this textbook and prepare them for the exam. (Interview recording, Bulut)

*Changing the allocated time*

The fact that detailed information is given on timing in the curriculum inevitably focuses on teachers' adaptation to timing. As adaptations to timing are commonly detected in observation, interview and documentary data, it has been considered that this can be explored as a different category than the ones already in the literature (Sherin & Drake, 2005; 2009; Drake & Sherin, 2006). The teachers have stated openly that they adapt the allocated times in the curriculum according to their needs and that they sometimes increase, and sometimes decrease the time periods suggested in the curriculum:

> I make changes in the timing. I do it for the topics that will be of use to them. We have a trigonometric ratio, for example, and it has been given 6 hours; I am going to decrease that. Because they will not use it much. But the similarity is important, for example. If it is 12 hours, I can make that 18. I use my own discretion. (Interview recording, Ege)

As is seen, if students' prior knowledge of a topic in the curriculum is insufficient, teachers cover the topic superficially and thus decrease the time allocated, or they increase the time and supplement the prior knowledge. The main reason forcing teachers to use these adaptation patterns is the topics that will 'be of use' to the students, as mentioned in Ege's interview notes, that is, topics that are measured in high stakes tests.

### RQ 3: How do teachers' curriculum adaptations differ across high school types?

In the yearly plans acquired for this study from the teachers working at different high schools, all the topics in the curriculum are included. However, in practice, it has been observed that almost all types of adaptation are used by the teachers working at different high school types. The real difference is in terms of why, how often and to what extent these adaptations are made. Therefore, in order to understand the data on this sub-question, it is necessary to look into these differences. According to the collected data, what creates this difference is the perceived student profile in the high schools (Figure 1).

As can be seen in Figure 1, teachers' aims for adaptation and the types used are based on student profiles. At schools like MPHS and VHS, where students are less successful and less interested in mathematics, teachers cannot teach the mathematics lesson as suggested

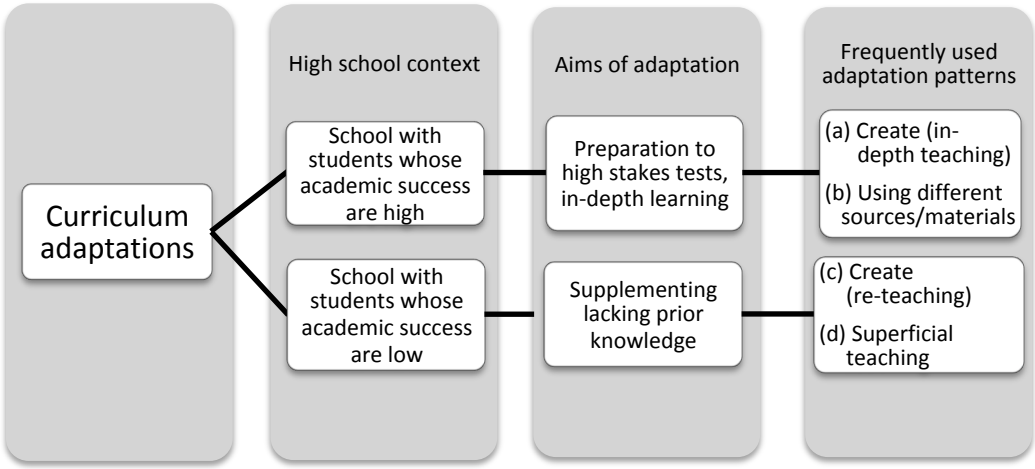


Figure 1: Variations in curriculum adaptations in different high school contexts

in the curriculum; they tend to re-teach some topics that they include in the lesson according to the needs of the students; they make adaptations to the allocated times to create time for these; and they go over some topics superficially. For example, it has been found that Canan, who works at MPHS, has allocated nearly all of the first month to supplement the students' lack of prior knowledge according to the results of the diagnostic assessment she performed before teaching, and after that, has tried to meet the requirements of the curriculum. Students' lack of prior knowledge is a common occurrence at these schools. Therefore, teachers working at VHS and MPHS tend mostly to use the re-teaching adaptation pattern, and superficial covering is done in almost every topic at these high schools.

