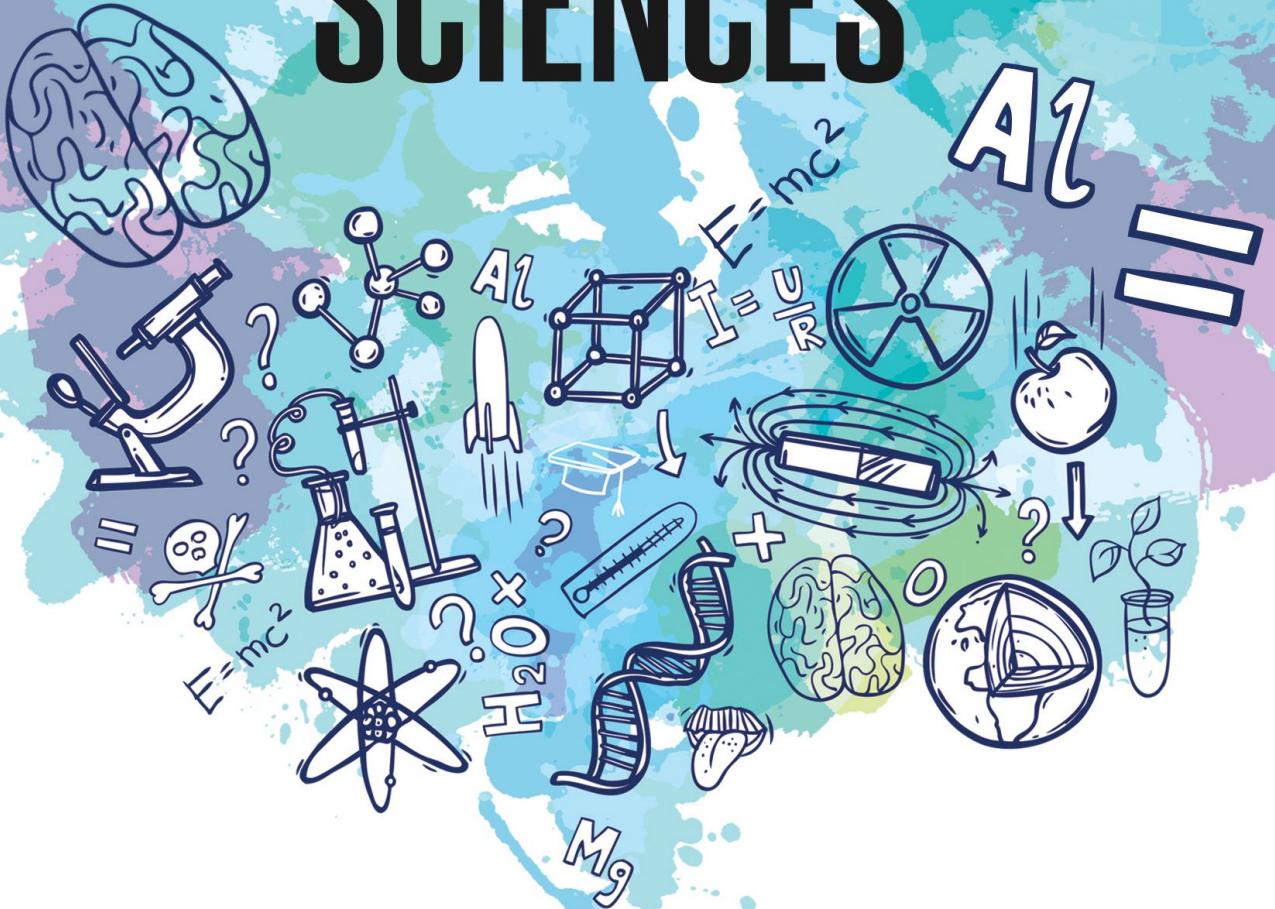


Unpackaging Theory & Practice in

EDUCATIONAL SCIENCES



Editor

Abdülkadir Kabadayı



LIVRE DE LYON

2023

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Unpackaging Theory & Practice in Educational Sciences

Editor • Prof. Dr. Abdülkadir Kabadayı • Orcid: 0000-0003-4114-5890

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e-mail • livredelyon@gmail.com



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FOREWORD

The theme of this year's book is *Unpackaging Theory & Practice in Educational Sciences* with many researches now taking on global dimensions, it is imperative to discuss innovative approaches towards educational sciences including the best research integrity practices. I believe that this book could serve as a catalyst for strengthening international cooperation on the transfer of innovative approaches towards education.

