Learning Mathematics in a Turkish-English Bilingual After School Club

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PhD

2018

Abstract

This thesis presents an investigation of a bilingual Turkish/English after school club in a UK secondary school. It investigates and analyses bilingual/multilingual students' naturally occurring language use during classroom activities and explores students' strategies while tackling mathematical tasks. It examines how learners construct a collaborative bilingual learning environment and form a community of practice. The study is set in a large mixed comprehensive school in North London where approximately 30% of students are from Turkish speaking backgrounds. Turkish speakers form one of the four largest ethno-linguistic groups in England.

The following major strategies emerged from my analysis: translanguaging, activating prior knowledge, employing play frames and learning in a social context. I discovered that translanguaging allowed students to access their own cultural and linguistic repertoire. They worked through mathematical tasks by activating prior knowledge, often using playful language. Through collaborative learning in a social context, they formed a bilingual community of practice. As a result of employing these strategies, mathematical understanding was enhanced, students performed better with improved self-confidence and mathematical problem solving was aided.

Key words: translanguaging, bilingual/multilingual, activating prior knowledge, naturally occurring conversations, cultural and linguistic repertoire, collaborative learning, community of practice

Acknowledgments

This thesis would not have been completed without the help of many people. I would like to thank you all for supporting me on this journey.

This thesis is dedicated to the memory of my beloved supervisor: Dr Tözün Issa. I am profoundly grateful to him for the professional and personal support, for giving me opportunity to do this work and supporting me in it. I was deeply shocked and could hardly believe the news of his sudden death. This thesis would not have been possible without him. He was always a perceptive and encouraging mentor and a gentle and supportive colleague.

I am also grateful to both my supervisors: Prof. Klaus Fischer and Dr. David Blundell for their continuous support in guiding me by means of their extensive knowledge. My thanks for your comments, suggestions, kind encouragement and support.

My recognition of appreciation also to: Cathy Larne, Research Administrator, for her support, guidance and friendliness.

A special thanks to family and friends, who supported me when I needed it most, who took so much care with their advice, technical support and hospitality, for being supportive, generous, patient and telling me there was a light at the end of the tunnel. I would especially like to express my sincere gratitude to the following:

To my parents and my brother Başak Ürkmez for your never-ending support, encouragement, patience and understanding.

To Berna Vardar, Elif Kayıkçı, Tricia Bishop, Ceren Bezzazoğlu for being so welcoming and for sharing your knowledge and experiences, and for being interested and supportive.

To Rita Linnett and Mert Mutlusoy for proofing and editing this thesis, and for doing such a great job.

To Berrin Eralp, Çiğdem Esin, Gökçen Odabaş for your caring, kind support and encouragement.

To Cefa Karabağ, Hatice Ölmez, Siamak Akbari for your technical support and hospitality.

To Nick Moore for challenging me to improve my work considerably.

To Aysun Özbaşak, Kemal Güler, Zeynep Pütkeli, for your regular comforting reassurances, and empathy.

Finally, my sincere thanks to all the students and parents who participated in the Club and the range of activities outlined in this thesis and freely gave up their time to contribute to this study.

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1. Introduction

"Hem konuşuyoruz hem de çalışıyoruz. Yani kafamız işliyo Miss"

We are talking also we are studying. So our head is working Miss

(Ayşe, a 13 year old female participant)

"The teaching and learning of mathematics like any other school subject must be communicated through a language medium" (Lawal Adetula)

1.1 Statement of the Problem

Being a bilingual Turkish speaking teacher in a school which was a home to a significant number of bilingual/multilingual students of whom a large number are Turkish speakers, has provided a unique, if somewhat painful, opportunity to reflect on and observe the students' 'underachievement' in a regular teaching environment. Working in the same school for seven years and coming from a similar linguistic and cultural background as my Turkish speaking students has given me the insight to identify and understand many of the factors contributing to their 'underachievement' and the barriers to their learning present in the given learning environment, in micro scale the school, in macro scale the education system.

The bilingual students' failure to grasp essential concepts in the maths class year after year, and their being stalled in 'lower sets' which in turn leads to issues of self-confidence and engagement with relevant academic tasks, obliged me, as a teacher, to think about what I could do to support these students to overcome the language barrier and, if these proved to be a contributing factor, cultural differences in a wider sense. This was the motivation and founding principle for the maths after school club which I ran for several years.

As a bilingual student myself, I have not long ago experienced similar obstacles and been obliged to recognise how working in my second language has often put up barriers for me and presented me with additional challenges which were simply more complicated than 'not being fluent' in the host language.

My aim and advanced planning for the maths after school club was to run a relaxed, accommodating and informal/semi-formal class in which as many barriers as possible, both actual and perceived, between teaching and learning would be lifted, and to observe and record the expected difference in achievement. The learning subject was maths, but my observations and experience pointed to additional non-mathematical obstacles. In just a few months, I realised the positive effects on Turkish Speaking students' engagement and confidence and how this affected their learning. I decided to extend my observations and to put my loose deductions into a research project in the hope of showing how, when made to feel comfortable, relaxed and encouraged, students use both Turkish and English to tackle the challenges in understanding and solving mathematics problems. I also sought in this way to reverse the challenges for these students embedded in a mainstream monolingual environment.

Before embarking on this research, I considered the possibility of organising both a bilingual mainstream maths class and an English medium maths mainstream class as a control group. Both classes would run in the same year group and with 'mixed ability' students and would follow the same maths curriculum and be taught by the same teacher, myself. At the end of the year I would compare the test results, achievement, attitude to maths learning and the learning strategies used by both groups of children.

However, as much as this would have provided useful and satisfying results and outcomes, it was outside the scope of the methodology designed within my research. Moreover, the school management could not accommodate the organisation of the research project in this way which caused me to alter the direction of my research and to focus on the after school club only with Turkish Speaking children as I had already run this maths after school club for several years. This tighter focus benefited my research objectives as it was a good opportunity for me to carry out the research with existing students who would continue to attend the after school club after I announced it for the forthcoming academic year and would look at the strategies presently used by students while tackling mathematical tasks.

1.2 Aims and Objectives

The aim of my research is to analyse bilingual/multilingual students' naturally

occurring conversations in the maths after school club during classroom activities in order to explore strategies used by children who are bilingual while tackling mathematical tasks and to focus on how these learners interpret their learning environment as they engage in the tasks through a bilingual medium.

The research objectives are:

- to document and analyse students' language use in tackling mathematical tasks,
- to explore how these learners construct knowledge through translanguaging in a bilingual medium as they engage in mathematical tasks,
- to understand how mathematical knowledge is acquired and processed in collaborative group settings.

A further aim of this research was to assess the role of parents in helping with mathematics homework and analyse the role of a bilingual home environment in supporting students' attitudes to maths homework.

1.3 Research Question

The research question is:

- How do Turkish, Kurdish and Turkish Cypriot students negotiate the construction of mathematical knowledge in semi-informal collaborative peer group settings?

In the following sections I will discuss what the Club was, where it took place, and how the project developed as well as how the difference between Turkish and English languages affected the learning process of students in the Club.

1.4 Chapters of the Thesis

My thesis is organised into five chapters. Following the Introduction chapter, Chapter **2** is **Literature Review.** This comprises of reviewed sources concerning bilingualism. Even though the majority of sources are about second language acquisition, some of the contributors (e.g. Vygotsky, Wenger, Cummins, Blommaert, Lytra, Garcia, Creese, and Blackledge) are discussed to support the

readers' understanding. Bilingual/multilingual children use several languages in their daily lives. Hence translanguaging emerged from this bilingual context of the learning environment in the Club. This natural switch between languages resulted in two other themes: activating prior knowledge and the use of play frames. Previous literature on these two subjects is examined. The other important subject to be examined is the Learning in a Social Context of the bilingual environment. The bilingual environment of the Club however has its own specific social structure. Learning in a Social Context is exemplified in other literature and other Learning Theories are referred to and explained in this context. Collaborative Learning and Communities of Practice and Peer Group Collaboration are exemplified and expounded in the section. In order to discuss the specific context of the research within a mathematical learning environment, a selection of literature on bilingual mathematics teaching is also reviewed in Chapter 2.

Chapter 3, Methodology records and details the methods of collection and analysis of the data. Audio taped students' naturally occurring spontaneous talk and ethnographic observations are combined during the Club. In the course of the Club lessons I was a participant observer in my role as both teacher and researcher. Details on the three elements of data collection which are questionnaires, focus group discussions and the Club Interactions are given and discussed. Field notes were taken during the course of the Club lessons whenever possible. These field notes aided to interpret audio tape recordings from the lessons. These field notes were also used to detail visual observations, such as facial expressions, body language, the general atmosphere of the Club and the before-after moments of particular interactions or the group in general, to amplify and give further weight and content to the audio recordings. Thematic analysis, including conversation analysis and an approach inspired by grounded theory were used. The field notes together with audio tape records, focus group discussions and answers of questionnaires create the basis for analysis of the transcripts. Students' voices were audio-recorded as they talked about the mathematical tasks and negotiated their learner positions while engaging through culturally contextualised discourse among themselves and with their teacher. This was usually in the form of a worded or written mathematical question introduced by the teacher, modelling translanguaging and encouraging students to do the

same by drawing on different linguistic features to negotiate their learner positions.

Chapter 4 is the **Analysis.** Analysis of the data, including the transcripts of the Club, the transcripts of two Focus groups and questionnaires is made in this chapter. The field notes and observations were utilised to aid the analysis. The main body of the analysis depends on the Club interactions which gave an opportunity to analyse students' naturally occurring language during classroom activities in order to explore strategies used by children as multilinguals while tackling mathematical tasks. The results are sorted under themes in order to make the analysis of the transcripts more comprehendible. All these themes, namely translanguaging, activating prior knowledge, peer group collaboration, cultural background, collaborative learning, play frames, linguistic repertoire and other sub-themes that appeared throughout the analysis of the three research tools of questionnaires, focus groups and the Club interactions, are intertwined.

Chapter 5 is the **Conclusion.** In this chapter concluding remarks are discussed. The results and evidence were found that corroborate the research aim and objectives. Thesis methods and analysis of the differences in bilingual and multilingual students' learning strategies and attitudes between mainstream class and the Club are stated in the first part of this chapter. The set-backs and missing links that can be improved are also discussed in this chapter. The end of the chapter lays out existing policy and suggestions on possible reforms that can be made for the better integration of the students (keeping in mind the possible drawbacks that could be faced in practice).

In the following sections I will discuss what the Club was, where it took place, and how the project developed as well as how the difference between Turkish and English languages affected the learning process of students in the Club.

1.5 The Club

When I first advertised a 'Turkish Speaking Maths After School Club' (henceforth 'the Club'), I did not necessarily plan to conduct the maths club solely in Turkish. It was only a 'suggestion' to the students and their parents that the students in fact can speak in any language they can command, including the ones I

may not know, such as Kurdish or Cypriot Turkish. In this 'suggestion' there was an additional invitation to bring all the 'baggage' that comes with culture, being and identity. The Club could be a miniature reflection of their day-to-day life.

The purpose of the Club was to teach mathematics (maths) to Turkish speaking children by means of constructing knowledge in the 'bilingual medium', i.e. using both English and Turkish as the students felt appropriate as a resource. The Club provided an atmosphere where the students could feel free to use naturally occurring bilingual/multilingual conversations. Turkish speaking students often have difficulty in understanding mathematics lessons taught solely in English medium. In the Club the initial aim was to create an environment in which students could naturally and freely switch between languages. This would provide them with opportunities to employ their cultural and linguistic repertoire in the learning process. During the mainstream school lessons I had realised that while they were learning maths, children were using both languages and changing between languages when they needed to, to establish a more secure knowledge of maths.

The students in the Club met for one hour once a week. This came about after I had announced my intention to set up "an after school maths club for Turkish speaking students". It was thus accepted as natural to work bilingually with them in a relaxed way. At the beginning of each lesson a worksheet of written questions was given individually to each student. Subsequently they worked together in one mixed ability group. They came from a variety of ability groups within the school and I was aware of each student's assessed group from the beginning. My lengthy and in-depth work with this group of individual pupils showed me that at the start they did not necessarily belong to the appropriate ability set. These pupils' inability stemmed not from their mathematical ability in itself but from their lack of proficiency in their second language. As the examples from the transcripts firmly support, once the linguistic barrier was lifted, the pupils did not have any difficulty in grasping and solving the mathematical problems. The time spent on each question varied and shortened towards the final classes, which can be interpreted as one of the positive indicators of accumulative and collaborative learning.

1.6 The Project

The project was set up as part of the Club in an inner London secondary school where approximately 30% of students were from Turkish speaking backgrounds (Turkish, Kurdish and Turkish Cypriot communities) included in its annual intake. With 90% of its school population from ethnic minority backgrounds, and 65% English as an additional language, the school was described as a 'larger than average comprehensive' by OFSTED (2007, 2010). The OFSTED reports (PVA OFSTED 2007, PV OFSTED 2010 and 2013) described the school as "improving". The levels of underachievement amongst ethnic minority students – particularly those from Turkish, Kurdish and Turkish Cypriot backgrounds – were high at the time of the study. This is a result of a number of interrelated factors such as cultural, linguistic and socio-economic differences. Language barrier is the main one that will be considered in this research by exploring the use of Turkish with English and together in the delivery of the Maths National Curriculum.

The duration of the study was October 2010 – June 2011. The number of students attending the Club ranged from 6-10 each week. Although the Club was open to all students it mainly attracted students from Turkish, Kurdish and Turkish Cypriot backgrounds. The age of students ranged from 13-16 years (School years 9-11).

I was the project teacher and I had been working for 7 years as a maths teacher at the school at the time of the project. I had obtained my undergraduate degree from a Turkish University, and then I completed my teacher training in the UK. As the participant observer of the project, I fulfilled both teaching and research tasks within the project and did not let these two tasks reflect on each other. I kept my distance as the teacher (details in the methodology section, participant observer, 3.3). My wish to set up an after school mathematics club arose from my concerns about the low levels of attainment of Turkish, Kurdish and Turkish Cypriot students that I taught at the school. All students attending the Club came from these three communities. Although they all communicated in Turkish and they have many cultural features in common, some were from Kurdish, some from Turkish and some were from Turkish Cypriot backgrounds. Turkish

Cypriots speak a dialect of Turkish that is understandable for most Turks and even though Kurdish is a different language than Turkish, students from Kurdish backgrounds were also able to communicate in Turkish with some differences of accent. They were all born in the UK to parents or grandparents that came from rural parts of Turkey or Cyprus.

Drawing on Blommaert (2005)'s theoretical perspective on the importance of linguistic and cultural repertoires of individuals on their practices, my aim is to evaluate the way mathematical knowledge is accessed through translanguaging and the use of learning strategies when tackling mathematical tasks. In connection with translanguaging, I consider linguistic and cultural resources in an interconnected way within the Club.

In this research, children and teacher use both languages in a "feel free" atmosphere to construct mathematical knowledge in the maths after school club. This kind of language practice has been described as 'translanguaging' (García 2009), 'flexible bilingualism' (Creese and Blackledge, 2010) and 'translanguaging as pedagogy' (Creese and Blackledge, 2010). According to García (2009) the role of educators is to notice learner needs rather than demarcate lines between particular languages. Meaningful instructional practices support students' linguistic and cognitive growth. García suggests that language choice in multilingual speakers involves negotiation in every interaction as speakers "decide who they want to be and choose their language practices accordingly" (2009, p.524). Translanguaging, according to García, "considers multiple language practices in interrelationship" (2009, p.7). The Club environment provided the students with a space in which they correlated their language practices. Having known that the environment was multilingual, they combined the knowledge of everyday languages, specific phrases and jokes across languages, body language and references to popular culture in all sessions. These interrelations enhanced their learning as will be discussed in further chapters.

As dealing with the translanguaging I will give the overview of the Turkish language and the Turkish speaking communities in the next section. The aim is not to provide a linguistic analysis of the differences between Turkish and English languages but to give an overview of the structural differences that directly affect

the language learning process. The learning of main curriculum subjects is also dependent on the language learning process in bilingual students.

1.7 The Linguistic Context of Turkish Language

The differences in the structure and grammar of Turkish and English languages are important to acknowledge as they are linked to the strategies that students use to move between languages. The Turkish language does not come from the family of European languages which makes it difficult for bilingual speakers to use words and phrases across languages since there are many differences in basic vocabularies. To clarify the linguistic context, the following is a brief introduction to the structure and syntax of the Turkish language in this section.

The related languages referred to by linguists as the Turkic group are spoken by around 100 million people in the world, most of them living in an arc stretching from the Balkans through Soviet Central Asia to the borders of China. These languages share a very similar agglutinative structure (Stubbs, 1985, p.67) and are to some extent mutually intelligible. Turkish is the most important member of the Turkic group of languages, which belongs to the Altaic family. About 50 million speak a Turkish whose standard form is based on the speech of the educated elite of Western Turkey.

Turkish has two extremely distinctive characteristics. The first is vowel harmony, whereby all the vowels in a word share certain phonological features. Thus, the plural suffix will vary according to the last vowel in the noun: *ev* (house) becomes *evler* (houses), while *at* (horse) becomes *atlar* (horses). Turkish is an agglutinative language, which adds suffix after suffix and produces words which may be the equivalent to a whole phrase or sentence in English,

gelmek- to come (*gel* is the root)
gel- *ebilir-* *im*
to come- may be able to- I
gelebilirim- I may be able to come or I can come
gel- *me-* *y-* *ebilir-* *im*
to come- not- buffer- may be able to- I
I may not be able to come

gelmeyebiliriz- we may not be able to come
gelebiliriz- we may be able to come / we can come
gelebilirsiniz- you may be able to come

In the Ottoman Empire Arabic script was used until 1923, when the Republic of Turkey was founded. Then the alphabet was changed to the Latin alphabet consisting of 29 letters. There are eight vowels and 21 consonants. The vowels in turn are divided into soft/front (e i ö ü) or hard/back (a ı o u) vowels and determine the harmony in words and their suffixes. There is no q w x in the Turkish alphabet but in addition to the letters s, c and g there is ş (sh), ç (ch) and ğ. It is also important to note that there is no gender in Turkish nouns, adjectives and personal pronouns and no articles.

There is a great deal of linguistic variety and different nationalities within Turkey. In addition to a small number of other Turkic languages such as Azerbaijani and Turkmen, Indo European languages such as Armenian, Greek and Kurdish are spoken by sizable communities. Also, there were many other different languages spoken by minority communities. However, the official language in Turkey became standard Turkish which was based on the Istanbul variety. Changing the alphabet and attempts to purify the Turkish language from other languages caused quite a lot of cultural changes in order to create a uniform national identity, that of the Turkish identity which truly damaged the multicultural and multi-lingual society.

The Turkish language's grammar is different from English grammar as seen in the examples above. These cause further delays for Turkish speaking bilingual children to grasp the English language, to master the meaning making process in English and to internalise both the structure, linguistic and cultural context. There are also cultural and social factors that shape the identities and interactions of bilingual children who are members of the Turkish speaking communities in London. The following section will briefly describe that specific context.

1.8 The Turkish speaking communities in London

Contrary to common assumptions about its homogenous nature, the Turkish

speaking communities are made up of three distinct groups: (i) Turkish Cypriots who were the earliest to immigrate among these groups (Taylor, 1988; Issa, 2005), (ii) Turkish people (Taylor, 1988; Mehmet Ali, 2001) and (iii) Kurdish people who also speak Turkish from Turkey (Griffiths, 2002). The mainland Turkish and Cypriot Turkish speaking population is estimated to be around 150,000 (Mehmet Ali, 1991; Reid, *et.al.*1999). The number of Kurdish speakers in London is estimated to be around 15,000 (Warner, 1991).

1.8.1 Turkish Cypriots:

This group is the earliest of the three groups to settle in Britain. Because of the lack of separate data on Turkish Cypriot migration and similarities between Turkish and Greek Cypriot outward movements from Cyprus, the Turkish Cypriot migration will be analysed within general Cypriot migration patterns.

Although some Cypriots settled in Britain during the end of the 19th century, the main bulk of the Cypriot migration occurred during the period of British rule 1878-1960 (Costantinides, 1977). Migration from Cyprus can be explained in three main stages (Alkan & Costantinides, 1982). Firstly, a small pre-World War One migration: This is thought to have consisted mainly of single men, students, seamen and merchants who came to Britain for a better life (Constantinides, 1977). Secondly, Post War Migration (1945-1974): The main migration predominantly started from Cyprus after the Second World War, increasing as the result of hostilities on the island during the 1950s and continuing until the early 1960s and Post - 1974 Migration. In July 1974 there was further, third, migration of refugees from Cyprus following the war between the two communities. It is estimated that around 10,000-12,000 refugees arrived in the UK as the result of the war (Swann Report, 1985; Clough and Quarmby, 1978).

1.8.2 Turkish people

Turkish mainland migration to the UK was an extension of the wider migration to Europe in the 1950s. The expanding European economy during the boom years of the 1950s and 1960s needed a workforce from other countries. It was West Germany until 1990, which received the first *legal workers* from Turkey (Issa, 1987). There is little information about migration patterns to England. The worker population arrived in the UK during the 1970s and 1980s. It is estimated that

4,000 or so Turks – only a fraction of Turkish workers in Europe – were working mainly in the catering and clothing industries (Paine, 1974; Berger, 1975).

1.8.3 Kurdish people

Kurds in the UK are from Iraq, Iran and Turkey. The different dialects of spoken Kurdish are not always mutually understandable. Kurdish migration to Britain was political as well as economical. The first Kurdish refugees came in small numbers in 1958 (Dick, 2002). They were from Iraq as well as Turkey. The main bulk of Kurdish migration from Turkey began with a first wave in the 1980s because of the military coup in Turkey.

The Kurds immigrated to the UK in three phases. The first was between 1987 and Spring 1988; the second period covers May 1989 until the imposition of visas on 23rd June 1989; the third phase was marked by the imposition of the visa requirements as well as the ascendancy of the PKK (The Kurdistan Workers' Party / Partiya Karkerên Kurdistanê is a left-wing organization based in Turkey and Iraq) affiliated organizations during the early part of the 1990s, in the Turkish-Kurdish community in North London. (Issa, 2005)

1.8.4 Settlement Patterns in London

There are small Turkish Speaking communities scattered around the UK, for example in Manchester, Edinburgh and the Midlands, but the majority live in or around London.

The initial Cypriot communities were established around Camden, Finsbury Park, Angel, Islington, Stoke Newington, Deptford and Camberwell in London. Turkish Cypriots have now moved beyond Haringey to Enfield and other outer London boroughs.

Mainland Turks settled in areas like Haringey, Newington Green, Hackney, Stoke Newington and Wood Green, where there were already established small businesses run by Turkish Cypriots. More recently mainland Turks have also acquired small businesses and bought their own homes in outer districts such as Enfield and Essex.

After the initial settlements of Iraqi Kurds during the 1950s and 60s in West London (Wahlbeck, 1997; Al-Rasheed, 1994) later settlements after 1980 of

Turkish speaking Kurds in areas such as Hackney and Haringey were encouraged by the Turkish Cypriot economy within the garment and catering trades (Hackney Council, 1993).

The family plays a vital part in the maintenance of mother tongue in Turkish speaking communities. In common with other large linguistic communities, Turkish speakers are able to meet all their day-to-day social needs without having to use English. The ethnic economy has important linguistic implications. They work in environments where there is at least one other Turkish speaker. The presence of Turkish, Kurdish and Cypriot languages, politics, culture, are important daily events present in every Turkish Speaking home in London.

2. Literature Review

This research aims to observe the learning strategies of multilingual children in a bilingual and informal learning environment which is the Club. The framework has been influenced by a variety of theoretical arguments focusing on the interconnection between learning, social context and various ways of using language as a component of the learning environment. Mathematical knowledge, in the first instance seems different form language knowledge in the sense that it does not directly link to language or culture but as seen in the thesis, there are correlations. The research explores the ways in which students' social, cultural and linguistic backgrounds and knowledge shape their acquisition of mathematical knowledge.

In this chapter, literature is brought together that provide a framework for an examination of how mathematical learning is part of a broader learning process which is cognitively processed but socially constructed, which involves what the students can learn through language, through interaction. Learning is an active process in which learners construct new ideas or concepts based upon their current or past knowledge. The learner selects and transforms information, constructs hypotheses and makes decisions; using one or more languages. As Vygotsky (1978) mentioned language is a tool for learning. In this learning process, the social and cultural aspects should be considered regardless of the subject (mathematics) and type of knowledge.

Firstly, a comprehensive review of the social constructivist perspective will be explored, focusing on the influence of language and its social and cultural context. After providing a comparison of the learning theories and situating this approach under social constructivism, the arguments on collaborative learning, communities of practice, bilingual learning, translanguaging, talk as play, activating prior knowledge will be elaborated further.

To conclude, the literature review will highlight and explain the main themes explored in the final discussion on learning mathematics in a bilingual environment.

2.1 Learning Theories

The learning theories evolved over the years starting with behaviorist approach with John B. Watson and Rosalie Rayner in 1920's and developed by Skinner (1974). According to McLeod (2015), the cognitive approach came about in the late 1950's and early 1960's, to become the dominating perspective in psychology by the late 1970's. It wasn't an opposition to the existing theories but it focused more on the individual's mental processes rather than seeing it as a stimulus and response like the behaviorists. Constructivism as proposed by Piaget (1972) focuses on individual's own construction of information. Later with Vygotsky (1978) the theories of social constructivism are introduced which sees the individual as a part of the society and assumes that knowledge is socially constructed. This separation resulted in the later learning theorists to refer to Piaget's work as cognitive constructivist and Vygotsky's work as social constructivist. This part of the literature review will explain each approach further but the thesis utilises predominantly social constructivist approach.

The behaviourist approach emphasized principles and suggestions on how to stimulate positive behaviors and decrease negative behaviours through outward conditioning (linking stimuli, rewarding/punishing behaviour) without recourse to mental processes (Skinner, 1974). It had been the dominant perspective in learning theories for a long time until the development of the cognitive approach. The focus of theoretical perspectives shifted to active mental processes that individuals go through while learning.

The cognitive approach tries to determine the ways individuals gather, store and link information. The majority of the theorists merge cognitive approach with the constructivist approach. Cognitive approach is involved in the processes within the individuals as the learning takes place. Constructivists theorize learning as being an individualized process, meaning each individual constructs their own knowledge depending on their own learning environment and prior experiences. The Cognitive constructivist theory defines learning as "an active mental process of acquiring, remembering and using knowledge" (Woolfolk, 1993, p.238 cited in Yıldırım et.al., 2002, p.115). The cognitive constructivist theory indicates that learning is an active, dynamic process of selecting information from the environment, organizing and relating it to what they already know, retaining what

they consider to be important, using the information in appropriate contexts, and reflecting on the success of their learning efforts (Chamot & O.'Malley, 1994, p.13). This type of learning is often conscious and deliberate (Chamot & O.'Malley, 1994, p.58).

The constructivist view of learning has been established by the Swiss developmental
psychologist Jean Piaget. Piaget (1972), while recognizing the connection between the stimulus and the individual's response to it, explored changes in internal cognitive structure. Piaget is the founder of cognitive constructivism, and Vygotsky is the founder of social constructivism. Piaget identifies four developmental stages and processes by which children progress through. There are sensory-motor stage (0-2 years), pre-operational stage (2-8 years), concrete reasoning (8 to adolescence), and abstract (formal) reasoning (adolescence onwards).

Piaget's theory is based upon biological maturation and developmental stages and also the notion of 'readiness' is important. Readiness concerns when certain information or concepts should be taught. According to Piaget's theory children should not be taught certain concepts until they have reached the appropriate stage of cognitive development. Piaget's stages of development are all about the ability to learn at different ages based on logical development of the child.

Vygotsky and Bruner are the two theorists that have a prominent role throughout my thesis. Both Bruner and Vygotsky put emphasis on the child's environment.

Vygotsky and Bruner would rather not talk about Piaget's developmental stages at all, preferring to see development as a continuous process. Vygotsky was a contemporary of Piaget and argued that social interaction is crucial for cognitive development. According to Vygotsky the child's learning always occurs in a social context in co-operation with someone more skillful. This social interaction provides language opportunities and language is the foundation of thought. For Piaget (1972), language is seen as secondary to action, i.e., thought precedes language but Vygotsky (1978) and Bruner (1978) argue that the development of language and thought go together. The origin of reasoning is more to do with our

ability to communicate with others and is less related the material world. They both recognize the importance of social environment and past experiences of the learner. Another similarity is that they both insist that there is no seperation between the mental and social development. However they have divergences in their theories.

Vygotsky (1965, 1978) assumed that students should not acquire information independently; he felt that students learned better through assisted learning or guided participation through conversation. Bruner however theorized that students learn better if they acquire the information themselves by active participation. The teacher should only give help when necessary and at the right time. My thesis focuses mostly on Vygotsky`s conceptions and therefore his works will be explained further after Bruner.

Jerome Bruner (1966, 1996), explored how mental processes could be linked to teaching, emphasizing and learning through discovery. Bruner states that a theory of instruction should address four major aspects of learning: (1) predisposition towards learning; (2) the ways in which a body of knowledge can be structured so that it can be most readily grasped by the learner; (3) the most effective sequences in which to present material; and (4) the nature and pacing of rewards and punishments. In relation to these four aspects, good methods for structuring knowledge should result in simplifying, generating new propositions, and increasing the manipulation of information. As far as instruction is concerned, the instructor and student should engage in an active dialogue, in which the instructor should encourage students to discover principles by themselves, (i.e. Socratic learning). According to Bruner, the task of the instructor is to translate information to be learned into a format appropriate to the learner's current state of understanding. The curriculum should be organized in a spiral manner so that the student continually builds upon what they have already learned.

Vygotsky, in contrast to the pre-existing individual oriented theories and to his contemporaries, sees the importance of social and collaborative aspects of learning. Sociocultural theory of Vygotsky focuses on how the learner gets through a task and how the interactions (teacher-learner, between peers) can scaffold and assist in the knowledge acquisition process. Vygotsky considers

learning as a collective process where participation in socially-mediated activities is essential. He also coined a term called Zone of Proximal Development (ZPD) which was also not in accordance with the current of the time. This theorem will be elaborated further in the coming passeges.

Social interactions actually produce new, elaborate, advanced psychological processes that are unavailable to the learner working in isolation. The Club context created for this thesis is a perfect example of the socially interacting classroom that Vygotsky is referring to. A Vygotskian classroom emphasizes creating one's own concepts and making knowledge one's property. This only happens when school learning takes place in a meaningful context, alongside the learning that occurs in the real world. The Vygotskian classroom stresses assisted discovery through teacher-student and student-student interaction. Some of the cognitive strategies that group members bring into the classroom are questioning, predicting, summarizing, and clarifying.

In "Mind in Society", Vygotsky (1978) adds a socio-cultural point of view considering that learning has not only an individualistic character but also a social one which involve an interaction between the individual and the social environment (teacher to student, student to student). Vygotsky argues that cognitive processes, including those involved in language, arise from social interaction. To illustrate, the teacher, other learners, and the writers of guidance materials are all components of a teaching-learning experience, in other words a social interaction (Braid, 2000, p.3).

As mentioned above, the Zone of Proximal Development (ZPD) is a critical term in Vygotsky's theory that helps to explain how a child's intellectual abilities can be developed through an interactional involvement (Mercer & Littleton, 2007). When a student is in the ZPD for a particular task, providing the appropriate assistance will give the student enough of a "boost" to achieve the task. This development is achieved over a period of time through support from an adult or a more capable peer targeting cognitive development (Mercer & Littleton, 2007; Mercer, 2008; Martin, 2009).

In ZPD, each student has their own unique level of potential learning development and actual learning development. The "distance" inbetween is dependant on the

educational strategies. The potential learning development can be reached if the student gets the propper educational sytem and support. Vygotsky (1978) described ZPD as

> the distance between the actual developmental level as determined by independent problem solving and the level of potential development, as determined through problem solving under adult guidance or in collaboration with more capable peers
> (p.86).

The Club could be viewed as a setting in which challenges are presented that are within grasp of the students, i.e. within their ZPD in which the interaction involves multiple linguistic, social and cultural practices. It develops students' abilities to learn from the instructor and more capable peers. Acknowledging the role of interaction should be examined as part of children's learning.

Furthermore, Vygotsky pointed out the significance of the "intramental" and "intermental" learning. The "intramental" learning is within individuals by means of social actions and the "intermental" learning is between individuals leading to cognitive development (Mercer, 2005, Vygotsky, 1978). Vygotsky (1978) argued that:

> An interpersonal process is transformed into an intrapersonal one. Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first between people (interpsychological) and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory and to the formation of concepts. All the higher actions originate as actual relations between human individuals (p.57)

Among others, Vygotsky's argument on the importance of inter and intra personal relations is particularly relevant to my research. The interaction between students in a social environment enhances their learning. The interpersonal communication of knowledge helps the student to process the knowledge and deepen their understanding which may not be possible in a more solitary learning environment. Language and communication of language, therefore, is a significant part of the learning, in addition to the interpersonal exchanges.

The Zone of Proximal Development also expresses the way a child's thought is transformed into deeper understanding through dialogue or "scaffolding" (Mercer, 2008, Martin, 2009, Cole et al. 1978). Scaffolding is a set of techniques developed in order to help students understand and ultimately to utilize the knowledge independently. Once the student, with the benefit of scaffolding, masters the task, the scaffolding can then be removed, and the student will then be able to complete the task again on his or her own. This scaffolding offers cumulative and gradual support to a learner from teacher or peer (Martin, 2009; Mercer, 1996). Martin (2009) emphasizes that the acquisition of knowledge can be achieved through communication and dialogue. Bruner (1990) argued that children's individual development is formed by their dialogues and conversations with adults as well as by the support from a "more knowledgeable learner" which can offer "scaffolding" to a student. The ZPD, cooperative learning, and "guided learning" has become synonymous in the literature with the term scaffolding. Vygotsky never used this term in his writing. It was proposed in 1976 by Wood et al.

In the next section, the discussion will focus on another aspect of the learning as a social context: that is, collaborative learning and its importance on the community of learning practices.

2.2 Collaborative Learning and Communities of Practice

In this thesis, the term collaboration is used to mean collaborative interaction/learning in situations where pupils are working together toward the achievement of particular tasks. The Club's students focus on collaboration as a group in such a way that thinking and talking is encouraged, allowing connections to be made between previous knowledge and experiences and new learning. Complex tasks are managed through the students' cooperation with each other and cued through language.

Collaborative learning activities were developed in the early 1980s by Stuart Scott, Susan Hart and others in response to the need to provide more relevant, engaging and accessible learning activities than the familiar lecture/textbook/worksheet based ones which often resulted in pupil apathy or resistance to learning. The collaborative group activities proved to be generally successful in motivating students and enabling them to develop important learning

skills. As Gravelle pointed out

> Teachers should aim to motivate and enable students to rehearse, internalise and make their own what they have heard and read. To this end they focus on student-student and student-teacher interaction for collaborative learning. (...) Students would be encouraged to express opinions and review and assess their own work (Gravelle 2000, p.133).

Student-student and teacher-student interaction/communication is essential part of the learning process and children acquire knowledge through support in a collaborative learning environment (Vygotsky, 1978). Vygotsky's theories also feed into current interest in collaborative learning, suggesting that group members should have different levels of ability so more advanced peers can help less advanced members operate within their Zone of Proximal Development. Vygotsky, pointed out that language is not identical to thinking but that language is a tool for thinking. Learning process, utilizes more than the mere significance (meaning) of the words, connections and the connotation of each word can also be a valuable tool. That is why Vygotsky conceptualizes learning as essentially socially constructed process.

> The child's intellectual growth is contingent on his mastering the social means of thought, that is, language (Vygotsky, 1978).

Vocabulary development is not just a matter of acquiring more colourful adjectives, and it is not a collection of technical terms for science and mathematics, important as these are; the development of vocabulary is linked both to cognition and to cultural experience. Each word has different connections and connotations in each language. Words always mean more than we think (McWilliam, 1998). Therefore, pupils' success in learning the curriculum depends on active involvement in building a complex network of linguistic meaning.

Jim Cummins explains this complex network further with his theorised "Cummins Quadrant Diagram". He first used The Cummins Quadrant Diagram (Cummins, 1996) (Hall, 2001) to discuss the nature of language. The theory that has directly influenced classroom instruction is Cummins's distinction between two types of language: basic interpersonal communications skills (BICS) and cognitive academic language proficiency (CALP). Cummins, (1996); Hakuta, Butler, & Witt, (2000) and Thomas & Collier, (1997) have shown that the average student can develop conversational fluency within two to five years, but that developing

fluency in more technical, academic language can take from four to seven years depending on many variables such as language proficiency level, age and time of arrival at school, level of academic proficiency in the native language, and the degree of support for achieving academic proficiency.

We can draw parallels to Cummins's framework with Vygotsky's interpersonal and intrapersonal skill development. Like (BICS) interpersonal skills develop with social interaction and (CALP) develops within the individuals' cognition. While Cummins's framework develops over time, Vygotsky's system does not specify a set time of development but it specifies that interpersonal skills need to proceed the intrapersonal.

Later, Cummins expanded this concept to distinguish between the different cognitive demands that communication can place on the learner. Cognitively undemanding communication requires a minimal amount of abstract or critical thinking. Examples are a conversation in the playground, or simple yes/no questions in the classroom. Cognitively demanding communication requires a learner to analyse and synthesize information quickly and contains abstract or specialized concepts. Examples are academic content lessons, such as a social studies lecture, a mathematics lesson, or a multiple-choice test (Cummins, 2000).

Understanding these theories can help teachers develop appropriate instructional strategies and assessments that guide students along a continuum of language development, from cognitively undemanding, context-embedded curricula, to cognitively demanding, context-reduced curricula (Robson, 1995). An example for cognitively undemanding concepts can be the four operations in a contextual question. However, advanced numeric mathematics is a cognitively more demanding and context-reduced concept. The teacher used of two media (Turkish and English) and translanguaged to explain tasks through the use of context embedded language. e.g. These different concepts were used where relevant during the Club, as explained further with examples in the Chapter 4.

Furthermore, social interaction leads to continuous step-by-step changes in children's thought and behaviour that can vary greatly from culture to culture (Woolfolk, 1998). Development depends on interaction with people and the tools that the culture provides to help form their own view of the world. In the Club, cultural tools are passed on from one pupil to another through collaborative

learning situations, which involve a group of peers who strive to understand each other and work together to learn a specific skill (Tomasello, et al., 1993).

"Collaborative learning" is a learning strategy, but a community of practice is the learning environment that the learners are situated in where a group of individuals share common goal and strive toward it. According to Wenger (1998, p. 76), a community of practice consists of a loosely defined group of people who are mutually engaged in a particular task and who have 'a shared repertoire of negotiable resources accumulated over time'. Wenger (1998) specifies three criteria (all or some of which may overlap) for the identification and classification of a community of practice: mutual engagement of members (mutual willingness), a jointly negotiated enterprise (shared objectives) and a shared repertoire. In other words, groups of students who share a concern or a passion for something, they learn and perform better as they interact regularly. The primary focus of this theory is on learning as a social participation. Participation refers to engagement with certain people. However more importantly refers to the process of being active participants in the practices of social communities and constructing identities in relation to these communities.

The "communities of practice" approach, as Lave and Wenger (1991) and Wenger (1998, pp. 52–53) summarize it, suggests a very explicit focus on the person, but more so defines a person-in-the-world, as member of a socio-cultural community. As individuals engage in shared social practice within communities of practice, their actions, including common ways of speaking are shaped by their social identities. The Club represented a community of practice in the sense of their collaboration and interactions as shown in the Chapter 4.

As Howe and Mercer (2007) claim, social interaction and collaborative activity among children in class can provide valuable, complementary and distinctive opportunities for learning and conceptual development. Also, the importance of using language in mathematics classroom is also emphasised by Halliday (1974, 1985), Laberde (1990) and Pimm (1987). According to Pimm (1987), there are three characteristics of the language in mathematics classroom: it is mathematical, it is for social engagement and it is situated within a particular context.

Social interaction among children plays a key role in children's social development and learning. Children's social development influences their patterns of interaction, which in turn affect learning, then; in turn, the development of ways of thinking and thus social development itself. Theoretically each individual interaction perpetually and gradually can fortify or lessen the existing social dynamic.

Also productive peer interaction depends on the nature of the talk among pupils in their groups, and in particular the achievement of what Barnes (1992), Mercer (2000) and Monaghan (2005) call 'exploratory talk'. This involves children in sharing, challenging and evaluating their views. Children, working together to engage in interactions where knowledge is shared, ideas are challenged, evidence is evaluated and options are reasoned about, are collaborating to succeed in a given task and working with peer groups and may be more likely to promote exploratory talk than working alone.

According to Lave and Wenger (1998), learning is central to human identity. A primary focus is learning as *social participation* – that is, an individual as an active participant in the practices of social communities, and in the construction of his or her identity through these communities. Students continuously create their shared identity through engaging in and contributing to the practices of their communities. The motivation to become a more central participant in a community of practice can provide a powerful incentive for learning.

This study focuses on a unique space in which the students of the Club learn mathematics in a multilingual and multicultural environment. The preceding sections have explored the main arguments on the social constructivist approach like; collaborative learning, communities of practice and peer group collaboration. In the following section, the aim is to review some of the studies on learning mathematics in the light of the arguments that have been summarised earlier.

2.3 The Social Context of Learning Mathematics

Piaget (1972), Vygotsky (1978), Bandura (1986), Rogoff (1990) and Wood (1998) reflected on the relationship between the social world and cognitive development. A common feature of these theories is that student learning involves an active social interaction in which, for example, a student constructs knowledge

through discovery and experiment (Piaget), learns through imitation or observation (Bandura), or relies upon teacher support which is congruent with the student's immediate (proximal) potential for learning (Vygotsky). The work of Vygotsky gives particular attention to social influences on learning in a broad sense. Social forces are viewed as important in the learner's development, in which the learner is considered an apprentice (Rogoff, 1990) requiring the guidance, facilitation and support of teachers and other students.

Schunk (2012) emphasized that all learning is mediated through tools such as language, symbols, and signs. Children acquire these tools during their social interactions with others. They internalize these tools and then use them in various forms from simple communication to more advanced learning (i.e. higher cognitive processes such as concept learning and problem solving). Through social interactions, children are taught knowledge by others (e.g. teachers, parents, peers). Children use the tools of language and symbols to internalize the knowledge. It is possible to learn concepts on one's own without social interactions. But even such independent learning is, in a social constructivist sense, socially mediated, because it involves the tools (i.e. language, signs and symbols) that have been acquired through previous social interactions. These tools are useful not only for learning but also for teaching. Children teach one another things they have learned. Vygotsky (1978) believed that by being used for social purposes, tools exert powerful influences on others.