It has been found that teachers at the AHS and VSH, where the success levels and student interest in mathematics lessons are higher, tend to go into detail while teaching the topics suggested in the curriculum, create content and expand the teaching with different examples in order to further the level of the students and especially to prepare them for the high stakes tests. Therefore, it is clear that the difference between the reasons and frequency for adaptation for teachers working at different schools stems from the perceived student profiles. For example, every participant teacher in this study has used the 'creating' adaptation pattern. However, while teachers at AHS and VSH used the 'creating' adaptation pattern in order to deepen the knowledge of their students, teachers at MPHS and VHS used it more in response to students' lack of prior knowledge of the students. Similarly, MPHS teachers Adem and Canan used the 'omitting' adaptation pattern more frequently than other participant teachers, because the levels of content and objectives in the curriculum were too high for their students. Bulut, working at AHS where there are more successful students, used the 'omitting' adaptation pattern relatively less often.

> … I went to the Anatolian High School (AHS). The students are sharp as a needle. But at vocational high schools, they have trouble. What I see most is that they do not even know the multiplication table… now, in such a place, it is really difficult to get them to grasp derivatives, integrals, functions, limit. We look at what we can get from this profile and make adaptations according to that. (Interview recording, Deniz)

## Discussion and implications

Even though participant teachers seem to be conforming to the requirements of the official curriculum, they have been adapting the curriculum according to perceived student profiles and needs. Interestingly, they have not clearly indicated these adaptations in their yearly plans. They associated these adaptations with compulsory regulations and inspection; therefore, they have been implementing one curriculum on paper and a different one in practice. Since Turkey has the most highly centralised educational system of any OECD member state (Çelik, Gümü & Gür, 2017; Fretwell & Wheeler, 2001), fearing the consequences of implementing the curriculum differently, teachers do not feel autonomous. Moreover, the fact that the curriculum does not include any guidance for teachers in terms of different school types and student profiles indicates a need for some pointers to be used by teachers in adaptation. Öztürk (2012) also emphasised the need for concrete guidelines for the adaptation of the general framework determined by the educational authority and for the teachers to become a part of the curriculum development process in the adaptation stage. Therefore, it is believed that in countries which have a highly centralised government, teachers need much more support with curriculum adaptations that will meet the needs of different student profiles.

In studies conducted in the US and China, adaptation patterns used by teachers have been classified as omitting, creating/inventing, adjusting, revising, supplementing and replacing (Drake & Sherin, 2006; Sherin & Drake, 2004, 2009; Li & Harfitt, 2017, Bernard, 2017). In our study, participant teachers have resorted to additional adaptation patterns; covering superficially; changing the allocated time; and using different sources/materials. This finding extends previous work on adaptation patterns. In order to find out if these new adaptation patterns are particular to Turkey, it might be beneficial to have similar research from other countries.

It can be presumed that the new adaptation patterns detected in this study are related to the highly centralised education system, regulations, quite hierarchical high schools and nation-wide high stakes tests in Turkey. Since students are accepted into high schools via nation-wide high stakes tests, the difference in levels of success among schools and regions can be quite high (Berbero lu & Kalender, 2005). However, these schools are obligated to use the same state-mandated, standard curriculum. Besides, other nation-wide high stakes tests are conducted after high school for acceptance to the university. This situation creates pressure on all stakeholders (teachers, students, school administrations, whole society, etc.) and leads to the narrowing of the curriculum according to the knowledge and skills measured in the tests. Teachers, who feel that they have to follow the state-mandated curriculum, prepare their students for the nation-wide tests, and consider

the student profile in their teaching process all at the same time, might have produced new solutions (new adaptation patterns) that differ from the adaptation patterns found in the Western context.

It has been observed that the adaptation patterns identified in this study are mostly concerned with 'content and timing'. This stems in part from the fact that the high school mathematics curriculum includes only the elements of objectives, content and time. The fact that detailed explanations are made in the curriculum regarding timing inevitably influences teachers' focus of adaptation and this situation, different from similar studies (Sherin & Drake, 2004; 2009; Drake & Sherin, 2006), results in a different adaptation pattern under the name for 'changing the allocated time'. The adaptation patterns which focus on 'content and timing' also indicate that teacher autonomy is limited to the content and timing elements of the curriculum. This confirms previous findings that in Turkey, teacher autonomy is limited (Öztürk, 2011; 2012) and that adaptations cannot go beyond the point of changing the order of the content in the curriculum (Çelik, 2012). Due to the fact that the curriculum is developed and published in a centralised, standardised fashion, and that teachers are public employees, it is highly unlikely for them to feel autonomous. Therefore, it can be predicted that in countries with a highly centralised education system, curriculum adaptations get stuck in between content and timing, instead of focusing on instructional activities and assessment.