The challenges in educational sciences are both difficult and interesting. Academicians are working on them with enthusiasm, tenacity, and dedication to develop new methods of analysis and provide new solutions to keep up with the ever-changing world. In this new age of global interconnectivity and interdependence, it is necessary to provide security practitioners, both professionals and students, with state-of-the art knowledge on the frontiers in educational sciences. This book is a good step in that direction.

This book provides a valuable window on educational sciences and covers the necessary components from educational sciences. *Unpackaging Theory & Practice in Educational Sciences* addresses especially educators, researchers, academics, postgraduate students, pre-service teachers, teachers and school leaders own development. It makes recommendations to educators, researchers, academics, postgraduate students, pre-service teachers, teachers, school leaders and policy makers and so on

The editor would like to thank all of the authors who made this book so interesting and enjoyable. Special thanks should also be extended to the reviewers who gave of their time to evaluate the record number of submissions. Especially to the LVRE DE LYON Publishing House, we owe a great debt as this book would not have been possible without their consent efforts.

At this juncture, I would like to thank the authors for all of their cooperation. We hope that all of those reading enjoy these chapters of the book as much as possible.

Editor
Prof. Dr. Abdülkadir KABADAYI

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CHAPTER I

UNRAVELING THE MOTIVATIONAL PUZZLE: ENHANCING ACADEMIC STUDENT SUPPORT THROUGH SUPPLEMENTAL INSTRUCTION

FAICAL BEN KHALIFA

(Lecturer), Dhofar University, Oman

faical_khalifa@du.edu.om

ORCID: 0009-0008-3500-8930

Introduction

The transition from secondary education to tertiary education presents significant challenges for students in Oman, particularly in meeting the entry requirements (Al'Adawi, 2020), especially in English and math. Despite completing a supposedly demanding secondary education, a notable proportion of graduates find themselves unable to meet the standards set for college admission (Samaranayake et al., 2022). This discrepancy is evident as around 90% of these students are placed at the A1 level according to the Common European Framework of Reference for Languages (CEFR) criteria. As a result, these students are required to undergo a year of foundational subjects, including English, mathematics, and computing, to bridge the gap between their current proficiency and the expectations of higher education institutions.

To address this issue, remedial intervention programs have been implemented in Oman's educational system, specifically targeting struggling students commonly referred to as "students at risk" (Al-Mahrooqi, 2012). These programs aim to provide additional support and resources to help these students cope with the challenges they face in concurrent mainstream classes. Remedial sessions, conducted outside regular class hours, are led by volunteer teachers as well as fellow students with high proficiency in the taught subjects. However, despite the existence of these remedial programs, a recurring issue

persists-- low student turnout and a lack of motivation among the targeted students. This lack of engagement and attendance has raised concerns about the effectiveness of these programs and their ability to address the academic needs of struggling students. Moreover, the consequences of this disengagement are severe, including repeated failures and a heightened risk of dropping out before completing college.

To uncover the reasons behind the students' lack of motivation and attendance in remedial programs, this study embarks on an in-depth investigation. The research starts with an investigation of an existing remedial program to expose the factors contributing to the students' motivational challenges. By delving into the underlying causes of their disengagement, this study aims to identify the barriers and obstacles hindering their active participation. The study then proceeds to implementing and evaluating a non-remedial academic support intervention known as supplemental instruction (SI). This intervention, conducted within the same educational context, aims to provide additional academic assistance to struggling students in a different format. By exploring alternative approaches to support and engage students, the study seeks to enhance the effectiveness of existing remedial programs and ultimately improve the academic outcomes of students in higher education in Oman.

The findings of this research endeavor hold the potential to inform educational institutions and policymakers about the critical factors influencing student motivation and engagement in remedial programs. By addressing the motivational challenges faced by students, it is anticipated that the support programs can be refined and tailored to cater to the particular needs of struggling learners, fostering a more conducive learning environment and increasing their chances of academic success in the tertiary education landscape in Oman.

Literature review

Extensive literature demonstrates that providing academic support to underperforming students beyond regular classes can significantly improve their chances of success (Balfanz et al., 2002). These support programs traditionally target students at risk and aim to enhance their academic performance, enabling them to bridge the gap with their peers and pass. Tutoring is one of the most renowned forms of academic support. Tutoring programs typically offer direct instruction, one-on-one attention, error correction, and motivation to improve performance. These programs are considered traditional and have been likened to a medical model based on diagnosis and referral (Martin et al., 1996). Students

are initially diagnosed with problems based on their prior history and diagnostic testing, and they are then either referred by professors or choose to self-refer. However, this system suffers from several significant issues. One of these issues is the stigma felt by students involved in these remedial programs (Stuart, 2009), leading them to ignore referrals. Unfortunately, the failure of the referral system only worsens the problem, as individuals who need assistance the most are the least inclined to seek it (Martin et al., 1996).