Many theorists present a viable model for explaining how mathematics is learned (Ball et al., 2001; Cobb, 1994; Lampert, 1990; Resnick, 1989). Mathematical knowledge is not passively absorbed from the environment, but rather is constructed by individuals as a consequence of their interactions.

Researchers have explored how learners construct knowledge, how experts and beginners differ, and which methods of instruction are most effective (Byrnes, 2008; Mayer, 1999; Schoenfeld, 2006). The improvement of instruction is important given that so many students have difficulty learning mathematics. A distinction typically is made between mathematical *computation* and *concepts* because of the amount of language and comprehension needed to deal with complex mathematical concepts. Computation refers to the use of rules,

procedures and algorithms and the concepts refer to the problem solving and use of strategies.

Problem solving requires that students first accurately represent the problem to include the given information and the goal and then select and apply a problem-solving strategy (Mayer, 1985, 1999). Translating a problem from its linguistic representation to a mental representation is often difficult (Bruning et al., 2004). Learners need to perceive and integrate the given information. In order to reach the mathematical knowledge, they need to have sufficient knowledge of the language.

The more abstract the language, the more difficult the text comprehension and the lower the likelihood of solution (Cummins, Kintsch, Reusser, & Weimer, 1988). Students who have difficulty comprehending show poorer recall of information and lower performance. Verbalizing steps in problem solving aids the development of proficiency (Gersten et al., 2009).

Research (De Corte, Verschaffel, and De Win (1985) and De Corte and Verschaffel (1987) has shown that rewording text and problem structure leads to significant improvements in problem solving. The learners with a knowledge in Turkish, use both Turkish and English in the Club which allows them to fully grasp these concepts. A more detailed on this type of language use, translanguaging, will be explored further in later chapters. Clarkson (2009) and Bernardo (1999) in their studies on Papua New Guinea and Philipino bilingual students respectively found that the students performed better when the problems were provided in students' first language.[1] Also Dawe's (1983) study on bilingual Punjabi/English speaking children found a positive correlation between increased

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1 The debate around 'first language' is worthy of our attention here. It is often assumed that this is the language the child is 'first exposed' at home. The argument is then blurred when the child starts school and the language of the home is then surpassed by that of the school. Although not conclusively it can be said that this is the case with a significant majority of children from linguistic minority communities in the UK.

competency in the use of the two languages and in the children's mathematical reasoning.

A worthy aspect relating to processing of worded problems which – most researchers working with bilingual students appear to agree on – relates to the processes of solving them. The construction of the abstract problem structure is based on the textual proposition of the problem (Carpenter et al., 1988; Kintsch and Greeno, 1985). The process is also called 'modeling of problem structure' (Cummins et al., 1988; Krutetskii, 1976). The examples from transcripts show how the teacher de-constructs the given (abstract) problem by exploring its textual proposition. The concrete words in Turkish and English helps students better contextualise the problem by forming associations through translanguaging.

Mathematical competence also depends on socio-cultural influence. In its essence social constructivist and socio-cultural are the same in that they focus the theory around the social interaction, whether it is student-student or student-teacher. The terms differ subtly in the way they define their focal points. Social constructivists, focus primarily on the individuals' processes within the community whereas, socio-cultural theory is more interested in the interactions amongst the more knowledgeable and the less knowledgeable. The former is geared more towards the symmetrical dynamics whereas the latter is more asymmetrical.

In addition to the social constructivist emphasis on reorganizations among individual students, socio-cultural theorists advocate cultural practices — especially social interactions (Cobb, 1994). The socio-cultural influence is incorporated through such activities as peer teaching, instructional scaffolding and apprenticeships. Vygotsky (1978) stressed the role of competent other persons in the zone of proximal development. Rittle-Johnson and Star (2007) found that seventh graders' mathematical proficiency was enhanced when they were allowed to compare solution methods with partners.

Furthermore, Kramarski and Mevarech (2003) found that combining collaborative learning with meta cognitive instruction raised eighth graders' mathematical reasoning more than either procedure alone. Meta cognitive instruction is the

reflecting on relevant concepts, deciding on appropriate strategies. In addition to these benefits of collaborative learning (Stein et. al., 2006), the literature on peer and cross-age tutoring in mathematics reveal that it raised children's achievements (Robinson, Schofield, & Steers-Wentzell, 2005). Both constructivist and socio-cultural perspectives suggest that, students can develop knowledge through social interactions.

In the following section, the theories of language acquisition within the context of learning will be the main focus. As the children in this research group are bilingual/multilingual, the discussion will revolve around learning a second language, bilingual learning and translanguaging.

2.4 Research and Theories of Language Acquisition

An understanding of second language acquisition can improve the ability of mainstream teachers to serve the culturally and linguistically diverse students in their classrooms (Fillmore & Snow, 2000; Hamayan, 1990). Research and theory on first language learning tends to be closely intertwined with the development of cognition (e.g. Brown, 1973; Carroll & Freedle, 1972; Hayes, 1970).

Theoretical frameworks for second language acquisition are presented in a number of different perspectives. Each individual has their own variables that take effect when a piece of information is provided for them to grasp. The significance of learner variables in language learning has been studied extensively, including abilities, motivation, cognitive styles, and learning strategies. Theories of intelligence (Sternberg & Gardner, 1982) clearly indicate that there are distinct linguistic abilities that differ across individual to individual. Research on learning strategies (e.g. Chamot & O'Malley, 1990; Wenden & Rubin, 1987) indicate that student performance can be improved by following certain strategies but the results are highly dependent upon the nature of the task and differ from learner to learner.

Brown (1980) argues that the analysis of errors made in language learning reveals the development of a set of rules made up by the learner that map the new language onto their native language. These rules can be seen as possible road maps when the learners are faced with other problems even if it is in their second

language. According to Brown, correction of errors is important in helping the student understand the grammar of the new language.

An environment which is at an appropriate skill level and encourages learners to participate in also beneficial. According to several studies (Pica et al., 1989; Swain & Lapkin, 1995), providing learners with opportunities to use the language and skills they have acquired, at a level in which they are competent, is almost as important as giving students the appropriate level of input. The environment of the learners is just as important as the knowledge given by the teacher.

Moreover, other research (Hakuta and Diaz, 1985; Bialystok, 1991 and Kovacs and Mehler, 2009) has shown that first language literacy and academic skills are an important support for the development of literacy and academic skills in the second language, and that bilingualism enhances cognitive flexibility. The first language skills help integrate second language (bilingual) cognitive processes and academic skills as well. The research on bilingualism suggests that first language of the learner is a valuable tool for the rest of their academic curriculum. In the following section, the arguments surrounding bilingualism and bilingual education will be reviewed.

2.5 Bilingualism and Bilingual Education

The terms bilingualism and multilingualism are applied when people alternately speak two or more languages in daily lives. Multilingualism refers to an individual who can speak more than two languages. In this research, unless otherwise specified, all remarks about bilingualism apply as well to multilingualism. However, as Beardsmore (1991) points out, it should not be forgotten that these generalizations give very little information about the degree of knowledge in two or more languages and there are various other definitions of bilingual and multilingual people across different contexts. The National Association for Bilingual Education defined that bilingual education can mean any use of two languages in school – by teachers or students or both – for a variety of social and pedagogical purposes (NABE, 2016).

Balanced bilingualism means that the speaker can function equally well in most circumstances in two languages. Most bilinguals use their two or more languages for different purposes, in quite specific circumstances and with a variety of people

in their everyday lives (Fishman, 2007/ Originally published in La Linguistinque, 1965). Most bilinguals have a dominant language though this may not be the same one throughout their lives. We can employ terms that refer to the time in which the individuals have started to learn the second language. Simultaneous bilinguals have stated to learn their two languages before the age of three; sequential bilinguals learn one language in the home and another at a later date (Baker, 2001). Over-ruling majority of students in this research fall into the latter category.

Below is the most common definition of bilingualism used in educational context:

> In England the term [bilingualism] is currently used to refer to pupils who live in two languages, who have access to, or need to use, two or more languages at home and at school. It does not mean that they have fluency in both languages or that they are competent and literate in both languages (Hall, 2001, p.18).

According to Hall (2001) the bilinguals' command of each language used may vary according to the area or topic in which it is used, regardless of their mother tongue. Some notions may be known or introduced in the second language and not known in the mother tongue, as it is later demonstrated in this thesis.
So too, social and political statuses of the countries might affect the perception of bilingualism and multilingualism even amongst educationalist. Languages are given a status, high for European languages and low status for the less developed countries. If given a high status then bilingualism is seen as an advantage. Yet when it is from a low status language, it is a disadvantage (Cummins, 2000). In the United Kingdom, the mainstream curriculum, in practice, is mediated solely through English. Except for the cases when the teacher is knowledgeable in the minority languages, and is willing to show special effort, the students are only graded by English, creating a rupture in measurement.

The Bullock Report (1976) has been one of the rare documents that underline a structural approach to the positive effects of bilingualism on the students' ability to learn. Rather than integrating one language in the formal education system, the report states that a positive attitude should be used, if possible, when it comes to letting students use their mother tongues. As the children build confidence it would be easier to include the second language (DES, 1976, p. 294). A more

recent document (DfE 2013) report on the learning occurring in multilingual environments however, the focus is on English as an additional language (EAL) issues rather than commenting on the positive effects of bilingual use in other curricular courses.

There are various models of bilingual education in different countries because of the different policies, minority languages and ethnic relations. Researchers from the Center for Research on Education, Diversity, & Excellence (CREDE) observed that no single approach or programme model works best in every situation (Genesee, 1999). Many different approaches can be successful when implemented well and local conditions, choices, and innovation are critical ingredients of success. Where programmes of bilingual education have been implemented significant achievements and enhanced linguistic development has been the result as is documented in the works of Thomas & Collier (1997 & 2002) in the state of California.

There are dissenting voices that criticise bilingual education generally on grounds of social divisiveness and indifferent educational outcome (e.g. Arizona Education Dept., 2004). A full bilingual programme would be difficult to implement in British schools mainly because of the number of languages spoken by the students. Historically, the only extensive example of the bilingual approach in the UK is the teaching of Welsh in Welsh-medium schools in Wales (Redknap et. al., 2006).

Beykont, (1994); Campos & Keatinge, (1988); Ramirez, (1992); Thomas & Collier, (1997) suggest that for linguistic minority students, the extent to which their language and culture is incorporated into the school programme increases the academic success. Such bilingual programmes use the oral and literacy skills in L1 (first language) as basis for supporting the development of the school language (L2). The use of first language for minority students as a medium of learning and curriculum communication has played a significant role. Even if it is a small number of pupils, it provided a possible solution to the mainstream response to linguistic diversity (Leung, 2002). It is shown that this process is also reversible where the facilitation of the use of the two languages interchangeably results in cognitive advantages (Cummins and Mulcahy, 1978; Kessler & Quinn, 1982;

Clarkson, 1992; Issa, 2005). Students' simple communication skills may hide their inadequacy in the language proficiency necessary to meet the cognitive and academic demands of the classroom. This makes it harder to solve and even to identify the problems related to language proficiency of the students.

According to Leung (1996) there is little discussion on learning English as a second language. Considering the high number of students that have to learn English as an additional language, there is no EAL (English as an Additional language) curriculum. Instead, the traditional English as a mother tongue curriculum is offered as EAL development and the EAL students have no option but to attend normal classes (Leung 2004). When EAL specialist teachers present classes, they have the means to explain further using the shared non-English language and this helps level the educational opportunities. The EAL specialist teachers may provide support not only on the class matter but also on how to use a proper transitional facility that might aid them (Bourne, 1989). According to the Bell Report (2014) the number of children that need a second language support has increased and the schools have gained more autonomy with their EAL budget. This will inevitably result in varying provisions of the schools and the EAL staff within each organization.

The EAL has not been emphasised until the mid-1980, when two landmark documents were published. The first one, the Commission of Racial Equality published a report in 1986 on the practice of teaching English to EAL students in separate language centres therefore, in terms of outcome found this practice racially discriminating (CRE, 1986). The impact of this report was a reflection of the gathering strength of an emergent view on social integration of ethnic and linguistic minorities. These were captured in the report of an official committee of inquiry, the second landmark document, generally referred to as the Swann Report (DES, 1985). The Swann Report (1985) expressed its belief that multicultural societies cannot be accomplished without the social integration of ethnic minority communities.

UK Government Policy implements ideas on the integration of the non-English languages into the curriculum. There are documents advising the merger of the minority communities' languages into the mainstream curriculum. For instance,

DfEE advocates 'building on pupils' experience of language at home and in the wider community, attempting to develop the use of both mother tongue and English. Therefore, in turn, increase the support of one another (DfEE and QCA, 1999, p.49).

Though these arguments are valid, the perception of the usage of non-EU languages remains discriminatory, as the uses of these languages are linked to underachievement. The DfES strategy document *Languages for All: Languages for Life* (2002)'s advice is to try to be inclusive of not only the language but also the social implication of its use. There is a dynamic both within the pupils and in the teacher-student relationship that has to shift in order to have a more inclusive integration of minority languages. There is a multidimensional perspective, as mentioned by Leung, that policy makers are to address the sociological implications like the perception of the minority languages, as well as practical implications such as improved student motivation or psychological implications on the students' attitudes towards this perspective (Leung, 2004).

However, Department for Education has not implemented this multidimensional approach. According to DfE (2013), pupils should be taught to control their speaking and writing consciously, understand why sentences are constructed as they are and to use Standard English. They should understand and use age-appropriate vocabulary, including linguistic and literacy terminology. DfE also states that it is important for pupils to learn the correct grammatical terms in English and that these terms are integrated within teaching (DfE, 2013, p134). Whereas, there are contradicting opinions on the issue as Leung suggests that EAL learners should be encouraged to use the full range of their communicative resources, including local vernaculars, translanguage and Standard English, where appropriate (Leung, 2014).

In addition, a substantial body of research exists relating to learning English as an additional language, which include Brent Language Service (1999), Cary (2000), Conteh (2003), Gibbons (2003), Gravelle (2000), Kenner (2010), Leung (2002), Leung and South (2001), McWilliam (1998), Ward (2002), Wrigley (2000) and also Thomas and Collier (1997), Cummins (1981). Their combined view indicates that a distinction needs to be drawn between interpersonal

conversational skills on the one hand and academic language skills on the other. Generally, pupils develop conversational skills in an additional language relatively swiftly, usually over a period of one or two years, in the case of young children. Although they gain this fluency in basic conversational skills, the acquisition and proficiency of academic language takes several more years. Most researchers agree that it takes between five and seven years for pupils to acquire academic English at the same level as their peers.

As mentioned in NALDIC (2004) document, the value of speaking another language is, not only as a skill in itself, but also as an invaluable asset in promoting mental agility, increased reasoning, problem solving ability and leads to greater interpersonal sensitivity and understanding.

> Processes of teaching and learning English as an additional language are to do with becoming bilingual, not with substituting one language for another (NALDIC, DfES/0416/2004, pp. 6-7).

These language learning skills go a long way towards promoting academic success, strong relationships and increased emotional security. As indicated above, this is a process that necessitates a consideration of several factors without simply approaching being bilingual as substituting one language with another. Among other approaches that emphasise the importance of using the knowledge of multiple languages, the literature on translanguaging is also relevant to this research. This was of notable significance during observation of students' conversations in the Club: their use and referencing of multiple languages was a form of translanguaging, leading to more proficiency with mathematics.

2.6 Translanguaging

Instead of bilingualism, the term translanguaging should be introduced because the former fails to cover the situation of the students in the Club. Translanguaging is not only the mere use of two languages but it also entails the culture and shared repertoire of the languages.

According to Garcia (2009) translanguaging is

> multiple discursive practices in which bilinguals engage in order to make sense of their bilingual worlds (Garcia, 2009, p.45).

Translanguaging includes but is not limited to use of two or more languages by a single person. It means more than the mere language contact among bilinguals. Rather than focusing on the language itself, the concept of translanguaging makes it obvious that there are no clear-cut boundaries between the languages of bilinguals. Translanguaging is the use of the two or more languages together as well as their cultural and linguistic implications. What exists is a languaging continuum that is being constantly accessed (Garcia 2009, p.47). Translanguaging thus includes but "goes beyond" phenomena such as code-switching (linguistic term refering to the alternating of languages within a conversation) (Garcia 2009, p.45).

Garcia (2009) argues for a dynamic and flexible bilingualism in schools which center on the individual students' language practices. According to Garcia the role of educators is to notice learner needs rather than segragating between particular languages.

According to the concept of 'valorising' low status languages developed by Fishman (1986); the de facto monolingual practice will give students the message that their language/idiom is not good for education although individual teachers will try to counteract this message. However, using students' language for education valorises it and thus strengthens identity and pride of culture in addition to the practical benefits with respect to comprehension. An example could be the high and low status languages as mentioned above in the bilingualism section. Meaningful instructional practices support students' linguistic and cognitive growth. Garcia has developed the term 'translanguaging' to discuss multiple language practices in relation to one another (2009). Garcia suggests that language choice in multilingual speakers involve negotiation in every interaction as they "decide who they want to be and choose their language practices accordingly" (2010, p.524). Creese and Blackledge (2010) describe how bilingual teachers translanguage to move between languages to include different participants (students, parents and teachers). They argue that this endorsement of flexible bilingualism by the bilingual teachers offers the students an identity position. As mentioned previously, Fishman (1986) adds on the term balanced bilingualism by positioning it in a social dynamic. Parallels can be drawn with the older theories and translanguaging on the importance of recognising the identity of minority

languages.

Jonsson (2012) analysed three English lessons which make up the data in Swedish and Spanish medium school to describe the multilingual language practices. She showed that translanguaging is useful to explore as a medium of learning, as it moves the focus from the language(s) to the speakers. Jonsson (p.23) mentioned that if translanguaging is used as a resource in education, it may potentially improve the learning ability of bilingual children, and may contribute to the development of strategies in dealing with language barriers.

The common practice has a monolingual vantage point towards bilingual language use however it may be valuable to view translanguaging through the perspective mentioned above. This perspective recognizes the heteroglossia, i.e. the presence of two or more voices or expressed inherent in bilingual dialogue (Bakhtin, 1994). Emphasising the heterogeneity in bilingual dialogue is important to challenge the existing perspectives that problematize bilingualism, by prioritising the dominance of one language over the others. The hierarchy embedded in this perspective reduces the potential of bilingual learners into a barrier by undermining the resourcefulness of all languages.

Additionally, when the message, implicit or explicit, communicated to children in the school is "Leave your language and culture at the school gate", they are also forced to leave a central part of who they are – their identities – behind. This approach was criticized in the Bullock Report dated 1976. When they feel this rejection, they are much less likely to participate actively and confidently in classroom activities. It is not enough for teachers to passively accept children's linguistic and cultural diversity in the school. Language acquisition requires a deep shift in the learner. Their personal, academic social and psychological identities will shift. This is an intense shift; therefore the perception of this transition is just as important. How does becoming bilingual emotionally affect the learners is an essential question for the teachers to ask because only with the schools respect and support, these languages can be integrated into the main curriculum (DfES, 2004).

In their study on the practices of multilingual young people in cities, in Denmark, Sweden, Netherlands and United Kingdom, Blackledge (2012) argues that young

people's communicative repertoires are connected and they respond to local and global concerns and oriented to a variety of identity positions.

> These identities are neither fixed nor unitary, but are bound up with overlapping histories, and are best understood through a lens which examines the fine grain of local interaction in the light of these histories (Blackledge, 2012, p.8).

In this study, the transcripts contain several examples of local interaction which were shaped by the cultural and linguistic backgrounds of students. Bilingual pedagogy, Hornberger (2002) proposes, is "essentially about opening up ideological and implementational space in the environment for as many languages as possible" (p.30). The data gathered also demonstrates the effect of using a bilingual pedagogy on the students' learning experience. García (2009) suggests that teaching methods should be centered on the emergent and dynamic bilingualism of each individual's language practices. Translanguaging also allows students to activate their prior knowledge which is an essential element for their progress in all learning activities.

2.7 Activating Prior Knowledge

Pupils' shared prior knowledge and shared understanding are important points for classroom interactions. Edwards & Mercer (1987) stated that classroom interactions, like those in any other social setting, are founded on the establishment of a base of common knowledge amongst speakers and necessarily involve the creation of more shared understanding. Interactions are within a particular institutional and cultural context and similarly the speakers' relationships also have histories. This shared understanding develops as the talk progresses. Speakers may invoke knowledge from their joint past experience (e.g. their recall of activities carried out in a previous day's lesson), or rely on common knowledge from similar, though separate, past experiences (for example, a teacher with a new class can usually assume some existing understanding of how teachers and students interact).

According to Blommaert (2005), this specific interaction creates an inequality between the learners, as each and every learner has different communication abilities and they differ in their interactions. The mainstream classes in the school create such a space that result in this specific inequality where bilingual pupils do not have the same means of communication as their English speaking peers and

teachers.

As Blommaert puts it:

> People are restricted as to what they can do with and in language, depending on the range and composition of their repertoires. In that sense, apart from what people do to language, there is a lot that language does to people. People, consequently, are not entirely free when they communicate, they are constrained by the range and structure of their repertoires and the distribution of elements of the repertoire in any society is unequal. Such inequality of repertoires requires us to use sociolinguistic backgrounds of discourse analysis because what people actually produce as discourse will be continued by their sociolinguistic background (Blommaert, 2005, p.15).

Students bring their cultural and linguistic repertoires to the class but when part of their repertoire is discouraged in the environment they are in, their ability to learn new things is severely impaired.

Speakers of a language in particular communities are able to communicate with each other in a way that makes them utilize their cultural and linguistic repertoire thereby activating their prior knowledge. This ability involves a shared knowledge of the linguistic code as well as of the cultural rules, norms and values which guide the conduct and interpretation of speech and other channels of communication in a community. It is not only correct but also appropriate to the socio-cultural context (Hymes, 1996).

According to Hartley (1998), it is easier to learn and remember if materials are well-organized and structured. Differences between individuals can affect learning as their prior knowledge will vary too. Therefore the materials should not only be well organized but also prepared taking the differences between the students into consideration.

James Hartley (1998) identifies the significance of prior knowledge as:

> Learning results from inferences, expectations and making connections. Instead of acquiring habits, learners acquire plans and strategies, and prior knowledge is important (1998, p.18).

Therefore, it is important for the teacher to provide an appropriate linguistic and cognitive challenge— offering new information that builds off prior knowledge and is therefore comprehensible (Sowers, 2000). Activating students' pre-existing knowledge in order to make connections between formal knowledge and students' informal intuitions helps problem solving and overcome difficulties with computations (Resnick, 1995).

Additionally, freedom to play around with language constitutes an important part of the learning environment. It is also a useful tool to call for the prior knowledge and to encourage multilingual students to use the knowledge from more than one language. One of the emerging themes from this data is the example of children's 'framing talk as play' through which they structure their social and personal experiences. This provides us with an interpretation of what is going on in a given interaction (Vally Lytra, 2007). This will be reviewed in the following section, with focus on playful talk as a strategic way to teach and learn.

2.8 Play Frames

Play frames allow a process in which the students make sense of the knowledge where they employ playful language patterns to integrate the given knowledge. Since the students come from different backgrounds whether it is cultural or linguistic; the shift in this paternal speech turns into lists, teasing, joking, verbal play, music making, chanting as activities. These are all examples of play frames. One of the most surprising points about play frames is that learning is seen as being supported by student-induced play, a concept that would traditionally be excluded from lessons.

Blommaert (2005) pointed out that even if two people speak the same language; they will have the complex of variations in communication due to the difference in their repertoires (social, cultural, and historical). This resonates with Lytra's (2007) findings that students draw upon these repertoires in various more or less strategic ways in their play frames (playful talk) to negotiate a range of identities, roles, stances and positionings (p.81).

Sometimes children have difficulty in issuing play cues that it could not be understood and returned. Their behaviour was not recognised as play by the other children. This interaction will not result in play frames, it is a miscommunication however when perceived by both parties, has a potential to aid the learner.

Bateson (1972) coined the term 'metacommunication' to refer to the non-verbal play signals and play faces (for example, winking, smiling, exaggerated movements, eyes sparkling) that denote behaviour as playing and therefore are not 'for real'. Children's meta communications (Bateson, 1972), the signals that send out the message "this is play," establish a frame within which the play can take place. The frame is largely psychological, and is essential for the players to understand that what is taking place within its boundaries is play and is therefore bounded by different rules, rituals and story lines. The frame sets the context for the play behaviour and separates it from what lies outside. The conversations within the Club, shows various themes of language such as bilingualism, translanguaging, activating prior knowledge and play frames. The final chapter of the literature review will be complementary to all the mentioned themes, as it will underline the correlations among each and collectively incorporate all these aspects of learning mathematics in a bilingual group setting.

2.9 Learning Mathematics in a Bilingual Group

Understanding the relationship between language and learning mathematics and how bilingual mathematics learners use language to communicate mathematically is crucial for teaching mathematics in a bilingual context. It is crucial when determining the policies, curriculum and in determining the approach of teachers.
Mathematical communication in bilingual classrooms have been addressed in several researches (Khisty, McLeod, and Bertilson, 1990; Brenner,1994; Khisty, 1995; Adler, 1998; Burton, 1999; Moschkovich, 1999; Barwell, 2001, 2003 and Setati, 2005) and these researches on learning mathematics emphasize how students construct multiple meanings and negotiate meanings through interactions with peers and teachers (Moschkovich, 2002).
Moschkovich (2002) mentioned three perspectives of the role of the language on bilingual mathematics learners' learning process: 1, acquiring vocabulary; 2, constructing of multiple meanings across registers and participating in mathematical practices: 3, sociocultural and situated aspects of language and mathematical learning.
1. As stated by the first perspective, acquisition of vocabulary involves acquiring knowledge of language to learn mathematics. This new vocabulary helps carry

out computations or solve traditional word problems with emphasis on vocabulary as the central issue for the students with English as second language. According to Cuevas, Mann, and McClung, (1986); Spanos, Rhodes, Dale and Crandall, (1988); Dale and Cuevas, (1987); MacGregor and Moore, (1992); Olivares, (1996); Rubenstein,(1996); understanding vocabulary terms, translating word problems from English and reading comprehension are the main issues causing difficulties for bilingual mathematics learners.

2. Constructing Multiple Meanings, the second perspective, includes the notion of the mathematics register. The mathematical register is a particular kind of language used in a mathematics context that could contain words which have meanings from daily use as well. It simply applies the concept of register to mathematics. Haliday (1978), defined mathematics register as "in the sense of the meanings that belong to the language of mathematics, and that a language must express if it is being used for mathematical purposes" whereas "a register is a set of meanings that is appropriate to a particular function of language, together with the words and structures which express these meanings" (p.195).

The multiple meanings consider differences between the everyday and mathematical registers. Multiple meanings sometimes might create obstacles in mathematical conversations because students often use colloquial meanings while the teacher (or other students) may use mathematical meanings. This perspective has contributed to descriptions of how learning mathematics involves, in part, a shift from everyday to more mathematical and precise meanings (Moschkovich, 1996, 1998 and O'Connor, 1992).

3. The third perspective is a situated and sociocultural view of language and mathematics learning. Using the concepts of mathematics register (Halliday, 1978) and mathematical discourses (as elaborated below) (Gee, 1996 and 1999) new studies enriched the past views of the relationship between language and learning mathematics, broadened what counts as competence in mathematical communication, and provided a basis for designing clear instruction. It is valuable to recognize the mathematical ideas that bilingual students are able to express despite limited use of both languages, their poor accents, or limited vocabulary. Their learning has social and cultural influences due to their participation in multiple language communities. The teacher, often aided by competent members of the student group, can then improve instruction and build

on students' competencies and resources (Moschkovich, 2002).

Lave (1991), Lave and Wenger (1998), Wenger (1998) and Creese (2005) use the term, situative perspectives with foundations created by Vygotsky (1978) to refer to the learning that takes place in communities of practice. Greeno et al. (1998) use 'situative' instead of 'situated'. This differentiation is there to clearly define that, situated is a perspective on learning, not a particular way of learning (situative). According to this perspective all learning in a community is 'situated'. Learning mathematics is preferable by using physical, discursive tools and resources which are provided by the mathematical community (Greeno and MMAP, 1998; Wenger, 1998).

Moreover, Moschkovich (2012, p.95) utilises the phrase 'Mathematical Discourse Practices' to draw attention to the fact that mathematical discourses are embedded in sociocultural practices, and that "mathematical discourse practices are social, cultural and discursive" (op. cit.). Mathematical Discourses (in Gee's description, 1999) consist not only of ways of talking, acting, interacting, thinking, believing, reading and writing but also communities, values, beliefs, points of view, objects and gestures. These practices emerge from the classroom community as a collaborative group. Mathematical Discourse practices include participating in thinking, signs, tools and meanings.

Moschkovich adopts the same point of view:

> Words, utterances or texts have different meanings, functions and goals depending on the practices in which they are embedded. Mathematical Discourses occur in the context of practices and practices are tied to communities. Mathematical Discourse practices are constituted by actions, meanings for utterances, foci of attention and goals: these actions, meanings, foci and goals are embedded in practices (Moschkovich, 2012, p.95).

Gee underlined how "Mathematical Discourses always involve more than language" (1999, p.25) and defines Mathematical Discourses as much more than vocabulary or multiple meanings:

> A Discourse is a socially accepted association among ways of using language, other symbolic expressions, and 'artefacts,' of thinking, feeling, believing, valuing and acting that can be used to identify oneself as a member of a socially meaningful group or 'social network,' or to signal (that one is playing) a socially meaningful role (Gee, 1996, p.131).

Social norms are inferred by identifying regularities in patterns of social interaction and show the social reality of the classroom (Yackel and Rasmussen, 2002). In an ordinary classroom, students' and teacher's goals, thoughts, suppositions are limited by these norms.

Yackel and Rasmussen (2002) suggested that "A student's inferred beliefs about his or her own role in the classroom, others' roles, and the general nature of mathematical activity can be thought of as a summarization of the obligations and expectations attributed to the student across a variety of situations" and also, "Norms and beliefs evolve together as a dynamic system". Interrelationship between beliefs and norms causes a shift in beliefs. Social norms can be thought of as shared beliefs that constitute a basis for communication and make the smooth flow of classroom interactions possible (Cobb et al., 1993 cited in Yackel and Ramussen, 2002). These norms can be developed and evolve as shared beliefs that create a positive atmosphere in the classroom by changing teacher's and students' preconceptions. Prediger (2004) considered school mathematics as a culture in itself, including all parts of implicit knowledge (like language, shared understanding, norms, questions accepted to be relevant), roles, forms of communication, habitus, etc.

Taking a holistic consideration of these multiple perspectives informs this research as it explores learning strategies and collaborative approaches in a group of Turkish, Kurdish and Turkish Cypriot students engaging in mathematical tasks, drawing on their existing linguistic as well as their cultural and personal repertories.

3. Methodology

This is a qualitative study that has been influenced by a variety of fields, in particular ethnography. The ethnographic study is one form of qualitative research and this is my main tool. The purpose of this study is to analyse students' naturally occurring language in the Club during classroom activities in order to explore strategies used by children as bilinguals while tackling mathematical tasks and to focus on how learners interpret their learning environment as they engage in the tasks through a bilingual medium.

This chapter consists of six sections.

3.1 Study Design

3.2 The Approach

3.3 Researcher's own position as a participant observer

3.4 The methods used to collect data

3.5 The methods of data analysis

3.5 Considerations of research ethics

3.1 Study Design

As I mentioned in the Introduction Chapter, I ran the Club in a large mixed comprehensive school in North London with higher than national average of diverse needs. As a full time Maths teacher at the school prior to the research, in the mainstream maths class I used predominantly English with only occasional Turkish to help some of my Turkish speaking students if they seemed to be really struggling. During the Club, however, I had freedom over some of the more challenging tasks using both Turkish and English according to the needs of the students rather than a clear preference for one language or the other. Children attending the Club had well developed spoken Turkish, which made some tasks more accessible as I explained things in two languages. During the research, my role was that of participant observer as well as a teacher.

The focus of the study is the Club which was attended by approximately 20 Turkish speaking students, ages between 14 and 16 years old. It was announced to the students that there would be a bilingual after school, mathematics study group and all of the participants were there voluntarily. The total number of students in the study is 20 however in each individual class there was 7-10 students. In total 6 classes were taped and transcribed. During the study a questionnaire to each student and their parents were collected about their impressions of the Club and its effects. Two focus groups were formed, also voluntarily. The Club Interactions were audio-recorded and field notes were taken. All of the mentioned data was used in the analysis and the emerging themes were conceptualized through methods of qualitative analysis like thematic analysis (coding and categories) and conversational analysis. The methodology includes a simple quantitative element (counting of answers in closed-ended questionnaire questions).

3.2 The Approach

This research is qualitative and ethnographic by its nature:

- Qualitative because there is not a clearly defined hypothesis underpinning the research which can be tested by analysing sets of figures but rather it deals with interpretation of transcriptions, observations, questionnaires and field notes (Patton, 1990).

- Ethnographic because it deals with real students in real settings addressing meaningful tasks. Thus the context and inter-relationships between the students and their teacher will be very significant in the search for a clear explanation of the realities being investigated (Wills & Trondman, 2000).

Kirk and Miller (1989) define qualitative research as a "particular tradition in social science that fundamentally depends on watching people in their own territory, and interacting with them in their own language, on their own terms". Watching people in their own territory thus entails observing, talking with people (interviews, focus groups and informal chatting) and reading what they have written. Qualitative research often employs several different methods or adopts a 'multi-method' approach. Data collected by these methods may be used in a variety of ways, but there is a common focus on talk and action rather than

numbers and statistics. In actual fact, these 'qualitative methods' are used every day by human beings to make sense of the world – we watch what is going on, ask questions of each other and try to comprehend the social world in which we live. Qualitative research involves the application of logical, planned and thorough methods of collecting data, and careful, thoughtful and, above all, rigorous analysis.

Ethnographic studies are those that take place within a definable cultural setting, for example studying the school where the students share the same environment in this research. Ethnography is widely used in many social science areas, including education and pedagogy, linguistics, health studies, media and cultural studies (Willis& Trondman, 2000). In educational studies, ethnography is sometimes equated with naturalistic enquiry, participant observation, or field based research.

Zaharlick (1992) identifies seven characteristics for ethnographic studies. These characteristics reveal an emphasis on social relationships, the researcher as a learner, the ethnographer as research instrument, naturalistic observation, firsthand observation, long-term observation and participant observation. This ethnographic study contains Zaharlick's identified characteristics that make it a distinct approach to research.

The ethnographic approach is a suitable approach for this study for a couple reasons: First, the research aims to examine interconnections between students' experience of a specific learning environment, their use and appropriation of language, the effects of culture and learning strategies using translanguaging. The best way to look into these connections was to use an ethnographic approach to gather data using participant observation and other methods. Second, the study aims to examine the learning strategies using translanguaging and peer group collaboration. The core of this examination is to look at students' participation in the learning environment using specific strategies. Therefore, it was crucial to conduct the research in a natural setting in which students learn and interact with each other, rather than, for example, interviewing them in an isolated space.

In this study many different strategies were used to discover what was going on in the situation and how those events could be monitored, described, evaluated and

placed within some sort of understandable theoretical framework. The ethnographical approach was chosen because the knowledge is acquired through social interaction. Research questions focus on the nature of naturally occurring conversations in the maths after school club during classroom activities and the participants' experiences, this including the teachers, students and parents.

One of the factors that affected the choice of the ethnographic study in this research as the methodology is the assumption that teaching and learning are interactive processes. As Vygotsky (1978) argued, all higher mental functions have their roots in social activity; and social interaction is an integral part of cultural development and the development of higher mental process. Accordingly, acquisition of knowledge happens through social interaction, and psychological tools or signs and cultural tools are an inseparable part of this process. My observations and what students and parents expressed during this research corroborates Vygotsky's argument as explored in the chapter on the analysis of the research and it results.

As a whole, I approach my research as an ethnographic case study in which the same group of students were observed in a consistent semi-controlled environment over a period of time. My ethnographic site in the study is the after school club working on mathematical classroom activities in which naturally occurring conversations are minimally interfered. This environment helps translanguaging to take place freely. In this environment all interactions including gestures; focus group discussions; questionnaires; my long-term direct knowledge and experience of the main stream class, are all sources of information.

Evaluation is the process through which the learning opportunities offered and experiences undergone by students are examined and judgments are made about their effectiveness and value (Oliver, 2000). In the context of analysing students' naturally occurring language these judgments usually concerned the classroom activities which take place during the Club.

I use the principles of illuminative evaluation throughout the research because I did not start upon pre-existing conceptions about the results. The points in which I found significance occurred naturally. My position on the emerging thematic consistencies was to find the important point as they occurred. As I use a

combination of methods for the study, this approach was useful to examine the factors and issues that emerged in particular group interactions, rather than following a ready-made structure in the field and analysis.

Illuminative evaluation is an observational approach to evaluation that is inspired by ethnographic research (Parlett, 1981; Parlett and Hamilton, 1988). Its aim is to discover the factors and issues that are important to the participants in a particular situation rather than the use of standard measures of evaluation. The combination of observations, interviews with participants, questionnaires and analysis of documents and background information are helpful in illuminating problems and issues (Parlett and Hamilton (1988, p.1). To put this into practice, two focus groups' discussions and questionnaires, as well as the Club Interactions amongst the students and with the teacher served as mediums for assessment. In doing this, I aimed to achieve balance between 'unplugged' (unplanned) conversations in the Club and seeking more structured answers through the questionnaires. This helped further to centre the students' learning strategies and direct personal and group experiences. This approach allowed me, both to report on important factors in the maths club arising from classroom activities and to identify unexpected factors or outcomes.

This research can also be described as having a naturalistic approach (Lincoln & Guba, 1985). The research was set in an informal atmosphere which students and the teacher can act like in their everyday lives. This is visible in their language, culture and relationship patterns. The research investigates these natural interrelationship and the learning strategies in the Club atmosphere. The naturalistic approach has a holistic view. According to Lincoln and Guba (1985) naturalistic inquiry involves the interrelationships among all of the parts of the whole and places emphasis on gestures, language and behavioral pattern, cultural rules, deep-seated values and motives arising from cherished traditions.

3.3 Researcher's Own Position as a Participant Observer

As a participant observer I was immersed in the Club for a prolonged period of time by teaching, watching, participating, asking questions and taking notes.

There are two different types of observations, covert and overt. In the covert observation the researcher does not reveal her 'true' identity. Whereas in the overt observation the participants are aware of the researcher's motives and they grant

their consent for the data to be used (Trzebiatowska, 2008). As a participant observer, my observations are overt and I was the member of the studied group as a teacher, observer and researcher.

Being a participant observer as a teacher and a researcher has its advantages and disadvantages. The main advantage is that, as a bilingual teacher, I have an understanding of the students' naturally occurring language in both languages (Turkish/English). Therefore I am able to recognise and record the content of the Club Interactions. I also have insider knowledge about the Club and the students which has proven to be advantageous. The disadvantage could be the nature of my different roles as a teacher, researcher and an observer. During the observations, I was responsible for the learning of the group and observing the group as a researcher as well. These were the two hats that I had to have throughout the research. I was aware of the borders/limits of the two roles and not to reflect these to the students or on the research.

Being the teacher in the group provided me with an in-depth insight into the group dynamics, students' identity and linguistic abilities in addition to academic skills. This insight enabled me to analyse multiple components of the Club. However, it also doubled my work during the Club sessions. I had to perform teaching and researching at the same time while maintaining a balance between the two roles. I was aware that neither the teaching nor the researching roles had to dominate the learning environment. I was switching between the roles of a teacher and a researcher when necessary focusing on one at a time to prevent any bias. Even though I took field notes as a researcher it did not reflect upon the students and it did not change my approach as a teacher.

At times, when I had to be part of the group interaction as their teacher, I used extensive note taking as a research strategy to supplement my observation in addition to audio-recording. Field notes are an important tool for the participant observer (Patton, 2002). During the Club sessions everything was recorded as much as possible. Detailed field notes (jottings – brief phrases to be developed; descriptions – everything is recalled about the occasion – time, atmosphere, students and their verbal and non verbal communications, surroundings; analysis – what have you learned so far? and reflection – what was it like for me as a researcher and teacher?) was invaluable as I was dealing with conversations and

emotional situations. The field notes facilitated transcribing the naturally occurring conversations in the Club and provide a good base for analysing the Club interactions.

3.4 The Methods Used to Collect Data

I conducted the ethnographic fieldwork using a multi-method approach in order to capture several aspects of the group interaction, conversation between the students and the contextual components of the group dynamics in which the data was gathered.

Three types of data collection (See Figure 1) was used to collect data as explained below in different sections.