The variations of common adaptation patterns and the reasons for adaptation seem to be related to perceived student profiles and nation-wide high stakes tests. Looney (2009) asserted that teachers lean toward the behaviour of teaching the content of the questions included in high stakes tests and that this is supported by school administrations. It is also emphasised that students' acquisition of the basic skills outlined in the curriculum is overlooked and that teaching has turned into a concept which focuses on instilling the habit of question-solving. Burkhauser and Lesaux (2017) also professed that teachers experience great frustration while on the one hand, they try to catch up to local standards in order to prepare the students for the tests they have to take, and on the other, they try to implement the curriculum. As is seen, even though high stakes testing is an indication in determining the quality of the education, it is not effective in shaping the teaching (Donlevy, 2000). The fact that nation-wide high stakes tests directly affect instruction, in other words, that the curriculum is narrowed down according to the tests, has been argued widely by researchers in Turkey (e.g. Ko□ar Altınyelken, 2013; Kumanda□ & Kutlu, 2015; Öztürk, 2012; Öztürk Akar, 2014). Although a study has not been conducted in Turkey specifically on curriculum adaptation, Ko□ar Altınyelken (2013) and Özgeldi (2012) stresses that teachers resort to other sources instead of the course book published by the MoNE (in other words, practise the using different source/material adaptation pattern) in order to prepare students for the tests.

In our study, teachers attempted to answer the question 'What will my students understand?' before instruction. Therefore, by focusing on student learning, they push teacher learning to the background. According to Sherin and Drake (2004), this shows that teachers do not view the curriculum as a source for their own learning or planning and adapting their instruction. The point emphasised here, actually, is that adapting the

curriculum requires a deeper understanding and the teacher needs to have the qualifications necessary for realising this understanding. In this context, in order for the teachers to participate efficiently in reform efforts, they need to be provided with the opportunity to adapt these reforms to their own conditions and classes. To this end, policymakers must view teachers not as technicians who will do as they are told but as experts who can build implementation plans in accordance with the aims of the reform, and increase their autonomy. It is also constructive to improve teachers' curriculum adaptation skills via professional development programs. Therefore, job-embedded and long term professional development activities which aim to improve pedagogical design capacity (Beyer & Davis, 2012) and to enrich adaptation skills must be organised. Similarly, activities aimed at furthering teachers' pedagogical design capacity must be considered in pre-service education.

## Conclusions

In contrast to the Western context, this study contributes to the field as it reveals how adaptation patterns vary in Turkey, where the school system is highly centralised, high schools are quite hierarchical, regional differences are intense, the curriculum is often renewed, and a single curriculum is put into practice in all types of high schools. Findings revealed that although teachers do not disclose it in their plans due to their lack of autonomy, they adapt the curriculum according to the perceived needs and attributes of students to 'cross over the brick wall' built by the Ministry of Education. It has been found that the observed adaptation patterns were 'omitting', 'creating', 'replacing', 'covering superficially', 'using different sources/materials', and 'changing the allocated time'. Since the last three of these are patterns that have not been detected in previous studies, this finding extends previous work on adaptation patterns. In addition, in high schools where there are high numbers of students with low academic success, adaptations are put into practice as supplements for students who lack prior knowledge (creating/re-teaching), while in high schools with higher levels of academically successful students, the reason behind adaptations is to carry them further along (creating/in-depth teaching) and to prepare them for high-stakes tests. These findings also contribute to the field in terms of school settings that affect curriculum adaptation.

Comparative case studies of the implemented mathematics curriculum (Lui & Leung, 2013; Pepin et al., 2013) show that educational and cultural traditions influenced and 'weaved their ways' from the policy level, through the textbooks to the classroom level and curriculum implementation. It has been acknowledged that what happens in mathematics classrooms is influenced by a country's visions, aims and goals, expressed in national curricular materials. From an international perspective, this study has confirmed again that national cultural traditions and philosophies have strongly influenced mathematics teaching and learning in classrooms.

The data collected in this study suggests that the messages Brooks (1991) mentioned have been fully received by teachers. Participant teachers do not put their adaptations in writing due to their feeling of lack of autonomy, they consider student profiles, regulations and high-stakes tests in their adaptations, and they focus mostly on 'content and timing'. Since

the centralisation of curriculum is not a remedy for what ails education (Brooks, 1991), Turkey and other countries with a similar context must reconsider decentralisation. However, the present state of local governments, the legal framework, geographical, cultural and social features indicate that Turkey's conditions are not ready for decentralisation in education (Papadopoulou & Yirci, 2013). If the transition to decentralisation in Turkey is not going to occur in the short term, different curricula must be developed for different high school types so that the curriculum will not be just a written piece of paper. Otherwise, high-stakes tests will keep dominating instruction, and teachers will continue adapting the curriculum informally to cope with perceived dead-ends of the educational system.