In response to these issues, a non-referral, non-remedial system known as SI was developed by Deanna Martin in 1973. Rather than attributing blame to students, this model shifts the blame to historically difficult, high-risk subjects. The goal is to enhance students' academic performance in these challenging courses (Hurley et al., 2006). The SI model draws upon various peer learning theories, including cognitive learning theories, behavioral learning theories, interpretive-critical theories and social learning theories (Hurley, Jacobs & Gilbert, 2006). In fact, peer learning has its roots in Vygotsky's (1978) learning theory and Bandura's (1977) Social Learning Theory, both of which recognize that students learn through interactive engagement with peers (Oxford, 1997).

SI is, unlike the traditional remedial system, a voluntary intervention program that operates on a non-remedial and non-referral basis. It provides regular peer-facilitated revision sessions where students can engage in discussions and actively assimilate information (Arendale, 1994). SI does not require pre-screening to determine who should or should not attend, making it accessible to all students, not just those diagnosed with specific "symptoms." Even when made mandatory, SI has shown effectiveness (Hodges et al., 2001). The open-door policy of SI provides a level of anonymity for at-risk students, allowing them to save face in front of their peers. Contrary to the diagnosis and referral-based remedial system, still in practice in many colleges and universities, including those in Oman, SI operates on the principles of free choice, preserving privacy and allowing students to maintain their dignity. This encourages underperforming students to engage in the program.

Apart from preserving self-esteem and evading stigma, struggling students benefit from stress-free peer support during non-remedial sessions. This peer support takes the form of cooperative learning, collaborative learning or just student-student interaction. While Topping (2005) places peer learning within the realm of cooperative learning, Martin et al. (1996) argue that it falls under collaborative peer group learning. Regardless of this categorization, peer

learning is believed to foster the creation of learning communities (Tinto, 2019), known for student centrality. These communities seem to derive significant benefits from the four principles that underpin SI, that is breaking down complex tasks, cause and effect relationships, modeling and most importantly positive reinforcement (Hurley et al., 2006).

Positive reinforcement assists students in developing new study habits and learning strategies that can enhance their performance in class and in assessment. Students acquire the skill of breaking down complex tasks into manageable parts, resulting in playing down the perceived challenges associated with the learning process. Through non-remedial classes, students establish causal relationships that improve their study strategies and preparedness for exams. SI heavily relies on student leaders who act as models, demonstrating effective study approaches and problem-solving techniques. Learners observe and internalize these behaviors, ultimately acquiring them.

In addition to drawing principles from behaviorism, SI also incorporates cognitive theories from scholars such as Bruner (1968), Piaget (1932, 1973), and Flower and Hayes (1981) (Hurley et al., 2006). For instance, students are provided guidance on organizing, assimilating, and integrating new information and learning experiences. This cultivates cognitive assimilation processing, leading to enhanced comprehension and retention of information. Through discussion, students develop critical thinking skills, enabling them to perceive concepts from different perspectives. Students are encouraged to utilize their existing schemata to understand new information and connect new concepts with prior knowledge. These connections equip learners with the ability to grasp new knowledge, resulting in a solid understanding and profound absorption.

Methodology

This research employed an empirical case study design to investigate two distinct student academic support interventions at a university in Oman. The first is an existing remedial academic support targeting pre-college students at risk and the second intervention is a non-remedial, non-referral intervention directed at a broader student population, not exclusively those at risk. A mixed-methods approach was employed, combining a qualitative inquiry premised on individual and focus group interviews and a quantitative inquiry through surveys, as illustrated in Figure 1 below. The in-depth individual interviews were specifically conducted with the chairperson responsible for committee work and the head of the student academic support committee charged with

the overseeing of academic support programs. The focus group interviews were held with five faculty members who were responsible for the organization and management of these support programs.

The quantitative research, however, involved the distribution of two sets of questionnaires. The first set was administered to 48 tutors and 58 tutees involved in the remedial support intervention. The second set was given to 10 tutors and 41 tutees involved in the SI intervention. The qualitative data collected from individual and focus group interviews was analyzed and thematized using NVivo, a qualitative data analysis software. The quantitative data gathered from the surveys was analyzed using SPSS, a statistical software package. By employing a mixed-methods approach and utilizing various data collection techniques and analysis tools, this research aimed to provide a thorough understanding of the challenges faced by students at risk in traditional remedial academic support and the merits of a non-remedial, non-discriminatory academic support program.