3.4.1 Questionnaires: Student Questionnaires and Parent Questionnaires were delivered to gather information.

3.4.2 Focus Group Discussions: the notes were taken during the two focus groups.

3.4.3 The Club Interactions: Six lessons were audio-recorded and field notes were taken.

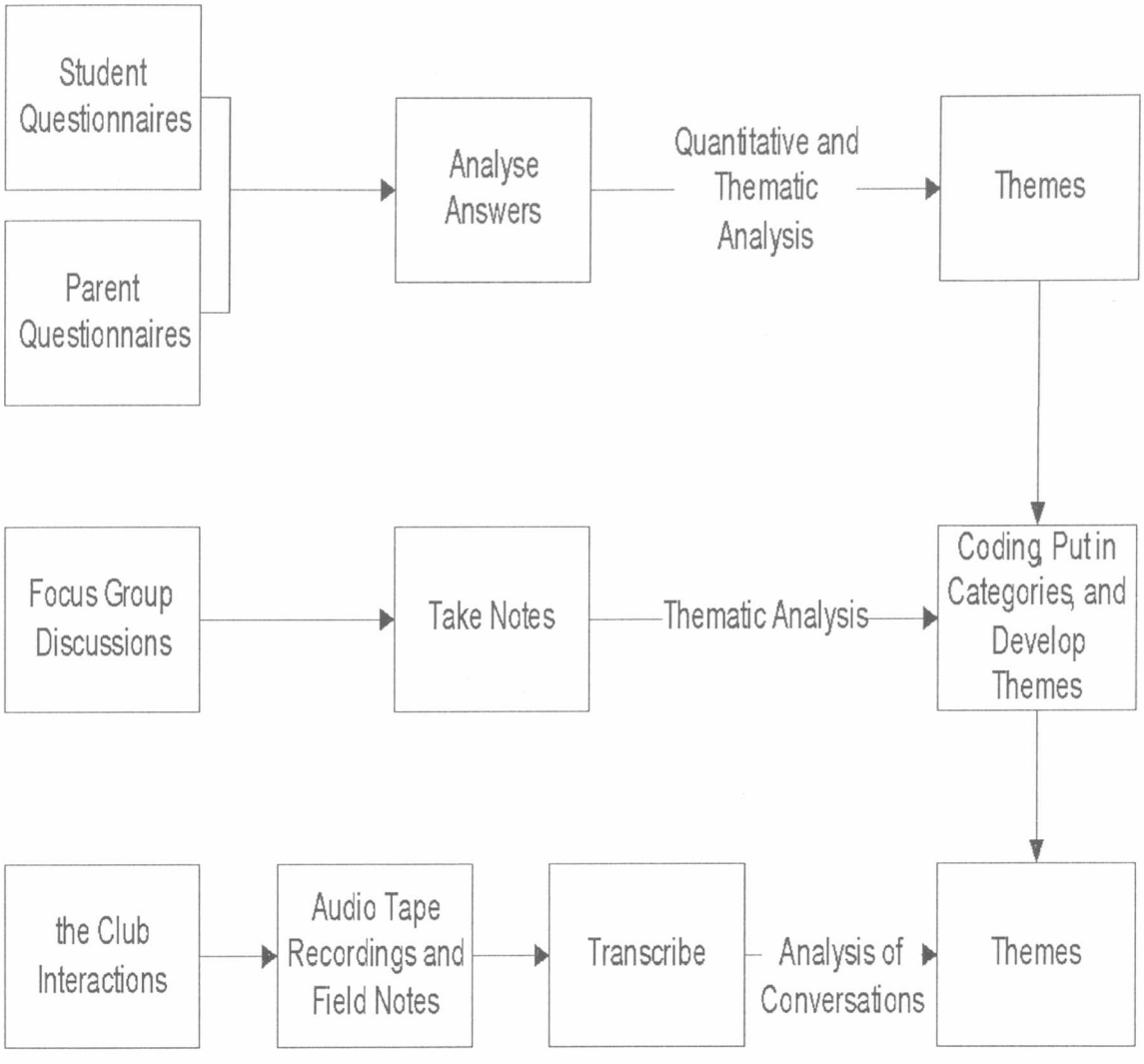


Figure 1. Methodological Framework

Questionnaires	No of participants	Total participants	Date
Students	9 male 11 female	20	10 & 17 Nov 10
Parents	6 male 14 female	20	17 & 24 Nov 10
Focus Group Discussions		**Total participants**	
1st Group	2 male 2 female	4	01 Dec10
2nd Group	2 male 4 female	6	15 Dec 10
the Club Interactions		**Total participants**	
Transcript 1	2 male 6 female	8	05 Jan 11
Transcript 2	4 male 6 female	10	26 Jan 11
Transcript 3	5 male 2 female	7	09 Feb 11
Transcript 4	3 male 4 female	7	16 Feb 11
Transcript 5	5 male 5 female	10	02 Mar 11
Transcript 6	2 male 7 female	9	23 Mar 11

Figure 2. No. of participants in Questionnaires, Focus Group Discussions and the Club Interactions

Figure 1. highlights the framework followed to carry out the research and Figure 2. enumerates participants along with the time period involved (see Appendix 8

for more detailed information about participants of the Club Interactions).

The participants/students attending the Club ranged from 6-10 each week. The age of students ranged from 13-16 years (school years 9-11). The students of the Club met for one hour once a week. This came about after I had announced my intention to set up "an after school maths club for Turkish speaking students". All of the students who joined the after school mathematics club (the Club) were the participants of the research. The participants/students participated in the Club as well as took part in questionnaires, focus group interactions voluntarily.

Thus, my choice to use the qualitative method of data collection is a deliberate one. I avoided the quantitative methods and refrained from focusing on students' individual profiles because I felt that this would deflect the attention from possible endemic issues of the educational 'system' and would be micro-focusing on each individual's 'traits'. However, I applied a quantitative mode of representation in the form of tables, in expressing the answers to some questions in the questionnaires.

Next, our focus will turn to exploring the characteristics of the following methods of data collection: Questionnaires, Focus Group Discussions and the Club Interactions.

3.4.1 Questionnaires

As part of the multi-method approach, questionnaires were used to gain information from the students' and parents' thoughts about the Club and its effects on their learning. The teacher presents the self-administered questionnaire designed by her to the target group. The purpose of inquiry is explained, and then the students and some of their parents/carers are left alone to complete the questionnaire, which was to be picked up later. This method of data collection ensures a high response rate, accurate sampling and a minimum of interviewer bias, while permitting interviewer assessment, providing necessary explanations (but not the interpretations of questions) and the giving benefit of a degree of personal contact (Oppenheim, 2004).

All students in this research project were asked the same question in the same circumstances to obtain meaningfully comparable answers. The same applied to

the parents' questionnaire. Question wording was not an easy task and therefore careful piloting was necessary to ensure that all questions meant the same to all students and parents. In the pilot study, a questionnaire was given to three students who had attended the maths club the previous year and would not be able to attend in the year of the research, and to their parents. This provided an effective method to test first and ensure the suitability of the question wording and meanings.

The questionnaire consisted of closed-ended questions that focused on demographic information and open-ended questions that focused on the evaluation and feedback of students on their attendance in the after school club. Some questions were included in the questionnaire to allow respondents to comment in more detail on their actual experiences and to allow them to raise other relevant issues not covered by the questionnaire. The purpose of the open-ended questions was to improve the content of the focus group, as well as permitting students and parents to express their ideas and concerns freely.

Faltis (1995) recognises the educational benefits of students' parents and communities working together, but also accepts that involving parents in school life may not always be easy, particularly if the parents do not speak the language of the school. So in implementing this, the firm intention was to develop strategies of effective parental engagement, using the data collected from them. This data was collected through a questionnaire to the parents, informal meetings in the school as well as individual visits to homes and was evaluated alongside data collected during homework club sessions and in conversations with students. Possible correlations between parental input and children's understanding of particular tasks were then investigated.

3.4.2 Focus Group Discussions

A focus group discussion was then chosen to examine the Club as it proved to be an effective technique for exploring attitudes and needs within a group (Kitzinger, 2000). Individual interviews tended to be more useful for evoking personal experiences and perspectives, particularly on sensitive topics. Group interviews tended to be more useful for capturing interpersonal dynamics, language, and culture. The hallmark of focus groups was the explicit use of the group interaction

to generate data and insights that was unlikely to emerge without the interaction found within the group (Giacomini and Cook, 2000). As interaction between participants was crucial to the focus group, it had to be appropriately representative to encourage discussion (Bloor et. al., 2002).

The focus group encourages students to generate and explore their own questions and to develop their own analysis of common experiences. It also allows an open conversation about sensitive subjects and permits the expression of criticism, which was invaluable to improving the teaching. Everyday forms of communication tell us much about peoples' experience and by analysing the inter-personal communication of students, shared and common knowledge can be identified.

Academic literature lacks consensus on an ideal focus group size. It varies from as little as four to a maximum of twelve (Morgan, 1998). The size is very important as participants need enough time to express their views but there has to be enough opinions to generate discussion (Bloor et. al., 2002). I held focus groups for the pupils aiming for maximum attendance in each case. There were two focus groups; one with two boys and two girls, and the other with four girls and two boys. It was not necessary for the group to reach any kind of consensus, nor was it necessary for people to disagree. The objective was to get high-quality data in a social context where participants could consider their own views in the context of the views of others, and where new ideas and perspectives could be introduced. The students were aware that this focus group was gathered to talk about the Club and what they thought about this environment. The focus group took place in a relaxed environment and the students were willing to express their opinions. As a researcher I did not forcefully switch the conversation but encouraged participants to speak about their experience.

I took the conscious decision to take notes in Turkish and English during the focus groups rather than making a full recording followed by a transcript. This was for various reasons. Firstly, I felt that some of the students would be inhibited or distracted by a tape recorder, however discreetly this would be managed. Some of them, in fact, actually expressed in advance a reluctance to be recorded and I felt this expressed wish should be respected. Secondly, I wanted to provide a

relatively objective discussion environment without my 'heavy presence' and felt I would achieve this better if I appeared busy – head down, taking notes. I managed to take notes and moderate the focus group at the same time to inform students at the beginning about the process and let them to talk about the Club and express their opinions and feelings freely but without disconnecting from the subject.

3.4.3 The Club Interactions

As my research focuses specifically on Turkish, Kurdish and Turkish Cypriot (henceforth TKC) groups, by adopting ethnography, students' naturally occurring conversations during tasks (Issa, 2005) were analysed (see section 3.5.3 for how I used Conversation Analysis to analyse the dialogues).

I audio taped students' naturally occurring language (spontaneous talk) and made ethnographic observations during the Club sessions, with the students' knowledge and consent and later transcribed these audio tapes.

During the lesson I was a participant observer in my role as both teacher and researcher. I also took field notes during the course of the lesson whenever possible. These field notes aided my audio tape recordings from the lessons as I used the former to detail my visual observations during the latter, such as facial expressions, body language and general atmosphere of the class, as well as the before-after moments of particular actors or the group in general. The field notes together with my audio tape records also created a basis for my focus groups with some of the same group of pupils.

Students' voices were audio-recorded as they talked about the mathematical tasks and negotiated their learner positions, while engaging through culturally contextualised discourse among themselves and with their teacher. Robson's (1995) bilingual curriculum delivery model was adopted where the child's previous learning is seen as a crucial starting point for the teacher. Using learners' oracy skills in the first language to talk about something which was culturally specific and cognitively less demanding enables useful links to be established for the introduction of cognitively more demanding context reduced tasks. Hence the two dimensional model of Fredickson and Cline (1990) was used as an

appropriate strategy for curriculum delivery. Our focus in the study related the teacher's use of Turkish and English media to clarify tasks through the use of context embedded language. For instance, during the session on *reflection* the students were asked to think about a boat trip while they were on holiday in Turkey, and to visualise how the sun's rays were reflected from the surface of the water. Students were instructed in Turkish to explain and to personalize the experience and then asked to reflect on their holiday in Turkey. This was then used as basis for introducing more demanding context reduced tasks and mathematical concepts which were then delivered in English and Turkish.

At the weekly informal sessions the students could either bring in particular work which they had had difficulty with during the school day or work on topics chosen by the teacher which related to on-going work in the school. This was usually in the form of a worded or written mathematical question which the teacher introduced, being a model for translanguaging and encouraging students to do the same by drawing on different linguistic features to negotiate their learner positions. When they encountered difficulty finding a word in one or the other language, students were encouraged to try and express the problem differently. The use of Turkish and its varieties, including Cypriot Turkish, was encouraged particularly in tackling mathematical problems by drawing on locally and culturally related discourse (Gee, 2011). The use of Turkish was encouraged particularly in tackling cognitively demanding concepts by drawing on locally/culturally related examples, e.g. on one occasion while introducing fractions, students were shown a poster of a Turkish pizza, called *lahmacun*, divided into equal segments and explored different fractional values linked to it e.g. ½, ¾, ⅚, etc. The students were invited to negotiate their particular positions on given tasks by discussing it initially as a class then in groups or pairs. Students were then encouraged to 'sound out' their understanding of the tasks. The students did this either through translanguaging or using their own localised vernacular – lexicon associated with *–Londralı (*Londoner) Turkish (Issa, 2005), a speech pattern created by attaching Turkish suffixes to English word endings or borrowing separate words from each language: e.g. ok'*dir (It's ok),* What's up *be adam! (What's* up man?) Burger*ci (*the person selling burgers*)*

3.5 The Methods of Data Analysis

When researchers have raw data, they have the option to analyse at varying levels. There are factors that come to play when deciding on the depth of the analysis. Two levels of the analysis procedure (Oliver and Conole, 1998) were considered which informed my decision: firstly, the time it takes the researcher to analyse the data and, secondly, the level of abstraction, that is the level of interpretation and how far it moves away from the raw data.

Responses to questionnaires, transcripts of focus group discussions and the Club Interactions provided a descriptive record, but they alone could not provide answers to the research question. As a researcher, I had to make sense of the data by filtering and interpreting them. I approached data analysis as a process in which I used interim analysis (Miles & Huberman, 1984), in which the data analysis is an ongoing and recurring process in qualitative research. The analysis partially begins during the data collection as the interim analysis feeds into and shapes the on-going data collection in various stages. It also contributes to mature the final analysis of the themes and allowed editing and refining questions in order to pursue emerging avenues of inquiry into further depth.

The methodology that was actually used in the research was overall a thematic analysis, including specifically conversation analysis and grounded theory which will be explained further.

Thematic analysis is a generic approach to data analysis that enables data sources to be analysed in terms of the themes. These themes were developed by me to enable the data to be reduced to key ideas which I found them in the data. Marshall and Rossman (1999, p.150) suggest that thematic analysis of qualitative data is the process of '…bringing order, structure and interpretation to the mass of collected data. … It is the search for general statements about relationships among categories of data … it is the search among data to identify content.' This process may be based on categories that become clear to the researcher only as the analysis proceeds.

Inspired by Fox's interpretation (2004) of Marshall and Rossman (1999) I also proposed six phases for the thematic anaylsis:

- Organising the data, consists of reading, familiarizing and understanding the data.

- Coding the data, requires the application of the set of emergent categories to the data in an organised fashion. All data should be coded systematically. In this research manual coding was used, a code was written alongside the passage or sentences that reflected a theme. Different colour highlighting pens were used to identify categories, and this permits a quick visual way to keep a record on each different theme in the data. The coding helped to apply the categories to the data and enabled examples of the data to be used in the write-up of the qualitative data analysis

- Generating categories and themes which involves noting patterns in the data, relating to the topics described by researcher

- Testing emergent understandings of the data: As categories and themes are developed, some kind of understanding of the data can begin to emerge, including the development of theoretical constructs. Marshall and Rossman (1999) suggest that in this phase of qualitative data analysis, a researcher should search the data to challenge the emergent understanding, seek out negative instances that undermine this understanding and start to draw categories of data together to establish the main themes.

- Searching for alternative explanations of the data: During data analysis, a researcher should not commit too quickly to one explanation of the data, but should consider alternative interpretations in depth, seeking alternative understandings of the data, and even trying to undermine the theses that are being used for analysis.

- Writing up the data analysis: this process is critical as it provides the explanation and evidence for the theoretical framework that supplies the understanding of the data.

According to Fox (2004), grounded theory should be grounded in the data gathered in a study rather than imposed from a previously existing framework. Theory can be refined by further data collection, so in a grounded theory approach

data collection and analysis should be iterative (the continuous comparison of the data and the theory approach). In this research, data was collected from questionnaires, focus group discussions and the Club interactions to assist in the development of the grounded theory (grounded approach). As a researcher, using the grounded theory approach, I was aware of my 'conceptual baggage', which could bias the emergent theory. Theory emerges through immersion in the data and the development of the coding. Both are entirely based on the data.

The techniques of grounded theory are those that have already been described in thematic analysis, but with a much stronger emphasis on the need for categories not to be imposed from a pre-figured frame of reference (Fox, 2004). Collection and analysis of data should proceed hand-in-hand, so even after one session, analysis might begin. Categories and early theoretical constructs then form the subsequent data collection. The examples of the raw data are presented in the Appendix section of the thesis, (see Appendix 4. 5, 6 and 7) to demonstrate that theory is truly grounded in the data: there is a sense in which the data will 'speak for itself' and the role of the researcher is simply to organise this in a comprehensible way.

The data set consisted of the data from the questionnaires, the focus groups discussions and the transcripts from the Club Interactions. Each data set that was gathered in different stages of data collection was then analysed separately. For each set, focus remained on content first and used of a rough coding system to identify the themes under which the analysis was structured. This was then examined to establish links between data sets (see Figure 1 for an illustration of the process). The themes that I used in the overall analysis emerged across all data sets. The methods of analysis of each data sets was given below.

3.5.1 Analysis of Questionnaires

There were two sets of questionnaires for students (see Appendix 2) and parents (see Appendix 3).

The questionnaires were prepared in both languages, in Turkish and English. There were three open and five closed questions in the student questionnaire and there were three closed and two open questions in the parent questionnaire.

Some responses to questions were analysed using quantitative methods in figures or tables. Answers of the closed questions like question 1, 2 and 3 were expressed in figures and then analysed. One of the other closed questions, question 4 was about the literacy background of the students and answers were analysed and also given in a table.

The question 6 elicited students' thoughts about the Club which had a ranking and was followed by open ended questions (question 7 and 8). The answers with a ranking were given in a table and were then analysed (see Appendix 2 and Analysis chapter).

Answers to open-ended questions were encouraged in the format of semi-structured interviews. This was not pre-planned, but rather was a response to hesitancy of parents' in responding and in order to encourage them to elaborate their thoughts rather than responding with one-word answers.

3.5.2 Analysis of Focus Group Discussions

A thematic analysis was used to summarize the main points and issues emerging directly the data from the focus group discussion. Coding allowed focus on identifiable themes in relation to student's approaches to the Club. Patterns, themes and categories emerged out of the data without presupposing the researcher's interaction with the data (Patton, 2002).

The first stage involved coding. Coding enables the researcher to organize large amounts of text and to discover patterns that would be difficult to detect by reading alone. The lists of codes were generated by conducting line-by-line analysis and breaking down the interview data into distinct parts (Strauss and Corbin, 1990). After initial coding, the codes were reviewed and the less useful ones were eliminated in order to see repeating ideas. This was a complex and lengthy process. Altogether, 119 codes were created (see Appendix 4).

The second stage involved developing categories. Questions were asked such as 'What do I see going on here? How can I organize these codes into categories?' Categories were developed by combining codes with similar meanings; and in keeping with the inductive approach to the analysis, there was constant checking

that the raw data fitted these categories. Overall, 19 categories were created (see Appendix 5).

The last stage involved forming the broader themes. Categories were clustered together into themes (see Appendix 6 and 7). Themes were then reviewed and modified by returning to the original data during the writing stage. In order to build a valid argument for choosing these themes, a consideration of related literature was also referred to (Morgan, 1988).

3.5.3 Analysis of the Club Interactions

The Club Interactions covers audio-recordings of the students' naturally occurring conversations and my observations and corresponding field notes during the after school club mathematics lessons.

Prior to analysing the Club Interactions, the data collected from the questionnaires was studied and the patterns observed were highlighted. Verbatim quotes from the focus group interviews and the data from the questionnaire were presented in an integrated fashion under the emergent themes. Themes were combined in an iterative process of moving between the data from the focus groups and the questionnaire. This made it possible to see the effects of the Club from two sources at the same time. Therefore the decision was taken to analyse the transcribed Club Interactions under four themes. The emergences of four themes will be explained in the Analysis chapter in detail. The themes are:

I. Translanguaging,

II. Activating prior knowledge,

III. Play frames,

IV. Learning in a Social Context (Peer Group Collaboration, Collaborative Learning, Communities of Practice)

The methodological approach to analyse the data especially from the Club Interactions, resonates with the approaches in conversation analysis, where talk occurs in 'bilingual interaction' (Auer, 1998; Gafaranga, 2000; Sebba and Wooton, 1998) where for the purposes of code-switching, language mixing is not

treated simply as that of 'indexing' but of 'negotiation of particular positioning' in relation to the group, as Li Wei (2002, 2005) stated:

> Those who adopt the conversation analysis approach to code-switching argue that one must not assume that, in any given conversation, speakers switch languages in order to 'index' speaker identity, attitudes, power relations, formality, and so on, rather, one must be able to demonstrate how such things as identity, attitude, and relationship are presented, understood, accepted, or rejected and changed in the process of interaction (Li Wei, 2002, p.172).

The approach was to explore how such variations in language use, which the term translanguaging more appropriately describes, are presented, perceived, understood and negotiated by students as they engaged in bilingual mathematical learning environment, while both the teacher and students in the group used bilingual communication tools. In this research context, conversation analysis means the analyses of students' naturally occurring language during the Club (Turkish Speaking Maths After School Club). This is the main data set (the Club Interactions) that was used in the analysis.

I was interested in observing and analysing the conversations in the group similar to everyday interaction that Gumperz (1982) observed immense linguistic and cultural diversity in everyday talk and sought to devise a method for analysing and understanding this diversity. According to Gumperz (1982), the key theoretical contributions of Interactional Sociolinguistics are to explain how speakers use signaling mechanisms or "contextualization cues" and how listeners, through a nuanced, context-bound process called "conversational inference" recognize and interpret contextualization cues through their own culturally-shaped background knowledge. Gumperz (1982a) suggests that communicative experiences lead to expectations regarding how to use contextualization cues; this study also demonstrates how members of diverse cultural groups often understand and employ these cues differently in the context of larger social problems such as ethnic stereotyping and differential access to information and opportunities. As the focus of this part of the analysis was to explore not only how language works but also to gain insights into the social processes through which individuals build

and maintain relationships, exercise power, project and negotiate identities, and create communities.

3.6 Considerations of Research Ethics

There are types of code of practice or protocols that require the researcher, the professional, to ensure that students and their parents are fully aware of the purpose of the research and understand their rights. There is wide agreement among all scientists that research involving human beings should be performed with the informed consent of the participants (Bowling, 2002). With this in mind, a full explanation of procedures was given to both students and parents to obtain their consent and participation.

I followed the ethical requirements of the London Metropolitan University Ethic Committee to seek ethical approval before I started the fieldwork. As I was a teacher, I had Disclosure and Barring Service (DBS) clearance already. Due to my specific dual position as the teacher and the researcher at the time of data collection, I also obtained written permission from the school. Also, for the same reason, it was crucial to emphasize that students and parents' participation was voluntary and that the participants were free to refuse to answer any questions. Students and their parents were reassured that they could withdraw their participation at any time without giving any reason.

Prior to each focus group and at the beginning of the each after school club lesson, I fully explained to all students that confidentiality would be maintained throughout and students' details would be anonymous. Only I had access to participant information and analysis. Following submission of the research study, for purposes of the dissertation, a report summarising the findings and recommendations will be available to all participants. Also, they were informed that should the findings be used in any future professional or academic capacity, it would only be after full cooperation with them.

Being aware of ethical considerations at each stage, I explained the purpose of the audio recording to my students and was careful to ensure that they understood that their participation was voluntary and that contributions and results would be collected anonymously and used with complete confidentiality. Additionally, I

had to reassure the students repeatedly during the sessions that the parts of the conversations and casual talk about their personal lives would not be used extensively in the analysis. In some sessions, students expressed their concern that the content of their recorded chats could be heard by other people outside the Club. Given the school's hierarchical structure and the close community relations, their concern was understandable. I clearly explained that my analysis would look at the connection between maths learning and the way they used both languages, as well as the strategies they used to learn maths, but that their personal lives and conversations would not be shared with anyone else known to them. As we progressed in the sessions, the students realised that my assurance was genuine, the recordings or any other information were kept confidential. This enabled me to build up a research-related trust relationship between the students, parents and myself.

4. Analysis

This chapter is structured into two sections which reflect two phases of data gathering. The first section contains a discussion of my analysis of the data gathered through Questionnaires and Focus Group Discussions. For this purpose, I prepared Questionnaires both for pupils and their parents (see Appendix 2 and 3) and I planned two focus groups (see Appendix 4, 5, 6 and 7). Using these methods, my aim was to collect basic demographic information about the participants of the Club in addition to their perception of and opinions about the Club.

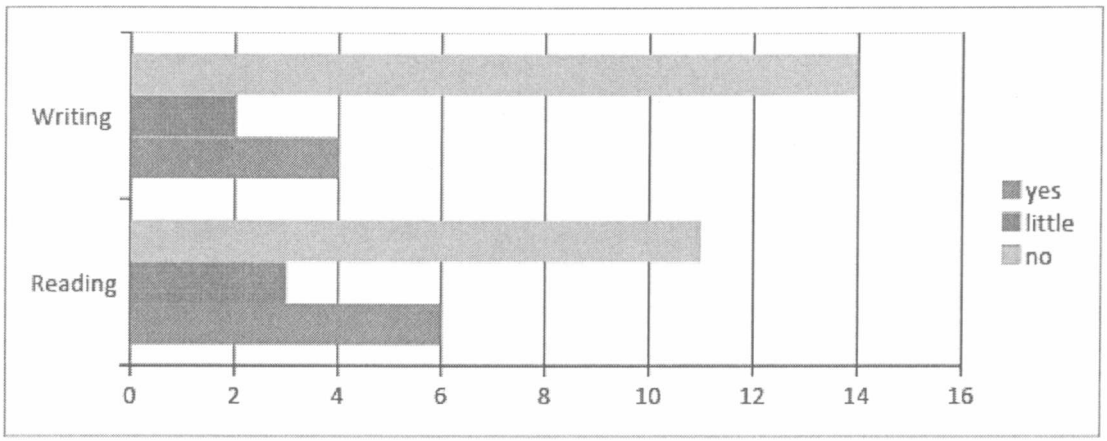
The second section examines the data gathered through the observations and audio-recordings that was conducted during the Club sessions. The main body of the analysis depends on the Club Interactions which gives opportunities to analyse students' naturally occurring language during classroom activities in order to explore strategies used by children as multilinguals while tackling mathematical tasks. The data used in this section is based on the transcripts of classroom interactions. Field notes taken throughout the research will also be utilised to inform the research. The setting, frequency of classes and the approach are explained in Methodology (Chapter 3) in detail.

4.1 Questionnaire Data

20 pupils in total who attended the Club on regular or irregular basis filled in the questionnaire (see Appendix 8). Eleven female and nine male pupils responded to the questionnaire. The length of the time spent in the UK education system varied among the pupils. 9 of the students have been in school in UK from Nursery, 3 of them from year 1, 2 of them from year 2, 4 of them from year 10, 2 of them from secondary school. 7 out of 20 have been in school in another country before coming to the UK.

All pupils were bilingual, speaking Turkish and English. There were also pupils who spoke other languages in addition to these two languages: 2 of them spoke Greek, 4 of them spoke Kurdish. The literacy levels in Turkish also varied. 6 students out of 20 were able to read in Turkish and 3 students were able to read 'little' Turkish. 4 out of 20 were able to write in Turkish and 2 out of 20 were able write 'little' Turkish (see Table 1).

Table 1: Number of students who can read and write in Turkish



Turkish speaking students are generally not literate in Turkish.

The difference between reading and writing skills among Turkish speaking pupils in this group depends on the length of time they have been in the UK, the literacy level of their families as well as other factors determining their linguistic and socio-cultural background.

Students were asked about their opinions on attending the Club. All of them stated that they found the sessions more helpful compared to their mainstream maths classes in school. They were given four scale questionnaires. The students were given statements in a positive tone about the Club on this scale. None of them ticked disagree or strongly disagree. The phrases that they agreed and strongly agreed indicate that the students found the club sessions helpful because it gave them the opportunity to revise the topic in an informal environment, the teacher used two languages which they all understood, they were able to discuss what they learnt in two languages, they had more space working in a small group and the bilingual material used in the classes enhanced their learning. The students were also given the opportunity to express their thoughts about the Club. These are as follows:

Teacher explaining in two languages

Understood key words when explained in Turkish and English

Speaking in both languages that's how we understand

If someone does not understand you can ask for help in both languages

The group is helpful to each other

Teaching and explaining in two languages

Same language spoken

Everyone helps to each other

Be able to express yourself in your own language

Be able to talk and understand the work in your own language

It is fun

Then students were also asked to compare the Club and mainstream class in their own words. They stated a number of opinions which demonstrated their strong agreement on the usefulness of the Club. The list of opinions as stated by the students is as follows:

Like private lessons, it is not crowded

Have more chance to ask more questions

Like a special class, focus more and understand better

The Club is more helpful

We speak in Turkish in lesson and this helps me understand more

We can speak our own language

We can discuss better in Turkish

We are working in a small group which helps me concentrate

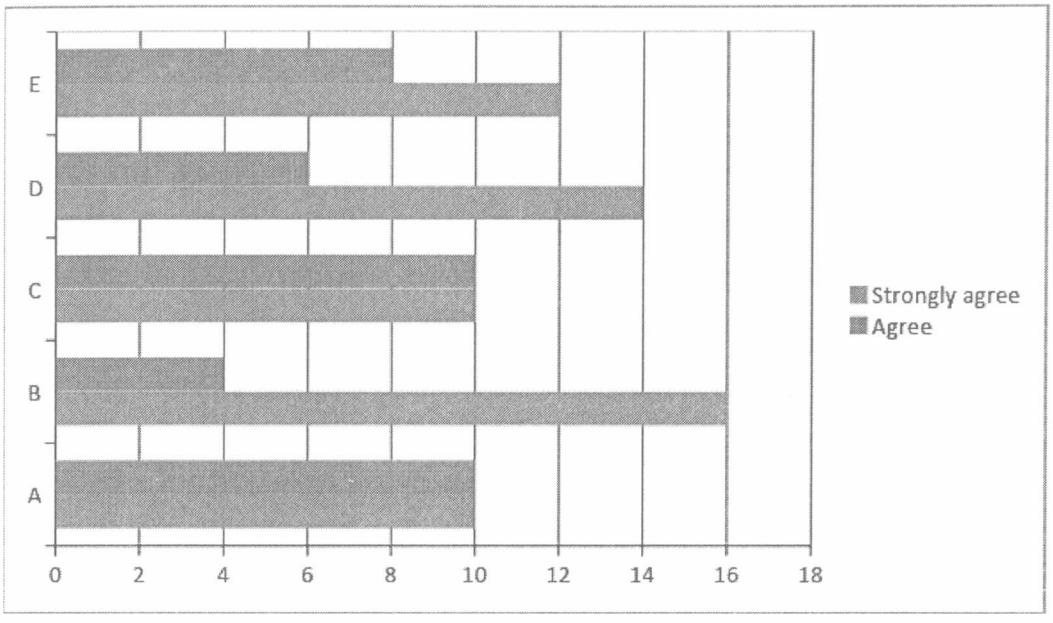
These lessons are much quieter than school lessons, fewer students

We are working effectively and more focused

As above responses overwhelmingly manifest, all the students indicated that the Club was helpful, mostly because of the use of and availability of explanations in two languages (see Table 2). They felt more confident when able to discuss and explain themselves using two languages and appreciated the use of bilingual materials. Several students particularly highlighted that they felt more able to ask questions when using both languages and this had improved their understanding. Because they felt they were not sufficiently literate in Turkish (see Table 1), they

often switched between two languages to express themselves better. This will be analysed in depth later under Translanguaging in the Club Interactions.

Table 2: Thoughts about the Club



A revising the topic

B using and explaining in two languages

C students using two languages

D working in small groups

E using bilingual materials

Frequently students have difficulty in solving maths problems because they are unable to understand the initial instructions written in English. After explaining the initial instructions in Turkish and English it was often found that they could approach their work with confidence and answer questions accurately. The difficulty they experienced initially was not so much with the maths as with the language in which it was conveyed.

The students clearly expressed that the Club was "like special classes" from which I understood that they mean they felt more comfortable, more valued and that they were being given fuller educational opportunities.

The questionnaires for parents were also sent out to 20 parents/carers, but this

time questionnaires were both in English and in Turkish (see Appendix 3). Fifteen out of twenty sent in written replies. The returns were all very positive and expressed the view that their children's self-confidence had improved and they had gained improved understanding of maths concepts. The parents/carers also found that their children involved them much more in their maths school work, showing their homework, discussing it with them and asking them for help after attending the Club. Informal conversations with Turkish Speaking (TS) parents at various Parents' Evenings and at the MEAP (Minority Ethnic Achievement Project) meetings indicated a general lack of awareness of the significant role of the home language in their child's education and also TS parents' lack of confidence in their ability to support their children's learning. After the Club, parents pointed out that their children started to use Turkish to discuss schoolwork in addition to social exchanges. It seemed that a barrier had been broken down and children now realised that Turkish was also relevant to their school work and lives, and was not just for social use.

4.2 Focus Group Discussions

The TS students participated in focus group discussions voluntarily. There were two focus groups; one had two boys and two girls; the other had four girls and two boys.

My notes which were taken during the focus group discussions consisted of a series of quotes from students in Turkish and English, without reference to the identity of the speaker. Using thematic analysis (see Methodology chapter), I attempted to draw out common themes and responses. These were their, and my, main conclusions and perceptions. Students talked and discussed in whichever language they preferred (Turkish and /or English).

In the first stage which was coding, 119 codes materialised (see Appendix 4).

In the second stage, codes were put into categories. 19 categories were developed (see Appendix 5) under which the codes can meaningfully be grouped (see Appendix 6).

At the last stage, categories were merged to create themes. Some categories

overlapped with each other. Five themes were created under which the 19 categories fell without repetition or overlap (see Appendix 7).

These themes are:

1. Using and understanding in two languages
2. Peer support
3. Mother tongue
4. Not confident in English
5. Affective factors

I have isolated these themes as they also consistently emerged from the responses to the questionnaires. Subsequently, I will examine the codes from the focus groups under these 5 themes.

I. Using and understanding in two languages.

Many TS children did not have adequate proficiency in Turkish and in English to talk and communicate.

> "If I don't know something in English I say it in Turkish, if I don't know something in Turkish I say it in English".

Students emphasised that they talk using two languages in their everyday life and when they heard and used the same kind of talking and explaining in the Club they felt more comfortable.

> "I know how to do but I can't explain. We know Miss will understand us. Miss. will explain us in both languages. If we don't understand in English she will explain in Turkish".

> "When I am in your lesson (the Club) Miss., I don't think about which language we need to use; just use it as it comes to our mind to express ourselves".

> "We use two languages together like in our everyday life. Because of that we want to come to your class and we want to learn".

They wanted to participate more and did not hesitate to ask questions. They thought in two languages as well. In the Club they did not switch off from listening, thinking and processing the information.

> "We felt we don't need to say "I don't know" because we were also speaking Turkish".

They were encouraged to keep trying to understand and solve the problem and had the opportunity to explain in Turkish what they could not have articulated adequately in English.

> "Miss. corrected our mistakes, misunderstandings. She explained words in Turkish and explained the usage of key words giving examples from our everyday conversations using Turkish and/or English".

> "I know I can ask questions and the teacher will understand us in these (the Club) lessons".

Moreover, other languages, notably Indian languages, Greek, Turkish, Italian or Spanish, are also frequently seen in UK mainstream classrooms. The Bullock Report (1976) noted that "These children are genuine bilinguals, but this fact is often ignored". There is a sense of oblivion when it comes to how bilingual students affect their class, their friends, or even the society as a whole. Multicultural approaches can be found in so many disciplines, enhancing social sciences as a whole. This view of seeing these differences as enhancing is something to be nurtured. This "positive attitude" towards the bilingual students and how they integrate into the educational system should be encouraged. The teachers should perhaps be more inclined to learn second languages. This will create confidence both in the teachers and in the students (DES, 1976, pp. 293-294).

II. Peer support

Students emphasized that they felt confident to ask questions to each other and get clarification about the points which they did not understand. Children learn from each other and share their experience. According to Gravelle (2000), the teachers should aim to encourage their students to express their views and enable them to

repeat, to make themselves understood in what they have heard and read. He highlighted pupil to pupil, or pupil to teacher, interaction in order to reach a collaborative learning environment. Pupils are stimulated to check their own work and assess themselves.

> "Talking to each other and explaining is very important in this Club".
>
> "My friend can help me and I help him as well".
>
> "We are helping to each other and learning from my friends. It is good to explain something to my friend. If she learns from me, it makes me happy".

In the Club the TS students gained the freedom to use their first language as a means of working collaboratively and supporting each other's learning in the classroom. This also had the effect of raising the status of their first language which came to be seen as an equal tool for discussion and explanation of mathematical concepts.

III. Mother tongue

The importance of bilingual children's mother tongue for their overall personal and educational development was reported in the researches of Baker, (2000); Cummins, (2000) and Skutnabb-Kangas, (2000).

In the Club students made use of the learner's home language or whichever language they were more proficient in. Language is used not only as a way of communication but also facilitates thinking.

> "I listen and we know we understand. We think we will understand when we listen because you teach us in our language".
>
> "You give us examples from our shared culture, used different examples using Turkish terms. We feel confident to ask questions in our home language".

Teachers should not assume that pupils exhibiting proficiency in everyday English will be able to communicate at the same level in Mathematics using mathematical language. Most multilingual learners will need continued support to develop the

proficiency required for academic success. This is particularly true in the teaching of Mathematics due to its specialised vocabulary and the necessity to disentangle worded problems. Central to the Club was the realisation and awareness of the role of the language in understanding and thinking process.

IV. Not confident in English

The pupils said that when I explained the lesson in Turkish and English they were able to concentrate on learning Maths as opposed to struggling with deciphering the language element of the maths problem. What they said was clearly linked to their self-confidence.

> "I always think, 'Doğru mu anladım'? Bana gülecekler mi? I am not confident about the language".
>
> *I always think, did I understand right? Will they laugh at me? I am not confident about the language*

The pupils were more engaged and motivated to listen and learn. They did not lose the mathematical content and explanation when they were following the lesson. They told me that when they were in their mainstream Maths class they missed the information parts of the mathematical explanations because they were always labouring to understand the actual language.

The following conversation with Mehmet, one of the students is the manifestation of the above.

> T: Did you solve the problem?
>
> M: I don't know how to do it.
>
> T: But you solved the equations correctly in the previous question.
>
> M: This question is different…. It is long...
>
> T: Did you read the question?
>
> M: Mmmm. Yes… NO
>
> T: Why?
>
> M: It is too long. I will not understand, I know.
>
> T: Did you try?

M: Yes… No, No

T: Let's read it slowly

M: "My mother's age is twice of my age. My father is 8 years older than my mother. My father is 48 years old. What is my mother's age? What is my age?"

M: What does twice means?

T: İki katı demek.

It means two times

M: Anladım. Bir kere daha okuyayım.

I understand. I will read one more time.

Mehmet read the question one more time and answered the question.

M: Miss kolaymış. Ben anlamam diye soruyu okumamıştım.

It was easy, Miss. I did not bother to read the question as I would not understand anyway

This is the typical situation for TS students. They generally do not answer the word problems because they cannot fully understand the English language in the question. Also they generally think "I will not understand the question" even before reading the question and feel overwhelmed by it and abandon the problem without trying.

Another student, Cansu, was new to school and her English was limited. She was unable to understand the maths question when I read it in English. I translated the question into Turkish and Cansu then answered the question. Without any further explanation, she wrote the equation. She used her previous knowledge after she had heard the keywords in the question in Turkish. She then answered another similar question with only little help. She asked for translations only for a few unfamiliar words.

Yet another conversation with another student shows the commonality of this almost self-defeating situation:

S: What does it mean Miss.?

T: Did you read the question?

S: Okumadım, biliyorum anlamıyacağım

I did not read it; I know I will not understand

T: I will read it for you then you will read it again

(I read the question, after that he read it.)

S: Onu mu demek istiyor? Kolaymış.

Does it mean that? That was easy.

(I encouraged the student to try the next question. So when he attempted the next question and solved it, he called me.)

S: Is it right, Ms? Doğru mu anladım?

Did I understand right?

T: Yes, it is correct.

S: Benim matematiğim iyi ama İngilizcesini anlamıyorum. Zor zannetmiştim. Yapamam diye çözmedim. Şimdi anladım.

My Maths is good but I do not understand the English text. I thought it was hard. I did not solve it because I thought I could not do it. I understood now.

V. Affective factors

When the pupils are multilingual and not confident in English, it inhibits effective communication between the teacher and the pupil.

This results in failure to meet the expectations of learning at the same rate as monolingual pupils of their age.

"I can answer questions with very limited language or don't respond. Because think about the teacher will not understand me"

"I (am) embarrass(ed) to ask questions. I don't know enough words. I don't understand some words even they explain it to

Effective learning depends on the confidence and motivation of the learner. Teachers are responsible for the environment of the classroom, ensuring the

learner feels secure and confident. A confident learner will possess the motivation required to achieve.

> "I think I will not understand again and I can't ask questions. I think about they will laugh at us when we ask or answer questions".

Children acquire proficiency in their mother tongue within the security of a loving and interactive relationship in which their needs are paramount. These multilingual children are often in a very different situation in the school environment, increasing feelings of uncertainty and insecurity. Many of their peers and adults around them appear to be already fluent speakers of English and able to communicate effectively with each other, however multilingual children do not feel they are part of this culture. Cummins (1996) stated that the students need to interact with the individuals of a new environment in a positive way, so that they can be actively involved in its cultural life and evolve a better sense of self and identity. Some of bilingual/multilingual students have come from traumatic or difficult backgrounds, in addition to having to learn and function in a language and culture in which they are not fluent. Sometimes important features of their home life and culture are poorly understood by education professionals and by their peers, requiring teachers and others to be sensitive and alert to all these factors.

4.3 The Club Interactions and Observations

The data collected from many years of running the Club, from the two focus group discussions and responses to the Questionnaire indicated this special focus for this dissertation. Further to this, the recurring themes also corresponded to previous research works done in this field as discovered within Literature written on the subject. Some of these themes, in layperson's terms, such as 'using both languages' or 'helping each other in class', have recurred in class practices and have been voiced in students' comments as scrutinised under previous headings in this chapter. Using thematic analysis, when I attempted to group these occurrences, expressions and 'codes' into meaningful headings or more precisely into themes, they crystallised into four established themes.

Hence, the following is an analysis of the transcripts of the Club Interactions under the following themes:

I. Translanguaging,

II. Activating Prior Knowledge,

III. Play Frames,

IV. Learning in a Social Context (Peer Group Collaboration, Collaborative Learning, Communities of Practice)

It is notable that Play Frames and Activating Prior Knowledge are not amongst the themes which occurred in Focus Group Discussions or Questionnaires however both themes prevail in the Club Interactions.

These four themes are usually and inevitably interconnected and co-exist. It is not uncommon that every extract from the transcripts hosts multiple elements from the above listed themes. Throughout the transcripts almost all extracts bear examples from translanguaging, peer group collaboration, activating prior knowledge, play frames and learning in a social context, consistently.

The extracts below are chosen because they are the most striking in their relation to the chosen theme. For the same reason some extracts are scrutinised under different themes for their different dimensions.

There are six transcripts of Interactions which consist of six of the Club sessions (see Appendix 8 and 9 for these transcripts). Each transcript is line numbered and the extracts are numbered in a consecutive fashion. In parenthesis the number of the Transcript is stated and the line numbers are the same as the Transcripts they are excerpted from.

In the transcripts, the first lines contain the original form of what was said. The second lines (in italics) are translations in correct grammatical form, to give the reader the correct, specific meaning. However, if the original sentence is grammatically incorrect or half-formed in Turkish or formed in translanguaging, this will be explained in the analysis of related extract. Where relevant the cultural

background to students' interactions will be highlighted, by utilising observational field notes, which will shed further light on the context. The students' names in the transcripts are not their real names.