### Limitations and future research

While this study was able to capture how and why a small sample of rural high school mathematics teachers made adaptations to a state-mandated curriculum, there are necessarily important limitations and directions for further research. Specifically, as Burkhauser and Lesaux (2017) mentioned, to date we have not studied empirically the effect of particular types of adaptations on student outcomes. Moreover, it is not known whether the adaptation patterns not detected previously are relevant in other highly centralised countries. In this context, the variation of adaptation patterns as teacher autonomy and educational equity increases, and the adaptation patterns in countries that give less weight to high-stakes tests should be investigated through further studies. Whether teachers in other centralised countries clearly display the adaptations they have used, the adaptation patterns detected in this study are also present there, and the relationship between the perception of autonomy and adaptation could be studied. By also considering teacher autonomy in these countries, the adaptation patterns of novice and senior teachers might be contrasted. Future research should continue to ask questions on the differences in adaptation patterns at primary, secondary and high school levels, and the impact of particular adaptations on students.

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## Appendix 1: Interview form

Dear teachers,

I am conducting research on the teachers' curriculum adaptation process. I would like to have an interview with your voluntary participation. I hope that the results of this research will contribute to improving the quality of the mathematics curriculum and the effectiveness of learning processes.

- During this interview, all of your comments will be kept confidential and will not be used anywhere else.
- There will be no information about your name and identity in the research report.
- If you allow the interview, instead of distracting your attention, I want to keep your voice recording in order to communicate more comfortably. This record will only be listened to by me. Is there anything you want to ask or add?
- I think it will take about 30-40 minutes, if you want, let's start.

*Questions:*

1. How many years have you been teaching?
2. Which school types have you worked in before? Did you experience the differences between the types of school when implementing the mathematics curriculum? What differences did you experience?
3. How do you prepare your yearly plan, or if you are using a ready-made plan where do you get it from?
4. Do you make any changes while following the yearly plan?
   *Alternative questions:*
   A: Although some subjects take part in the curriculum, some teachers think that some subjects are not suitable for class / type of school and they omit them. Do you have such or different implementations?
   *Probes*:
   i. create/supplement
   ii. omit
   iii. getting the objectives into a different unit
   iv. getting the content into a different unit

   B: It is said that the sequence of learning domains, sub-learning domains and objectives in curriculum should be considered as the order of processing. Are you doing a different sort of content? Why is that?
   i. changing sequence of content

ii. replace (at different grade level)

C: Do you make any changes in the recommended time for an objective or a subject? How?

5. Do you use other sources in your courses? How do you benefit with them? Why did you need to use other resources?
6. When do you make the adaptations on the curriculum? Why?
   i. before the instruction
   ii. during the instruction
   iii. after the instruction

7. Do you have any ideas that will help to improve the mathematics and to make learning better? Have you put them into practice?
   *Probes*:
   i. learning outcomes/objectives
   ii. content
   iii. duration
   iv. activities
   v. assesment and evaluation

8. What kind of problems do you experience when adapting the updated grade 9 mathematics curriculum for your classes?
   *Probes*:
   i. yearly plan approval and inspection issues (lack of flexibility)
   ii. school inspection
   iii. Ministry inspectors
   iv. the problems in practice
      - student level (readiness)
      - intensive content (time restriction)
   v. effects of high stakes tests

9. When you think your curriculum adaptation process, what are the aspects that work for you or not? If there are parts that don't work, how do you plan to follow the next period or year?

10. Considering your experiences, different school types and opportunities to work in different regions, what do you think about following a curriculum, continuing teaching in the framework of a centralised curriculum?