I. Translanguaging

As I have explained in Literature Review, translanguaging has been developed by García to discuss multiple language practices in interrelationships (2009). Bilingual teachers, students and parents switch between languages, in other words translanguage, to include different participants (Creese and Blackledge, 2010). According to Garcia (2009, p.45) translanguaging includes several discursive practices in which bilinguals try to utilise their bilingual worlds in a meaningful way.

Within the context of the Club, translanguaging creates freedom to move between the two languages, transfers both direct meaning and any cultural meaning. It aids an easier expression of thoughts, especially when a word or notion is not known or remembered in one language, by using the required word in another language, the blockage is overcome, the flow is possible, for the speaker and listener alike. In my thesis, this is the teaching and learning process in a Turkish speaking maths after school club for bilingual students whose English is less than perfect and Turkish does not yet cover the notions learnt in English. In other words they are not necessarily literate in either language. The translanguaging process is not limited to a two-way motion between the languages. It is also loaded with cultural associations, shared experiences and triggers of prior knowledge; hence translanguaging becomes hugely instrumental in the learning process in a bilingual context, as seen in Extract 1 below.

Extract 1 (from Transcript 3)

226. Teacher: Compare ne demek? [Ne demek compare?]
What does compare mean? What is comparing?

227. Ferhat: [Compare biliyon mu] =
You know compare.

228. Burcu: =Birbirine kıyaslamak.

Relating one another.

229. Ozan: Birbiriyle karşılaştırmak.
Comparing one another.

230. Teacher:Düşün ki iki tane mesela. Şeyle, Ozan ile Ferhat'ın aldığı dereceler var onları karşılaştırıyorsun.
Think now. there are two things. Um, Ozan and Ferhat's grades, you compare them.

231. Ferhat: Elli almış elli iki almış. İkinci sınavda yetmiş almış seksen almış. Karşılaştırıyoruz.
One got fifty the other was fifty-two. The second exam got seventy and eighty. We compare.

232. Burak: Karşılaştırma compare demek.
Compare means compare.

The teacher says "compare" in English and completes the sentence in Turkish to ask what it means, and then repeats the sentence in English (in Line 226). After hearing the correct answer in Turkish from the class, and even after getting different explanations from other students, the teacher asks the maths question in Turkish. The students then proceed to solve the problem after having the non-mathematical and language related obstacles out of the way. The teacher's use of alternating languages is intentional and from the outset the students are told that they can switch languages or express themselves either in English or in Turkish, "just like in their daily life", to remove any actual or perceived barrier. As explained in Methodology, Focus Group Discussions (see Figure 1) informed the Club, and vice versa. In one Focus Group (see Focus Group codes, Appendix 4, pp.170-175), students were asked about their views on teacher's use of both languages and in what ways it affected their learning, if at all. The benefits of translanguaging are manifested in what students said:

" İngilizce anlamazsak Türkçesi anlamamıza yardımcı oluyor"
If we don't get it in English it helps us to understand in Turkish.

" Karşılaştırmak deyince Miss, Türkçe 'trink'* hemen kafamda anladım ne demek. Miss says in English anlamamıştım"

When Miss says compare in Turkish, "trink" suddenly I understand what it means in my head. When Miss says in English, I did not understand.

*trink is the sound of someone understands suddenly i.e. the penny drops.

"Sometimes I understand in Turkish, sometimes I understand in English, öğretmenimiz ikisini de kullanıyor, hangisini anlarsak yani"

Sometimes I understand in Turkish, sometimes I understand in English, our teacher uses both, I mean whichever we grasp.

As children expressed in various ways above, classroom interaction in both languages, which is based on their shared knowledge, demonstrates the creation of their shared understanding (Edwards & Mercer, 1987).

As seen in the Extract 1, students begin to understand the meaning of 'compare' in English and Turkish. In the institutional context displayed here, pupils' multilingual skills are made use of during the teaching and learning activities in a manner that also cherishes supports and empowers their multilingual and multicultural identity and heritages. Commonly, both the teacher and pupils are engaged in meaningful negotiations where the use of any "languages" and repertoires at the speakers' disposal are accepted and even encouraged.

Similar to Hymes (1996)'s argument as elaborated in the Literature Review, the ability of communication of the bilingual pupils in the following Extract 2 (from Transcript 2) is clear as no-one seems to have any difficulty in understanding each other despite the hybrid use of two languages or code-switching in one sentence. However, no grammatical correctness is observed by the participants while communicating as their main interest is to convey the thoughts and ultimately to solve the mathematical problem.

Extract 2 (from Transcript 2)

7. Ali: For eight people. Ne kadar cheese needed diyor.
   For eight people. How much cheese needed, does it say?

8. Burak: I multiply fifty by eight and sonucu bulurum, four hundred
   I multiply fifty by eight and then find the answer, four hundred

9. Zeynep: Oldu mu şimdi?
Was it all done?

10. Teacher: Read the question again, Burak, sesli okur musun?
Read the question again. Burak could you read it aloud

11. Burak: Here are the ingredients needed to make shepherd's pie for five people=

12. Kemal: =İşte burada çuvalladık…beş kişiyi okumadık.
Now we are in a mess. We have not read the five people

Ali moves into the question (in Line 7), by half repeating and half rephrasing the question, mixing Turkish and English.

Burak offers a mathematical method, solving the problem by again mixing Turkish and English (in Line 8). Zeynep (in Line 9) throws in a testing question 'oldu mu şimdi/do you think so?' inviting Burak to rethink his answer.

As opposed to the mainstream class where bilingual pupils were struggling to convey their ideas and thoughts in a grammatically correct manner in order for their English speaking teachers and peers to understand them, in the Club I observed that the pupils were using naturally occurring language. In the mainstream class, as focus is inevitably shifting to deciphering the language rather than the mathematical problem itself, multiple issues occur: the bilingual's focus diffuses, the participation is damaged, the grasp of the given problem, and thus the process of solving it, considerably slows down. This is not merely a speed issue but has a negative impact on the bilingual's confidence, participation and motivation.

Interestingly Mehmet speaks (Line 40, below) as if Turkish and English are the same language; his switching is quick and seamless, both languages flowing into each other and indicating that he is now thinking in both languages and situations, according to previous experiences.

Extract 3 (from Transcript 2)

40. Mehmet: Bir kişilik, (3) fifty divided by five on gram dedik, sonra da for eight people diyo (4) eight ile ten çarparsak eighty grams buluruz.

For one person, fifty divided by five, and we found ten grams and then it says for eight people so if we multiply it by eight we find eighty grams.

The following extract (Extract 3) highlights that translanguaging practices can be used "to include and facilitate communication with others, but also to construct deeper understandings…" (Garcia 2009, p.45).

Extract 4 (from Transcript 6)

6. Teacher: Evet çok güzel.. Burcu anlatır mısın onu bana?

Yes very nice. Burcu can you explain this to me

7. Sema: Burcu bak this is speed, bu distance, bu da times …

Burcu look this is speed, this is distance, this one is times.

8. Burak: Böyle olunca times yapıyorsun, böyle olunca distance.

Speed olunca divide it. Böyle olunca times... çok kolay... Şimdi ona göre bu soruyu nasıl çözeriz?

When it is like this you do times, when like this distance. When it is speed divide it. When like this times. Very easy. Now according to this how do we solve the question?

9. Burcu: Ne şeyleri yerleştiriyoruz yerine? Times mı yapıyorduk?

What things do we put in place? Do we do times?

In this conversation, the teacher has encouraged Burcu and asked her to answer the question. However, apparently Burcu is having difficulties, so Sema attempts to support her in a semi-Turkish, semi-English sentence, by translanguaging. Burak breaks in and continues to explain the components of the problem to Burcu. Then Burcu tentatively starts to solve the problem, still checking with her peers. Here her questions in Line 9, though her first question is in Turkish, does not abide by Turkish grammar rules, but she is still able to express her question and

her peers are able to understand the conveyed meaning in these 'naturally occurring language'. It is observed that Burcu feels comfortable enough to ask this (not necessarily the most articulate question) of her peers without fear of being ridiculed. It is not, in this context, relevant whether this fear is real or perceived; as either way it paralyses the student and hinders her opportunity to voice her question. Whereas in the Club, where translanguaging became the norm, she would not hesitate or remain silent with the fear of being 'mocked'. This was in stark contrast to the situation in the mainstream class where 'language' became a barrier to learning for the bilingual/multilingual students. Alternately, in the Club where the majority of conversations indicated that the languages were used as an aid, the students' access to translanguaging skills enabled them to activate their prior knowledge in order to understand the maths concepts.

Below, Extract 5 is an example of supporting each other where no-one is left behind because of unfamiliar notions or cultural and linguistic challenges.

Extract 5 (from Transcript 2)

1. Teacher: OK. Soruyu okudunuz. Bu bir recipe.

   OK. *You read the question. This is a recipe.*

2. Ayşe: O da neymiş?

   What is that supposed to mean?

3. Sema: Lokantalarda oluyor ya hani yemek adları

   In the restaurants, the name of the foods

4. Teacher: That is menu.

5. Fatma: In food technology we follow the instructions and do the yemek, hatırladın mı=

   In food technology we follow the instructions and prepare the food, remember?

6. Sema: =Haa, OK. OK. Yemek tarifi.

   Aha. *OK, OK recipe.*

To explain, Ayşe did not know the word 'recipe'. Sema volunteers an explanation but does not quite get there; she looks as if she knows but she confuses 'recipe' with 'menu'. The teacher clarifies the word, explaining that the recipe (the word in question) and the menu (what Sema understood) are different things. Fatma offers the right explanation for the word 'recipe' and also helpfully reminds everyone that the class prepared this food (shepherd's pie) in the food technology only yesterday. Interestingly Fatma uses both English and Turkish for the same word (food/'yemek') in the same sentence interchangeably, possibly to help Ayşe to understand. She helps Ayşe and Sema by using and mobilising their existing linguistic knowledge and familiarity with the items involved. It is interesting that in the same sentence she uses both Turkish and English to explain the same item but it works to bring those who did not understand the English version to the same point from which they can move forward. This is a useful example of children's use of linguistic resources in clarifying meaning through code-switching (Gardner-Chloros, 2009) in Line 5 as well as in Extract 2, above. The class can now continue to focus on the given task. Repeatedly, we see examples of every member of the group offering what they know to enhance the group's collaborative understanding and all of them inadvertently reflect this in their use of both languages (see also Transcript 2, Appendix 9.2, Line 11, 12, 28, 29, 30).

In these transcripts, analysis has focused on activating prior knowledge being triggered by and/or plaited with translanguaging in the Club setting, but in the following section, the transcripts will be analysed solely in relation to activating prior knowledge.

II. Activating prior knowledge

Activating prior knowledge can be defined as the use of linguistically and culturally relevant experiences, and is present in the Club context.

Translanguaging is one of the significant triggers which activate knowledge from the past. This knowledge may correlate with prior experiences or with linguistic repertoire. Both are valuable to learning as they not only increase the familiarity to the subject or to the learning environment but also strengthen communications. Thus the learner feels more comfortable, providing a contributing factor to learning.

Blommaert (2005) argued every language user's repertoire is different and they will each control a different complexity of linguistic resources which will reflect their social being and shape what they can actually do with and in language. In the Club, students come from different cultural and linguistic backgrounds. The repertoire allows people to deploy certain linguistic resources more or less appropriately in certain contexts. Conversely the lack of it, as well as the lack of different life experiences, may and will limit the use of linguistic resources. Turkish, Kurdish and Turkish Cypriot (TKC) students in the Club with different linguistic repertoires then resort to their own repertoire to aid each other in solving the mathematical problem. Generally, this is not the case in the main stream class as the repertoire of the children and of the teacher operating in an exclusively English speaking medium as the latter's linguistic repertoire will differ immensely from the former and to the disadvantage of the former. For instance, a pupil used to traditional home-cooking and probably has never or seldom dined out at a restaurant, will not readily have the word 'menu' at their disposal. Similarly, if the child grew up in the tradition of oral 'recipe' and 'Mum' already knows her food by heart, the word and the concept of 'recipe' with exact amounts of ingredients will be alien to the pupil, which is mostly the case for TKC students sample in this research. In the class Ali explained the term 'shepherd's pie' by reminding the others of yesterday's food technology class, and interestingly, it was not part of their diet at home (see the line 29 below). Here Ali activated a prior learning experience relating to his other class.

Extract 6 (from Transcript 2)

29. Ali: Kıyma üzerine patates gibi hani. Food technology'de de yapmıştık.

It was like potato on top of the mincemeat. We cooked it in food technology

It is clear from the transcripts that the pupils are distracted from the given activity by the unknown elements of the problem, both linguistic and cultural; for example Shepherd's Pie problem (see Appendix 9.2) will be a purely mathematical question for native speakers. But the Turkish speaking students who have never heard of this dish cannot visualize the question. Furthermore they are stalled by

the word 'pie', perhaps thinking it as a mathematical notion. The confusion stems from it is very apparent on Lines 23-25.

Extract 7 (from Transcript 2)

23. Sema: Shepherd's ne demek=

What does shepherd mean?

24. Teacher: =Çoban

Shepherd

The two students who obviously did not come across this dish before are trying to understand it in stages. "Shepherd ne demek?" "What is a shepherd's pie?" and especially "Çoban pay mı almış?" "Has the shepherd got his share?" demonstrate the confusion. The similarity of the sounds between the English word 'pie' and the Turkish word 'pay' (share) leads to further confusion, as can be seen in Line 25, on the following example (Extract 8).

Extract 8 (from Transcript 2)

25. Ayşe: Çoban pay mı almış?

Has the shepherd got his share?

26. Fatma: Pie is börek,[2] [börek, akıllım]

Pie is 'börek,' börek, clever clogs

'Clever clogs' 'akıllım' is used for the opposite effect. It is however not sarcastic

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2 'Börek' is a very traditional Turkish/Kurdish/Turkish Cypriot pastry food with many cultural connotations. The reminiscing of börek making resonates with Zeynep's claim to be associated with it: It would be very clear to those who belongs to the same culture the ritual of 'börek' making brings to the mind at once the hubbub of the family Sundays, perhaps mothers and grans rolling the pastry, the mess of the flour, the children snatching bits of uncooked pastry despite the protests, the smell of the slow cooking of either spinach, mince meat, cheese or other variety of the 'börek', lively exchanges around the table, perhaps neighbours or guests gathering and all the rituals attached to this process. None of which can be found for the bilingual pupils in the shepherd's pie.

but an affectionate term of address. 'Akıllım' means 'silly' but by volunteering the 'correct answer' quickly and clearly the pupil is aiming to help, rather than to humiliate the other.

Once the pupils receive clarification (pie is not 'pay' (çoban pay mı almış?)), shepherd's pie becomes the familiar ıspanaklı börek (spinach 'börek') not a mere translation but a familiar cultural equivalent which enables them to focus more clearly on the mathematical task as they have now placed it in a culturally appropriate context. They have also demonstrated additional mathematical understanding in showing that 'pay' is used in Turkish when dividing or sharing for one or more items. They then become visibly more enthusiastic about solving the problem. It is as if a curtain has been lifted. This is a clear example of using linguistic and cultural prior knowledge to help them to understand the problem and solve it.

Lack of this multilingual environment would negatively impact on their ability to activate prior knowledge. This can be seen in the following extract. Below, the students are distracted not by the mathematical complexity of the task but rather due to the cultural unfamiliarity of a key item in the sentence, i.e. Shepherd's pie.

Even the ones who knew what Shepherd's Pie is are momentarily distracted by their longing of something much familiar, perhaps something bears many happy memories even their focus is also on the mathematical task: "Şimdi bi börek olacaktı ki.." "If only they had given us our 'börek'."

In the mainstream class, many pupils might find the text or oral explanation in a lesson seemingly to be a collection of points that are not worth thinking about, because their connection to their life experience was weak or non-existent.

See the related Extract 9 from the transcript and a more detailed analysis below.

Extract 9 (from Transcript 2)

30. Zeynep: Şurada bir ıspanaklı börek tarifi verselerdi (mmm) (2) nasıl güzel çözerdik soruyu ama değil mi? Shepherd's Pie bizim bildiğimiz bir yemek değil ama ıspanaklı börek… *If they had given us the recipe for spinach 'börek', we*

would have solved the problem easily, wouldn't we? Shepherd's pie is not a familiar dish but spinach börek

In Line 30, Zeynep thoughts on the activity seem to be saying that if the question was culturally familiarized by linking it to their own lived experiences; they would be much more enthusiastic and successful in solving the problem. This is a significant observation on her part as it indicates that she has clearly analysed a fundamental reason for much of her difficulty with mathematics and that this is not due to lack of intelligence on her part. It also demonstrates an increased self-awareness and self-confidence. It also demonstrates Zeynep's claim of a particular expertise in drawing upon a culturally familiar resource – Turkish pastry making – in negotiating an alternative approach to solve a task on a less familiar dish. This could also be interpreted as Zeynep presenting her particular expertise in 'börek making' as possible shared 'participatory experience' in the group. The use of Turkish provides a useful tool for Zeynep to convey culturally relevant experiences.

This is in line with Lave & Wenger's proposition that any interaction between students and/or teachers within the academic context cannot be viewed in isolation from their cultural and historical construction (Lave & Wenger, 1998). This is further elaborated under Social context of learning.

The extracts analysed in the section below are simultaneously related to activating prior knowledge and social context of learning, and also clear examples of how lack of a multilingual environment impacts on one's ability of activating prior knowledge, as previously mentioned.

In the following extract, (Extract 10) in Line 49, Ayşe asks the meaning of 'density'. It may be that she would know the notion, or at least she would have a familiarity and the basic understanding of the notion in a Turkish speaking context, from the daily life and non-mathematical social conversations, which would help give the student a headstart in understanding and solving the problem. Here, not knowing the words in a mathematical question in a second language, impedes her ability to solve it, regardless of whether she knows the answer or not. When the number of 'unknown' words inevitably increases, so too the student

experiences difficulties which works against them like an additional lock, prohibiting further progress in the task at hand. Observations and field notes witness/indicate this disengagement (playing with a pencil, glazed over looks, yawning, simply giving up on the problem or rather giving up on her/his own ability to tackle the problem) among students experiencing this dilemma.

Extract 10 (from Transcript 6)

49. Ayşe: Density demek ne demek?

What does density mean?

50. Teacher: Bir şeyin cm3 başına ağırlığı demek

It means the weight per cm3

51. Ayşe: 1 cm^3 ne kadar bir şey?

What is it like 1 cm^3?

52. Teacher: Şöyle bir küp yaparsak bu 1 cm 1cm 1cm 1cm^3

If we make a cube like 1 cm 1cm 1cm 1cm^3

53. Fatma : Kesme şeker gibi

It is like sugar cube

54. Teacher: Niye bunu kullanıyorlar diyelim ki tahta alıyoruz bir de demir malzeme aldık ağırlık olarak bunlara baktığınızda bunları eşit 1 cm^3 boyuta .... ikisini de bu küp büyüklüğünde kesersek onunda ağırlığını alırsak gram olarak eşit hacimde (1 cm^3) karar veririz, hangisinin daha ağır olduğuna yoksa karar veremeyiz

Why do they use this? Let's say we take a piece of wood and iron. When we look at their weight per equal 1 cm^3 size, if we cut them in that size of cube, and weight them, we can decide gram per equal cm^3, otherwise we can't decide which one is heavier

55. Mehmet: Anladın mı, Şekerim?

Did you understand, Sweety?

In this conversation, the teacher explains the meaning of density, without giving its synonym in Turkish. In Line 51 Ayşe asks for further explanation on the teacher's response. After the teacher explains it with words and gestures, Fatma rushes and further materialises it by saying 'kesme şeker/sugar cube'. The word 'sugar cube' is part of the Turkish daily tea ritual, and many other cultures. In Line 54, the teacher explains density and in Line 55, Mehmet asks and checks his peer's understanding 'anladın mı şekerim?/did you understand sweety?', a playful reference to Line 53. In this case, the student assists and asks the peers' understanding by bringing an example from their own prior knowledge and culture, checking if the peer understood, which is a display of collective collaborative learning and collective responsibility, and his use of affectionate playful 'şekerim/sweety' is direct use of the word 'sugar cube' to which she nods. It is a play frame which vaguely started with Line 53 with 'like a sugar cube' and continues in a more tangible way in Line 55, another example of an extract where various themes overlap. The teacher says 'centimetercubed (cm3)' and gestures the word. The student (Fatma) follows it with 'like a sugarcube', then after the teacher's mathematical explanation, a student (Mehmet) uses the word 'sugar' in a different context: just an address to his friend as in 'şekerim/sweety/my sugar'. Repetition of this word demonstrates not only his engagement with the lesson, but also illustrates the peers' enjoyment and relaxed and playful attitude which is accomodated by this particular exchange in the Club setting.

Extract 11 (from Transcript 6)

56. Burak: Bizim dükkanda bir şişe yağ mesela aynı şişe sudan daha ağırdır.

In our shop a bottle of oil is heavier than a bottle of water.

57. Teacher: Evet güzel örnek. Yani bir şişe bir litre diye düsünsek hacim volume olarak

Yes it is good example. If we think one bottle is one litre as volume

58. Sema: Aynı miktar yağ fakat daha ağır

Same amount of oil but heavier

59. Teacher: Demek ki yağın densitesi yani yoğunlugu sudan daha fazla

So that means density of oil is more than water

60. Mehmet: Tamam mı?

Is it okay?

In this extract, in Line 56, Burak gives two examples of items from his father's shop, activating his prior knowledge and bringing clarity for his friends. In a way, his daily life observations and experience are shared and contribute to understanding of the whole class. In Burak's statement, the teacher's 'mathematical' explanation in Line 57 is relating it to real life. For the first time in this lesson, in Line 58, Sema uses the key word 'Density' in Turkish. Subsequently, the teacher uses 'density' (Line 58) and its Turkish equivalent in the same sentence, to link what may be 'two separate entities' until that moment. Then in Line 60, Mehmet asks to another student 'is it OK?' and by using, just like the teacher, the word 'density' in both languages in one sentence, making sure of perhaps his own learning as well as the peers which shows that he feels this collective responsibility for peers' understanding, so they can move on together as a class. This is another indicator for collaborative learning/community of practice.

However, a more explicit example of peer group collaboration and collaborative learning can be seen between Line 20 and 46 at the Transcript 6 (see Transcript 6, Appendix 9.6) in the context of activating prior knowledge. In these lines, repeatedly, the student who asked the question is given clues, encouraged to find the way in a maze of the problem, like a riddle, 'knowing' the student is not giving the answer but leaving the pleasure of finding the answer to the student who asked the question, as if the reward of finding the answer is left to the student who originally asked the question. In Line 39, Burak says 'the bell ringing', heralding that the 'answer' is coming.

It is almost consciously or subconsciously that students are making the learning itself 'playful', teaching each other but not giving the 'final' answer.

Extract 12 (from Transcript 6)

130. Teacher: Nasıl yaparız?

How do we do it?

131. Burak: Bir cm^3 ü 12 grammış. Bir de 2 kg ının kaç cm^3 olduğunu bulucaz.

1 cm^3 of it was 12 grams. We will find how many cm^3 it makes its 2 kilograms.

132. Mehmet: Ben her zaman formül olduğu ...

I think always there is formula

133. Burcu: Aboo

Wow

134. Teacher: Eğer bilmiyorsan formülü, ezberlemiyorum bu şekilde yazıyorum

If you don't know the formula, I don't memorise it I write it like this

135. Ayşe: burada da aynı şey

It's same thing here too

136. Mehmet: denklem

equation

137. Teacher: Genelde bu şekilde yazıyorum ama

Usually I write it like this way

138. Sema: Bunların eşit olması lazım

These should be equal

139. Teacher: g da g kg da kg

gr in gr kg in kg

140. Ayşe: 2000 g demek ki ne yapacaz demek ki ne yapacaz

2000 gr, so what are we going to do what are we going to do

141. Burcu: Bunla bunu çarpıp buna bölücez

We will multiply this and divide by this

142. Zeynep: 2000`i 12 ye böldüğünüzde cevap çıkıcak Kaç mı 2000

divide 12

The answer will come out when you divide 2000 by 12...

How many? 2000 divided by 12

143. Sema: Bana söyle

Tell me

144. Zeynep: 166

145. (xxx)

146. (3) ((Laughing))

147. Mehmet: 166.6 cm^3 müş o kadar işte

It was 166.6 cm^3 that is it

148. Teacher: Şunu öğrenirseniz her türlü soruyu çözersiniz

If you learn that you can solve all kinds of questions

In this extract, in Line 132, Mehmet expresses perplexity when Burak shows that the particular problem can be solved without the formula (in Line 131) but applying comparative logic/ proportion. Mehmet expresses this with a half-formed/ incomplete sentence as an utterance, as if thinking loud as opposed to not expressing himself. Similarly Burcu (in Line 133) expresses her 'realisation' of a new fact with a strong exclamation. "Aboo" is an exclamation mark mostly specific to the villages, rural areas in Turkey and not used in formal or urban language except mockingly. Burcu is of Kurdish background and she is highlighting her cultural identity too.

In Line 134, the teacher gives them a tip from her experience to solve the problem easily using the proportion. In this way, she reinforces what Burak said in Line 131. When setting up protocols within the Club, the teacher deliberately aims to remove herself as an authoritarian figure who knows everything and who imposes rigid class rules, aligning herself with learners instead. In Line 134 she tells children, in case they don't know the formula, that they should not worry but apply their pre-existing reasoning to work out proportion.

Between Line 135 and 147, children are guided by each other and the teacher,

using proportion find the answer. The teacher, in Line 148, encouragingly repeats that 'by using the formula' they will be able to solve any similar questions.

Extract 13 (from Transcript 6)

15. Ebru: mph anlamadım mile per hour

I didn't understand mph

16. Mehmet: Ha çok kolay Simone

Oh it is very easy Simone

In Line 15, (Extract 13), Ebru expressed that she didn't understand 'mph'. Even though she already knows it as 'mile per hour', the acronym 'mph' seems unknown to her. Mehmet comes in immediately and in a way encourages her by saying 'it is very easy', but there is no disparagement in his tone. On the contrary, this student sounds like he is willing to tell Ebru and Ebru will 'get it' in a second. The atmosphere is one of activating prior knowledge intertwined with peer group collaboration which is explored under the learning in a social context theme. Another emerging theme here is the children's 'framing talk as play' (Vally Lytra, 2007) through which they structure their social and personal experiences to provide us with an interpretation of what is going on in a given interaction. This will be further explored under the next theme, Play Frames.

III. Play frames

A play frame is typically defined as the real or imagined boundary that keeps the play intact through cues and returns. When a child is playfully teased during play, the child that is being teased has the choice to either take the teasing seriously or make a joke of the teasing. If the latter occurs, then the play frame is maintained. Play frame is freedom to re-formulate language in such a way that creates multilingual connections. Through play frames, lessons become more enjoyable and accessible.

As Vally Lytra (2007) explores playful talk among Turkish speakers in Western Thrace- Greece, as furthered in this research too, the analysis of some parts of the data suggests children's 'framing talk as play' through which they structure their social and personal experiences to provide us with an interpretation of what is going on in interactions between pupils. The extracts below show that lighter and

playful nature of the maths re-formulations and playfulness lightens the atmosphere of the Club.

In Extract 14, the teacher's strategic interventional support triggers collaborative meaning making. It can be seen quite starkly in the following extract that when the students apply play frames to their conversation, the teacher's approach is to make the most of it and make it part of the learning/teaching. In the same extract students also consciously or unconsciously apply translanguaging into their conversations. This rather long extract analysed here under Play frames hence could have been easily analysed under activating prior knowledge or peer group collaboration.

Extract 14 (from Transcript 4)

31. Ozan: t t t t
32. Ayşe: Simplify expressions diyo... t t t t… 2b add 3b
    It says simplify expressions
33. Teacher: Simplify ne demek
    What does simplify mean
34. Burcu: Bir araya getiricez
    Bring together
35. Teacher: Simple desem
    If I say simple
36. Ayşe: Basit
    Simple
37. Ferhat: Sadeleştirmek
    to simplify
38. Ozan: Sade var kaymaklı var
    There are plain and creamy
    ((These are ice cream varieties in Turkish and he imitates the ice cream man sound))
39. Teacher: Diyelim ki iki sade sen.. iki sade dondurma da sen aldın..
    yani iki s artı iki s
    Let's say you buy two plain... and you buy two creamy ice cream.. so two s add two s
40. Burak: Four s
41. Ozan: Dört top dondurma yummy

Four scoops of ice cream yummy

42. Teacher: But be careful four top sade dondurma. Yani four s. If I say iki top sade (s) iki top kaymaklı (k)

But be careful four scoops of plain ice cream. So four s. If I say two scoops of plain, two scoops of creamy

43. Ferhat: two s and two k

44. Ozan: two s add two k

45. Burak: Farklı dondurmalar karıştırmıyoz. Ohh ne güzel like summer kuzenlerle Türkiye'de dondurma yiyoruz

Different ice creams we don't mix them. Ohh what a beautiful l like summer we are eating ice cream with my cousins in Turkey

46. Ayşe: yummy four s same ice cream iki s and iki k mix yummy

yummy four s same ice cream two s and two k mix yummy

In this exchange, the teacher and students discuss the meaning of 'simplify', using Turkish and English.

After some thinking aloud over the meaning of 'simple/simplify', Ferhat discovers the exact meaning of simplify in Turkish in Line 37 and students understand its meaning. Meanwhile, during the thinking loud, Turkish word 'sade' which also means 'plain' resonates with ice-cream variety and there is an example of this in Line 38. Ozan says "there are plain and creamy" in Turkish, pretending he is an ice-cream vendor.

The teacher uses this playful language and atmosphere of enjoyment as an advantage and uses it to teach the topic in a fun way. As the teacher is from the same culture and shares the same linguistic repertoire (Blommaert, 2005), she is able to understand and use the play frame (Lytra, 2007) as a learning cue (Gumperz, 1982). This is also reflected in Hornberger and Link (2012)'s argument that translanguaging practices "offer possibilities for teachers and learners to access academic content through the linguistic resources and communicative repertoires they bring to the classroom while simultaneously acquiring new ones" (p.268). Teacher seizes children's play frame as a linguistic resource in learning maths context.

In Line 39, the teacher says "You buy two plain and two (plain) creamy ice creams" and from this point she arrives at the expression which could simplify the topic and says "Two s and two s" (just to remind, s is the beginning letter of 'sade', which means plain in Turkish). Ayşe answers the question. Ozan says "Yummy"

They are now really enjoying the lesson and role play. Then the teacher takes the topic further and asks them to simplify different terms and the pupils answer the question correctly.

In Line 45, Burak points out the misconception and says that not to mix the different ice-cream means mathematically one does not mix the different terms when you collect (add or subtract the terms in the expression) them. Then he emphasizes that they are enjoying the lesson by adding "Ohh how beautiful .... like summer..... we are eating ice cream with my cousins in Turkey".

Students link linguistic knowledge with cultural ones, as Garcia remarks, language practices of bilinguals "simply reflect greater choices, a wider range of expression than each monolingual separately can call upon, and convey not only linguistic knowledge, but also combined cultural knowledge that comes to bear upon language use" (García 2009, p.47).

The following extract demonstrates this link effectively:

Extract 15 (from Transcript 4)

47. Teacher: şimdi look at the other ones

now look at the other ones

48. Ayşe: t t

49. Ozan: Tey tey tey tey[3] ((Singing))

50. Burak: Bir tey iki tey... tey tey

one tey two tey tey tey

---

3 'tey tey' is a call to dancers to dance. It is a folk dancing tone to encourage the dancers to join and dance and enjoy

51. Teacher: Dikkat bir tey iki tey mi yoksaaaa tey tey mi? What is the difference?

Be careful is it one tey two tey oooor tey tey?

52. Ferhat: Iki t veeeeee t squared

two t aaaand t squared

53. Teacher: Evet doğru. Adding and multiplying

Yes. Right.

54. Ferhat: Sanki bir tey senden bir tey benden yani t t t t tey tey tey tey
ama öbürü hep beraber çarpılmış bir büyük teeeeeeeey
Like one tey from you, another tey from me, so t t t t tey tey tey tey but the other one altogether multiplied makes one big teeeeeeeeey

55. Ayşe: O zaman öbür soru iki c ve c square

Then other question two c and c squared

56. Ozan: cey cey cey ((like the tey tey sound))

57. Teacher: O zaman ne olur Ozan

Then what happens Ozan

58. Burak: üç c miiiiiii ((prolonging the sound))

Is it three c

59. Ferhat: Bak bi (2) adding or multiplying

Look ones adding or multiplying

60. Burak: I see (1) c times c times c ne dicem

I see c times c times c what do I say

61. Ozan: Ben yardım edeyim [cubed olur yaniiii

Let's I help sooo it would cubed

62. Burak: [c cubed

In Line 48, Ayşe reads another question. In this question they need to multiply two terms rather than collecting them. Ozan starts to sing "Tey tey tey tey", the

folk dance tune. The students use play frames (Lytra, 2007) to recall a culturally meaningful activity in tackling the task.

In Line 50, Burak takes the question in a fun way, reading the example and at the same time dancing to the tune of "Tey tey" as if he was at a wedding ceremony.

The teacher again takes the opportunity to teach in this atmosphere of fun and carries on the same sound but showing the importance of mathematical concept of collecting or multiplying terms when simplifying expressions.

In Line 52, Ferhat gives the correct answer.

Then the teacher emphasizes the importance of the answer, reinforcing the learning process that has taken place.

In Line 54, Ferhat is dancing and waving the handkerchief as if he is in a 'halay', which is a variety of Kurdish folk dance. At the same time he is using the tey sounds to show the correct answers to the question and says *"Like one tey from you and another tey from me it means t t two tey but the other one altogether multiplied makes big teeeeeeey"*

He is trying to say that mathematically, if one t adds one t, means when you collect them the answer is t t, which means two t, and when you multiply t by t the answer is t squared. These are good examples of use of play frames on tasks.

They then continue answering the other examples and questions.

In Line 56, in another example of the question is c c c and Ozan again mimics the tey sound like they did before to continue with the fun they are experiencing in this lesson.

In Line 58, Burak is not sure about the answer he gave and he is a little hesitant to answer the question. At the end of the line he shows this hesitation by lengthening the question form, which is indicated in Turkish by the particle "mi", by saying miiiiiiiii.

In Line 59, Ferhat understands that Burak is misunderstanding the question and helps him and encourages him to think. He does not give the answer straight away. He gives Burak a chance to think and allows him to take her time to answer.

In Line 60, Burak is on the way to finding the correct answer. In Line 61, Ozan helps him as well and they give the answer together.

This extract shows how translanguaging helps these students to be freely selective between Turkish and English to construct meaning in mathematical tasks as shown in detail under Translanguaging theme above. Students are using play frames to construct an informal 'fun' atmosphere during tasks as they sensed this is 'allowed' and encouraged in the Club. Importantly also, they are supporting each other in an atmosphere of collaborative learning. Because the teacher and students have a shared linguistic and cultural repertoire, they have the ability to understand even one letter sound (e.g. tey) and its huge relevance to the cultural context of folk dancing, weddings, fun, family and traditions. In Maths they are playing with numbers. In communication they are playing with words.

The following extract (Extract 16) shows how students play with synonyms and similar sounding words while they solve the problem by playing with numbers.

Extract 16 (from Transcript 1)

66. Elif: Şunları düzenli yazıcam

I will write down these ones in order

69. Fatma: Karıştı

It is muddled

70. İnci: Kafam karıştı=

I am confused

71. Burak: =Neresi karıştı ((When he was scratching İnci's head))

Where did you get confused/ muddled?

72. İnci: …Two times one equals two=

73. Burak: =İki zero koy

Put two zeros

74. İnci: This forty this is six, two hundred [seventy-six]

75. Burak: [Niye karıştı]

Why confused/muddled

76. Kemal: (xxx) ((Stands up and comes next to İnci and pats her head))

77. İnci: TAMAM tamam

OK ok

Synonymous words are also used interchangeably to create play frames and this is illustrated effectively in Extract 16 above. In Turkish 'karıştı' could signify different things like disorganised, muddled or confused. In Line 66, Elif says she will write down in order. Fatma replies to her by saying it is muddled. Until this point it also makes sense in English too. However İnci's reply seems unrelated if the word's synonymity is ignored. İnci's reply is a play on the word 'karıştı' as she talks about her confusion. İt is interesting that İnci's 'confusion', a state of despair is prevailed by both pragmatic help from the peer ("put 2 zeros") and playful language and attitude.

Like playframes of synonymity, a play on words could be made with similar sounding words. The root of the word 'karıştı' comes from 'karıştırmak' which means mixing. Also 'karıştırmak' sounds like 'kaşımak' which means scratching. In Line 68 when İnci says she is confused Burak replies by where is itching and he scratches İnci's head (Line 69). Student brings 'physicality' to play frames along with a verbal aspect of it. This is similar to their dancing to the 'tey tey' tune in the preceding Extract 15 and both highlight the relaxed participation and fun experienced in the Club.

Again, in the above extract (Extract 16), in Line 71, Burak reminds İnci to add zeros.

So in Line 72, İnci finds the solution and in Line 73, at the end of her sentence Burak overlaps her sentence and in a playful way he asks 'why confused'. Almost simultaneously, Kemal comes over and pats İnci's head to congratulate her but not scratching at this time.

In Line 75, İnci's "ok ok" shows İnci's satisfaction for understanding and also for being nurtured by her peers. This is a flowing 'interchange' in which one student being confused by a word, is transformed to the solution point and this almost

rejoiced by the other participants.

In the Transcript 6, in Line 16, there is another example of play frames which was already mentioned (see Extract 13, on p.101) at the end of the Activating Prior Knowledge theme. Mehmet addresses Ebru as 'Simone' even though he knows this is not her name. This is probably a reference to a prior shared conversation or a play and apparently accepted by both parties. In Line 17, Zeynep attempts to help Ebru's question, and gives an everyday example to clarify the term. Zeynep uses the prior knowledge and hopes or is confident that Ebru will do the same. In Line 20, Ebru asks another question and Fatma says "Why Simone why?" in English. Her tone is playful and friendly teasing.

Extract 17 (from Transcript 6)

17. Zeynep: Sizin araba bir saatte kaç mil gider

How many miles your car goes per hour?

18. Ebru: What give me what

19. Mehmet: one hour sixty dakika

one hour sixty minutes

20. Ebru: kirkbeş divided sixty neden

Why forty-five divided by sixty

21. Fatma: Why Simone why

The friendly teasing and counter-teasing continue in the following extract. Note that whilst the students are having a conversation about outside (being picked up by Mum, rain, hair do) they also continue to be immersed in the lesson (Extract 18, Line 118 to 121). Learning and enjoying themselves is not fragmented but seems integrated.

Extract 18 (from Transcript 4)

118. Nur: Annen seni almaya geliyor. Yağmurda

Your mother is coming to pick you up. Under the rain

119. Burcu: Ay anneciğim bana kıyamıyor

Oh my mummy doesn't want me to suffer

((kıyamamak: not to have the heart to hurt anyone, kıyamıyor is present countinuous tense form))

120. Ozan: Anneciğim ((Teasing))

My mummy

121. Nur: Saçı bozulur de mi

Her hair will be messed up won't it?

((Singing))

122. Burcu: Ne biçim yardım bu

What kind of help is this?

123. Ozan: Ne biçim örnek bu

What kind of example is this?

124. Le le le le le ((Kurdish folk dance tune, singing all together))

In the following extract (Extract 19), the students start a conversation over grades they may get. This speculative talk leads to nonchalant challenges, exchanges and the use of half improvised old riddles they have probably overheard from their elders.

Extract 19 (from Transcript 3)

319. Ferhat: Ben good boyum işte A alıyorum. =

I am a good boy. I get an A

320. Ozan: =Fatih de birşey yapmadı A alıyormuş.

Fatih did not do anything either. He is getting an A

((‘muş’ is a tense suffix that signifies uncertainty and displaces the active knowledge responsibility of the speaker))

321. Ferhat:Ben o testi yapmadım ki.

But I did not do that test.

322. Ozan: Anlamadım…A alamazsın.

I don’t get it. You can't get an A

323. Ferhat: Alırım=

I'll take it.

324. Burak: =Turkish'ten alırım

I will take it from the Turkish

324. Ozan: Say, Ocak, Şubat, Mart, bak birinci ay

Count January, February, March, look the first month

325. Burak: Ağustos August

August is August

326. Ozan: Eylül

September

327. Burak: Eylül ne lan

What the hell is "Eylül" (September)

(("lan"is a slang used as an exclamation for dramatic effect))

328. Ozan: E'le başlıyor…Eylül 10uncu ay

Starts with E(S). September is the 10th month

330. Ferhat: Eylül 9uncu ay

September is the 9th month

331. Ozan: Pazartesi giyelim fesi

Salı bugün sallanır

Yarın çarsafa dolanır

Perşembe ...

Cuma mübarek gün

Cumartesi pazar resmi tatil

Monday let's put on the Fez

Tuesday shakes

Tomorrow wraps around the sheets

Thursday

Friday is the holly day

Saturday Sunday is official holiday

((A funny rhyme about the days with a few personal twists))

332. Burak: Pazartesi, salı, çarşamba, perşembe, cuma, cumartesi, pazar.

Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday.

333. Burcu: Sen karşılaştırmadın

You didn't compare.

334. Ozan: Günleri karşılaştırdım

I compare the days

When the extract (Extract 9) is read from Line 320 to 333, there is no single reference to the maths topic and simply reading the conversation gives the impression that the topic (problem) was put aside, however from the field notes and observations it is evident that this is not the case. The students are fully conversing on a variety of topics from TV series, football, their saz (Turkish musical instrument) classes and teasing and testing each other on the Turkish names of the months, and also carrying on the mathematical task that they were given. When Burcu asks and almost expects an explanation (Line 334) as to why her peers did not do the 'compare' question, Ozan teasingly answers "I compared days" referring to the days riddle.

Free from formal rigidness and limitations present in the mainstream class, the Club is a place for students to create and maintain simultaneous engagement with both 'daily life' and mathematical tasks in hand, without confining themselves to strict 'classroom' protocols. The zigzags between mathematical and non-mathematical conversations, utterings and even mutterings are seamless.

As scrutinised elsewhere in this thesis, a student expressed this in the Club (see Appendix 9.4, Transcript 4, Line 80):

"Hem konuşuyoruz hem de çalışıyoruz. Yani kafamız işliyo Miss"

We are talking also we are studying. So our head is working Miss

IV. Learning in a social context

Learning is a social activity. The main dynamic of learning is through the teacher teaching directly to the students. This requires a more hierarchical system that operates vertically. Another important social dynamic is between the students.

The elements of social context of learning can be exemplified as talking to each other, asking questions, joking, playing with words. TKC students speak about their memories and what activities they did or will do. They collaborate with their peers and teacher, study and chat at the same time. The students are socially active because they feel comfortable in the Club.

Transcripts of the Club show the elements of peer group collaboration and community of practice throughout. These are manifested in students helping each other, checking and finding their mistakes and also explaining to each other how to correct these errors. While concentrating, on the one hand TKC students rebuke their peers not to talk or remind them to talk quietly, on the other hand they utilize thinking loud as a way of checking their answers and trying to work together and boost their confidence in order to calculate correct answers. They are open to each other's suggestions and interference. When they work together, there is no competition or at least not at the expense of each other. Finding the solution and showing an effort to learn collectively to move onto the next question has been the consistent motif in the entire Club as the transcripts demonstrate below.

Extract 20 (from Transcript 1)

76. Teacher: Anlamadığınızı hemen sorun. Which one? That one

When you do not understand something, ask immediately

77. Demet: Six times [three oniki]

Six times three twelve

78. Fatma: [Elde var bir]

Carrying one

79. Ayşe: Abla içinden söyleyebilirsin

Sister you can talk quietly

80. Demet: KONUŞMA

Do not talk

81. Ayşe: BAK yanlış yapmışsın=

Look you made a mistake

82. Fatma: =Hangisi? =

Which one?

83. Ayşe: =Sixty-three thirty-four

84. Kemal: …Anladın mı? Carrying leri öbür diagonala taşı

Did you understand? Take the carryings out to the? other diagonal

85. Demet: Öbür soruya geçelim hocam

Let`s go to the other question, Miss

In this extract, in Line 76, the teacher invites the students to raise the questions on the spot if they are confused. There are two sisters in the class, Ayşe and Fatma. Ayşe is obviously closely observing her sister Fatma. Her comments to Fatma can be perceived as both protective and intervening. Ayşe's 'intervention' is, loving and not ignoring the fact that they are sisters; 'abla' is 'big sister' in Turkish. In Line 79, telling her not to think loud (perhaps thinking she sounds funny or she confuses her), and a moment later, in Line 81, pointing out that Fatma made a mistake in her calculations. Fatma is receptive to this, and asks 'which one'. In Line 84, Kemal is further explaining to Fatma and making sure she understands. Clear distinction emerges in his translanguaging; all nouns are mathematical notions and in English, and all verbs are in Turkish. When they all finish and solve the problem, Demet in Line 85 tells the teacher that they are ready for the next question. In the whole exchange, between Line 76 to 85 there are continuous examples of a collaborative supportive work atmosphere. Students ensure the errors are addressed, explained, checked if the explanation is understood and the group moved forward as a whole: no one is left behind or 'maimed' or humiliated. Throughout the transcripts these themes keep recurring (see Transcript 1, Appendix 9.1, Lines 95-99).

As a teacher and participant observer, I emphasize that the students' focused casualness is evident in the naturally occurring language and this is typical to the

Club where cultural and linguistic commonness of the group accommodates and aids the learning. The way the pupils speak to each other and respond to the bilingual teacher's prompts both around the problem and in naturally occurring language their styles and the context is one of unstrained sets of dialogues. Pupils express themselves as much as demonstrated in the dialogues, hums and in volunteering information.

Extract 21 (from Transcript 1)

126. Ayşe: Bunu anladık

We have understood this

127. Fatma: Öbürü [de kolaymış]

The other one is easy as well

128. Elif: [Niye yapamıyorduk ki] daha önce=

Why couldn't we do it before?

129. Demet: =Anlamamıştık

We did not understand

130. Fatma: Doğru

True

131. Demet: İkililerden de örnek yapalım

Let's do the examples from two decimal place ones

132. Teacher: Don't forget to put decimal places

133. Burak: Two point to the left=

134. Teacher: =İki tane sola gidiyor, Evet [doğru]

It is going two places to the left, yes true

135. Burak: [Thirty-two] point two

136. Kemal: O zaman bu da four point eighty three oluyor

At that point this is four point eighty-three

137. Demet: Daha önce öğretmen anlatmamıştı ya da ben anlamamıştım

Before, the teacher did not explain or I did not understand.

138. Burak: Hocam durun ben anladım ona ben anlatayım

Teacher, just a minute, I understood this, I will explain to her.

During this exchange, in Line 126, Ayşe says they understood the maths problem. Fatma backs her up, and adds her voice that the other question is also easy. In another overlapping speech Elif jumps on the bandwagon and is amazed as to why they were unable to solve this before. A group of students simultaneously express a kind of relief of 'so easily understanding' a problem that they could not previously understand in their mainstream classes. It is quite clearly seen that they are willing to go for a more complicated level of this problem and pushing the teacher to provide it to them (Line 131). The infectious enthusiasm is quite tangible between Lines 126-137. Although in Line 124 Ayşe is hinting she would like to 'go', saying they will pop in to see their aunt, and in Line 125, Fatma is reminding everyone about the time. So too, they also blend in the happy realisation of how easily they solved the questions which was not the case when they had 'perceived' a similar maths problem before. In Line 129, Demet is also amazed and cannot believe that she had not 'understood it' previously. It is significant that she ponders the reason, was it that the teacher failed to explain it in mainstream class, or had she herself not understood it (Line 137). This illustrates that the students are unclear about the reasons why they did not understand it earlier, however it is extremely evident when examined as a whole. The Club provides a place where the pupils are encouraged and not alienated for translanguaging, they are able to use and utilise their cultural backgrounds/identities, linguistic resources, shared experiences. Furthermore, it provides a place where a collaborative learning atmosphere is supported, which significantly speeds up the learning process and increases confidence in a chain reaction.

In Extract 22 below, the Lines 42, 44, 47 and 50 illustrate how the exchange in which Elif's outspoken reasoning gives opportunities to fellow students and to the teacher to correct Elif's language-based misunderstanding. It also provides an opportunity for Elif to make sense of what she understood in the question, in a way that she had not understood before it was clarified.

Extract 22 (from Transcript 2)

41. Teacher: Elif sen de b yi yapar mısın

Elif, could you solve the part b

42. Elif: (2) Hangisi?

Which one?

43. Teacher: Read part b of the question first.

44. Elif: For six people, how much stock is needed? …Hepsini toplarsak…

For six people how much stock is needed? İf we add all of them.

45. Ali: [Olmaz, ben yapayım mı?]

No not like that, can I do it?

46. Teacher: [Bir dakika, Elif, niye topluyorsun?]

One minute, why do you add, Elif?

47. Elif: (3) Stok diyor, (1) hepsini toplarsak bulurum=

It says stock. If I add everything I find it out

48. Fatma: =Stok et suyu demek, akıllım*

Stock means meat broth, clever clogs

*Literal translation 'my clever one`- Fatma is effectively using seemingly derogative remark in an affectionate way about Elif's level of understanding.

49. Teacher: Evet, beş kişi için üçyüz ml. etsuyu gerekiyor, for six people?

Yes, for five people, three hundred ml meat broth is needed. For six people?

50. Elif: Tamam tamam şimdi anladım, ben stok deyince (2) stok etmekten toplarsak olur dedim ama olmadı tabi ki (x) ama anladım şimdi,

divided by five, sixty eder, sonra da times by six=

OK, OK now I understand. When I read stock, I understood they are stocked all together, and I thought I had to add but it was wrong of course but I understood now, divided by five and then multiply by six

51. Kemal: =three hundred and sixty.

52. Teacher: Oldu. Soruyu bitirelim, Sema c yi de sen yap.

That is right. Let's finish the rest of the question. You do part c, Sema

In the above exchange, the meaning of 'stock' (stock cube) in food making is not known to Elif but she knows stock only in the sense of stockpile or stash as in Turkish it is 'stok'. This confuses Elif (Line 47) until Fatma explains this to her in Line 48. Then she was quickly able to understand and address the mathematical problem. This paragraph can also be tied to 'talk out loud' inclination when the learning environment allows naturally occurring language and when 'the language becomes a tool for thinking' again. In one of the focus groups Elif clearly expressed that if she was not given the opportunity to voice her internal dialogue 'she would not be able to ask the specific question which hinders her grasp and she would not feel free to talk out loud if this was not encouraged as if a normal thing to do in the class'. Elif's comment is confirmed by other children in the focus group. This further strengthens the view that if the pupils do not speak or speculate out loud and comfortably, the teacher might not know the series of non-mathematical obstacles they face in solving the given problem. The student is likely to assume that the given problem is difficult rather than she does not have the sociolinguistic means to solve it while her native peers have the natural means with their proficiency in English.

When sociolinguistic obstacles are lifted as in the above example and they find the answer, students' facial expressions and the sounds they make indicate their realisation of their own ability. They managed to find a solution to a problem that they had almost failed to solve due to sociolinguistic obstacles and attached psychological obstacles in addition to external factors such as low expectations – which may be, and often are, internalised. In one of the focus groups the students

emphasized that the presence of a bilingual teacher and the relaxed and comfortable environment made this realisation possible. If they were not in the Club (like Elif's 'stok' issue in above extract) with a bilingual teacher who can identify and sympathise with her misconceptions, Elif would not be able to explain her misunderstanding. This is evident in the above extract with Elif's use of the word 'stok' (Turkish pile) where there is an additional complication that she is clearly familiar with the English word 'stock' referring to the goods available in a shop or loading up shelves. Here she has been perplexed, not only by words that sound similar in both languages, but also by an English word that has multiple meanings, not all of which are known to her.

The following Extract 23 from the Transcript 3 is another example of a "to think out loud conversation", in another word, of exploratory talk.

Extract 23 (from Transcript 3)

213. Teacher: Are you finished?

214. Burcu: Nooo, not yet.

215. Burak: Miss, I don't understand Question C

216. Ferhat: Yardım edim ben yardım edim. Hocam ben yardım edeyim mi?

I can help, I can help... Teacher/ Miss can I help?

217. Ayşe: Ben iyiyim, bak.

I am good, see.

218. Burak: Use the frequency polygon to compare the two weeks and write down three observations you have found.

219. Teacher: İki tane hafta var iki haftayı karşılaştırıcaksın.

There are two weeks you will compare the two.

220. Ferhat: Polygon'u yapmadın ki sen. Daha yapmadın ki sen.

But you did not do the polygon. You didn't do it yet.

221. Ozan: Aaaa, yapmış koçum benim. ((Patting Burcu's back))

Aaaa ((Surprisingly)) *she did it koçum**

*literal translation is 'my ram' It implies declaration of strong friendship bond to show support and encouragement, although it is used for men.

222. Ayşe: Doğru yaptın di mi sen?

You did it right didn't you?

In this exploratory talk above, Ferhat 'thinks aloud', taking the risk that others can hear and comment on his partly-formed ideas. Engaging in exploratory talk is therefore rather a brave thing to do and tends not to happen unless there is a degree of trust within a discussion group. From Barnes' (1992) definition, exploratory talk might be seen as a kind of lone venture for the individual. Its potentially rich benefits stem from the way that thinking aloud precipitates ideas, as the mind draws on previously unconnected reserves to come up with something new, creative or well-reasoned. In this extract above, one student is positioning himself as the 'knowledgeable other' to offer support and encouragement to another.

Examples of social context of learning/play frames/peer group collaboration are seen in Lines 106-108 below.

Extract 24 (from Transcript 1)

104. Teacher: Soru var mı?

Any questions?

105. Elif: …Bu doğru mu?

Is this correct?

106. Ayşe: Üç kere dört bilmiyor musun ne?

Don`t you know three by four makes what?

107. İnci: Yedi kere…kaç? ((Laughing)) Kaç kaç

Seven times what? *Run run*

((Whole class is laughing))

In this exchange, in Line 104, Teacher asks the class to make sure everyone understands. In Line 105, Elif wants assurance when she asks "Is this correct". In Line 106, Ayşe corrects the answer while she is complaining that Elif does not know what three by four makes. Ayşe asks Elif "don't you know" with slight amazement. In fact she insinuates that Elif must know the answer but that she is not saying it. This is a subtle reference to the mainstream classes where Turkish Speaking pupils (or any bilingual student) cannot achieve because of the language barrier, because of social alienation. She is questioning Elif as to why she is underestimating herself.

In Turkish 'kaç' has two meanings. It is used to ask for a numeric answer and it also means 'run away'. İnci uses 'kaç' in both meanings in Line 107. First she uses it to ask for the numeric result, and then she recalls the homonym and uses the word to mean 'run away'. This amuses the class and makes them laugh. Through homonymous words she creates play frames. Play frames in this instance also highlight the theme of social context of learning. The unexciting subject of times tables seems more amusing with this word play. It draws the attention of the entire class and makes a more interesting class in general.

The following extract highlights the language barrier in maths learning context with students' self-diagnoses.

Extract 25 (from Transcript 1)

59. Fatma: Ben neden o derste birşey anlamıyorum?

Why do I not understand anything in that lesson?

60. Elif: Ben İngilizce [bilmiyorum ya]

Because I do not know English

61. İnci: [Annemden kağıt da] getirdim

I have brought paper from my mum

62. Elif: Bakarız bakarız ((Apparently mimicking the teacher))

We will see, we will see

In this conversation, in Line 59, the remark may seem like a question but it is rhetorical. Fatma states that her lack of knowledge in English caused her to not

understand that lesson.

In Line 60, the vocalization 'ya' is used to validate that the other students know of Elif's lack of English skills. The tiny two lettered word of 'ya' contains a circular dynamic. It shows that others told Elif about her not knowing English and Elif is now reminding them of this. She strengthens her case about not being able to speak English through prior remarks coming from her social environment.

In Line 61, İnci cuts into Elif's speech and overlaps by saying that she is also in a similar situation. She says this by talking about the letter she brought from her mother. Her lack of English is validated by the mother too.

Through Lines 59 to 61, Fatma, Elif and İnci all seem to be like one single person. They complement each other in a way that it almost seems to form a single monologue. The reason why Fatma does not understand is shown through Elif, which is also validated through İnci and her parents. The students' lack of confidence in English affects their participation and understanding of the lesson.

In Line 62, Elif mocks the teacher by mimicking her. She is bothered by the teacher's reaction because the teacher was disinterested. This alienated the students and it created a rupture in the teacher-student relationship. The trust relation of learning is compromised.

This alienation or potential alienation is reflected in the following extract (Extract 26).

Extract 26 (from Transcript 5)

33. Teacher: Anlatır mısın, yaparken

Can you explain while doing?

34. Sema:Yaparım ama anlatamam

I can do it but I can't explain

35. Zeynep: Yapıyoruz anlatmaya gelince …

We do it. When it comes to explaining

In Line 34, Sema has no word for the problem she is already in the process of

solving. In Zeynep's words (in Line 35) we understand that this is not uncommon amongst Turkish speaking students. One can guess how this 'voicelessness' might feel in the mainstream class, and what kind of isolation process this will lead to. It is significant that even in the Club where the student could try to explain the problem that she solved by translanguaging, she apparently has not attained sufficient vocabulary to express this, or it could further suggest that she has no prior practice of it.

After Line 36 (see Appendix 9.5, Transcript 5) some students try to explain what they are doing when they work on the problem.

In doing this, highlights that at the Club they have the liberty to ask or answer in both languages. There is no language oriented blockage and sociocultural exchanges are flowing alongside mathematical exchanges.

The following extracts have examples of how students themselves address the issue to overcome these blockages, at least in the Club setting. Two students display a teacher-like attitude to the learner student, which is from their own experience.

Extract 27 (from Transcript 5)

88. Teacher: Ferhat anlatır mısın Duygu'ya question'ı nasıl yaptığını

Ferhat can you explain Duygu how you solved the question?

89. Ferhat: Bak 1750 12 ile çarpıyosun 24 000 senelik

Look, you multiply 1750 by 12. Annual 24 000

90. Ali: Sonra … 2350 Sonra

Later 2350 Later

91. Sema: Yavaş slowly slowly

Slowly

92. Ali: Hayır

No

93. Ferhat: 4200

94. Duygu: Daha çok para yapıyor

It is making more money

95. Ferhat: Tamam mı sister?

Is it alright sister?

96. Sema: Anladın mı Duygu'cum

Did you understand dear Duygu?

97. Ali: Bir kere bir iki tamam mı?

One time one is two Okay?

98. Sema: Anlamadıysan, anlıyacağı şekilde anlatması gerekir

If you didn't understand, he/she should explain the way you understand

99. Nur: Anlamıyorsa

If he/she doesn't understand

100. Duygu: Öğreniyoruz işte

See we are learning

101. Nur: Evet anlatır mısın lütfen

Yes, can you explain please?

102. Teacher: Ozan anlatır mısın

Ozan can you explain

103. Ozan:Neyi hocam

What teacher

104. Teacher: Bir kere daha anlat geçiyoruz

Explain it one more time, moving on

In Line 88, the teacher asks Ferhat to show Duygu the way he solved the problem. Ferhat, despite his proficiency in English, proceeds to explain in Turkish because he is probably well aware that Duygu will understand better in this way. He is not the only one; Sema also asks Ferhat to do it slowly and when the explaining is over, both Sema and Ferhat are checking with Duygu whether she understood or not and they do this in a very affectionate way. In Line 95, Ferhat addresses her as 'sister' and in Line 96, Sema addresses her with a diminutive suffix, "Duygucum" instead of just "Duygu".

In Line 98, Sema makes it even more explicit by saying teaching should be

tailored, in other words, acknowledging that everyone has a unique learning style which needs to be catered for.

In Line 104, the teacher wants to make sure that each child has understood before moving on to another question, by asking a student to repeat it, reinforcing learning. This is echoing the peer group collaboration in the Club, as well as leading by example.

In the extract below (Extract 28), in Line 22-29 various points are demonstrated in students' comments which are in line with Vygotsky's suggestions that "language is a tool for thinking" and "learning is essentially socially constructed" (Vygotsky, 1978).

Extract 28 (from Transcript 2)

22. Fatma: Shepherd's pie yapacaklar

They will make shepherd's pie

23. Sema: Shepherds ne demek=

What do shepherds mean?

24. Teacher: =Çoban

Shepherd

25. Ayşe: Çoban pay mı almış

Does the shepherd get a share?

26. Fatma: Pie is börek, [börek, akıllım]

Pie is börek, börek, clever clogs[4]

27. Sema: [Çoban böreği]

Shepherd's börek

---

4 'Clever clogs' 'akıllım' is used for the opposite effect. It is however not sarcastic but an affectionate addressing. It means 'silly' but by volunteering the 'correct answer' quickly the pupil is aiming to help, rather than to humiliate the other.

28. Zeynep: Dün yemekte vardı

Yesterday it was on the lunch menu.

29. Ali: Kıyma üzerine patates gibi hani. Food technology de de yapmıştık.

It was like potato on top of the mincemeat. We cooked it in food technology

As seen in the extract above the students are not actively negotiating their positions as learners but they are collaborating socially within a group which has identified common threads e.g. Turkish language – in its localised vernacular. Also the 'buddy' system is used to support one another – again using discourses that would reflect that commonality and understanding created by the group. This is a "communities of practice" approach.

As elaborated in Literature Review, for Lave and Wenger (1998, pp.52-53) community of practice approach very clearly refers to a person in detail, and as the individuals' place in the world, as a unit of the socio-cultural community. As members of the community engaged in a common social practice, including the current forms of speaking, their interactive roles affect their social identities and vice versa. Also Wenger (1998, p.76) underlines that, a community of practice (CofP) consists of a loosely defined group of people which has 'a shared repertoire of negotiable resources accumulated over time' and this is a mutual engagement between them for a certain piece of work. Wenger (1998) defines three criteria, for the identification and classification of a CofP, although they may sometimes overlap: mutual engagement of members, a jointly negotiated enterprise, and a shared repertoire.

The example of conversation (see the Extract 28 above, Line 22-29) shows how five students and the teacher together negotiate the answer to the initial question by means of common language and culture: what is shepherd's pie. Students did not only recognise the term shepherd's pie, while initially they did not even know that it was a dish. They are then able to progress from an initial culturally similar dish ('spinach börek') to recognise the original item 'shepherd's pie' which they have seen on the school lunch menu and to make comparison between the two

dishes. Interestingly there is a very similar dish to shepherd's pie in Turkish cuisine called 'kıymalı patates' but because the students had to negotiate the meaning linguistically and gradually by using both English and Turkish, the name of this other dish was not obvious to them. Whereas for the English students, shepherd's pie is a familiar, and linguistically and conceptually instantly recognised concept, it was quite a lengthy and involved process for the Turkish speaking students to overcome three levels of misunderstanding ('pay' 'pie' confusion, clarification of the English word pie and their sudden awareness that they recognise the dish from the school lunch menu as 'kıymalı patates') before they could begin to solve the mathematical problem.

In Line 23, Sema's question 'what does shepherds mean' and her uttering 'shepherd's börek' in Line 27 shows how unsure she is, as if she first wants to digest what this word is. Similarly Ayşe's question 'does the shepherd get a share?' is an even more interesting example of mixing the words, their meanings and sounds. As mentioned earlier, 'pie' in English sounds like 'share' in Turkish (in Turkish 'share' is 'pay', phonetically 'pai'.)

Ayşe brings her experience in from her vernacular, she adopts the dual-language medium, opens up the mathematical task by probing into it which invites quite a few comments from the peers, even though some of the comments are inaccurate explanations, at least partly (In Line 27). Once again the linguistic and cultural repertoire is evident in the connections that Ayşe makes between the two languages when she takes the shepherd of shepherd's pie and asks 'if shepherd gets a share'. In the focus group, Ayşe explained that 'I jumped to the word because share (in Turkish) is a mathematical word'. This demonstrates that Ayşe's mathematical knowledge in her own language is good as she processes the word pie as a mathematical notion. Ali's helpful explanation (in Line 29) also comes in the form of a Turkish dish 'potato on mincemeat'. As Vygotsky suggested, most references are embedded in students' own culture and social background.

In the interchange below (Extract 29) as a response to the teacher's invitation to refocus on the problem, Burak and Mehmet's discourses are interesting in terms of showing their clear awareness that naturally occurring language is a means of learning. In the focus group they came back to the point and emphasised that 'we

kept talking but we kept solving the question'.

In Line 31, 32, 33 (Extract 29) three pupils progress into having a chat, seemingly outside the context of the maths problem, and drift into their daily life until the teacher warns them to remain on the task at hand (Line 34). Burak on Line 35 and Mehmet on Line 36 promptly indicate that 'this non-mathematical talk is helpful to their understanding and solving'. This demonstrates that the informal atmosphere and affective factors enable them to relax, yet maintain their concentration and achieve their goals.

Extract 29 (from Transcript 2)

31. Burak: Benim annem dün yaptı, [teyzemgiller de bizdeydi.]

My mum cooked it yesterday. My aunties were with us.

32. Sema: [Bize niye seslenmediniz] =

Why did you not call us?

33. Burak: =Aniden geldiler.

They turned up suddenly

34. Teacher: Konuşmaktan bir soruyu çözemediniz.

You haven't managed to solve the problem since you keep talking.

35. Burak: … Ama öğretmenim biz hem sohbet ediyoruz hem de soruyu yapıyoruz.

We are chatting but we are also working on the problem, Miss

36. Mehmet: Sohbet ederken kafamız da çalışıyor

While we talk our brain is also working.

4.4 The Role of Parents

One of the most surprising results from the research was the extent to which students began to involve their parents in discussion of homework and that parents now felt themselves to be much more fully involved in their children's school

work and education and to have a greater understanding of the British education system and their children's place within it.

Bilingual homework (Turkish/English) was given to help Turkish speaking parents to engage with their children's homework as well as the Maths curriculum. Being able to conduct conversations and home visits in Turkish was also extremely beneficial as it increased parents' confidence and gave them the opportunity to express their views and anxieties and to ask questions. Hence it was more conducive to the success of this research and its data collection.

In terms of parents' role in this context, Wolfendale, (2000) emphasised the importance of home-school relationship and a connection between parental involvement in school and the school achievement of the child. Torres−Guzmán, (1995) suggest that parents who appear not to take an interest in their child's education transmit a negative attitude towards it.

Some of the student's comments on parents' involvement in the Club were:

> "You know us and we know you"
>
> "You talk to my family, you understand each other"
>
> "Babam bilmez zannetmiştim, ona sormamıştım fakat iki dilde homework'umu gosterince long division'i bana cok guzel anlattı."
>
> *I think my father did not know the topic and I did not ask him but when I show him my bilingual maths homework he explain long divisions very well to me.*
>
> "My parents like to have a look at and understand the work and we solve some problems together."

Parents pointed out their children started to use Turkish and English to discuss bilingual maths homework with them. They had broken down a barrier and recognised that Turkish was also relevant to their school work and lives and not just for social use. Parents emphasised that they felt they have been valued and important.

4.5 Summary of Findings

Keeping in mind the research objectives are:

- to document and analyse students' language use in tackling mathematical tasks,
- to explore how these learners construct knowledge through translanguaging in a bilingual medium as they engage in mathematical tasks,
- to understand how mathematical knowledge is acquired and processed in collaborative group settings.

Ensuring the first objective of the research, students' naturally occurring conversations during the Club sessions were documented and students' use of language in tackling mathematical tasks was analysed.

Thematic analysis was used. All these elements, namely translanguaging, activating prior knowledge, peer group collaboration, cultural background, collaborative learning, play frames, linguistic repertoire and those which appeared throughout the analysis of three media of questionnaires, focus group discussions and the Club interactions, are interconnected themes. They accompany and complement each other and it can be seen that they are all represented in the transcripts of the Club Interactions. This is also evident in the fact that sometimes the very same transcript is an example of multiple themes and is clear in the responses to questionnaires, focus group discussions and analysis of the Club Interactions extracts which highlighted one of the research's main objectives, namely, "to explore how children construct knowledge in the bilingual medium through translanguaging". Translanguaging is specific to multilingual and minority communities and this analysis and observational field notes show that barriers to learning in a second language can be overcome when translanguaging, activating prior knowledge and learning in a social context is not only utilised but also positively encouraged. Learning strategies were discovered and given under the themes to expose how mathematical knowledge is acquired and processed in collaborative group settings. This was the other objective of the research.

The students emphasise in the focus group that they feel much more comfortable in the Club in raising questions when they do not understand. Whereas in

mainstream classes they withhold their questions, hesitations and opinions due to the anxiety of being labeled 'slow', 'thick' or 'silly'. It was also observed that their confidence is built gradually in the Club where translanguaging is applied and encouraged, and this accommodates and activates prior knowledge, and becomes a contributory factor to learning. Functioning almost like a chain reaction, the pupils respond to this learning environment in which their mother tongue and the language they gained in UK become complementary. In addition, they do not feel alienated because they cannot understand or express what they know. When these students realised through their interactions with each other and the teacher that their cultural background and language repertoire were a significant part of their learning process rather than a disadvantage, there was a clear sense of relaxation and improved self confidence in exploring and mastering the academic task they were attempting. They understood they were not 'slow' or 'unintelligent' but that with a more culturally sensitive approach to teaching they could prove their true potential. This can be seen in many extracts throughout the transcripts, almost like a quiet climax.

The Club environment was seen like a Zone of Proximal Development (ZPD) (Vygotsky, 1978) (cf. literature review) to overcome the barriers of the learning. The research showed that students and teacher formed a community of practice (Lave and Wenger, 1998) (cf. literature review) working for the common goals by using learning strategies like translanguaging, activating prior knowledge, playframes while learning in a social context. It developed students' abilities to learn from the teacher and their peers and involve multiple linguistic, social and cultural practices.

Further analysis of the data gave evidence of children's 'framing talk as play', a strategy by which they structured their social and personal experiences to provide us with an interpretation of what was going on in their interactions with each other. Vally Lytra's book (2007) 'Play Frames and Social Identities' was highly relevant to this as she explores playful talk among Turkish speakers in Western Thrace- Greece. In the Club the students felt relaxed and they recognised or re-invented their 'ability' of understanding, while also playfulness and play frames occurred.

It is true that some of these themes are not necessarily specific or unique to bilingual settings. For example, peer group collaboration is a valuable aid to any group learning process and could be occurring in any learning group, adult or children, native or bi/multilingual. Still, in mainstream maths class peer group collaboration of Turkish Speaking children or in fact any multilingual children are almost non-existent. Failure to encourage this means of collaboration leads to an absence of any means of referring to the first language and culture in the classroom setting. Unfortunately, too, the attempt to collaborate with other Turkish Speaking children can be misunderstood by professionals who do not share this language background and perceived these exchanges as unnecessary and even disruptive 'noise'. As a result of this, TS pupils indirectly or directly are denied opportunities for peer group collaboration. The same thing can be said with reference to activating prior knowledge and using naturally occurring language as a positive aid to learning. Neither is accommodated in the mainstream classroom where the expectation is that all teaching and learning and even social conversation will be conducted in English.

5. Discussion and Conclusion

This chapter consists of the following sections:

5.1 Summary and the Referral to the Literature review

5.2 Original contributions to knowledge in the field

5.3 Limitations and the ideas for further research

5.4 Discussions on the implications for policy and practice

5.1 Summary and the Referral to the Literature review

The aim of my research was to analyse bilingual/multilingual students' naturally occurring conversations in a mathematics after school club (the Club). During their classroom activities, I explored strategies bilingual children employed while tackling mathematical tasks and further focused on how these learners interpreted their learning environment as they engage in the tasks through a bilingual medium.

I explored the bilingual linguistic practices of Turkish, Kurdish and Turkish-Cypriot children in the Club in an inner city secondary school in North London. The transcripts were documented and analysed resulting in the following themes and sub-themes: translanguaging, activating prior knowledge, peer group collaboration, utilising cultural background, collaborative learning, using play frames, and accessing linguistic repertoire. All these themes and sub-themes that appeared throughout the analysis of the three research tools of questionnaires, focus groups discussions and the Club interactions were interconnected. They accompanied and complemented each other and this was evident from the very same utterance that could offer examples of multiple themes. This was shown in the responses to questionnaires, focus groups discussions, the Club interactions and analysis of transcripts which investigated the main objective "to explore how children construct knowledge in the bilingual medium through translanguaging". Translanguaging is specific to multilingual and minority communities and my analysis and observational field notes show that barriers to learning in a second language can be overcome when translanguaging, activating prior knowledge and

learning in a social context are not only utilised but positively encouraged.

Furthermore, students insisted on accessing their cultural and linguistic repertoire and prior knowledge as seen in the analysis chapter. The data showed that, when given more freedom to interact and learn collaboratively, the students did not separate particular aspects of their language repertoire to address specific social or academic situations. Students could be seen to ask questions when they were not clear in their understanding, tease each other, offer peer support and share their life or cultural experiences. They moved naturally between Turkish and English according to their level of understanding, to enhance and explore this and as a means of social communication and problem solving. The concept of translanguaging was used to describe these complexities of language use and the related pedagogic practices that utilised them. Being bilingual creates multiple issues in the daily experiences of students. They do not only use translanguaging as a learning strategy but rather as the way in which their thinking and communication are shaped as bilingual children. All too often they do not feel confident enough to express themselves in either language in more formal or predominantly monolingual situations. They transfer their relation with language into the learning environment in a unique way which needs to be addressed and utilised to become more positive for them and their classmates and teachers.

Notable was the fact that students employ translanguaging to reflect on their multiple experiences as they negotiate the construction of mathematical knowledge and their bilingual/multilingual identities in group contexts. This finding concurs with Creese and Blackledge (2010) and Møller (2008). Analysing transcriptions revealed how the students collaborated to construct meaning and these meanings were explored. I discussed how the alternation of language was treated by the students in the interaction and was able to show that, through simultaneous use of different linguistic repertoires, students performed a variety of roles to position themselves as experts, collaborators or teasers. For example, they negotiate academic understanding of concepts and language by means of their shared language repertoire and social and cultural experiences.

I emphasized that the Turkish speaking students' focused casualness was evident in the naturally occurring bilingual/multilingual conversations and this was typical

of the Club where the shared cultural and linguistic repertoire of the group accommodated and aided the learning. The way the pupils used their common language repertoire to construct reality thorough clarifying, modeling and activating prior knowledge was fundamental in enabling them to reach a consensus as to how to tackle and solve a mathematical problem. Finding out how learners construct mathematical knowledge (i.e. drawing on their shared cultural and linguistic repertoire), I analysed the data and it showed clear evidence of the processes described above, as well as echoing Blackledge and Creese's translanguaging situation (2010, p.105). This allowed learners to succeed in their mathematical tasks as it improved understanding as well as fulfilling my research objectives.

It was observed that; where the pupils resorted to naturally occurring conversations and felt free to use their linguistic and cultural prior knowledge whilst attending to any given mathematical problem. This created an environment that positively and dramatically affected their engagement, enthusiasm, motivation and speed of working, and ultimately their individual and group achievement. When they were unable to tease out the meaning of the problem linguistically and conceptually, it inhibited their understanding and negatively impacted on ownership of the learning process. As observed by the pupils who participated in it, the purposeful learning atmosphere of the Club allowed learning to take place with the sense of challenge and recognized their cultural and sociolinguistic background. This also allowed and valued their use of translanguaging and accommodated the cultural factors which often alienate them from the mainstream classroom. It was also crucial in facilitating their learning and building their self-confidence. Sadly, this is often not the case in mainstream classes; the current system does not recognize and encourage the use of minority students' full cultural and linguistic repertoire as an important aid to academic and personal development.

Unfortunately, this lack of interest is in fact a two-way process: the mainstream methods' lack of interest in and understanding of minority students – in my research Turkish speaking students – is mirrored by the students' disengagement from the learning process and academia as a whole. The findings confirm those in the work of Aydın Mehmet Ali (2001), it is still true that the underlying dynamics

have not been addressed within the education system broadly. The current education system does not provide the student with the bilingual environment. In this research, the bilingual pupils in question, who were enabled by the deliberately constructed environment to utilise their prior knowledge, thereby had greater control over the mathematical process and the attitude of the class towards learning was one of willing participation. This finding was expressly stated by the parents and the pupils alike.

All learners interpret their learning environment. They do so directly and indirectly. Directly, in my field work when they explicitly give account of how they perceived and reacted to this particular class medium, stating that in the Club they were relaxed, they became both focused and playful, and they felt supported by their peers and by the learning environment. And indirectly, as their behaviors displayed a playful attitude to each other while focusing on the task in hand. This is an indirect, or subconscious, reaction to and reflection of their feelings of being comfortable and at ease in the Club.

The socio-cultural perspective in mathematics sees the community in practice as a formation where the cultural experiences of the learner are included in the learning process. The research explored the collaborative meaning making of a group of Turkish speaking students as they engaged in mathematical problem solving tasks drawing on their existing linguistic, cultural and personal repertories. With all their variations and use, linguistic repertoires constitute an important social dimension to be taken into account in mathematics teaching and learning in the Club.

In mainstream schooling, where bilingual students are learning through the medium of English, their first language is either excluded in the classroom completely or used either in quick communication between same language speakers or even to express things they do not wish the majority, including the teacher, to hear. Outside the classroom it is used to reinforce friendships and solidarity between members of the same language group. However, it can separate them and even cause them to be perceived negatively by other students and professionals.

In contrast, in bilingual classes such as in the Club, the first language was seen as a means not only of the teacher supporting students' learning but also of the students supporting each other in a learning situation. When home languages are brought into the learning process children's identities are foregrounded. The transcribed data analyses showed that students successfully solved worded mathematical problems, which at first sight appeared obscure to them. The analyses provided evidence of the positive effect of Turkish speaking teacher and pupils using both first and second language in a natural manner, accessing shared cultural understanding, and translanguaging during the activity. In the Club, students translanguaged as members of a 'Turkish speaking' group (in school) but also as members of a wider linguistic community. Also students translanguaged as they constructed discourses to help themselves and others tackle mathematical tasks. Students' social interchanges were mainly related to the task and furthered their understanding rather than distracting them from it. This supports the answer to the research question. The research question is that Turkish, Kurdish and Turkish Cypriot students do use a variety of learning strategies to negotiate construction of mathematical knowledge in semi-informal collaborative peer group settings. Through activities and interactions in the Club the children's self-esteem increased and they were more able to attempt the given mathematical tasks with greater confidence and competence. This bears out the crucial point made by Cummins (1996) that, when students developed sense of self is affirmed and extended through their interactions with a teacher, they are more likely to apply themselves to academic effort. The encouragement of translanguaging is a way that teacher might use to encourage students to interact.

I was also conscious of Cummins' (2000) statement that there was a gap of several years, on average, between the attainment of peer appropriate fluency in second language (L2) and the attainment of grade norms in academic aspects of L2. His work proposed that conversational aspects of proficiency reached peer-appropriate levels usually within about two years of exposure to L2 but it takes a minimum of five to seven years to develop academic proficiency in a language and this is generally with appropriate specialised support (Collier, 1997; Cummins, 1984a, 2000). In order to address the gap that Cummins stated, the motivation to progress for these students was the Club atmosphere that I created

and my findings show its success. As presented in the data, promoting their translanguaging was the antidote to mainstream blindness towards their language, culture and experience.

My study showed that as children's confidence and competence grew through bilingual interaction, this affected their acquisition of mathematical concepts positively. This finding is in support of Dawe's (1983) study which showed how children's mathematical reasoning was related to the use of the two languages. It also supports Cummins (1984a) work as the children used cognitively undemanding information that I shared as their teacher to make sense of cognitively demanding mathematical tasks.

What Cummins, (1996, 2000), Baker (2000) and Skutnabb-Kangas (1984, 2000) underlined concerning the importance of bilingual children's mother tongue for their overall personal and educational development is echoed in my research in relation to learning maths in the Club. I found that when parents were able to spend time with their children and discuss issues with them in a way that developed their mother tongue vocabulary and concepts, they came to school well-prepared and equipped to learn the school language and to succeed educationally. Both languages nurture each other when the educational environment permits children's access to both languages. Both the parents' questionnaire and the children's statements indicated a greater integration between home and school life. I propose that preparing and sending bilingual homework home with a view to increasing parent/carer participation in the Club is a creative strategy essential to enable students to progress to an age appropriate level of academic language acquisition.

Moreover, while also realising that at times parents experience difficulty in providing the support owing to their own limited or disrupted educational experience, this would also reinforce students' multicultural heritage and the parents' role in their lives. Thus Chapter 4.4 emphasised the importance of the role of parents. Students began to involve their parents in discussions about their school work and the parents began to feel much more fully involved in their children's education and added to this, that they had greater understanding and confidence and reassurance about what the school was trying to achieve.

5.2 Original contributions to knowledge in the field

The learning strategies that were explored and presented as one of the research objective was original contribution in this field and gave ideas how mathematical knowledge is acquired and processed in collaborative group settings.

The existing researches shows the how bilingual/multilingual students use their mother tongue to learn second language, this research showed the importance of using mother tongue in learning mathematics. Also it was emphasised the effective of the collaborative learning atmosphere in teaching and learning.

There are researches on bilingual learning but this research was contributed to the field by giving translanguaging examples and how translanguaging was used as a strategy to support learning.

The Club is a mathematics learning environment and it was used as a base for getting information to learn the effects of the community in practice and collaborative learning and it can be a starting point for the other researchers who want to build up this kind of environment for their research.

The research environment created allowed for me to address the missing link between language acquisition of the students and how it reflects on their curricular courses. The existing research and data on these specific conditions were limited even though this is a very prominent subject. This research helped address this data gap.

This research gave insights on how language is used (translanguaging) in a curricular subject (mathematics). Other researches generally showed how the mother tongue was used to learn second language.

As a researcher with same linguistic and cultural background -other researchers might not have this inside knowledge- I had the ability to understand the difficulties that these students face. I too have learned English as a second language and had a similar experience using two languages both in my daily life and in my academic pursuits. This unique perspective has proven to be beneficial in deciphering the processes behind the students' linguistic and academic struggles. Though there is a possibility of many other fruitful research.

5.3 Limitations and ideas for further research

This research investigated learning strategies used by Turkish/English speaking students and explored how these learners construct knowledge through translanguaging in a bilingual medium as they engage in mathematical tasks.

Before embarking on this research, I considered the possibility of organising both a bilingual mainstream maths class and an English medium maths mainstream class as a control group. Both classes would run in the same year group and with 'mixed ability' students and would follow the same maths curriculum and be taught by the same teacher, myself. At the end of the year I would compare the test results, achievement, attitude to maths learning and the learning strategies used by both groups of children.

However, as much as this would have provided useful and satisfying results and outcomes, it was outside the scope of the methodology designed within my research. Moreover, the school management could not accommodate the organisation of the research project in this way which caused me to alter the direction of my research and to focus on the after school club only with Turkish Speaking children as I had already run this maths after school club for several years. This tighter focus benefited my research objectives as it was a good opportunity for me to carry out the research with existing students who would continue to attend the after school club after I announced it for the forthcoming academic year and would look at the strategies presently used by students while tackling mathematical tasks.

The underachievement of bilingual students did not apply only to the Turkish speaking group but, because of my own background and language repertoire and my position in the school, it seemed appropriate to address the situation with this specific language group, i.e. Turkish speakers. I developed strategies that would enable me to identify more clearly the reasons for the underachievement and the apparent lack of engagement of these students and their families with the school and education environment. The research could be further built up with children and teachers from different linguistic and cultural backgrounds.

However it is challenging to find teachers who have same linguistic and cultural backgrounds with the students to support them. The solution is that the teachers can learn the language of their students but even learning the students' language

would not equip the teachers with the same cultural background with their students. Children and the teacher translanguaged because they shared same linguistic and cultural backgrounds. If the teacher only knows the students' language but not the cultural background the cultural process will not be possible. Cultural baggage (language, culture and experience) cannot be learned as it is the accumulation of life experience.

The research showed that language is not the barrier; it is the aid for the students to learn and express their feelings, ideas. They felt free and not embarrassed to speak out the difficulties they encountered and got help without embarrassment from the teacher or their peers. This is the originality of the research that shows how translanguaging used as a tool for learning especially in a curriculum area (mathematics) in a collaborative learning atmosphere (the Club).

5.4 Discussions on the implications for policy and practice

My research demonstrates how through recognizing the students' full language repertoire and valuing their different cultural background, valuable progress was to be made. These students were able in a purposeful learning atmosphere to use their full range of linguistic skills and cultural understanding to explore the mathematical tasks. They became unafraid to express problems in understanding the language and were content, and they enjoyed working together and sharing knowledge to solve these.