11. What can be the recommendations of the Ministry of National Education in terms of adaptation to help teachers?

## Appendix 2: Observation form

The aim of this observation is to define the ways in which teachers adapt the curriculum and to clarify the problems experienced in this process. Notes will be taken during the observation according to the dimensions given below:

- adapted elements of the curriculum
- curriculum adaptation time
- patterns of adaptations
- problems encountered in adapting the curriculum

*Coding list to be used in the analysis of observation notes*

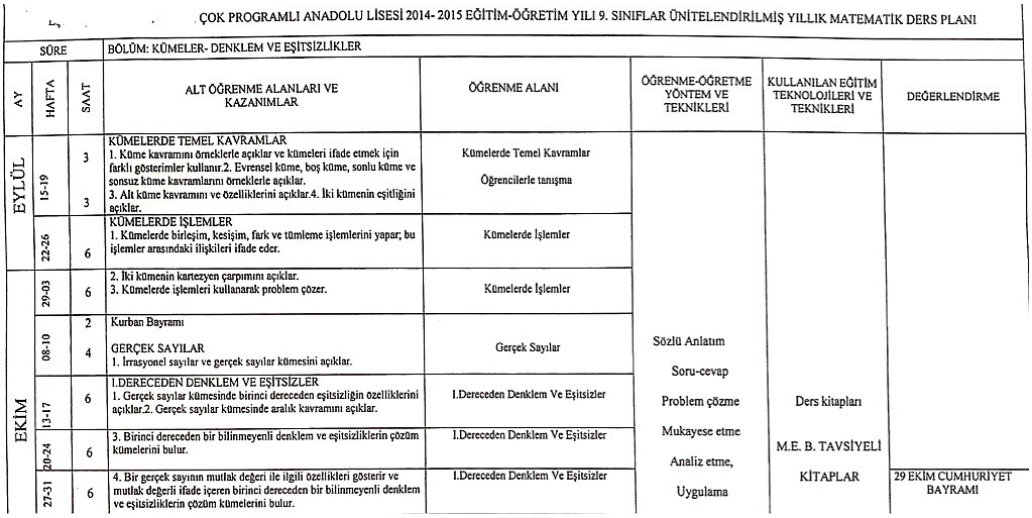
The codes listed below clearly show the dimensions that the observer should pay attention to in the classroom. These codes can be reviewed according to the data obtained during the observation process; additions and subtractions can be made.

Date:
Time:
Teacher:
Subject:
The subject of observation: Patterns of adaptation and problems

| | |
|---|---|
| Subject and duration<br>(differences from the yearly plan-daily plan) | |
| Materials used and how they were used | |
| Learning-teaching methods and activities | |
| Adapted elements of curriculum<br>Objectives/learning outcomes<br>• Number of objectives<br>• Modifying the unit<br>- Teaching in a later unit<br>- Teaching in an earlier unit<br>- Change the order in the same unit<br>• Lesson duration<br>- decrease<br>- increase<br>• Content<br>- supplement a new subject<br>- omit some subjects | |

| | |
|---|---|
| Curriculum adaptation time<br>• Before instruction<br>• During instruction<br>• After instruction | |
| Patterns of adaptation<br>• Omitting<br>- content<br>- learning outcomes<br>- time<br>• Creating<br>- create content in a unit<br>- add content at another class level<br>- designing an event<br>- use more than necessary time<br>- deepening<br>• Replacing<br>- changing content<br>- changing activities<br>- changing sequence of learning outcomes/objectives | |
| Problems of curriculum adaptation process<br>• Deficiencies related to professional qualifications<br>• Lack of self-confidence and self-control<br>• Lack of flexibility<br>• Pressure of inspection<br>• The readiness of students (high level/low level)<br>• Shortage of time and intense content<br>• High stakes test effects | |

**Appendix 3a: Sample from a yearly plan, multi-program high school (Turkish version)** [zoom in to obtain a closer inspection]