Words in all languages behave in complicated ways and often have multiple and diverse meanings which consequently affect bilingual/multilingual pupils' understanding and engagement with curriculum content. Bilingual/multilingual pupils are not only developing conceptually, they are also acquiring new cultural knowledge which in many ways differs from the cultural ideas attached to their mother tongue – the language of their family and immediate community. Their understanding and competence in English, on which their academic achievement depends, will be strongly affected by their ability and willingness to engage with cultural features of the school environment and learning material which are expressed through this language. This in turn will be influenced by the extent to which they feel comfortable, accepted and valued as individuals and as a group within the school community. Bilingual/multilingual students need to know how

words relate to knowledge about their world and need to negotiate new meanings by making connections with their stored world knowledge, some of which will be drawn from cultural and linguistic schema that teachers often do not share with them.

Essentially, if meaning-negotiation processes are to be effective, the learning milieu must be culturally inclusive: learners must feel that they belong in the classroom, so they must have a share in the control of meaning-seeking. Where meanings are drawn from a closely shared cultural and experiential repertoire, it might be expected that a high degree of rapport exists in the meaning of both parties. When cultural experiences are closely allied to a different language, it makes sense to use that language to explore the references. Use of their first language (L1) by children, and by teachers who share their repertoire, will enhance the collective referencing. References to L1 equivalents will not only help to clarify the intended meaning needed for learning the curriculum but, crucially, they will affirm the role of home and community culture in the learning process.

Many bilingual students appear initially reluctant to attempt tasks and this is often related to feelings of inadequacy, embarrassment and poor self-image. They feel doomed to failure before they even begin because of factors beyond their control. Furthermore, this causes feelings of alienation from the school and academic environment which are hard to overcome and become a vicious circle. Many have seen their elder siblings go through the same experience of detachment/estrangement from the classroom environment and thus from the learning process. My work establishes that undoing the mainstream dynamics which centre only around 'the mainstream pupil' can also undermine and destroy the above mentioned vicious circle of fear and disinterest.

When children's linguistic and cultural background are ignored or excluded in classroom interactions, the students feel that they start from a disadvantaged position. Everything they have learned about life and the world up to this point is being omitted as irrelevant to school life and work. There are few points of connection between their previous life experiences, connections expressed in their first language in particular, and curriculum materials or instruction. The students

are rather expected to learn in an experiential vacuum. Indeed, students' silence and non-participation under these conditions have frequently been interpreted as lack of academic ability or effort, and teachers' interactions with students have reflected a pattern of low expectations which jointly create a vicious circle.

In short, by bringing together these different aspects of life experience they developed into more confident individuals and as a collaborative group, they were more able and willing to address academic tasks. It is essential that all teachers, and particularly those who do not share pupils' home linguistic and cultural repertoire, need to develop their own consciousness of the way in which language affects cultural belonging, that is teachers need to become more analytical and aware of how their own first language, and any other language of which they have knowledge, function and define the world for them.

Students could understand and answer the questions in the mathematical tasks relatively easily, but trying to reach an understanding of the overall meaning was much harder for them. The considerable difference between the sentence structures of English and Turkish makes this overall understanding more difficult to achieve. On top of this, words with unfamiliar cultural aspects or multiple and often very specific meanings contribute to a further clouding in their understanding and the way they perceive and position themselves as learners. Consequently their perceptions of themselves and their own initial understanding of what the task is about are affected, leading to anxiety. Familiarity is linked to culturally, linguistically and psychologically recognised aspects that the learners reflected on and referred to in approaching a given task. The learners' absence of full understanding can frequently result in a task becoming overly difficult or completely inaccessible. My observational field notes showed that this caused reluctance in attempting problems, the appearance of alienation and sluggishness almost equaling lethargy when confronted by a problem which contains several unknown elements, as the extracts from the transcripts reveal. These unknown elements for the bilingual pupils would often be the well-known expressions for a native speaker.

In order to overcome and compensate for this tangible alienation from the mathematical task, the environment that I constructed deliberately allowed and encouraged translanguaging, which in turn created a warm, comfortable and

totally functional medium for addressing the mathematical tasks at hand. This was my ultimate aim proved to be the case for the Club, both during the process and at the end. Therefore, I propose that this constructed learning environment and its contribution to learning and teaching are applicable to any bilingual/multilingual group of learners including those whose mother tongue is English and is also applicable and relevant to any subject, not only to mathematics.

The transfer from the language of school to the home language can also be extremely beneficial in enabling parents who have not been educated in the second language to be involved in and supportive of their children's education and to feel less disempowered in the host society. In conclusion, the positive findings/results from my research project seemingly related to Turkish speaking students have relevance for other bilingual students in our school communities, whether in large groups or as sole representatives of their community and language group. Many of these students are inaccurately assessed and lose motivation as a result. Their problems with academic tasks are frequently related to the imperfect understanding of the language in which the task is expressed and its cultural features. This is accompanied by a sense of distance between the school and education and the home and linguistic environment. Unfortunately, there is a little chance of replicating the learning environment of the Club for each group of bilingual students; however I believe that my findings have more general relevance for understanding the difficulties experienced by these students. Translanguaging helped these students to feel confident when expressing themselves linguistically; however, the environment of the Club also gave them the opportunity to explore social and cultural features and to activate their prior knowledge in an enjoyable and relaxed atmosphere. Their shared language and cultural and social background removed previously existing barriers to understanding and enabled them to concentrate on the maths tasks completely and to support each other to achieve together. By utilising their full linguistic repertoire, we seek to enable all students to examine and explore what they already understand and extend this to increase their understanding and ability to approach new learning situations with increased confidence and competence.

For other linguistic groups of students, it may not be possible to provide bilingual/multilingual teaching support. However, a sensitive understanding of

the needs of these students is essential as well as providing them with opportunities to express themselves using their full linguistic repertoire. Supporting each other in a relaxed atmosphere activates their understanding and enables them to think, to break through the language barrier and to understand and learn more effectively, as was demonstrated and achieved in the Club.

Therefore, the challenge to all professionals working in multilingual schools is to find ways to address the needs of their multilingual/bilingual students in linguistically and culturally sensitive ways. This will enable students and their families to feel accepted and confident within our education system, to diagnose impediments to learning accurately and to work to create a learning environment which will give them the maximum opportunities to achieve their potential. I strongly believe that my research project has provided essential evidence as to how this can be achieved as well as strategies which can be considered and adapted in a more far reaching range of situations.

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Appendices

Appendix 1

Transcription key

[ ] overlapping speech
= indicates latching between utterances
... very short/short/medium break/break of 1, 0 sec.
(2) numbers in single parenthesis represent pauses in seconds
(x) inaudible word
(xxx) inaudible words
(()) investigator's comments
OK capitals represent markedly increased amplitude

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Appendix 2

The Questionnaire for Turkish Speaking Maths After School Club (the Club)

Age:

1. Length of the time in UK and UK school:

2. Have you been in school in another country? Where and how long?

3. Do you speak other language beside Turkish and English?

4. Do you read and write in Turkish?

5. How would you describe the Club (maths after school club) compare to usual lessons in school?

6. Tick for following applies to you about the Club. (Tick one option for each sentence)

	Strongly Agree	Agree	Do not agree	Strongly do not agree
Revising the topic				
Teacher using/explaining in two languages				
Students being able to discuss/explain in two languages				
Working in smaller group				
Using bilingual materials				

7. What else do you think about the Club/ the group?

8. What are the main differences between the Club and your main lessons in school?

Appendix 3

The Questionnaire for Turkish Speaking Parents

1. Çocuğunuzun yaşı ve sizin yaşınız:

(Your and your child's age)

2. İngiltere'de ne kadar süredir çocuğunuz okula gidiyor?

(Have long your child have been in UK school?)

3. Başka bir ülkede okula gitti mi? Ne kadar?

(Have your child been in school in another country?)

4. İki dilli dersler konusunda herhangi bir tecrübeniz oldu mu? Olduysa nelerdir?

(Have you got experience about bilingual lessons? What are they?)

5. İki dilli derslerin çocuğunuza ne gibi etkileri oldu?

(What are the effects of the bilingual lessons to your child?)

Appendix 4

Codes

Her iki dilde de anlıyorum
I can understand in both languages

Lisan eksikliği olanlar yararlanır
The ones who profit from this are the ones who has problem with one language

Bir dilde anlamayan ötekinde anlar
Who ever is not able to understand in one language can understand in another

Anadilimiz kullandıgımız dil
The language we usually use is our mother tongue

Çekinmiyoruz
We do not hesitate

Günlük hayatta da böyle konuşuyoruz
We always talk like this

İki dil daha iyi konuşmama yardımcı oluyor
Two languages help me to speak better

Bir dilde bilmedigimi öbür dilde söylüyorum
When I do not know how to say some things in one language, I say it in the other

Yetersiz İngilizce
Insufficient English

Daha iyi algılama öğrenme
Better understanding learning

Ana dili gibi hakim olamıyoruz
We are not efficient as we are in our mother tongue

Yanlış anlaşılmaların önüne geçer
It prevents misunderstanding

İngilizceye hakim olamama
We do not know English perfectly

Türkçeye hakimiz
We know Turkish

Deyimleri bilmiyoruz
We do not know the idioms

Kelime yetersiz
Not enough words

Akademik İngilizce yok
No academic English

Anlamayınca sıkılıyoruz
When we do not understand, we get bored

Sıkılınca yaramazlık yapıyoruz konusuyoruz
When we get bored we misbehave

Bakıyoruz kopya ediyoruz ama anlamıyoruz
We just look at, we copy but we do not understand

Anlamadığımızı öğretmen anlamıyor
The teacher does not understand that we do not understand

Fikirlerimizi söyleyemiyoruz
We cannot express what we think

Yarı İngilizce yarı Türkçe
Half English half Turkish

Türkçe anlatılıyor
It is explained in Turkish

Anadilimiz
Our mother tongue

İletişim kolay
Communication is easy

Karşılıklı yardım
Mutual help

İngilizcem yetersiz
My English is not enough

Sadece Türkçe olmasından daha iyi
It is better than only Turkish

Türkçemizde tam olmadığı için hangisi aklımıza gelirse onu kullanıyoruz
As our knowledge of Turkish is not proper, we use whichever comes to our mind first

Bazı kelimeler Türkçe aklımıza gelmiyor
We do not remember some words in Turkish

Bazı kelimelerin de İngilizcelerini bilmiyoruz

Acaba yanlış mı söyledim
I wonder have I said it wrong

Bana gülerlermi acaba
Do they laugh at me?

Nasıl söyleyeceğiz stresi yok
We do not have any stress of how to say it

Öğretmen nasıl olsa bizi anlar diyoruz
We think the teacher understands us in either way

Daha önce bildiklerimi hatırladım
I remembered what I knew before

Babamın shop undaki para alışverişleri aklıma geldi
I recalled money exchange in my dad's shop

Türk parasını İngiliz parasına çevimistik
We had exchanged Turkish lira to Pound

Kendimi rahat evde gibi hissettim
I felt like home

Kendime güvenim geldi
I regained my self confidence

Kafam karışmadı
I did not get puzzled

Bildiğim dilde konuşuyorum
I speak in language that I know

Çok yazılı problem olunca anlamak çok zor oluyor
The more the wordings of the problems get longer, the more difficult it becomes to understand

Nasıl yapılacağını bilsek bile problemi anlamayınca çözemiyoruz
Even if we know how to solve it, when we do not understand the words, we cannot solve it

Siz Türkce okuyunca ve anlatınca hangi yolla yapılabileceğini düşünebiliyoruz
When you read and explain it in Turkish, we can work out how to solve it

Türkçeden örnek veriyorsunuz
You give example in Turkish

Anlamaya anlamaya artık sormuyorum ve dinlemiyorum

As I do not understand, I give up listening and asking questions

Soru sormadığımdan yapamıyorum
I cannot understand as I do not ask any question

Bazı kelimelerin ne demek olduğunu bilmediğimden soruyu anlayamıyorum
As I do not know the meaning of some words I cannot understand the problem

İngilizce anlamazsak Türkçesi anlamamıza yardımcı oluyor
If we don't get it in English it helps us to understand in Turkish

Karşılaştırmak deyince Miss, Türkçe 'trink' hemen kafamda anladım ne demek. Miss says in English anlamamıştım
When Miss says compare in Turkish, 'trink' suddenly I understand what it means in my head. When Miss says in English, I did not understand
(trink is the sound of someone understands suddenly i.e. the penny drops)

Sometimes I understand in Turkish, sometimes I understand in English, öğretmenimiz ikisini de kullanıyor, hangisini anlarsak yani
Sometimes I understand in Turkish, sometimes I understand in English, our teacher uses both, I mean whichever we grasp

Soruyu açıklayınca kolay olduğunu anlıyorum
When you explain the problem, I see that it is easy

Soruyu anlamadığımdan yapamıyorum
I cannot solve the problem as I cannot understand the question

Biliyorum ama söyleyemiyorum
I know it but I cannot say it

Daha önce bildiğimizi kullanıyoruz
We use what we already know

Arkadaşıma rahatça sorabiliyorum
I can easily ask my friend

Arkadaşım bana yardım edebiliyor bende one yardım ediyorum
My friend can help me and I help him as well

Anlamadığımız için cevap veremiyoruz
We cannot answer because we do not understand

Doğru söylediğimizden emin değiliz
We are not sure we said the right thing

Öğretmenler bizi anlamıyor
Teachers do not understand us

Basit cümlelerle anlatmıyorlar

They do not explain in simple words

Kelimeleri açıklamıyorlar
They do not explain what the words mean

Ekstra çaba göstermiyorlar
They do not try hard enough

Öğretmen ne bilip ne bilmediğimizi anlamıyor
The teacher does not understand what we know and what we do not

Türkçe Matematik After School Club ta gerekli yardımı alıyoruz
In Turkish Maths After School Club we get enough support

Farklı dillerde iki defa anlatılıyor
It is explained in both languages

Birinde anlamazsak öbüründe anlıyoruz
If we do not understand in one language we understand in other one

Mental testte panik oluyoruz
We panic at mental test

Birde worded problemlerde
We also panic at worded problems

Problemi okuyup anlamamak bizi korkutuyor
It scares us not to understand when we read the problem

Problemin ne demek istediğni anlamaya calışırken matematik kısmını kaçırıyoruz
When we try to understand the wording we miss the mathematical side of it

Aslında matematik kısmı daha kolay ama yapamıyoruz
In fact the mathematical part is easier but we cannot manage

Sözcüklere odaklanıp sayılarla olan işlemleri anlamıyoruz
We focus on wording and we miss the numerical part
How shy, awkward, embarrassed or dismissive about talking about our language

We are teased or weird for using languages other than English

We speak a bit of English, a bit of Turkish and a bit of Kurdish

Turkish is my own language

Speak English is better in class I think, because some people start laughing because we speak Turkish, they think that's weird or we talk about themselves

Because it is my language

Turkish is our first acquired language

We try to speak and ask questions in English because they don't understand Turkish. I wish they did because it would be easier to explain something.

I speak Turkish to my Turkish speaking friends the other friends "take the mick".

We use the words we know. If I don't know a word in Turkish I just say it in English.

Use both languages because we don't understand everything Turkish or everything English.

I speak both languages. I speak both at the same time. If I don't know something in English I say it in Turkish, if I don't know something in Turkish I say it in English.

We do not listen we know we do not understand.

I am not afraid to make/do mistakes.
Not afraid to not to be understood or misunderstood.

Feel free to explain my taught.

Not embarrassed by my English

Not hesitate to talk; I can express myself in both languages

More explanation

Feel confident

Help each other better

Advantage to be in small group

We need extra extra support

Sharing experiences

Supportive environment

Given opportunities to participate

Comparing previous learning

Take assurance by checking/testing with first language

Lack of understanding/switch off

Appendix 5

Categories

a- Using / understanding in both languages
b- Teacher using/explaining in two languages
c- Same language is spoken
d- Mother tongue
e- Express yourself in your own language
f- Not confident in English/ Not having academic English
g- Key words
h- Discuss/ understand better
i- Feel confident
j- Not understanding
k- Cannot express myself
l- Help each other/Peer support
m- Not feel confident/ hesitate to talk
n- Previous knowledge
o- Teachers do not understand us
p- Afraid to make mistakes
r- More explanation
s- Small group
t- Supportive environment

Appendix 6

Codes in Categories

a- Using/understanding in both languages

Her iki dilde de anlıyorum
I can understand in both languages

Lisan eksikliği olanlar yararlanır
The ones who profit from this are the ones who has problem with one language

Bir dilde anlamayan ötekinde anlar
Whoever is not able to understand in one language can understand in another

Günlük hayatta da böyle konuşuyoruz
We always talk like this

İki dil daha iyi konuşmama yardımcı oluyor
Two languages help me to speak better

Bir dilde bilmedigimi öbür dilde söylüyorum
When I do not know how to say some things in one language, I say it in the other

Yarı İngilizce yarı Türkçe
Half English half Turkish

Türkçemizde tam olmadığı için hangisi aklımıza gelirse onu kullanıyoruz
As our knowledge of Turkish is not proper, we use whichever comes to our mind first

Bazı kelimeler Türkçe aklımza gelmiyor
We do not remember some words in Turkish

Bazı kelimelerin de İngilizcelerini bilmiyoruz
And also we do not know how to say some words in English

Kafam karışmadı
I did not get puzzled

Birinde anlamazsak öbüründe anlıyoruz
If we do not understand in one language we understand in other one

İngilizce anlamazsak Türkçesi anlamamıza yardımcı oluyor
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When Miss says compare in Turkish, 'trink' suddenly I understand what it means

in my head. When Miss says in English, I did not understand
(trink is the sound of someone understands suddenly i.e. the penny drops)

Sometimes I understand in Turkish, sometimes I understand in English, öğretmenimiz ikisini de kullanıyor, hangisini anlarsak yani
Sometimes I understand in Turkish, sometimes I understand in English, our teacher uses both, I mean whichever we grasp

Sadece Türkçe olmasından daha iyi
It is better than only Turkish

Farklı dillerde iki defa anlatılıyor
It is explained in both languages

We speak a bit of English, a bit of Turkish and a bit of Kurdish

We use the words we know. If I don't know a word in Turkish I just say it in English.

Use both languages because we don't understand everything Turkish or everything English.

I speak both languages. I speak both at the same time. If I don't know something in English I say it in Turkish, if I don't know something in Turkish I say it in English.

b- Teacher using/explaining in two languages

Türkçe anlatılıyor
It is explained in Turkish

Siz Türkce okuyunca ve anlatınca hangi yolla yapılabileceğini düşünebliyoruz
When you read and explain it in Turkish, we can work out how to solve it

Türkçeden örnek veriyorsunuz
You give example in Turkish

Soruyu açıklayınca kolay olduğunu anlıyorum
When you explain the problem, I see that it is easy

Türkçe Matematik After School Club ta gerekli yardımı alıyoruz
In Turkish Maths After School Club we get enough support

Take assurance by checking/testing with first language

c- Same language is spoken

Öğretmen nasıl olsa bizi anlar diyoruz
We think the teacher understands us in either way

We speak same language

We understand each other easily, we have same expressions

d- Mother tongue

Anadilimiz kullandığımız dil
The language we usually use is our mother tongue

Ana dili gibi hakim olamıyoruz
We are not efficient as we are in our mother tongue

Anadilimiz
Our mother tongue

Bildiğim dilde konuşuyorum
I speak in language that I know

Turkish is my own language

Because it is my language

Turkish is our first acquired language

e- Express yourself in your own language

İletişim kolay
Communication is easy

We try to speak and ask questions in English because they don't understand Turkish. I wish they did because it would be easier to explain something.

Feel free to explain my thought.

f- Not confident in English/ Not having academic English

Yetersiz İngilizce
Insufficient English

İngilizceye hakim olamama
We do not know English perfectly

Türkçeye hakimiz
We know Turkish

Akademik ingilizce yok
No academic English

İngilizcem yetersiz
My English is not enough

g- Key words

Deyimleri bilmiyoruz
We do not know the idioms

Kelime yetersiz
Not enough words

Bazı kelimelerin ne demek olduğunu bilmediğimden soruyu anlayamıyorum
As I do not know the meaning of some words I cannot understand the problem

Sözcüklere odaklanıp sayılarla olan işlemleri anlamıyoruz
We focus on wording and we miss the numerical part

h- Discuss/ understand better

Daha iyi algılama öğrenme
Better understanding learning

Yanlış anlaşılmaların önüne geçer
It prevents misunderstanding

Çok yazılı problem olunca anlamak çok zor oluyor
The more the wordings of the problems get longer, the more difficult it becomes to understand

Nasıl yapılacağını bilsek bile problemi anlamayınca çözemiyoruz
Even if we know how to solve it, when we do not understand the words, we cannot solve it

Soruyu anlamadığımdan yapamıyorum
I cannot solve the problem as I cannot understand the question

Anlamadığımız için cevap veremiyoruz
We cannot answer because we do not understand

Mental testte panik oluyoruz
We panic at mental test

Birde worded problemlerde
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Problemi okuyup anlamamak bizi korkutuyor
It scares us not to understand when we read the problem

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When we try to understand the wording we miss the mathematical side of it

Aslında matematik kısmı daha kolay ama yapamıyoruz
In fact the mathematical part is easier but we cannot manage

Not afraid to not to be understood or misunderstood

i- Feel confident

Çekinmiyoruz
We do not hesıtate

Kendimi rahat evde gibi hissettim
I felt like home

Kendime güvenim geldi
I regained my self confidence

Rahat hissediyorum
Feel confident

j- Not understanding

Anlamayınca sıkılıyoruz
When we do not understand, we get bored

Sıkılınca yaramazlık yapıyoruz konuşuyoruz
When we get bored we misbehave

Bakıyoruz kopya ediyoruz ama anlamıyoruz
We just look at, we copy but we do not understand

Anlamadığımızı öğretmen anlamıyor
The teacher does not understand that we do not understand

Anlamaya anlamaya artık sormuyorum ve dinlemiyorum
As I do not understand, I give up listening and asking questions

Soru sormadığımdan yapamıyorum
I cannot understand as I do not ask any question

We do not listen we know we do not understand.

Lack of understanding/switch off

k- Cannot express myself

Fikirlerimizi söyleyemiyoruz
We cannot express what we think
Biliyorum ama söyleyemiyorum
I know it but I cannot say it

Not hesitate to talk; I can express myself in both languages

l- Help each other/Peer support

Karşılıklı yardım
Mutual help

Arkadaşıma rahatça sorabiliyorum
I can easily ask my friend

Arkadaşım bana yardim edebiliyor bende ona yardım ediyorum
My friend can help me and I help him as well

Help each other better

m- Not feel confident/ hesitate to talk

Acaba yanlış mı söyledim
I wonder have I said it wrong

Bana gülerlermi acaba
Do they laugh at me?

Nasıl söyleyeceğiz stresi yok
We do not have any stress of how to say it

Doğru söylediğimizden emin değiliz
We are not sure we said the right thing

How shy, awkward, embarrassed or dismissive about talking about our language

We are being teased or though weird for using languages other than English

Speak English is better in class I think, because some people start laughing because we speak Turkish, they think that's weird or we talk about themselves
I speak Turkish to my Turkish speaking friends the other friends "take the mick".

Not embarrassed by my English

n- Previous knowledge

Daha önce bildiklerimi hatırladım
I remembered what I knew before

Babamın shop undaki para alışverişleri aklıma geldi
I recalled money exchange in my dad's shop

Türk parasını İngiliz parasına çevirmiştik
We had exchanged Turkish lira to Pound

Daha önce bildiğimizi kullanıyoruz
We use what we already know

Sharing experiences

Comparing previous learning

We compare with Turkish.

o- Teachers do not understand us

Öğretmenler bizi anlamıyor
Teachers do not understand us

Basit cümlelerle anlatmıyorlar
They do not explain them in simple words

Kelimeleri açıklamıyorlar
They do not explain what the words mean

Ekstra çaba göstermiyorlar
They do not try hard enough

Öğretmen ne bilip ne bilmediğimizi anlamıyor
The teacher does not understand what we know and what we do not

p- Afraid to make mistakes

Yanlış anlamaktan korkuyoruz.
I am not afraid to make/do mistakes.

I always think what the teacher say when I did not will do right

I don't want to solve problems wrong. It is embarrassing

r- More explanation

More explanation

We need extra extra support

I want to somebody read the question for me and explain.

I feel confident to solve problem when I got explanations Turkish

s- Small group

Advantage to be in small group

These lessons are like special classes

We don't distract each other

t- Supportive environment

Supportive environment

Given opportunities to participate

I feel we are cared

You know us and we know you

You talk to my family, you understand each other

Appendix 7

Themes

1. Using and understanding in two languages

a- Using / understanding in both languages

b- Teacher using/explaining in two languages

c- Same language is spoken

g- Key words

h- Discuss/ understand better

r- More explanation

2. Peer support

l- Help each other/Peer support

m- Not feel confident/ hesitate to talk

3. Mother tongue

d- Mother tongue

e- Express yourself in your own language

4. Not confident in English

j- Not understanding

f- Not confident in English/ Not having academic English

k- Cannot express myself

5. Affective factors

i- Feel confident

n- Previous knowledge

o- Teachers do not understand us

p- Afraid to make mistakes

s- Small group

t- Supportive environment

Appendix 8

The participants of the Club Interactions

Name	Gender	Transcript 1	Transcript 2	Transcript 3	Transcript 4	Transcript 5	Transcript 6
		05-Jan-11	26-Jan-11	09-Feb-11	16-Feb-11	02-Mar-11	23-Mar-11
Ali	Male		X			X	
Ayşe	Female	X	X	X	X		X
Burcu	Female			X	X		X
Burak	Male	X	X	X	X		X
Demet	Female	X					
Duygu	Female					X	
Ebru	Female						X
Elif	Female	X	X				X
Fatma	Female	X	X			X	X
Ferhat	Male			X	X	X	
İnci	Female	X					
Kemal	Male	X	X				
Mehmet	Male		X				X
Nur	Female		X		X	X	
Ozan	Male			X	X	X	
Sema	Female		X		X	X	X
Tansu	Male					X	
Volkan	Male			X			
Zeynep	Female	X	X			X	X
Ahmet	Male			X		X	

Appendix 9

Transcripts

9.1 Transcript 1

1. Fatma: Dört kere dört üç kere üç
   Four times four three times three

2. Teacher: Eldeleri unutmayın…Çarparken eldeleri carryingleri unutmuyoruz.
   Do not forget carryings. When we multiply, we should not forget carryings

3. Zeynep: Eldeleri unutmuyoruz.
   We do not forget carryings

4. Teacher: Bu metodla da yapabiliriz.
   We can also do it by this method

5. Burak: Two different methods

6. Kemal: Altmışdört ile dördü çarpıyoruz=
   We multiply sixty four by four

7. Teacher: =Carrying two on these=

8. Kemal: =Eldeleri yazdım.
   I have written the carryings

9. Burak: Dört kere dört [onaltı]
   Four times four sixteen

10. Kemal: [One carrying]

11. Ayşe: Six times four twentyfour eder =
    Six times four makes twenty-four

12. Elif: =Bir de elde var.
    There is one number in your hand

13. Teacher: Eldeleri unutmayın.
    Do not forget the carryings

14. Kemal: Sixtysix di mi ikinci soru
    Was the second question sixty-six?

15. Demet: Altı kere yedi, six times seven=
    Six times seven

16. Ayşe: =Kirkiki four carrying
Forty-two

17. Demet: Two times two …ondört
Fourteen

18. İnci: Çarptığımızda ne yaptık=
What have we done when we multiply?

19. Kemal: =Buraya yazdık
Wrote it here

20. İnci: Demet bana bakıyor.
Demet is looking at me

21. Teacher: Devam edin Bu kısımları bitirinki Long divisionlara geçelim.
Carry on. Finish this part so that we can do the long divisions

22. Burak: İkinci kısımda carrying ler daha fazla
In the second part, there are more carryings

23. Teacher: Grid metod method. Bu metodu da kullanabilirsin. Whichever method you find easy, use that method.
You can use this method

24. Fatma: Four times two

25. (xxx)

26. Teacher: Hangisini kolay buluyorsanız, o metodu kullanın.
Whichever you find easy, use that method.

27. (xxx)

28. Elif: Kırk iki ile yediyi çarpacan.
You will multiply forty-two by seven

29. Ayse: Bununla bunu çarparsan ondört
You multiply this one by this

30. Elif: Fourteen dört daha onsekiz
Fourteen plus four makes eighteen

31. Burak: We used grid method as well.

32. Teacher: İkİnci kısım… İki metod var.
Second part... There are two methods

33. Teacher: İnci sen buraya gelip [otururmusun]
İnci, could you come here and sit here

34. Demet: [Gel, hep] beraber yapacağız.
Come we will do it together

35. Teacher: Grid methodu [gösteriyorum]
I will show the grid method

36. Burak: [Ben ben…Yirmiüç] twentythree ile sixtyfive altmışbeşi çarpıyoruz.
Me me… We multiply twenty three by sixty-five

37. Demet: Bir tane [carrying]
One carrying

38. Fatma: [Bir tane] eldemiz var
We have one in your hand

39. Elif: Gridi yapiyoruz
We do the grid

40. Teacher: Yirmiüç yazdık. Çünkü twenty tens, onlar, three units, birler
We have written twenty-three. Because twenty unit tens three unit ones

41. Elif: Hocam oraya mı yazacağız.
Do we have to write over there, Miss

42. Fatma: Five nine onehundred [ninety five]

43. Demet: [Beş dokuz kırkbeş]
Five times nine forty-five

44. Fatma: …Aynı sonucu bulduk
We have found the same results

45. Teacher: Gelosia method. Sixty-five hiç değiştirmeden yaz... Yirmiüç hiç değiştirmeden yaz
Sixty-five, write it, without changing it. Twenty-three, write it without changing it

46. İnci: Sixtyfive. [Twenty-three]

47. Demet: [Sixty-five.] Yirmiüç
Twenty-three

48. Teacher: Dinlermisiniz… İki kere beş
Could you listen... Two by five

49. İnci: Haaa. Öyle mi olacak?
Yes. Will it be like that?

50. Teacher: Two times five on. Onu buraya yazdım

Two times five ten. I have written it in here

51. Fatma: Ten…It is here

52. Teacher: İki kere altı eşittir oniki. Yazdım buraya
Two by six equals twelve. I have written it here

53. Kemal: Üç kere altı onsekiz
Three by six eighteen

54. Teacher: Bu çaprazda, bu bölümde, bu diagonalda=
In this diagonal, in this part

55. Kemal: =Bölüm bölüm, çapraz çapraz gidiyoruz
We go part by part diagonal by diagonal

56. Burak: Sonuç bulundu
The result has been found

57. Demet: Aaa ne kadar kolay
Ayy, how easy

58. Teacher: Hangi metodu kolay buluyorsanız onu yapın
Whichever method you find easy, use that method.

59. Fatma: Ben neden o derste birşey anlamıyorum?
Why I don't understand anything in that lesson?

60. Elif: Ben İngilizce [bilmiyorum ya]
Because I don't know English

61. İnci: [Annemden kağıt da] getirdim
I have brought the paper from my mum

62. Elif: Bakarız bakarız ((Apparently mimicking the teacher))
We will see, we will see

63. Fatma: Böyle mi yapacağız
Are we going to do it like this

64. Elif: …Mmm

65. Teacher: Farketmez. Which ever you find easy use that method
Does not matter

66. Elif: Şunları düzenli yazıcam
I will write down these ones in order

67. Fatma: Karıştı
It is muddled

68. İnci: Kafam karıştı=
I am confused

69. Burak: =Neresi karıştı ((When he was scratching İnci's head))
Where did you get confused/ muddled?

70. İnci: …Two times one equal two=

71. Burak: =İki zero koy
Put two zeros

72. İnci: This forty this is six, two hundred [seventy-six]

73. Burak: [Niye karıştı]
Why are you confused?

74. Kemal: (xxx) ((Stands up and comes next to İnci and pats her head))

75. İnci: TAMAM tamam
Ok ok

76. Teacher: Anlamadığınızı hemen sorun. Which one? That one
When you do not understand something, ask immediately

77. Demet: Six times [three oniki]
Six times three twelve

78. Fatma: [Elde var bir]
Carrying one

79. Ayşe: Abla içinden söyleyebilirsin
Sister you can talk quietly

80. Demet: KONUŞMA
Do not talk

81. Ayşe: BAK yanlış yapmışsın=
Look you made a mistake

82. Fatma: =Hangisi? =
Which one?

83. Ayşe: =Sixty-three thirty-four

84. Kemal: …Anladınmı? Carrying leri öbür diagonala taşı
Did you understand? Take the carryings out to the other diagonal

85. Demet: Öbür soruya geçelim hocam
Let`s go to the other question, Miss

86. Teacher: Decimal'lara geçeceğiz=

We will start decimals

87. Burak: =Birinci two point three ile four'u çarpıyoruz
We multiply first two point three by four

88. Teacher: Kaç decimal place var
How many decimal places are there?

89. Kemal: [Yirmiüç kırkbeş]
Twenty-three forty-five

90. Demet: [Bir daha onbir]
One more makes eleven

91. Kemal: Topluyorum
I am adding

92. Burak: İki decimal place var.
There are two decimal places

93. Teacher: One two buraya koyuyorum
One two I write it here

94. Demet: Just multiply

95. Teacher: Normal çarptım=
I multiply normally

96. Elif: =Haaa anladım. Hiç bir değişiklik yok
Aha. Now I understand. Nothing is different

97. Kemal: Sadece çarpı [yoruz… sonra]
Only multiply...then

98. Teacher: [Normal çarpıyoruz] .Kaç decimal place varsa onu koyuyoruz
We multiply normally. We write all the decimal places

99. Kemal: …Kolaymış
It is easy

100. Elif: Böyle mi hocam
Is it like this, Miss?

101. Teacher: Evet evet, normal yapıp decimal place koyuyorum
Yes yes I do it normally then I write decimal place

102. Fatma: On yedi point zero mu? =
Is it seventeen point zero?

103. Burak: =Seventeen point zero seventeen aynı şey

Seventeen point zero and seventeen are the same thing

104. Teacher: Soru var mı?
Is there any questions?

105. Elif: …Bu doğru mu?
Is this correct?

106. Ayşe: Üç kere dört bilmiyormusun ne?
Don`t you know three by four makes what?

107. İnci: Yedi kere…kaç? ((Laughing)) Kaç kaç
Seven times what? Run run
((Whole class are laughing))

108. Zeynep: Ben o soruyu yapmışım
I had done this question

109. Fatma: Sesim gitti, gözlerim sulandı
I have lost my voice, my eyes are watery

110. Ayşe: İyi oldu. Öyle (xxx)
It is good like that...

111. Zeynep: Bu da kafasına takmış gerizekalı
This idiot is obsessed with this one

112. Teacher: Are there any questions?

113. Fatma: No no ((Laughing))

114. Ayşe: Hepsini yaptı da ((Laughing))
As he has done all of it

115. Fatma: İngilizce bilmediğin heryerden belli oluyo
It is obvious you do not know English

116. Elif: Yani
Well

117. Ayşe: Bu geçen gün arkadaşına please stop diyeceğine gift shop demiş
The other day she said "gift shop" instead of "please stop" to her friend

118. İnci: Sekiz kere dört kaç?
What is eight by four?

119. Demet: Otuziki
Thirty-two

120. Ayşe: Dur yaa
Hang on

121. İnci: Thirty-two

122. Ayşe: (xxx)

123. Fatma: Bilmiyon mu ne? Ya thirty-two
You know what? It is thirty-two

124. Ayşe: Fatma yengem gile gidek
Let`s go to aunty Fatma

125. Fatma: …Saat dörde geliyor
It is almost four o`clock

126. Ayşe: Bunu anladık
We have understood this

127. Fatma: Öbürü [de kolaymış]
The other one is easy as well

128. Elif: [Niye yapamıyorduk ki] daha önce=
Why couldn't we do it before?

129. Demet: =Anlamamıştık
We did not understand

130. Fatma: Doğru
True

131. Demet: İkililerden de örnek yapalım
Let's do the examples from two decimal place ones

132. Teacher: Don't forget to put decimal places

133. Burak: Two point to the left=

134. Teacher: =İki tane sola gidiyor, Evet [doğru]
It is going two places to the left, yes true

135. Burak: [Thirty-two] point two

136. Kemal: O zaman bu da four point eighty three oluyor
At that point this is four point eighty-three

137. Demet: Daha önce öğretmen anlatmamıştı ya da ben anlamamıştım
The teacher did not explain before or I did not understand

138. Burak: Hocam durun ben anladım ona ben anlatayım
Teacher, let's pause, I understood, I will explain to her.

9.2 Transcript 2

The worksheets about the solving problem task (Recipe worksheet) were given.

The question was below:

Here are the ingredients needed to make shepherd's pie for five people.
500 g potatoes, 50 g cheese, 150 g butter, 1onion, 2 carrots, 300 ml stock 1kg lamb.
a) What weight of cheese would be needed to use to recipe for eight people?
b) For six people, how much stock is needed?
c) For nine people, what weight of lamb should be used?

1. Teacher: Ok. Soruyu okudunuz. Bu bir recipe.
   Ok.You read the question. This is a recipe.

2. Ayse: O da neymiş?
   What is that supposed to mean?

3. Sema: Lokantalarda oluyor ya hani yemek adları
   In the restaurants, the name of the foods

4. Teacher: That is menu.

5. Fatma: In food technology we follow the instructions and do the yemek, hatırladın mı=
   In food technology we follow the instructions and prepare the food, remember?

6. Sema: =Haa, OK. OK. Yemek tarifi.
   Yes. OK, OK food recipe

7. Ali: For eight people. Ne kadar cheese needed diyor.
   For eight people. How much cheese needed, does it say?

8. Burak: I multiply fifty by eight and sonucu bulurum, four hundred
   I multiply fifty by eight and then find the find the answer, four hundred

9. Zeynep: Oldu mu şimdi?
   Was it all done?

10. Teacher: Read the question again, Burak, sesli okur musun?
    Read the question again. Burak could you read it aloud

11. Burak: Here are the ingredients needed to make shepherd's pie for five people=

12. Kemal: =İşte burada çuvalladık…beş kişiyi okumadık.
    Now we are in a mess. We have not read the five people

13. Teacher: Always read the questions carefully, beş kişi için fifty grams cheese, ne yapmalıyız?
Always read the questions carefully. For five people fifty grams cheese, what shall we do?

14. Mehmet: Önce divide it by five than multiply by eight...değil mi?
First divide it by five than multiply by eight. Is it right?

15. Teacher: Tamam şimdi oldu.
That is right

16. Nur: Ben anlayamadım=
I could not understand

17. Mehmet: =Gel sana yardım edeyim, bak şimdi, listen carefully, kulaklarını aç
Come here, I help you. Look, now listen carefully, open your ears

18. Nur: Kulaklarım açık lal lal [la la lal la la]
My ears are open, lal lal la la lal la la

19. Teacher: [Şamatayı keselim] concentrate please.
Stop the noise concentrate please

20. Mehmet: Bak şimdi… for five people yani beş kişi elli gram peynir yerse bir kişi on gram yer değil mi?
Look now... for five people, which means if five people eat fifty grams of cheese, one person eats ten grams is it right?

21. Zeynep: Yemiyorlar, yemek yapmak istiyorlar.
They do not eat they want to cook food

22. Fatma: Shepherd's pie yapacaklar
They will cook shepherd's pie

23. Sema: Shepherd's ne demek=
What does shepherd mean?

24. Teacher: =Çoban
Shepherd

25. Ayşe: Çoban pay mı almış
Has the shepherd got his share?

26. Fatma: Pie is börek, [börek, akıllım]
Pie is börek, börek, clever clogs

27. Sema: [Çoban böreği]
Shepherd's pie

28. Zeynep: Dün yemekte vardı

Yesterday it was on the lunch menu.

29. Ali: Kıyma üzerine patates gibi hani. Food technology de de yapmıştık.
It was like potato on top of the mince meat. We cooked it in food technology

30. Zeynep: Şurada bir ıspanaklı börek tarifi verselerdi (mmm) (2) nasıl güzel çözerdik soruyu ama değil mi? Shepherd's Pie bizim bildigimiz bir yemek degil ama ıspanaklı börek…
If they had given us the recipe of the spinach pie,(mmm)we would have solved the problem easily, wouldn't we? Shepherd's pie is not a familiar dish but spinach pie...

31. Burak: Benim annem dün yaptı, [teyzemgiller de bizdeydi]
My mum cooked it yesterday. My aunties were with us.

32. Sema: [Bize niye seslenmediniz] =
Why did you not call us?

33. Burak: =Aniden geldiler.
They turned up suddenly

34. Teacher: Konuşmaktan bir soruyu çözemediniz.
You haven't managed to solve the problem since you keep talking

35. Burak: …Ama öğretmenim biz hem sohbet ediyoruz hem de soruyu yapıyoruz
We are chatting but we are also working on the problem, Miss.

36 Mehmet: Sohbet ederken kafamız da çalışıyor
While we talk our brain is also working.

37. Teacher: Tamam, soruya dönelim, evet Mehmet devam et
Ok. Let's get back to the question. Carry on Mehmet

38. Nur: Kulaklarım [açık lal lal la la] ((Singing))
My ears are open lal lal la

39. Teacher: [Tamam yeter]
Ok. That is enough

40. Mehmet: Bir kişilik, (3) fifty divided by five on gram dedik, sonra da for eight people diyo (4) eight ile ten çarparsak eighty gram buluruz.
For one person, fifty divided by five, and we found ten grams and then it says eight people so if we multiply it by eight we find eighty grams

41. Teacher: Elif sende b yi yapar mısın
Elif, could you solve the part b

42. Elif: (2) Hangisi?
Which one?

43. Teacher: Read the part b of the question first.

44. Elif: For six people, how much stock is needed? … Hepsini toplarsak…
For six people how much stock is needed? If we add all of them.

45. Ali: [Olmaz, ben yapayım mı?]
No not like that, can I do it?

46. Teacher: [Bir dakika, Elif, niye topluyosun?]
One minute, why do you add, Elif?

47. Elif: (3) Stok diyor, (1) hepsini toplarsak bulurum=
It says stock. If I add everything I find it out

48. Fatma: =Stok et suyu demek, akıllım*
Stock means meat broth, my clever
*Literal translation "my clever one" Fatma is effectively using seemingly derogative remark in an affectionate way about Elif's understanding.

49. Teacher: Evet, beş kişi için üçyüz ml. etsuyu gerekiyor, for six people?
Yes, for five people, three hundred ml meat broth is needed. For six people?

50. Elif: Tamam tamam şimdi anladım, ben stok deyince (2) stok etmekten toplarsak olur dedim ama olmadı tabi ki (x) ama anladım şimdi, divided by five, sixty eder , sonra da times by six…
Ok, ok now I understand. When I read stock, I understood they are stocked all together, and I thought I had to add but it was wrong of course but I understood now, divided by five and then multiply by six

51. Kemal: three hundred and sixty.

52. Teacher : Oldu. Soruyu bitirelim, Sema c yi de sen yap.
That is right. Let's finish the rest of the question. You do the part c, Sema

53. Sema: 1 kg lamb for five people, böleceğiz beşe… Nasıl böleceğiz beşe? calculator lazım.
I kg lamb for five people, we will divide it by five. How are going to divide it? I need a calculator

54. Burak: Yok yok. Ben bilirim (3) bizim shoptan, yarım kilo kıyma beşyüz gram eder yani… bir kilo one thousand eder.
No, no. I know it from my dad's shop that half a kilo is five hundred grams so... one kilo is one thousand grams

55. Teacher: Evet, 1kilogram eşittir 1000 gram
Yes, one kilogram equals one thousand grams

56. Sema: yani one thousand, böleceğiz beşe, two hundred. Sonra da dokuz

people diyo,çarparsak dokuzla …
Then we will divide one thousand by five which is two hundred grams. Then it says nine people. If we multiply it by nine

57. Burak: Ooooo, müşteri bu kadar beklemez. İki dokuz onsekiz, iki de sıfır bir kilo sekizyüz gram=
Oooo customer does not wait that long. Two times nine is eighteen and if you write two zeros after that, which means, one kilo and eight hundred grams

58. Kemal: =Heyt … [yaşasın, sizin shopta bir iş te biz kapalım]
Yippie lovely, We get a job in your dad's shop

59. Sema: [one thousand and eight hundred. Evet yani]…bir kilo sekizyüz gram.
One thousand and eight hundred, yes indeed. One kilogram and eight hundred grams

60. Nur: Bu gibi soruyu iyi yaparız artık. Anladık… lal la la=
We can solve this kind of questions from now on. I have understood. lal lal la

61. Fatma: = lal la la=

62. Burak: = lo lo lo ((Singing))

9.3 Transcript 3

1. Teacher: Tamam, bu burda dursun. Hiç ellemeyim. Unutun onu, kağıdı veriyorum.
   Okay, *this should stay here. Let's not touch it. Forget it, I'm giving the paper.*

2. Ferhat: Kağıtlar.
   Papers.

3. Teacher: Sorting and Presenting Data'yı yapıyoruz. … Toplamı. Al kağıt
   We are doing Sorting and Presenting Data. Total. Here is the paper.

4. Ferhat: …Drawing bar graph. Thank you very much.

5. Teacher: Tamam burda soruyu okuyorsun.
   Right here you read the question.

6. Ferhat: The number of pupils late for school are given in this table=

7. Teacher: =Tablo var. Tabloya göre dolduruyorsunuz (4)
   There is a table. You will fill it according to the table.

8. Teacher: Draw bar graph diyor. (2) Sonra da orta pointleri birleştiriyorsunuz. Bakalım yapabilecek misiniz?
   It says draw bar graph. (2) Then you connect the middle points. Let's see, if you can do it.

9. Burak: [Geç*]
   Pass/Late
   * Geç has two meanings to pass and it is late.

10. Burcu: [Gitmeseydin] ((Laughing))
    You should not have left.

11. Ferhat: Arkadaşlar rahat.
    My friends relax.

12. Burcu: İlk şey.
    First thing.

13. Ozan: İyisen... Görebiliyo kamera.
    If you are good... Camera can see you.

14. Burak: Hooo hoooo ((Laughing))

15. Ferhat: Ben kayseriliyim ... [şeker, şeker]
    *I am from Kayseri**

*Kayseri is a city in Turkey. He does not necessariliy want to say that he is coming from Kayseri but he defines his identity in relation to the Kayseri culture.

16. Burak: [Dring]

17. Ozan: Kayseriliymiş.
So she is from Kayseri

18. Burak: Bak ding ((Laughing))
Look ding

19. (xxx)

20. Burcu: şekerim=
Sweety

21. Ozan: =On Wednesday

22. Burak: Wednesday. You know what people, we got to do.[Whatever week due]

23. Ozan: [You dont know week]

24. (xxx)

25. Volkan: week two=

26. Ozan: =and week one

27. Ferhat: Yok.
Isn't here.

28. Ozan: Nerde
Where

29. Volkan: Aha burda=
Here it is.

30. Ferhat: =Dotları yapmadın.
You did not do the dots.

31. Volkan: Yaparım.
I will.

32. Teacher: Orta noktaları buldunuz mu?
Did you find the midpoints?

33. Volkan: Evet orta noktaları Şöyle
Yes, the mid points are like this.

34. (x) ((Laughing))

35. Ferhat: Bu tamam oldu, [doğru bu]
This is done, this is correct

36. Volkan: [Bu week one,] tamam
This is week one, okay

37. … ((Laughing))

38. (xxx) (Laughing))

39. Ferhat: Bunun ortasını mı çizeyim? Bu. bunu yada?
Should I draw the middle of this? This. Or this?

40. Teacher: Arkasına yapabilirsin… İstersen başka kağıt vereyim.
You can do it on the back. If you want I can give you another page.

41. Ferhat: Arkasına yapabilirim....
I can do it on the back

42. Volkan: Bir de öğretmenin ... ((Whispering))
And the teacher's

43. Ferhat: Hocam sen kaçta bitiriyorsun işi? … Üçte mi?
Teacher/ Miss when do you finish? At three?

44. Teacher: Bitiririz üçte isterseniz. O kadar gitmek istemiyoruz. İstiyor musun sen?
We can finish at three if you like. We don't want to go that much. Do you want to?

45. Burcu: [Yooooooooo]
Noooooooo

46. Ferhat: [Ben bilmem] valla benim için hava hoş
I don't mind, actually it is fine by me

47. Teacher: Oooo

48. Burcu: Why did you? Sen az önce. Bu ne?
Why did you? You just. What is this?

49. Ferhat: Middle (3) middle point işte bak. İşte şöyle... nokta nokta
Middle middle point there look. Like this... dot dot

50. Ahmet: www nokta nokta var ya. nokta nokta. please call me.
www dot dot you know. dot dot. please call me.

51. Volkan: that's extra point

52. Burak: No

53. Burcu: bum ba bum ba ((Singing))

54. Teacher: ... Please

55. Burcu: Ta ta ta ta ((Singing))

56. … (xxx)…

57. … (x) ((They are eating sweets))

58. Ozan: Kaçtan kaça? On üç'e gidiyor, All right
From when to when? Leaves at thirteen alright

59. Burcu: Nine

60. Volkan: ((Laughing)) boğazımda kaldı.
Stuck in my throath.

61. Burak: Bak vuruldum. ((Laughing)) ne vuruyon
Look I am hit. *Why are you hitting me?*

62. Ozan: Boğazımda kaldı da ondan vuruyor
It is stuck in my throath that is why

63. Volkan: Yok vurmuyorum.
No I am not hitting.

64. Ozan: Öhö Öhö
(Caughing)

65. (xxx) ((Laughing))

66. Ozan: Nolur....
Please

67. Ferhat: ....so rude=

68. Burak: =in it. look [at]

69. Burcu: [we all] learning doing our work

70. Ozan: What? [Alla allah?]
what? Alla allah?*
* an exclamation to show suprise and discontentment like 'God's sake'

71. Burak: [I'm only doing] this evening .I learn it ... TV
((Laughing))

72. Volkan: Hocam ben gidiyom.
Teacher I am leaving.

73. Ferhat: Nereye?
Where?

74. Volkan: Annem amelyat olacak da. Hastaneye [gitmem lazım]
My mother is having surgery. I need to go to the hospital.

75. Burak: ((Laughing)) [sabahtan] beri gidiyor.
He is leaving since the morning.

76. Volkan: Beli boynu falan ağrıyor
Her neck and back is aching.

77. Teacher: Hayır… Beli mi rahatsız?
No... Does her back hurt?

78. Volkan: Bel fıtığı ile boyun fıtığı
It is back and neck hernia.

79. Teacher: [Geçmiş olsun]
Get well soon to your mom.

80. Burak: [Fıtığı]
Hernia

81. Ozan: [Benim babamda da var]
My dad has it too.

82. Teacher: [Geçmiş olsun ama haftaya] gel. Tamam mı?
Get well soon but come back next week. Okay?

83. Burcu: [Volkan]

84. Ozan: Benim annem de dört kez ama=
My mother too had four but

85. Burak: =Volkan bıraksana beni yaaa*
Volkan let me go maaan
* slang word that shows discontent

86. (xxx) ((when Volkan trying to leave they do not let him go))

87. Ferhat: Ortada kaldı. Volkan geçemiyo
Left in the middle. Volkan cannot pass.

88. Burak: ... that's why.

89. Volkan: Kalemimi unuttum=

I forgot my pen

90. Ozan: =Kalem mi yok.
Isn't there any pen?

91. Ahmet: ... naapıyım abi*
what can I do bro?
* direct translation means big brother but it is a slang word often added in speech. It denotes different meaning according to context.

92. Burcu: ((Laughing)) Eve gideceğim [Ozan]
I am going home. Ozan

93. Burak: [Kayserili] thank you.

94. Burcu: Nereye gideceksin Ozan?
Where are you going Ozan?

95. Ferhat: Mehmet'e yapacaksın ... kanka
You will do it to Mehmet. dude

96. Ahmet: Çok güzel yaptı bu ...
This did it good

97. Burak: ... bak ...
look

98. Ozan:Buraya kim [koydu lan?]
*Who the hell, had put this here?lan**
* "lan" is a slang used as an exclamation for dramatic effect.

99. Ferhat: [Bu ne biçim?] Me and Mehmet got it.
What sort of thing this is? Me and Mehmet got it.

100. Burak: Şişşşt belli bile olmuyor.
Hushhh it's not even obvious/detectable/apparent

101. Burcu: Benimki bariz belli oluyor. [Hı Hı belli olmuyor.]
Mine is very obvious. A Hah, it's not obvious.

102. Ozan: [I don't know.] I'm not getting

103. Burak: Belli bile olmuyor=
It's not even obvious

104. Burcu:=Çok belli oluyor=
It is very much obvious

105. Ozan: =Do you remember? Baya uğraştım olmadı
Do you remember? I tried hard but it didn't work

106. Burak: Belli olmuyor [ki]
But it is not obvious
((They are discussing how to draw graphs and correcting each others graphs))

107. Ferhat: [What's that?]

108. Burcu: [Şu var sadece]=
There is only this

109. Burak: =Daha
More

110. Ozan: I remember that in English. Bayağı uğraştım.
I remember that in English. I tried hard for it

111. Burak: Ya* git burdan. Ben seninle kanka olmam =
Man, go away. I won't be pals with you.
*ya is an exclamation like whining

112. Burcu: =Aaaa*
* includes an element of suprise and discontent

113. Ozan: Öyle işte.
So that's it.

114. Ferhat: ... in English ((Laughing))

115. Burcu: Madame Tussaud

116. Ozan: Öyle şey mi olur ya (3) Bizim kayserilileri geçmem [biliyon mu]
How come, man? I never give up our people of Kayseri. You know

117. Burak: [Neee, Kim?]
What, Who?

118. Burcu: Kayseriler =
People of Kayseri

119. Ferhat: =Sen Kayserinin neresindensin? …I'm not really in bothered.
What part of Kayseri are you? I'm not really in bothered.

120. Burak: I'm on the British

121. Burcu: I'm British Kurd…British

122. Ferhat: You know maşallah*. Bizim Erdem köyü ...
Our Erdem village

* God protects you

123. Ozan: Hocam, siz nereliydiniz?
Teacher where are you from?

124. Teacher: Ben İstanbull[uyum.
I am "from İstanbul

125. Burak: [İstanbul hıı]

126. Ozan: [Ben de İstanbul'da] doğdum=
I was born in İstanbul too

127. Burcu: =Yaa neresinde?
Really, Where?

128. Ferhat: Neresinden doğdun? Ben de İstanbulda doğdum ama [İstanbullu değillim. Kayseriliyim.]
Where of İstanbul? I was born in İstanbul but I am not from "Istanbul. I am "from Kayseri.

129. Burcu: [İstanbul'da doğdun]
Born in Istanbul

130. Ozan: Zeynep Kamil Hastanesinde? Tanıyon mu? ((Laughing))
Zeynep Kamil Hospital? You know?

131. Burcu: Zeynep Kamil Hastanesi
Zeynep Kamil Hospital

132. Ozan: Doğduğun hastane bile yok.
There is even no hospital you were born.

133. Burcu: Ney? nası yok?(2)İstanbul'un neresinde
Wha? How come? Where in İstanbul?

134. Teacher: Tamam. Bitti mi sorular?=
Okay are the questions finished.

135. Ferhat: =Avrupa yakasında
European side (of Istanbul)

136. Teacher: Ferhat bitti mi?
Ferhat is it finished?

137. Burcu: İkincisi
The second.

138. Burak: Ben Thursday'deyim…Week two thursday
I am on Thursday. Week two thursday.

139. Ferhat: Sen daha orda mısın?
Are you still there?

140. Teacher:Bundan bir soru muhakkak geliyor.
A question from this always comes.

141. Ozan: [Ben bunu yaparım.]
I will do this.

142. Ferhat: [Bunlar birşey değil.]
These are nothing.

143. Teacher: Kolay değil mi?=
Easy, isn't it?

144. Ferhat: =Evet.
Yes.

145. Ozan: Monday kaç oluyor?=
Which one is monday?

146. Ferhat: =Dokuz
Nine

147. Ozan: Dokuz
Nine

148. Ferhat: Kaçta açılıyormuş? … Dokuzda ((Whispering))
When does it open? At nine

149. Burak: Burcu where are you? What are you doing Friday?

150. Burcu: [I knew]

151. Ozan: [Çok güzel] ((Laughing))
Very nice

152. Burak: What are you doing friday?

153. Burcu: eve
to home

154. Burak:Eve gelsin.Abim neeeerdeeeeee? Bomboş eve beni koydular.
Should come to the house. Where is my brother? They put me in a stark house.

155. Burcu: Senin nephew nasıl? Anladın? Sana resim göstericem bak.
How is your nephew? You get? I'll show you a picture.

156. Burcu:[Stop recording me] ((Talking to Ferhat)) ((Laughing))

157. (xxx)

158. Burcu: [That's so cute.]

159. Burak: [Oooo]

160. Ferhat: She does come to us=

161. Burak: =Why don't you tell me when she comes to yours?

162. Ferhat: Nasıl söyliyim ben sana. Evde kalıp seni çağırıp geriye mi geleyim?
How can I say to you? Would I stay home, then call you and come back again?

163. Ahmet: Your mum can't call my mum.

164. (xxx)

165. Ferhat: [Anamda senin] ananın numarası var mı? Ananın numarasını ver bana=
My mum has your mum's number? Give me your mum's number.

166. Burak: [I don't have] my mum's [number]

167. Teacher: [Lütfen]
Please

168. (xxx)

169. Ozan: Arkadaşlar Şrşş, hoca [not alıyo ya napıyonuz?]
Friends shush. Teacher's taking notes. What are you doing?

170. Burak: [My mum my mum] don't know my number either

171. Teacher: Ne yapıyoruz? Derslerinizi yapın.
What are you doing? Do the lesson.

172. (xxx) ((Laughing))

173. Burak: No one has their number

174. Burcu: I got Naciye's.

175. Ozan: [Give Naciye's]

176. Ferhat: [Give me Naciye's] or your number. Naciye yada senin numarana bak=
Give me Naciye's or your number. Look at Naciye's or your number

177. Ozan: =I changed that.

178. Burak: Give me my mum's or [punch you.]

179. Burcu: [How do you know] [my mum's home?]

180. Ozan: [My mum's ...]

181. Burak: Bu daha [sarıydı o zaman.]
This was more yellow then.

182. Burcu: [Hatırla yalandı gibi]
Remember, it was like a lie

183. Ferhat: ... Turkey ... Seriously Are you serious? Why?

184. Ahmet: Bizim annemiz aynı ilkokula gittiler
Our mothers have gone to the same elementary.

185. Burcu: ... yaa*
* implies "know-it-all" kind of an attitude

186. Ferhat: İnanmıyorsan birlikte gördüğünde sor bak.
If you don't believe it ask when you see her.

187. ((P hone rings)) I have a lot of credit ... my phone.

((You have two options -voice from the phone))

188. Burcu: Question C'yi [yapmadım.]
I did not do question C.

189. Ferhat: [What about that?]

190. Ozan: Çağırıyım ya da Wood Green'e geliyim=
I should call or cometo Wood Green

191. Ferhat: =Burcu'nun evinin yanına [geleceklermiş]
They supposed to come next to Burcu's house.

192. Ozan: [Yaa, herkes biliyo]
Soo, everyone knows

193. Ferhat: Kim olduğunu bilmiyo ama ...
But s/he doent know who

194. Burak: ...Elif said....

195. Ferhat: Hangi Elif? Elif kim ya*
Which Elif? Who is Elif man!
* exclamation remark

196. Burcu: hıı* year ten-one …Elif has contracted phone
* "hıı" includes aproval and sudden recall

197. Ferhat: Ben de benim de [var da.]
Me too. I have it too

198. Burak: [Bir tane] vardı ya.
There was this one.

199. Ozan: Hatırlamıyor musun? Köşede oturuyordu =
Dont you remember? She/He used to sit at the corner.

200. Ferhat: =She looks like from the girls look like indian she looks like Paki-indian

201. Burak: Do you remember Demet?

202. Ozan: Hangi Demet? Geldi, gitti. ((Laughing))
Which Demet? Came and went.

203. Ahmet: Oh my goodness! [Ben onu gördüm, la.] Hala yaşıyor.
Oh my goodness! I saw her, la she is still alive*
* cultural exclamation slang usually used in the middle and eastern part of Turkey.

204. Burak: [Bizim private schooldan] bir tek benle sen kaldık.
From our private school only you andI are left.

205. Ahmet: O da geldi gitti. Başka kim vardı? =
She came too. Who else?

206. Ozan: =I don't care

207. Burak: … Nur … şey vardı. [Orda başka kim vardı?]
There is something. Who else was there?

208. Ahmet: [Başka kimse kalmadı ki]
No one else is left.

209. Burak: Onu adamdan [saymıyorsun]
You do not count him as a man.

210. Ozan: [Onun yaşaması anlamsız]
Her/ his life is meaningless.

211. Ferhat: Allah kahretsin benim primary'den kimse gelmedi.
God damn it, no one from my primary came.

212. Volkan: Sadece Mehmet geldi. ((Laughing))
Only mehmet came.

213. Teacher: Are you finished?

214. Burcu: Nooo, not yet.

215. Burak:Miss, I don't understand Question C

216. Ferhat: Yardım edim ben yardım edim.Hocam ben yardım edeyim mi?
I can help, I can help... Teacher, can I help?

217. Ayşe: Ben iyiyim bak.
I am good, see.

218. Burak: Use the frequency polygons to compare the two weeks and write down three observations you have found.

219. Teacher: İki tane hafta var iki haftayı karşılaştırıcaksınız.
There are two weeks you will compare the two.

220. Ferhat: Polygon'u yapmadınki sen. Daha yapmadın ki sen.
But you did not do the polygon. You didn't do it yet.

221. Ozan: Aaaa, yapmış koçum benim. ((Pating Burcu's back))
Aaaa ((Surprisingly)) *she did it koçum**
*Literal translation is 'my ram'. It implies declaration of strong friendship bond to show support and encouragement, although it is used for men.

222. Ayşe: Dogru yaptın di mi sen?
You did it right didn't you?

223. (xxx)

224. Teacher: Ferhat söyler misiniz, nasıl compare edeceksiniz? Karşılaştırıcaksınız.

Ferhat tell me how do you compare? You will compare.

225. Ferhat: Bak tamam şimdi bakıyim.
Look okay now I will look.

226. Teacher: Compare ne demek? [Ne demek compare?]
What does compare mean? What is comparing?

227. Ferhat: [Compare biliyon mu] =
You know compare?

228. Burcu: =Birbirine kıyaslamak.
Relating one another.

229. Ozan: Birbiriyle karşılaştırmak.
Comparing one another.

230. Teacher: Düşün ki iki tane mesela.Şeyle, Ozan ile Ferhat'ın aldığı dereceler var, onları karşılaştırıyorsun
Think now. there are two things. Um, Ozan and Ferhat's grades, you compare them.

231. Ferhat: Elli almış elli iki almış. İkinci sınavda yetmiş almış seksen almış. Karşılaştırıyoruz.
One got fifty the other was fifty-two. The second exam got seventy and eighty. We compare.

232. Burak: Karşılaştırma compare demek.
Compare means compare.

233. Burcu: Şimdi bunlar ne anlatıyor?
Now what are they saying here?

234. Teacher: Bunu karşılaştıralım (2)
Let's compare these

235. Evet. Nasıl Karşılaştıracaksın Ferhat?
Yes. How will you compare Ferhat?

236. Ferhat: Bak… Şimdik*
Look... Now
*"şimdik" resembles "şimdi" which means now but with the playful addition of the last letter the words implies that something is going to be explained.

237. Burak: Burda, [Fourteen
Here, Fourteen

238. Ferhat: [Compare nasıl yapıyoz şimdik? (2)Mesela…
How do we compare now? For example...

239. Teacher: Önce Monday'i compare edin (3) Pazartesi gününü compare edersen.

First compare Monda. (3) If you compare monday.

240. Ahmet: Burda dokuzmuş burda altı, tamam mı? (2) Tuseday'i compare edersin
Here it is nine and six here, okay? Compare Tuesday.

241. Ferhat: Burda onüç burda ondört yok burda sekiz=
Here it is thirteen, here fourteen, No here is eight

242. Burak: =Birinde sekiz birinde sekiz (2) Birinde ondört birinde sekiz
One is eight other is eight. One is fourteen other is eight.

243. Teacher: İkinci haftada yükseldikten sonra (3)
After the rise in the second week

244. Ferhat: Thursday'e kadar oluyor ondan sonra tekrar yükseliyor fakat ikinci hafta önce Wednesdey'e kadar gidicek sadece
Happens until Thursday, then it rises but the second week it only goes until Wednesday.

245. Burak: Bir gün dolaşıyor. Tekrar…
One day, it mixes. Again

246. Ozan:Burda dönüş günü iki gün yükseldikten sonar bir gün sonra aşağıya düşmüş
Here, the return day rises two days. Than falls after one day later.

247. Teacher: O şekilde karşılaşma olacak. Tamam?(3)
It is going to be this kind of a comparison. Okay?

248. (xxx)

249. Teacher: Başka neyini karşılaştırabilirsiniz?=
What else can you compare?

250. Burak: =Başka neyini karşılaştırabiliriz? (2) [Hıııı]
What else can we compare? huh

251. Teacher: [Sen nasıl]
karşılaştırırsın?
How do you compare?

252. Ozan: … Biri week one biri week two
One is week one, one is week two

253. Teacher: Evet
Yes

254. Ahmet:Neyini karşılaştıryorsun, yani?
So what are you comparing?

255. Ozan: Başka nedir? (2) Bir graph ondörde kadar gidiyor.
What else? (2) One graph goes to fourteen.

256. Teacher: Bunları yazmak çok önemli bunlardan ekstra puan alıyorsunuz.
Karşılaştırma sorularından.
It is very important to write these. You get extra points from

these. From comparison questions.

257. (xxx)

258. Teacher: Şimdi mesela yapıyorsunuz…İki mark (2) İki [mark ekstra] …Bunlar üzerine biraz çalışalım.

Now, for example you do... Two mark two mark extra ... Let's work on these.

259. Ferhat: [on iki mark]
Twelve marks

260. Teacher: Bak diyor ki; use the frequency polygon. Bu çizdiğiniz frequency polygon oluyor

Look it says, use the frequency polygon. This thing you are drawing is a frequency polygon.

261. (x)

262. Teacher: Üç tane point yazman lazım. (2) Üç observation demek=
You need to write three points. It means three observations

263. All: = Üç point demek?
What does three point mean?

264. Teacher: Üç tane observe ettiğin gördüğün üç tane point yazman demek.
Three means, that you will write three points that you observe.

265. (xxx)

266. Ahmet: Birirncisi nedir birincisi? (3) ne dedik…
What is the first?) what did we say...

267. Ferhat:…Burda biri yükseliyo=
Here one rises/goes up

268. Burak: =Biri yükseldikten sonra diğeri düşüyor=
When one rises the other falls/goes down

269. Ozan: =Burda iki gün yükseliyor…Bir gün düşüyor.
Here it rises for two days... Falls for a day.

270. Teacher: Başka, ikinci olarak ne söyleyebiliriz? …Sayı olarak max yükseldiği point…en çok çıktığı point fourteen=

What else can we say? As a number the highest point. The max point is fourteen

271. Ferhat: =[Fourteen]

272. Burak: [Bu max ondört'e] çıkıyor=
This max goes to fourteen

273. Teacher: =Birinci haftada… Bu max ikinci point olarak yazabilirsiniz.
(2)Üçüncü point olarak ne yazabiliriz?...Min pointini yazmalıyız…Matematiksel olarak bişeyler yazmalıyız

At first week. You can write this max as a second point. What would the third point be? We should write the min point. We should write something mathematical.

274. Burcu: … Bi gün yükseldikten [sonra iki gün] düşüyor
After a day of rise it falls for two.

275. Burak: [Min point]

276. Teacher: Onu söyleyebiliriz…O da bir karşılaştırma. İkisinin min pointi aynı diyebiliriz …Hıı hıı (3)
We can say that. That is a comparison too. We can say that both have the same min point. A huh

277. Ahmet: Tamam mı? Pozitin negatif yönleri eşit yönler mi? (2) Hıihıı
Okay? Are the positive and negative values going in the same direction? A huh

278. Burcu:Karşılaştıralım bakalım=
Let's compare

279. Ferhat: =Haydi [başla karşılaştır]
Come on start compare

280. Ozan: [Week one da elli kişi] late olmuş…Week two da otuz sekiz kişi
In week one fifty people are late... in week two thirty eight people

281. Teacher: Güzel, bak Ozan bir point söylüyor.
Good look Ozan is saying a point.

282. Ferhat: ((Clapping)) koçum* benim=
*direct translation is my goat/ram. It implies support and encouragement and admiration for males.

283. Ozan: Çek elini, dikkatini çekerim*
Take your hands off me, I will take your attention/mind you.

* word play

284. Ferhat: İşte bana [bak.]
There, look at me

285. Ozan: [Ben]yaptıktan sonra
After I have done it

286. Ferhat: On dört, yirmi sekiz, otuz sekiz, [kırk, elli]
Fourteen, Twenty-eight, Thirty-eight fourty, fifty

287. Ozan: [Aklına gelmedi mi?]
Did you not think of it?

288. Ferhat: Yapmak istemedim.
I didn't want to do it.

289. (xxx)

290. Ferhat: Give me…

291. Ozan: I give you ten pounds

292. Burcu: What are you [doing?]

293. Ferhat: [koçum] ((Patting Ozan's back))
direct translation is my goat/ram. It implies support and encouragement.

294. Burcu: Mr. Mohamed, detention'a bak
Mr. Mohamed, look at the detention

295. Ferhat: Sen niye kaldın?
Why did you stay?

296. Burcu: Neye?
For what?

297. Burak: Maths için
For maths

298. Burcu: No beni...
No me...

299. Ferhat: Burda keriz mi yazıyo?
Does it say keriz here?*
*this term means that it does not write an idiot on their forehead. Which implies that they are aware of what is going on, contrary to what the others might suspect.

300. (xxx)

301. Ozan: Orda bir makina, cihaz bizi dinliyo ha!!
There is a machine there, it is listening to us ha!!
*ha is an exclamation marker that usually signify a warning.

302. Ahmet: ((Laughing)) record ediyo, fazla konuşmayın.
It is recording, dont talk to much.

303. Ferhat: Bu şeyi duydun mu? Komser takıyor
Did you hear this thing? The officer puts it on.

304. (xxx)

305. Ferhat: The guy speaks all of his course work a staff in the room

306. (xxx)

307. Ferhat: Alıcam ben, yazacam
I will take it I will write it

308. Ozan: Comma falan diyor mu bari? ... [When you stop]…I full stop
Does it even say comma? .... When you stop I full stop

309. Ferhat: [Ben ne biliyim] lan?
How the hell am I supposed to know?

310. (x) ((Laughing))

311. Ozan: Work ((Laughing)) La la…nokta…How much…stop
full stop

312. Ferhat: Ne diyon lan?=
What the hell are you saying?=

313. Ozan: cut cut … sarımsaklasakta mı saklasak*
cut cut ... should we preserve it with garlic
*this is a part of a tongue twister/ riddle.

314. Burak: [Excuse me stop acting]

315. Ozan: [Kızım sen ne giymişsin böyle lan?]
Girl what the hell are you wearing,man.*
* slang way of refering to a female. Direct translation is my daughter but is used as a slightly patronizing introduction.

316. Burak: Niye?
Why?

317. Ferhat: Yok yok ben bişey yapmadım ki=

No no I did not do anthing

318. Burak: = O da bişey yapmadı.=
He did not do anything either.

319. Ferhat: =Ben good boyum işte A alıyorum.
I am a good boy. I get an A

320. Ozan: Fatih de birşey yapmadı A alıyormuş*.=
Fatih did not do anything either. He is getting an A
* "'muş" is a tense suffix that signifies uncertainty and displaces the active knowledge responsibility of the speaker.

321. Ferhat: =Ben o testi yapmadım ki.
But Idid not do that test.

322. Ozan: Anlamadım...A alamazsın.
I dont get it. You can't get an A

323. Ferhat: Alırım=
I can.

324. Burak:=Turkish'ten alırım
I can fromTurkish

325. Ozan: Say, Ocak, Şubat, Mart, bak birinci ay
Count January, February, March, look the first month

326. Burak: Ağustos August
August is August

327. Ozan: Eylül
September

328. Burak: Eylül ne lan
What the hell is "Eylül"(September) "lan"

329. Ozan: E'le başlıyor...Eylül 10uncu ay
Starts with E(S). September is the 10th month

330. Ferhat: Eylül 9uncu ay
September is the 9th month

331. Ozan: Pazartesi giyelim fesi
Salı bugün sallanır
Yarın çarsafa dolanır
Perşembe ...
Cuma mübarek gün
Cumartesi pazar resmi tatil

Monday lets put on the Fez

Tuesday shakes
Tomorrow wraps around the sheets
Thursday
Friday is the holly day
Saturday Sunday is official holiday
((A funny rhyme about the days with a few personal twists))

332. Burak: Pazartesi, salı, çarşamba, perşembe, cuma, cumartesi, pazar.
Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday.

333. Burcu: Sen karşılaştırmadın?
You didn't compare?

334. Ozan: Günleri karşılaştırdım
I compare the days

335. Ferhat: It doesn't matter full [stop konuşurken]
It doesn't matter full stop when talking

336. Ahmet: [One day one week]

((when another teacher come to ask the teacher something students talk about football teams, TV dramas, saz playing and folk songs, … and the lesson as well)) ((It is difficult to recognize which student's talks))

337. [Ali topu at]
*Ali throw the ball**
*a standard phrase used when first graders are learning to read.

338. [check etmeye çalışıyor...]
trying to check

339. [eskiden…]
before

340. [Fatmagül'ün suçu yok *…]
Fatmagül has no fault
*a Television show that is about the rape of a girl named Fatmagül.

341. [Watch...]

342. [yine tecavüz olayı…]
It is another rape incident

343. [aaaa…]

344. bişey demiyo =
does not say anything...

345. = imagine…=

346. =[Beşiktaş*…]
* one of the biggest football teams in Turkish league.

347. [ama …]
but

348. [siyah beyaz mı?...]
black or white?...

349. ... come on then …Wood Green

350. ((Singing)) Do re mi fa

351. [Week one…]

352. [Odam kirec tutmuyor…]
My room does not build lim

353. [Proud to play saz…]

354. [I must left the saz…]

355. Ben Kezban yengeyi çalıyorum…
I am playing "Kezban yenge.

356. Teacher: Hadi bitti mi?
Come on is it done?

357. Ferhat: Bitti.
It is done.

358. Burcu: No ben yanlış yaptım. Oo crap
No I did it wrong. Oo crap

359. Ozan: Yoo biraz eksik baaaaak (2) oldu bak
Noo, a little missing loook done look.

360. Ferhat: Tamam mı, öğrendiniz mi?
Is it okay, did you learn it?

361. Ozan: Ben bunları biliyodum zaten=
I already knew these

362. Ferhat: =Yorumla…Compare etmeyi de biliyor muydun?
Compare... Did you know to compare?

363. Ozan: İşte, çat pat
Meh, so so.

364. Ferhat: Daha çok öğrendin mi? Arttı mı bilginiz bu konuda?

365. Burak: Şu şeyi öğrendim ben =
I learned this thing.

366. Ferhat:= Hıı hıı
A hah

367. Burak: Şu şeyi, frequency polygon'u [öğrendim]
This thing, frequency polygon I learned that

368. Ozan: [Daha once] bilmiyormuydun?
You didn't know before?

369. Burak: Bilmiyordum
I did not know.

((they are just aware of what they have done correctly or wrongly and free to say know or don't know))

9.4 Transcript 4

((Children are running around.))

1. Teacher: Oturur musunuz lütfen
Can you please sit down?

2. Ayşe: Ben yakalarım ((Running each other))
I catch

3. Teacher: Ozan otur otur yerine otur. Evet, lütfen hadi. Ozan, tamam yeter
Sit down, sit down. Yes, please come on. Ozan, ok that's enough

((Waiting them settle down, I am carrying on to finish my way))

4. Ayşe: Sen kimin peşindesin
Who are you after?

5. Nur: Hayır olamaz hayır
No, it cannot be, no

6. Ayşe: Önüne dönsene kızım
Hey girl turn back

7. Teacher: Yeter kızım artık
That's enough my daughter

8. Ayşe: Susar mısın lütfen
Can you be quiet please?

9. Burcu: Susun yahu ((Mimicking me))
Be quiet for god's sake

10. (xxx)

11. Teacher: Size bir tane exam sorusu vericem
I'll give you an exam question

12. Burak: Haziran ayının exam sorusu Bu senenin Haziran ayının exam sorusu
June's exam question.. This year's June's exam question

13. Sema: Ay doğum günüm
Oh *my birthday*

14. Teacher: Dinliyor musun? Altlarına Türkçelerini yazdım
Are you listening? I' wrote in Turkish underneath
(subtitled in Turkish)

15. Sema: Gerçek mi gerçek mi gerçek mi
Is it real, Is it real, Is it real

16. Ferhat: Evet gerçekmiş.. Evet evet gerçek
Yes it's real. Yes yes real

17. Teacher: Geçen Haziran ayının onbirinci sınıflarının exam soruları. Eve götürün bakalım anneniz babanız çözecekler mi? Beraber yapalım dinliyor musunuz? Bakın ne kadar kolay. Herhalde telefonla oynamaya falan geldiniz bakıyorum

Last June's year eleven's exam questions. Take them home, let's see if your parents will solve? Let's do it together, are you listening? Look how easy. It seems you came here to play with your phones

18. Sema: Beni rahat bırakırmısınız?
Will you leave me alone?

19. Nur: Yok hocam
No teacher

20. Teacher: Tamam
Okey

21. Sema: Kes tamam kes, başım ağrıyor *((Mimicking the teacher))*
Cut it okey cut it, I have a headache

22. Ferhat: Next week okul yok
Next week there is no school

23. Sema: Ne zaman okul yok
When is no school

24. Burcu: Evde oynadığınız yetmiyor mu? Laughing
Isn't it enough you play at home?

25. Teacher: Buraya koyuyorum. İsteyen alsın tamam mı?
I put them here. Take some if you like, okey?
((Teacher puts some refreshments on the table))

26. Nur: Yemek ...
Meal

27. Ozan: Yemekte ...Cips, bisküvi falan
At meal Crisps, biscuit etc

28. Sema: Ne bu?
What is it?

29. Nur: Sen yiyon mu?

Are you eating?

30. Burcu: ... al
take

31. Ozan: t t t t

32. Ayşe: Simplify expressions diyo ... t t t t ... 2b add 3b
It says simplify expressions

33. Teacher: Simplify ne demek?
What does simplify mean

34. Burcu: Bir araya getiricez
Bring together

35. Teacher: Simple desem
If I say simple

36. Ayşe: Basit
Simple

37. Ferhat: Sadeleştirmek
To simplify

38. Ozan: Sade var kaymaklı var
There are plain and creamy

((These are ice cream varieties in Turkish and he imitates the ice cream man sound))

39. Teacher: Diyelim ki iki sade sen... iki sade dondurma da sen aldın.Yani .2s arti 2s
Let's say you buy two plain...and you buy two creamy ice cream...so two s add two s

40. Burak: four s

41. Ozan: Dört top dondurma yummy
Four scoops of ice cream yummy

42. Teacher: but be careful four top sade dondurma. Yani four s. If I say iki top sade(s) iki top kaymaklı(k)
But be careful four scoops of plain ice cream. So four s. If I say two scoops of plain, two scoops of creamy

43. Ferhat: two s and two k

44. Ozan: two s and two k

45. Burak: farklı dondurmalar karıstırmıyoz. Ohh ne güzel like summer

kuzenlerle Türkiye'de dondurma yiyoruz
different ice creams we don't mix them. Ohh what a beautiful like summer we are eating ice cream with my cousins in Turkey

46. Ayşe: yummy four s same ice cream iki s and iki k mix yummy
yummy four s same ice cream two s and two k mix yummy

47. Teacher: şimdi look at the other ones
Now look at the other ones

48. Ayşe: t t

49. Ozan: tey tey tey tey ((Singing))

50. Burak: bir tey iki tey.....tey tey
One tey two tey tey tey

51. Teacher: Dikkat bir tey iki tey mi yoksaaaa tey tey mi?What is the difference?
Be careful is it one tey two tey oooor tey tey?