ÇOK PROGRAMLI ANADOLU LİSESİ 2014- 2015 EĞİTİM-ÖĞRETİM YILI 9. SINIFLAR ÜNİTELENDİRİLMİŞ YILLIK MATEMATİK DERS PLANI

| SÜRE | | | BÖLÜM: KÜMELER- DENKLEM VE EŞİTSİZLİKLER | | | | |
|---|---|---|---|---|---|---|---|
| AY | HAFTA | SAAT | ALT ÖĞRENME ALANLARI VE KAZANIMLAR | ÖĞRENME ALANI | ÖĞRENME-ÖĞRETME YÖNTEM VE TEKNİKLERİ | KULLANILAN EĞİTİM TEKNOLOJİLERİ VE TEKNİKLERİ | DEĞERLENDİRME |
| EYLÜL | 15-19 | 3<br>3 | KÜMELERDE TEMEL KAVRAMLAR<br>1. Küme kavramını örneklerle açıklar ve kümeleri ifade etmek için farklı gösterimler kullanır.2. Evrensel küme, boş küme, sonlu küme ve sonsuz küme kavramlarını örneklerle açıklar.<br>3. Alt küme kavramını ve özelliklerini açıklar.4. İki kümenin eşitliğini açıklar. | Kümelerde Temel Kavramlar<br>Öğrencilerle tanışma | | | |
| | 22-26 | 6 | KÜMELERDE İŞLEMLER<br>1. Kümelerde birleşim, kesişim, fark ve tümleme işlemlerini yapar; bu işlemler arasındaki ilişkileri ifade eder. | Kümelerde İşlemler | | | |
| EKİM | 29-03 | 6 | 2. İki kümenin kartezyen çarpımını açıklar.<br>3. Kümelerde işlemleri kullanarak problem çözer. | Kümelerde İşlemler | | | |
| | 08-10 | 2<br>4 | Kurban Bayramı<br>GERÇEK SAYILAR<br>1. İrrasyonel sayılar ve gerçek sayılar kümesini açıklar. | Gerçek Sayılar | Sözlü Anlatım<br>Soru-cevap<br>Problem çözme<br>Mukayese etme<br>Analiz etme,<br>Uygulama | Ders kitapları<br>M.E. B. TAVSİYELİ<br>KİTAPLAR | |
| | 13-17 | 6 | I.DERECEDEN DENKLEM VE EŞİTSİZLER<br>1. Gerçek sayılar kümesinde birinci dereceden eşitsizliğin özelliklerini açıklar.2. Gerçek sayılar kümesinde aralık kavramını açıklar. | I.Dereceden Denklem Ve Eşitsizler | | | |
| | 20-24 | 6 | 3. Birinci dereceden bir bilinmeyenli denklem ve eşitsizliklerin çözüm kümelerini bulur. | I.Dereceden Denklem Ve Eşitsizler | | | |
| | 27-31 | 6 | 4. Bir gerçek sayının mutlak değeri ile ilgili özellikleri gösterir ve mutlak değerli ifade içeren birinci dereceden bir bilinmeyenli denklem ve eşitsizliklerin çözüm kümelerini bulur. | I.Dereceden Denklem Ve Eşitsizler | | | 29 EKİM CUMHURİYET BAYRAMI |

**Appendix 3b: Sample from a yearly plan, multi-program high school (English translation)**

| Duratıon | | | Chapter: Sets and equatıons-ınequalıtıes | | | | |
|---|---|---|---|---|---|---|---|
| Month | weeks | Hours | Sub-learnıng domaıns and learnıng outcomes | Learnıng domaıns | Learnıng-teachıng method and technıques | Teachıng technol-ogıes and technıques | Assessment and evaluatıon |
| September | 19 sep. - 15 Sep. | 3 | MAIN CONCEPTS IN SETS<br>Explains the basic concepts of sets.<br>Explains the concepts of universal set, blank set, finite set and infinite set. | Main concepts in sets | Lecture<br>Question and answer<br>Problem solving<br>Criticize<br>Analysis<br>Practice | Textbooks and books recomm-ended by the Ministry of National Education | |
| | | 3 | Performs operations using a subset.<br>Performs operations using the equality of two sets. | Main concepts in sets | | | |
| | 22 Sep. - 26 Sept. | 6 | OPERATION IN SETS<br>Solves problems in sets by means of combination, intersection, difference, integration operations | Operation in sets | | | |
| October | 29S ep. - | 6 | Explain the Cartesian product of two sets.<br>Solve the problems with sets. | Operation in sets | | | |
| | 08Oct. - 10Oct | 6 | Feast of the sacrifice holiday (4-5-6-7 Oct.)<br>REAL NUMBERS<br>Explains a set of irrational numbers and real numbers. | Real numbers | | | |
| | 13 Oct.-17Oct. | 6 | FIRST ORDER EQUATIONS AND INEQUALITIES<br>Explains the properties of first order inequalities in a set of real numbers.<br>Explains the concept of range in real numbers set. | First order equations and ınequ-alities | | | |
| | 20 Oct. - 24Oct | 6 | Find solutions of first order inequalities and first order equation with an unknown. | First order equations and ınequ-alities | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 27 Oct.-31 Oct | | Shows the properties related to the absolute value of a real number.<br>Finds solution sets of first order equation and inequalities with an unknown containing an absolute value. | First order equations and inequ-alities | | | Republic day 29 October. |

**Appendix 4a: Examples of decisions in unit meeting documents, multi-program high school, indicating adaptations (highlighted in both Turkish and English versions)**