52. Ferhat: iki t veeeeee t squared
Two t aaaaaand t squared

53. Teacher: Evet dogru. Adding and multiplying
Yes right.

54. Ferhat: Sanki bir tey senden bir tey benden yani t t t t tey tey tey tey ama öbürü hep beraber çarpılmış bir büyük teeeeeeeey

Like one tey from you, another tey from me, so t t t t tey tey tey tey but the other one altogether multiplied makes one big teeeeeeeey

55. Ayşe: O zaman öbür soru iki c ve c square
Then other question two c and c square

56. Ozan: cey cey cey ((Like the tey tey sound))

57. Teacher: O zaman ne olur Ozan?
Then what happens Ozan?

58. Burak: üç c miiiiiii ((Prolonging the sound))
İs it three c

59. Ferhat: bak bi(2) adding or multiplying
Look ones adding or multiplying

60. Burak: I see(1)c times c times c ne dicem
I see c times c times c what do I say

61. Ozan: Ben yardım edeyim [cubed olur] yaniiii

Let's I help soooo it would cubed

62. Burak: [c cubed]

((Students talk together and solving problem, teacher loitering around, checking and helping each by one or together))

63. Teacher: Sen anlandın mı?
Did you understand?

64. Ayşe: x2...x

65. Burcu: 6 p

66. Ayşe: Minus 8 6p minus 8

67. Ozan: Değişik bir şey çarpı 4
It's a different thing multiply by 4

68. (xxx)

69. Ferhat: Ne diye toplarsın
How do you add it?

70. Burak: Sen anladın mı
Did you understand?

71. Burcu: Bunu biliyom zaten
I know this already

72. Ayşe: 8 time square equals to

73. Sema: Hocam
Teacher

74. Sema: Bir saniye
One second

75. Ayşe: BURCU BURCU ((Screaming))

((Laughing, teasing each other))

76. Ozan: Bu onun kafası ...
This is her head.

77. Burcu: Hocam ... yapmış
Teacher done it

78. Teacher: ... ders yapmak daha mı iyi?
Is it better to do the lesson?

79. Nur: Neden?
Why?

80. Ayşe: Hem konuşuyoruz hem de çalışıyoruz.yani kafamiz işliyo Miss
We are talking also we are studying. So our head is working Miss

81. Sema Kafam çalışıyor valla*
My head is working honestly
*valla is used to make it more believable

82. Nur: He ya Ver bi bakıyim
That's right. ... Let me see

83. Ozan: Kim?
Who?

84. Ferhat: Vay ... Arkadaşlar
Wow Friends

85. Burcu: H and M

86. Burak: Çene ... Ben bakıyim soruya
Chin Let me see the question

87. Burcu: Ay başım ağrıdı, lütfen
I have a headache, please

88. Nur: Hang on ... 12 ama
But 12

89. Ayşe: b times c ...

90. Ozan: Çekme üstümü
Don't pull my clothes

91. Ferhat: Ne?
What?

92. Burcu: Adı ne?
What is the name?

93. Burak: Aslı geliyor mu
Is Aslı coming ?

94. (xxx)

95. Ferhat: Oha ... ((Sneezing))
Whoa

96. Burak: Çok yaşa iyi yaşa

Live long, live well

97. Nur: Sen yaptın mı
Did you do?

98. Ayşe: Ney*
What is?

*Ney is the shorter version of Neyi which means 'what is it'

99. Ozan: Sen ne yapıyon ya*
What are you doing for god's sake?
*Ya is used to emphasise the question

100. Burcu: Sen ne konuşuyon ya
What are you talking about?

101. Ozan: Hadi yap bakalım*
Go on do it
*has the meaning of 'I dare you'

102. Ferhat: İki doğru
Two corrects

103. Teacher: Hadi konuşmadan yapalım
Come on, Let's do it with no talking

104. Nur: Ne hava attın ne hava ((Exaggerate))
What a show off, what a show off

105. Burcu: Allah bilir ...
God knows

106. Burak: Malatyalı*
*Malatyali is used for the person who is from Malatya, a Turkish town.

107. Nur: Yaptık
We've done it

108. Sema: Eight nine...Wood Green

109. Ayşe: Ney
What is?

110. Teacher: Parantezlileri bir gösteriver*
Show it to me the ones with the parenthesis

*'bir gosteriver' used by thinking the student knows it already asked it to show the others

111. Sema: Hello

112. Ferhat: Hello

113. Burcu: Ferhat bir sus ya*
Ferhat be quiet for havens sake

* ya is used to emphasise on the sentence

114. Nur: Bilmiyorum
I don't know

115. Sema: Minus two minus 6 b

116. Ozan: Biraz sonra
A little bit later

117. Nur: Tamam
Okey

118. Nur: Annen seni almaya geliyor. Yağmurda
Your mother is coming to pick you up. Under the rain

119. Burcu: Ay anneciğim bana kıyamıyor*
Oh my mother doesn't want me to suffer

*kıyamamak: not to have the heart to harm anyone, kıyamıyor is present continuous tense form

120. Ozan: Anneciğim ((Teasing))
My mumy

121. Nur: Saçı bozulur de mi
Her hair is to be break down isn't it?

((Singing))

122. Burcu: Ne biçim yardım bu
What kind of help is this?

123. Ozan: Ne biçim örnek bu
What kind of example is this?

124. Le le le le le
((Kurdish folk dance tune,singing all together))

125. Burak: Gelmiş; sizin oradaymış
He/She has come; he/she is over yours

126. Ozan: Hocam ...
Teacher

127. Teacher: Hani yardım ediyordun
I thought you were helping

128. Burak: Otur yerine ya
Just sit down

129. (xxx)

130. Nur: Üç defa ...
Three times

131. Ferhat: Susun lan
Hey you!! Quiet

132. (xxx)

133. Ozan: Shut up

134. Burak: Stop it man stop it

135. Ozan: Yanlış yapmış
He/She made it wrong

136. Teacher: 15 times ... toplıyacaksınız
You will add them up

137. Sema: Şikayet yok
No complaint

138. Burcu: Susar mısınız çocuklar ((Mimicking the teacher))
Will you be quiet children?

139. Ozan: Hocam hava karardı ben eve gidebilir miyim?
Teacher the weather got dark, can I go home?

140. Nur: Çabuk çabuk
Hurry hurry

141. (xxx)

142. Sema: Ağzınızı bağlıycam sizin
I will tie up your mouths

143. Burcu: Bi daha konuşamıyacaksın
You will not be able to talk again

144. Ferhat: Ama Burcu
But Burcu

145. Ozan: Burcu'nun gözleri konuşuyor

Burcu's eyes are talking

146. Nur: Onun gözleri hep
Her eyes are always

147. Burak: ...yaptın ((Singing))
You did it.

148. Sema: Last week ...

149. Ferhat: Shus men

150. Ozan: Bye bye

151. Burak: Anne
Mummy

152. Ferhat: ...annemin yanında hiç konuşmam
I never talk by my mum

153. Annecim ((Altogether))
Mummy

154. Teacher: Beraber yapıcak mısınız? Şimdi yapmak yok. Önemli olan bunları evde beraber yapmanız
Will you do it together? Don't do them now. Important thing is to do them at home together

155. Nur: Haftaya
To the next week

156. Teacher: Şimdi yapmayın evde annenizle babanızla birlikte yapacaksınız
Don't do now, you will do at home with your parents

157. Burcu: babam nasıl yapacak
How does my father do?

158. Sema: babam geliyor beni almaya
My father is coming to pick me up

159. Burak: İnşallah
God willing

160. Sema: Wood Green

161. Nur: ben niye gelmiyim ha ha ha
Why aren't I coming ha ha ha

162. Burcu: Babanın malı mı?
Is it your dad's goods?

163. Teacher: Var mı şemsiye isteyen? Vereyim yarın getirirsin
Does anybody want umbrella? I will give it, you can bring

tomorrow

164. Burak: Senin var mı şemsiyen
Have you got your umbrella?

165. Burcu: Onun var şemsiyesi
He/she has umbrella

166. Teacher: Nur var mı şemsiyen. Bak bir tane daha var. Vereyim yarın getirin
Nur, Do you have umbrella? Look there is another one. I will give it, you can bring tomorrow

167. Nur: Teşekkürler
Thank you

168. Teacher: Güle güle
Bye bye

((After all these talking and arguing even shouting and crossing with them. This is all about to engage and motivate them to the lesson. At the end like nothing happened teacher care about the students (like their parents) and asking them if they have got an umbrella and make sure they arrive home safe and sound))

9.5 Transcript 5

1. Teacher: Evet birinci sorudan başlayalım…Evet ne diyor birinci soruda?
   Let's start from the first question. Yes, what does it say in the first question?
2. (xxx)
3. Ahmet: Ooo (xxx)
4. ((One student reads the question but difficuly to hear it))
5. Sema: … kaldırır mısın?
   Take it away
6. Teacher: Gayet kolay bir soru. Açıkla bakalım nasıl yaparsın bu soruyu
   It's an easy question.Could you explain how you would do this question?
7. Nur: Bakarsın kaç tane
   You look how many
8. Teacher: Hergün 10 tane yapsa
   Every day if he does 10
9. Duygu:Yapılmaz
   It can't be done
10. Ferhat: 62 yi 10 a bölüyoruz
    We divide 62 by 10
11. Zeynep: 6.2 çıkıyor
    It makes 6.2
12. Ali: 6.2 gün diye birşey olmadığına göre normal şartlarda 2 kişi 6 güne sıkıştırılır
    There is nothing like 6.2 days so under the normal circumstances 2 people are squeezed in 6 days
13. Teacher: İki tanesi yedinci güne geçer
    Two of them will pass to seventh day
14. Ali: Demek ki 7 gün oluyor. Tamam mı?
    So it makes 7 days. Is it okey?
15. Teacher: İkinci soruya bakalım. Yani beşe
    Let's look at the second question. I mean five

16. Duygu:Siz bitirene kadar …
Until you finish

17. (xxx)

18. Teacher: Evet, beşe bakalım (One student reads)
Yes. Let's look at five

19. Ozan: Kapıyı açalım
Let's open the door

20. Teacher: Bir senelik ne yapacaksa
Whatever it will make annually

21. Ahmet: Metod nedir
What is the method?

22. Sema: … times close bracket

23. Nur: Bir senelik
For one year

24. Teacher: Nasıl yaparız Duygu?
How do we do Duygu?

25. Ali: Duygu biraz sonra gidiyor çünkü
Duygu is leaving soon because

26. Ozan: Burada boşuna vakit geçiriyor
She is wasting her time here

27. Duygu: Birşey vermek için
To give something

28. Zeynep: Aynen bunu söylüyor
Saying exactly this

29. Ali: yüzde yirmisi ya da onları bölücez
Twenty percent of it or we will divide them

30. Ahmet: Eger … fazla gelirse
If comes more

31. Teacher: Günlük hayatta kullandığınız şeyler
Things we use at daily life

32. Tansu: çarpı 24 … yüzde 20 sini bulup 12 ile çarpıp üzerine eklicez
multiply 24. After finding it's 20 percent we will multiply by 12 then add it on

33. Teacher: Anlatır mısın, yaparken

34. Sema: Yaparım ama anlatamam
I can do it but I can't tell

35. Zeynep: Yapıyoruz anlatmaya gelince …
We do it. When it comes to explaining

36. Teacher: Anlatmak önemli birşey
Explaining is important

37. Fatma: Hangi soru
Which question

38. Tansu: Beşinci soru
Fifth question

39. Ali: Hangisi daha çok, birincisi zaten
Which one is more, anyway the first one

40. Teacher: Ona birsey yapmayacağiz. Dinliyor musun?
We won't do anything to that. Are you listening?
((Take assurance that they are listening))

41. Ferhat: Senelik aylık 1750 bir sonraki
For a year monthly 1750 the next one

42. Nur: 1750 x 12

43. Ozan: 12 percent of monthly pay diyor
I is saying that 12 percent of monthly pay

44. Nur: 1750 x 12 (1750 x 12 + 1750 x 20/100)

45. Sema: 21 000 ediyor
It makes 21000

46. Zeynep: 21 000

47. Ali: Sonra 12 ile çarpsak mı acaba
After that shall we multiply by 12

48. Ferhat: bonus of 20 percent

49. Tansu: Yani sadece 1 aylık
Means only one month

50. Teacher: Tansu doğru söyledi 12 ile çarpıyoruz
Tansu said it right we will multiply by 12

51. Nur: çarpıyor muyuz?
Are we multiplying?

52. (xxx)

53. Teacher: Nasıl buluyorsun 100 de 20 sini
How do you find its 20 of 100

54. (xxx)

55. Teacher: 20 ile 1750 çarparsın 100 a bölersin di mi
You multiply 1750 by 20 then divide by 100 don't you?

56. Nur: 350 di mi. Bir tane 350 eklicez. 12 le çarpacaksın.
It's 350 isn't it? We will ad one 350. You will multiply by 12.

57. Zeynep: 12 ile çarpacak mısın?
Will you multiply by 12?

58. (xxx)

59. Fatma: 350 one of

60. Nur: Hocam
Teacher

61. Teacher: Benim sorduğum soruyu anlamadınız siz
You didn't understand the question I asked
((Teacher is aware of that students do not understand))

62. Nur: The question is not clear that 350 is one of

63. Teacher:Beni dinleyin
Listen to me

64. (xxx)

65. Teacher: Simdi 1750 per month + bonus of 20 percent monthly pay
Now

66. Tansu: Bunu her ay mı ekliyoruz
Are we adding this every month

67. Ali: Yoksa sadece bir kez mi?
Or only once?

68. (xxx)

69. Fatma: Evet bu. Burcu nereye gitti?
Yes this is. Where did Burcu go?

70. (xxx)

71. Ozan: Maalesef
Unfortunately

72. Tansu: Gönderiyor
Sending

73. Duygu: Mesaj var mesaj

74. Fatma: Neden
Why

75. (xxx)

76. Nur: Ney
What

77. Tansu: … çarşıya gönderdi
sent to the market

78. Fatma: annesi (xxx)
her/his mother

79. Nur: Biliyon mu
Do you know

80. Tansu: …Turkish Lesson (xxx)

81. Nur: İste (xxx)
Here it is

82. Ferhat: Sen niye geri geldin? Öğrenmeye geldi
Why did you come back? Came to learn

83. Sema: Wood Green'e gitmeliyiz
We must go to Wood Green

84. Fatma: Sen gelme
Don't come

85. Duygu: Sana ne en güzel yere gitmiş
It's not your business. He/She has gone to the beautiful Places

86. Nur: Lordship Lane'e gitti
He/She went to Lordship Lane

87. Ali : Tamam mı, anladınız mı
Is it Okey? Did you understand?

88. Teacher: Ferhat anlatır mısın Duygu'ya question'ı nasıl yaptığını
Ferhat can you explain Duygu how you solved the question?

89. Ferhat: Bak 1750 12 le çarpıyosun 24 000 senelik
Look, you multiply 1750 by 12. Annual 24 000

90. Ali: Sonra ... 2350 Sonra
Later 2350 Later

91. Sema: Yavaş slowly slowly
Slowly

92. Ali: Hayır
No

93. Ferhat: 4200

94. Duygu: Daha çok para yapıyor
It is making more money

95. Ferhat:Tamam mı sister
Is it alright sister?

96. Sema: Anladın mı Duygu'cum
Did you understand dear Duygu?

97. Ali: Bir kere bir iki tamam mı?
One time one is two Okey?

98. Sema: Anlamadıysan, anlıyacağı şekilde anlatması gerekir
If you didn't understand, he/she should explain the way you Understand

99. Nur: Anlamıyorsa
If he/she doesn't understand

100. Duygu: Ögreniyoruz işte
See we are learning

101. Nur: Evet anlatır mısın lütfen
Yes, can you explain please?

102. Teacher: Ozan anlatır mısın
Ozan can you explain

103. Ozan: Neyi hocam
What teacher

104. Teacher: Bir kere daha anlat geçiyoruz
Explain it one more time, moving on

105. Ozan: Hi, Duyguya mı?
Hi, is it to Duygu?

106. Teacher: Evet
Yes

107. Duygu: Ozan birincisi tamam
Ozan the first one is done

108. Ozan: İkincisi aylık 1750 lira + yüzde 20 bonusu

The second one, monthly 1750 lira (means Turkish lira) plus 20 percent bonus

109. Zeynep: 1750 x 12 = 21 000

110. Duygu: Ben böyle yaptım.
I did it like this

111. Ferhat: Divided by hundred 1750/100 x 20

112. Nur: multiply 20

113. Ozan: Hem onu buldun (xxx) hem de 20 ile çarpıp bölersen
You found it at the same time if you multiply and divide by 20

114. Zeynep: … yüzde on da öyle
Ten percent is the same

115. Ferhat: Bulunmaz öyle
It can't be solved like this

116. Ali: Bunu da buna eklersen bu bundan fazla çıkar
If you add this to this, this will be more than this

117. Teacher: Evet, altıyı yapalım
Yes, let's do the sixth

118. Ahmet: Altıyı okuyalım
Let's read the sixth

119. Tansu: Sssst 6 ıncı soru
Sush the 6th question

120. Teacher: Question 6 okuyoruz
We are reading the question 6

121. Ali: Tamam 6
Okey 6

122. Fatma: Biz burda okuyalım
We read here

123. Zeynep: Bi gün 110 u 4 ile çarparsak 440 eder
If we multiply 110 by 4, it makes 440

124. Nur: 440 four day için
440 for four days

125. Duygu: Öbürü 5 days için 550
The other one for five days 550

126. Fatma: Ne demek istiyor
What does it mean?

127. Teacher: Bir plan yapmış bu insan kendine
This person has made a plan for himself

128. Ferhat: Daha çok para kazanmak için Plan B mi daha iyi?
Is plan B better plan to earn more money?

129. Zeynep: 1. plan mı daha iyi plan mı?
1st plan is better plan?

130. Ahmet: Bütün planlar burda
All the plans are here

131. Nur: 2. plan daha iyi
2nd plan is better

132. Teacher: Açıklayın o zaman
So explain it

133. Zeynep: Çünkü daha çok E var
Because there are more E

134. Fatma: Nasıl
How

135. Ali: Bunların hepsini add yapıcaz
We will make add all of them

136. Teacher: Nasıl yaparsınız?
How do you solve it?

137. Sema: Dört tane C kaç lira ediyor
How much lira does four Cs make?

138. Ali: Kaç lira eder
How much lira does it make?

139. Duygu: 550

140. Sema: Bunda 4 tane C var
There are 4 Cs in this

141. Ali: Dört tane E ne kadar eder
How much do four Es make?

142. Tansu: Demek 1.plan kaç lira kazanıyor
So, how much does first plan earn?

143. Zeynep: All days

144. Fatma: Dokuz yüz birşey 990
Nine hundred something 990

145. Ozan: İkinci planın kaç lira kazandığını bul
Find how much lira the second plan earn?

146. (xxx)

147. Zeynep: İkinci plan
Second plan

148. Ferhat: Ne kadar basit sorular
How simple questions they are

149. Ali: Sayfa bomboş 20 point aldın
The page is empty you got 20 points

150. Zeynep: Su sayfada açıklama yok ne yazacaksın
There is no explanation in this page what are you going to write

151. Teacher: İkinci plan ne kadar kazanıyo
How much does the second plan earn?

152. Sema: İkinci plan
Second plan

153. Ali: Birinci plan daha iyi
The first plan is better

154. Teacher: Açıklama yazmadığınız için
Because you didn't write explanation

155. Teacher: Matematiksel olarak açıklaman lazım
You should explain it mathematically

156. Zeynep: Açıklamadıgında puan vermiyorlar
They didn't give points when you didn't explain

157. Sema: Neden ikinci plan, Açıkla
*Why the second plan, expl*ain

158. Teacher: Onun için getirdim bunları
That's why I borought these

159. Ozan: Week 3 diyoor
It saaays week 3

160. Ahmet: C'den C şöyle oluyor
From C, C happens like this

161. Fatma: One two three four

162. Sema: 4 gün çalışırsa 550 lira oluyor
If works 4 days it makes 550 liras

163. Fatma: Bi gün
One day

164. Nur: 2 gün bundan çalışmış
Worked two days for this

165. Fatma: … 3

166. Sema: Week e de başlıyalım. 440 440 daha 880 eder
Let's start week a. 440 plus 440 makes 880

167. Nur: Plan B daha iyi
Plan B is better

168. Fatma: Di mi Plan B
Isn't is Plan B

169. Teacher: Hani yapmadınız bundan ….
So you haven't done from this

170. Ali: ((talks very quickly and reads the question again))

171. Teacher: 5 tane nasıl yapacak
5 pieces how will make it

172. Sema: 550 etti
Made 550

173. Nur: 550 + 440

174. Fatma: beş dört daha dokuz
Five plus four nine

175. Sema: nine point nine … four hundred forty

176. Nur: altı yedi sekiz dokuz
Six seven eight nine

177. Ali: Bu binyüz di mi
This one thousand and one hundred ,isn't it?

178. Teacher: Çarpma
Multiplication

179. Fatma: Bu binyüz eder

This makes one thousand and one hundred

180. Teacher: Evet sonuncu soruya bakalım yedinci soru
Yes let's look at the last question the seventh question

181. Sema: Anladın mı sen bu soruyu
Did you understand this question?

182. Ahmet: 1 2 3 4 tane C 550
1 2 3 4 pieces C 550

183. Ali: 1 2 3 4 tane E 440
1 2 3 4 pieces E 440

184. Sema: İkisini toplayınca 990 yapıyor
When you add them up it makes 990

185. Fatma: İkincisinde
At the second one

186. Ahmet: 4 C var
There are 4 Cs

187. Sema: 5 E var 550 yapıyor
There are 5 Es, it makes 550

188. Ali: Toplarsak da 1100
When add them up 1100

189. (xxx)

190. Fatma: Ha evet
Oh yes

191. Teacher: Explain only for Duygu while others read the question

192. (xxx)

193. Teacher: İkinci soruya bakalım. Valla ailenize versem şu soruyu çatır çatır cevap verirler
Let's look at the second question. Honestly if we give this question to your parents they will answer it very easily

194. (xxx)

195. Teacher: Götürün bu kağıtları açıklayın çatır çatır cevap vermezlerse burdayım.
Take these papers, explain, if they don't answer them easily I will be here

196. Ferhat: Zehir gibi çalışır onların kafası

Their head work very sharply

197. Fatma: Matematiğe
To mathematics

198. (xxx)

199. Teacher: Complete the claim form

200. Nur: Claim form ne demek?
What does claim form mean?

201. Ahmet: Ne demek claim form?
What does it mean claim form?

202. Tansu: İş yerinde bir yere gittim. Gece kaldım, taxi falan. Onların parasını şirketten geri alabiliyorum.
I went somewhere at work. Stayed overnight, taxi etc. I can claim those money back from them

203. Zeynep: Maria interview'e gitti
Maria went to interview

204. Nur: Yiyecek paramı
My money for meal

205. Zeynep: Taxi paramı veriyorlar
They give my money for taxi

206. Ozan: She has this claim form

207. (xxx)

208. Nur: 939

209. Duygu: Hı hı

210. Tansu: Şimdi deki ne sen bir yere gidiyosun
Now, let's say you are going to somewhere

211. Zeynep: Onlarda senin yemek yol paranı ödüyorlar
They pay your meal and travel money

212. Nur: Train ....

213. Duygu: Car ....

214. Ozan: Travel rest ....

215. Sema: Ne kadar claim ediceksin onlardan

How much will you claim form them

216. Ali: 130.80

217. (xxx)

218. Nur:...araba ile
by car

219. Fatma:...paraları pahalı oluyor
money is expensive

220. Ahmet: Tren parası
Train money

221. Sema: Gidecegin zamana bağlı
It depends on the time you go

222. Ferhat: 30 lira gidiyorsun. 30 lira geliyorsun
You are going for 30 liras. You are coming for 30 liras

223. Sema: Sabahları pahalı
It's expensive in the morning

224. Ali: Return off peak gidersen pahalı olmuyor
If you go return off peak it won't be expensive

225. Sema: Öyle
Exactly

226. Ferhat: İkinci kısmına bakalım
Let's look at the second part

227. Ahmet: 30 mille 27 per mile

228. Sema: 27 ile 30u çarpmam lazım
I should multiply 27 by 30

229. Ferhat: Sonra bu kısmı toplayıp buraya yazıyorsun
Then after you adding up this part you write it here

230. Teacher: İkinci kısmı da yapın gidelim
Let's solve the second part and we go home

231. Nur: İkinci kısım
The second part

232. (xxx)

233. Fatma: Öyle mi
Is it like this?

234. Ozan: How much

235. Duygu: 60

236. Ali: Aynen böyle
Exactly like this

237. Sema: Birisi 60 dedi
Somebody said 60

238. Teacher: 60 Lira mı 60 penny mi
Is it 60 lira or 60 penny

239. Duygu: Bence 60 penny
I think it is 60 penny

240. Ali: 60 lira

241. Ferhat: Birisi 60 lira diyor bu taraf 60 penny
Somebody says 60 lira, this side 60 penny

242. Sema: Senin cüzdanın .....
Your purse.....

243. Ahmet: Sekiz on
Eight ten

244. Ferhat: 29 penny diyor 29 la 30 u çarptım
Says 29 penny, I multiplied 29 by 30

245. Tansu: Burayı yaptım
I solved here

246. (xxx)

247. Ozan: Hocam 81 lira 68 kurus
Teacher 81 liras 68 kurus

248. Sema: 60 penny

249. Nur: Bu 60 lira diyor
This says 60 liras

250. Teacher: Çok büyük bir yanlışlık biliyor musunuz
Do you know this is a very big mistake?

251. (xxx)

252. Teacher: O kadar yaptığınız şey boşa gidecekti
All you have done would be wasted

253. (xxx)

254. Nur: 1 pound

255. Duygu: Bu ne olacak?
What happens to this?

256. Ferhat: Ufak bir yanlışlık bu soruyu götürüyor.
A small mistake takes off this question

257. Sema: Ne kadar basit bir soru aslında
Actually, what a simple question

258. Teacher: Sizden ne isteyecem götürün bunları eve bakalım sizinkiler ne yapacak
What I am going to ask you to do is take these home, see what your parents will do

259. (xxx)

260. Fatma: Aman ne güzel birşey
What a wonderful thing

261. Zeynep: En güzel öğrenme şekli
It is the best way of learning

262. Teacher: Functional skills

263. Ferhat: Çıkacak bunlar bak şansınıza
They will be on the exam if you are lucky

264. Nur: Gidebilir
She/he can go.

((Students mix up the Currencies. They use Turkish lira with British penny, or British pound with Turkish kuruş. The units of the currencies are same.100 kuruş makes 1 lira like 100 penny makes 1 pound. So they concentrate on the units more than the names))

9.6 Transcript 6

1. Sema: Ok Başladı mı
Ok. Has it started?

2. Teacher: Birinci soru: a cyclist travels 12 miles in 2 hrs.
The first question:

3. Sema: What`s the cyclist`s speed in mhp?

4. Ayse: Tamam hangisinin adını
Okey which one's name

5. Fatma: ... Bak nerede ara bir ...
Look where, look for

6. Teacher: Evet çok güzel.. Burcu anlatır mısın onu bana?
Yes very nice. Burcu can you explain this to me?

7. Sema: Burcu bak this is speed, bu distance, bu da times …
Burcu look this is speed, this is distance, this one is times.

8. Burak: Böyle olunca times yapıyorsun, böyle olunca distance.
Speed olunca divide it. Böyle olunca times... çok kolay... Şimdi ona göre bu soruyu nasıl çözeriz?
When it is like this yo do times, when like this distance. When it is speed divide it. When like this times. very easy. Now according to this how do we solve the question?

9. Burcu: Ne şeyleri yerleştiriyoruz yerine? Times mı yapıyorduk?
What things do we put in place? Do we do times?

10. Teacher: Nasıl yaparsınız
How do you do it?

11. Burak: Speed m per hour

12. Elif: Neyi bölersin oniki mi
What do you divide? Is it twelve?

13. Burak: Mile per hours

14. Teacher: mph miles per hour

15. Ebru: mph anlamadım mile per hour
I didn't understand mph

16. Mehmet: Ha çok kolay Simone
Oh it is very easy Simone

17. Zeynep: Sizin araba bir saatte kac mil gider?
How many miles your car goes per hour?

18. Ebru: What give me what?

19. Mehmet: One hour sixty dakika
One hour sixty minutes

20. Ebru: Kirkbes devided sixty neden
Why forty-five devided by sixty

21. Fatma: Why Simone why

22. Ebru: Olur mu oyle olmaz
Can it be? It can't be

23. Mehmet: Neden olmaz? Çünkü time
Why can't it be?Because time

24. Fatma: Bir de distance soruyor
And it asks distance too

25. Teacher: Bunların aynı ünitte olması lazım
They should be in the same unite

26. Fatma: Bunu ne yapmalıyız
What do we do this?

27. Sema: 1 hour 60 dakika
1 hour 60 minutes

28. Burcu: 45 ... 45 dak.
45 mins.

29. Ebru: Bunu 45/60 yazicak
It will write 45/60

30. Fatma: Neden
Why

31. Sema: Çünkü altmışın içinde 40 var
Because there is 40 in sixty

32. Teacher: Neden olduğunu açıklar mısınız
Can you explain why it is like this

33. Fatma: 1 saat 60 dak
1 hour is 60 mins.

34. Ebru: 45 min

35. Fatma: Bunu buna divided
This is divided by this

36. Sema: Yapamadın mı
Couldn't you do it?

37. Burak: ... çok güzel
Very nice

38. Ebru: Bu öbürkünden daha kötü
This one is worse than the other one

39. Burcu: ... Bell ringing

40. Ebru: Anlamadım
I didn't understand

41. Burak: Neyi anlamadın
What didn't you understand?

42. Ebru: Olmuyor
It is not happening

43. Teacher: Kalın bitiyor
Stay. It's gonna finish

44. Ebru: 45 demek ki
So it's 45

45. Teacher: Şimdi anladınız mı
Did you understand it now?

46. (xxx) ((Laughing))

47. Teacher: Birinci soruyu yapalım
Let's do the first question

48. Burak: c

49. Ayşe: Density demek ne demek?
What does density mean?

50. Teacher: Bir şeyin cm^3 başına ağırlığı demek
It means the weight per cm^3

51. Ayşe: 1 cm^3 ne kadar bir şey
What is it like 1 cm^3

52. Teacher: Şöyle bir küp yaparsak bu 1 cm 1cm 1cm 1cm^3

If we make a cube like 1 cm 1cm 1cm 1cm^3

53. Fatma: Kesme seker gibi
It is like sugar cube

54. Teacher: Niye bunu kullanıyorlar diyelim ki tahta alıyoruz bir de demir malzeme aldık ağırlık olarak bunlara baktığınızda bunları eşit 1cm^3 boyuta ... ikisini de bu küp büyüklüğünde kesersek onunda ağırlığını alırsak gram olarak eşit hacimde (1cm^3) karar veririz, hangisinin daha ağır olduğuna yoksa karar veremeyiz.
Why do they use this? Let's say we take a piece of wood and iron. When we look at their weight per equal 1 cm^3 size, if we cut them in that size of cube, and weight them, we can decide gram per equal cm3, otherwise we can't decide which one is heavier

55. Mehmet: Anladın mı Sekerim?
Did you understand Sweety?

56. Burak: Bizim dükkanda bir şişe yağ mesela aynı şişe sudan daha ağırdır.
In our shop a bottle of oil is heavier than a bottle of water.

57. Teacher: Evet güzel örnek. Yani bir şişe bir litre diye düsünsek hacim volume olarak
Yes it is a good example. If we think one bottle is one litre as volume

58. Sema: Aynı miktar yağ fakat daha ağır
Same amount of oil but heavier

59. Teacher: Demek ki yağın densitesi yani yoğunlugu sudan daha ağır
So that means density of oil is heavier than water

60. Mehmet: Tamam mı?
Is it okey?

61. Teacher: Densite olarak, bunun bize çok yararı olur.
As density, this will be very useful for us

62. Burak: Demek ki
That means

63. Mehmet: Buradaki gramı buradaki santimetreküpe bölersek densiteyi buluruz. Kaçı kaça bölüyoruz
If divide the gram here by the centimetrecubed here we find the density. What do we divide by what

64. Sema: Dinlemiyorsun ki ama
But you are not listening

65. Burak: Üçyüzkirk otuza bölersek cevabı buluruz
If we divide threehundred and forty by thirty we find the answer

66. Mehmet: Neden üçyüzkirkı otuza bölersek cevabı buluruz
Why do we find the answer if we divide threehundred and forty by thirty

67. (xxx)...

68. ((Laughing)) ... (xxx)

69. Burcu: Dedi ki üçyüzkirk
He/She said three hundred and forty

70. Ayşe: Ama
But

71. (xxx)

72. Fatma: 2 decimal place

73. Zeynep: Çalışmıyor
It doesn't work

74. Fatma: Niye ki
Why is that

75. Sema: Neyi yapalım
Which one do we do

76. Fatma: miles per hour

77. Ebru: miles per hour speed oluyor.
Miles per hour makes speed

78. Teacher: O üçgenden bulabilir misiniz
Can you find it from that triangle?

79. Sema: Speed

80. Teacher: Denklemi denkleştir
Balance the equation

81. Fatma:1 saatte ne kadar
How fast per hour

82. Burcu: Make sure

83. Ayşe: It doesn't matter o şeyden
It doesn't matter that thing

84. Burcu: Distance speed x times

85. Ayşe: Bunla bunu çarparsak buluyoruz
If we multiply this by this we find it.

86. Burcu: Yaptın mı sen
Have you done it?

87. Ayşe: Çarptın mı
Have you multiplied

88. Burcu: Hı hı
Yeah yeah

89. Sema: Öbür soruyu yapalım
Let's solve the other question

90. Teacher: Kolay di mi bunlar kesinlikle geliyor sınavda
They are easy aren't they? They definitely come in the exam.

91. Burcu: Evet
Yes

92. Sema: Sue drives at an average speed of fiftyseven mph and covers a distance of twohundred and fiftysix point five miles. How long does the journey take in hours and minutes?

93. Burcu: Doğru mu
Is it correct?

94. Zeynep: Nasıl yaptın
How did you do it?

95. Teacher: Anlatır mısın
Will you explain it?

96. Burak: 256.5 i divide ettim 57 ile
I divided 256.5 by 57

97. Mehmet: Ondan sonra birşeyler yaptım
After I did something else

98. Burak: Kaç çıktı
Literary translation ; how much/many did it come out?
The meaning : what is the result?

99. (xxx)

100. Mehmet: Hours`mu miles`mı? Saat olur değil mi
Is it hour or mile? It will be hour, won't it be?

101. Burak: miles

102. Ebru: Saati nasıl dakikaya çevirirız
How do we convert an hour to minutes?

103. Ayşe: 60 ile çarparız
We multiply by 60

104. Teacher: Olur mu
Can it be?
((By asking 'can it be' instead of 'is that right' we let student think more))

105. Mehmet:4 saat 240 dakika
240 minutes in 4 hours

106. Burak: üzerine 30 u ekle
Add 30 on it

107. Teacher: Anlatır mısın lütfen
Can you explain please

108. Burak:Bak şimdi
Look now

109. Burcu: Uzaylı
Alien

110. Ayşe: saat .... dört nokta beş
hour .... four point five

111. Burcu: 4 saat
4 hours

112. (xxx)

113. Sema: Yaa
Oh

114. Mehmet: Canım benim uzaklık distance
My sweethearth distance distance

115. Fatma: ee sonra
so later (meaning what happens)

116. (xxx)

117. Zeynep: per hour her saat
per hour every hour

118. Mehmet: 5 mms

119. Burcu:Nerdeydi? Cennette mi?
Where was he/she? In heaven?

120. Ayşe:Olmasa olmaz
Literary translation: If not,no way
The meaning: It is essential

121. (xxx) ((Laughing))

122. Sema:Soru
Question

123. Mehmet: Soru da soru olsa
If the question is a question (What a question)

124. Sema: Soru
Question

125. Mehmet:How long does the journey take hours and minutes diyor. Kolay gibi
It says How long does the journey take hours and minutes.. It looks easy

126. Fatma: Tamam
Okey

127. Ebru: Evet
Yes

128. ((Yawning))

129. Zeynep: (f) okunuyor. A piece of lead is density of twelve grams per centimetre cubed and a mass of two kilogram work out the volume in centimetre cubed.
Reading (f)

130. Teacher: Nasil yapariz?
How do we do it?

131. Burak: Bir cm^3 ü 12 grammış. Bir de 2 kg ının kaç cm^3 olduğunu bulucaz.
1 cm^3 of it was 12 grammes. We will find how many cm^3 it makes its 2 kgs.

132. Mehmet: Ben her zaman formül olduğu ...

I think always there is formula

133. Burcu: Aboo
Wow

134. Teacher: Eğer bilmiyorsan formülü, ezberlemiyorum bu şekilde yazıyorum
If you don't know the formula, I don't memorise it I write it like this

135. Ayşe: burada da aynı şey
It's same thing here too

136. Mehmet:denklem
equation

137. Teacher: Genelde bu şekilde yazıyorum ama
Usually I write it like this way

138. Sema: bunların eşit olması lazım
These should be equal

139. Teacher: g da g kg da kg
Gr in gr kg in kg

140. Ayşe: 2000 g demek ki ne yapacaz demek ki ne yapacaz
2000 gr, so what are we gonna do what are we gonna do

141. Burcu: Bunla bunu çarpıp buna bölücez
We will multiply this and divide by that

142. Zeynep: 2000`i 12 ye böldüğünüzde cevap çıkıcak Kaç mı 2000 divide 12
The answer will come out when you divide 2000 by 12.. How many? 2000 divided by 12

143. Sema: Bana söyle
Tell me

144. Zeynep: 166

145. (xxx)

146. (x) (3) ((Laughing))

147. Mehmet: 166.6 cm^3 müş o kadar işte
It was 166.6 cm^3 that is it

148. Teacher: Şunu öğrenirseniz her türlü soruyu çözersiniz
If you learn that you can solve all kind of question

149. (x) ...

150. ((Laughing)) (xxx)

151. Fatma: Yapamadığını bil
Know that you couldn't do

152. Ayşe: Yapmak istedim ama
But I wanted to do it

153. Burcu: İnşallah
God willing

154. Ayşe: Tamam tamam
Okey okey

155. Sema: Ayy
Oh

156. Ebru: İkinci soruya geçiyoz
We are passing to the second question

157. Burcu: Ayy ben nefes alamıyom
Oh, I can't breath

158. Ayşe: Alırsın alırsın
You can breathe you can breathe

159. Sema: Camı aç biraz
Open the window a little bit

160. (xxx)

161. Burcu: Astımım vardı da
I got asthma that's why

162. Teacher: Evet , ikinci soru
Yes, second question

163. Sema: Kolay
Easy

164. Teacher: Change the followingto percentages. Give your answers to one decimal place.

165. Ayşe: Burcu yapsın
Burcu will do it

166. Sema: Percentage ın ne olduğunu biliyorsun değil mi
You know what percetage is don't you?

167. Teacher: Kim yapar
Who does it?

168. (xxx)

169. Teacher: Nasıl yaparız
How can we do it?

170. Mehmet: 17 out of 67 yazalım
Let's write 17 out of 67

171. Sema: Gülme 17/67 yazdın mı
Don't laugh. Did you write 17/67?

172. Mehmet: Şimdi bunu decimal`a çevirelim
Now, let's convert this into decimal

173. Fatma: Çevirelim, nasıl çevirecez bunu
Let's convert, how do we convert this?

174. Ebru: Çevir bakalım bunu
Let's see, convert this

175. Mehmet: Bunun neyi var
What is this got? ((meaning; what's wrong with this))

176. Fatma: O sana benziyor biraz
That looks like you a bit

177. Ebru: Oooo

178. Fatma: Neyi olduğunu bilmiyor
(he/she) doesn't know what is (he/she) got

179. Ayşe:17/67 bölüyor di mi
17/67 divides it, isn't it

180. Ebru: olunca
when it happens

181. Fatma: 25

182. Sema: 0.25

183. Ebru: Annem
My mother

184. Burcu: Önemli değil
It's not important

185. Teacher: 0.28 olduğu zaman percentage olarak ne demektir

When it is 0.28, what does that mean in percentage

186. Fatma: 28% o kadar
28% that's it

187. Burcu: ... yaa
Oo

188. Mehmet: Kızım
My daughter

189. Ayşe: Decimal

190. (xxx)

191. Fatma: Ama 50 nereden aldın
But where did you get 50 from

192. Teacher: İkinciyi yapalım (b)
Let's do the second one (b)

193. Burcu: b ya
Oh, b

194. (x)

195. Fatma: b yi yapalım
Let's do b

196. Mehmet:134/138

197. Burak: Ne diyor … coursework
What does it say coursework

198. Mehmet:Hayır
No

199. Zeynep: Anlamıyom ... ne anladın
I don't understand what did you understand

200. (xxx)

201. Ebru: ben şey yapayım
Let me do the thing

202. Sema: çok büyükmüş
It was very big

203. (xxx)

204. Burcu: almış, vallaha

(he/she) took it, honestly

205. Ebru: Yapalım, kaçıncı sorudayız
Let's do, which question are we on

206. Fatma: b

207. Burcu: b yi yapıyoruz
We are doing b

208. Mehmet: No,

209. Ebru: Nasıl yaptın
How did you do?

210. Sema: Deminki gibi
Like the one before

211. Mehmet: Sonra da böldün
Then you divided it

212. (xxx)

213. Ebru: Zero 34 seven

214. Mehmet: c yi yapalım kolay
Let's do c, easy

215. Teacher: kim yapacak
Who is going to do it?

216. Burak: Kolay 82 possible
Easy 82 possible

217. Sema: ... kaybettim
I lost it

218. Ayşe: yanlış almış
(he/she) has taken wrong

219. Fatma: doğru almış
taken correct

220. Burak: Yani 82 out of ... 82 bölü 120 yazıcaz
That means we will write 82 out of 82 divided 120

221. Fatma: Bölücez Tamam
We divide (it) Okey

222. Teacher: Bana sormak istediğiniz soru var mı
Is there any question you want to ask me

223. (xxx)

224. Burcu: Kafam karışıyor
My head is getting mixed up/ getting confused

225. Mehmet: Sen
You

226. Teacher: İsterseniz grafiklere bakalım biraz
If you like let's look at the graphics a little bit

227. ((Laughing))

228. Mehmet: Birkaç tane problem
A few question

229. Sema: Evet, şeyi biliyor musunuz
Yes, do you know the thing

230. Burak: Table`ları. Genelde hep table`lar geliyor.
Tables, usually tables come (at exam)

231. Teacher: Mesela two way table`lar
For example two way tables

232. Sema: Kolay, geçelim o zaman
Easy, so let's move on

233. Teacher: Mesela şöyle birşey biliyor musunuz
For example do you know something like this

234. Ebru: iki tane
two pieces

235. (xxx)

236. Burak: Geçelim
Moving on

237. (xxx)

238. Teacher: Three diyagramları biliyor musunuz
Do you know three diagrams

239. Burcu: Ney
What

240. Burak: Şimdi three diyagramda
Now in three diagram

241. (xxx)

242. Sema: three one tekrar ayrılınca ikinci kola
When three one divides again to the second branch

243. Zeynep: 5/9 olduğu için
That's because 5/9

244. Mehmet: Tekrar 4/9 5/9 bu ikisini birbiri ile çarpıyoruz.
Again 4/9 5/9, we multiply these two with eachother

245. Teacher: Hem red green hem green red derse çarpıp ekliyoruz.
If it says both red green and green red, we multiply and add up

246. Mehmet: Yehh

247. Teacher: Soruyu çözelim
Let's solve the question

248. Fatma: Kitap getireyim
Let me bring a book

249. Ayşe: Ben
I

250. (xxx)

251. Sema: 278

252. (xxx)

253. Teacher: Evet, yapabilirsiniz
Yes, you can do (it)

254. Mehmet: 278 ...gör
278 see

255. Fatma: ikincisi
The second

256. Burcu: ... head head

257. Burak: Nasıl yaparız
How do we do it?

258. Mehmet: Şimdi bak
Now look

259. Burak: Birinci, dinliyor musun
The First (one), are you listening?

260. Mehmet: Birinci gel ikinci gel
The first (one) come, the second (one) come

261. (xxx)

262. Burak: Evet half, burası halfsa burası half olucak
Yes half (of it), if this is half this will be half

263. Burcu: yarı yarı yarı yarı
Half half half half

264. Ebru: Susar mısın lutfen
Can you be quiet please

265. Sema: Evet ona göre çarpıyoruz bunları
Yes we multiply these like that

266. Zeynep:Çok basit
Very simple

267. Teacher: Kesin yaparsınız
You definitely do (it)

268. (xxx)

269. ((Singing))

270. Fatma:Yapıcam laughing
I'll do

271. Ebru: Ben de alabilirim
I can take it too

272. (xxx)

273. Zeynep: 0.5 (xxx) 0.5

274. Teacher: Anladınız mı
Did you understand?

275. (x) ((Laughing))

276. Fatma: Doğru mu
Is it correct?

277. Ayşe: belki orada şey
May be there, thing

278. Mehmet: Eve geç yollanacakmışta
It will be sent home late

279. Burcu: Yemek yiyecekmişte
(He/She) will be eating meal

280. Burak: good ... ((Laughing))

281. Mehmet: Öğretmen geldi
Teacher came

282. Sema: Birinci soru bitmedi konuşuyorsunuz.
The first question hasn't finished and you are talking

283. Mehmet: a var going 5
There is a, going 5

284. (xxx)

285. Fatma: red card and table

286. Burcu: It's gonna be you

287. Ebru: Tamam
Okey

288. Burcu: Anlayabiliyorsun
You can understand

289. Mehmet: Herşeyi yazıyor
It writes all (it says it all)

290. Burak: Hadi
Come on

291. (xxx)

292. Teacher: Bitti mi
Has it finished?

293. Zeynep: Bitti
Finished

294. Mehmet: Tamam
Okey

295. Teacher: Çözersiniz onu da
You solve this one too

296. Mehmet: x 0.5

297. Burak: Ne çıkar
What comes out?

298. Sema: b yi nasıl yaptın
How did you do the b?

299. Burcu: a yi b yi
the a the b

300. Mehmet: Sonuç 0.5
Result 0.5

301. Fatma: Bu kaç ki?
What is this number?

302. Ebru: a'yı nasıl (x)
How did you (do) the a

303. Mehmet: bir dakika bak oğlum
Can you look one minute my son?

304. Sema: b 0.25

305. Burak: Probability diyoruz
We say probability

306. Teacher: Yarın gelip probability worksheet alın
Tomorrow go and get probability sheet

307. (xxx)

308. Fatma: Ne zaman
What time (When)

309. (xxx)

310. Teacher: Okuldan sonra
After school

311. Ayşe: Gelmiyorsun
You are not coming

312. Sema: Geliyorum
I am coming

313. Ayşe: Yarın
Tomorrow

314. ((Laughing))

315. Sema: Yarın gelince
When you come tomorrow

316. Zeynep: Hadi geç kalmayın
Come on don't be late

317. Teacher: Eve gidin çıkınca
Go home when leave (here)

318. Zeynep: Ablama gidiyom
I am going to my big sister

319. Ayşe: Yarın geliyor
Coming tomorrow

320. Zeynep: çağırdı
(He/She) called

321. Teacher: Kağıtları eve götürün
Take the paper home