**5-Öğrenci merkezli öğrenmenin bir gereği olarak öğrencinin sınıftaki rolü ve etkinliği konusunda uygulanabilir kararların alınması;**

öğrenci merkezli eğitim için öğrencinin eğitim sürecinde edilgen taraf olmaktan çıkarıp etken bir konuma getirmeliyiz. Ayrıca matematikte kullanılan formül ve aksiyomların neler olduğunu biz öğretmenlerden değil kendilerinin bulmasını sağlamalıyız varsa yanlışlarını düzeltmeliyiz" dedi.
Ayrıca derslerde ;

- Öğrencilerin seviyesine ve ilgilerine uygun, aktif katılımlarını sağlayacak gerçekçi problem çözme ve modelleme etkinliklerine dayalı öğrenme ortamları tercih edilmelidir.
- Öğrencilerin matematik öğrenme sürecinde bilgi ve iletişim teknolojilerinden aktif olarak yararlanmaları sağlanmalıdır.
- Matematiksel bilginin oluşturulmasında veya oluşturulan matematiksel bilginin kullanılmasında farklı disiplinlerle ilişkilendirme önemsenmelidir.
- Öğrencilerin varsayımda bulunma ve genelleme gibi matematiksel düşünme süreçlerini yaşayabilmeleri için kendi aralarında tartışabilecekleri uygun ortamlar hazırlanmalıdır.
- Öğrencilerin matematiksel bilgiyi yapılandırma süreçleri çoklu temsiller ve materyallerle desteklenmelidir.
- Öğrenmeyi destekleyici dönütler verilmelidir.
- İşlenecek konuların derinliği ve öğrenme-öğretme süreçleri öğrencilerin hazır bulunuşluk düzeyleri, algı ve motivasyonları, bireysel farklılıkları dikkate alınarak yapılandırılmalıdır.

**Group decision 5:**
Students' mathematical knowledge structuring processes should be supported by multiple representations and materials. In order to experience mathematical thinking processes such as hypothesis and generalisation, appropriate environments should be prepared. Feedback should be given to support learning. The depth of the subjects to be taught and the learning-teaching processes should be structured by taking into consideration the readiness levels and individual differences of the students.

**Appendix 4b: Examples of decisions in unit meeting documents, multi-program high school, indicating adaptations (highlighted in both Turkish and English versions)**

**6- Öğrenci başarısının ölçülmesi ve değerlendirilmesi;**
13/09/2014 tarihli MEB Orta Öğretim Kurumları yönetmeliğinde değişiklik yapılmasına dair yönetmeliğine göre: Haftalık ders saati sayısına bakılmaksızın her dersten en az iki yazılı sınav yapılır maddesine dayanarak, Matematik ve Geometri derslerinde her dönem için 4 ve 6 saatlik derslerde 3 er yazılı 2'şer performans, 2 saatlik derslerde 2 yazılı ve 2 Performans değerlendirme ve yıl içinde Proje alan öğrencilerde en az 1 proje notu verilmesine ve yazılıların o sınıfa giren zümre öğretmenlerinin yazılı sınavın ortak yapılarak soruların sınıf seviyelerine uygun olarak hazırlanması gerektiği kararlaştırıldı.

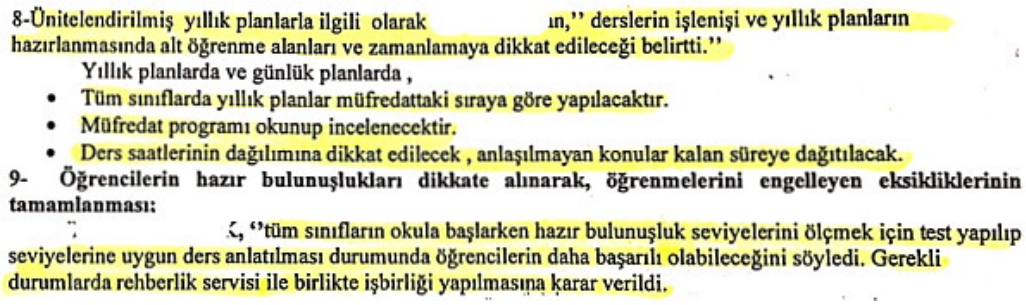
- 11 harita kadastro ve yaşlı bakımı bölümlerinde,12 çocuk gelişimi bölümlerinde başarının artırılması ygs ye hazırlık sebebiyle 9.sınıf matematik konularının işlenmesine karar verildi.

| 1. DÖNEM MATEMATİK ve GEOMETRİ DERSİ | 2. DÖNEM MATEMATİK ve GEOMETRİ DERSİ |
|---|---|
| 1.YAZILILAR: KASIM 2.HAFTA | 1.YAZILILAR: MART 5.HAFTA |
| 2.YAZILILAR: ARALIK 2.HAFTA | 2.YAZILILAR: NİSAN 4.HAFTA |
| 3.YAZILILAR: OCAK 2. HAFTA | 3. YAZILLAR:MAYIS 3. HAFTA |

- Sınıfların tüm derslerde yazılıların aynı haftaya yığılması durumunda yıllık planda belirtilen tarihten bir hafta önce ya da sonrası yazılı sınav yapılmasına karar verildi.
- Öğrencilerin ilköğretim matematik ve geometri bilgilerini hatırlatmaya yönelik okulun açıldığı ilk haftalarda derslerde hatırlatmalar yapılacağı belirtildi.
  Yazılı yoklamalarda sorulacak soru tipleri düşük ,orta.yüksek düzeyde öğrencilerin konuyu kavrayıp kavramadıklarına yönelik ,aynı zamanda öğrencilerin matematik dersinin ilgili ünite ve kavramlarla ilgili hedef ve davranışlarını ölçmeye yönelik olacaktır.
- Soru sayısı olarak ,çok sorulu ,kısa cevaplı soruların yanında uzun cevaplı sorularda sorulacak.
- Yazılı sınavlara ek olarak çoktan seçmeli sınavın her dönem için bir kez ve dönem sonunda yapılabileceği kararlaştırıldı.
- Sınav sonrasında genel hatalar belirlenecek ,başarısız olunan konularda hazırlık soruları verilecek, konunun tekrarı sağlanacaktır.
- Yazılı sınav sonunda, öğrenci mevcudunun çoğunluğu başarısız olmuşsa öğretmen, başarısız öğrenciler için bir sınav daha yapabilir. Bu sınava isteyen başarılı öğrenciler de katılabilir. Bu sınavlarda, öğrencinin aldığı en yüksek puan geçerli sayılır.

**Group decision 6:**
For students of 11th-grade elderly care and cadastral departments and 12th-grade child development department, 9th-grade mathematics subjects were decided to teach again in order to increase the success due to preparation for national exams. [Curriculum adaptation emphasis according to high stakes test]
...
At the beginning of the academic year, it was decided that students would be instructed in the courses aimed at reminding students of primary mathematics and geometry.
...
After the exam, general errors will be determined and preparation questions will be given about the failed subjects.

**Appendix 4c: Examples of decisions of unit meeting documents, multi-program high school, indicating adaptations (highlighted in both Turkish and English versions)**



8-Ünitelendirilmiş yıllık planlarla ilgili olarak ın,'' derslerin işlenişi ve yıllık planların hazırlanmasında alt öğrenme alanları ve zamanlamaya dikkat edileceği belirtti.''

Yıllık planlarda ve günlük planlarda ,

- Tüm sınıflarda yıllık planlar müfredattaki sıraya göre yapılacaktır.
- Müfredat programı okunup incelenecektir.
- Ders saatlerinin dağılımına dikkat edilecek , anlaşılmayan konular kalan süreye dağıtılacak.

9- Öğrencilerin hazır bulunuşlukları dikkate alınarak, öğrenmelerini engelleyen eksikliklerinin tamamlanması:

ç, ''tüm sınıfların okula başlarken hazır bulunuşluk seviyelerini ölçmek için test yapılıp seviyelerine uygun ders anlatılması durumunda öğrencilerin daha başarılı olabileceğini söyledi. Gerekli durumlarda rehberlik servisi ile birlikte işbirliği yapılmasına karar verildi.

**Group decision 8:**

Regarding the united yearly plans, the teacher indicated that the sub-learning domains and timing will be taken into consideration in the preparation of the lessons and the preparation of the yearly plans.

- Yearly plans in all grades will be made according to the order in the curriculum. [curriculum fidelity emphasis]
- The curriculum will be read and studied.
- The distribution of the course hours will be paid attention and the unclear subjects will be distributed to the remaining periods. [adaptation emphasis]

**Group decision 9:**

Taking into account students' readiness, for completing their learning deficiencies:

The teacher said that if all classes are tested in order to measure their readiness levels at school, the students can be more successful if they are taught the appropriate level. It was decided to cooperate with the level of the necessary situations. [curriculum adaptation emphasis according to students profile]

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