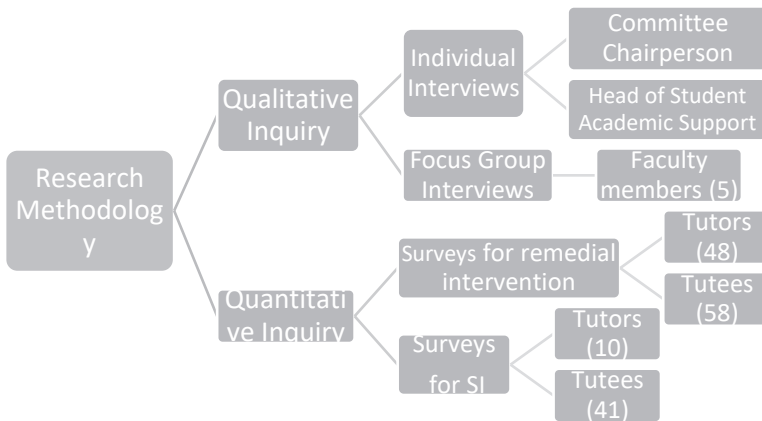


Figure 1. Research methodology illustrated

Uncovering challenges faced in a traditional remedial support program

Findings from individual and focus group interviews revealed three main challenges faced by students at risk while participating in remedial sessions, as illustrated in Figure 2 below.

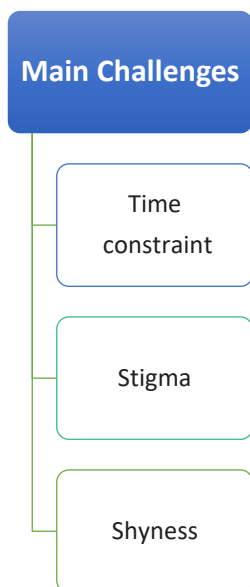


Figure 2. *Challenges encountered in an existing traditional remedial program*

i. Time constraint

Time constraint was identified as a significant factor affecting students “at risk”. The individual interviews with both the committee work chairperson and the head of the academic support program revealed that these students seemed to be facing challenges in managing their academic workload (cf. Bowering, Mills & Merritt, 2017; Nadinloyi, et al., 2013). One of the interviewees disclosed that students “at risk” “were not motivated to give up their time to participate in study groups” (L. N., personal communication, March 4, 2020). The juggling of a demanding regular coursework and a remedial program resulted in a time crunch, leaving students struggling to balance the additional remedial sessions with the mainstream academic responsibilities. This time constraint also affected their ability to actively engage in the remedial sessions, causing delays or absences. The latter seemed to have impacted upon their ability to fully assimilate the material, which appeared to impede their progress and potential success. The discussion with the focus group, or five faculty members overseeing the program, highlighted the importance of the time constraint, but also suggested that some other deeper underlying issues might have undermined the students’ motivation for this program (Focus group, personal communication, March 9, 2020). Recognizing the need to explore further, I decided to investigate the potential existence of other factors that kept causing delays and absences from the remedial sessions.

ii. Stigma

Stigmatization emerged as a key factor affecting students-at-risk. The individual interviews disclosed how these underperforming students perceived the label as stigmatizing and therefore demotivating. One of the individual interviewees stated that “no survey has ever been made, but the anecdotal evidence was that students felt stigmatized slowly by the label and that I think is unfortunate” (L. N., personal communication, March 4, 2020). They added that “students at risk were noticed to lack motivation, but what the label has done is to turn the lack of motivation to demotivation” (ibid). A member of the focus group of faulty further asserted the presence of a “stigmatization syndrome” among this category of students. Another member described the issue as an “identity crisis” and a “coping mechanism” that enabled students to save face in a cultural context where students come from closely connected tribes and communities. The clash between personal ego and the recognition for the need of academic support appeared to prioritize the ego, resulting in an inner decision to ignore attending the remedial sessions. This finding seems to align with the literature suggesting that “whether through denial, pride, or ignorance, students who need help the most are least likely to request it” (Martin et al., 1996, p. 2).

iii. Shyness

Shyness was identified as another factor contributing to students’ reluctance to actively engage in remedial classes. The focus group discussions revealed that students “felt shy” to ask for help publicly (focus group, personal communication, March, 2020). The need of attending remedial classes requires that students overcome this shyness, which proved to be a real challenge for some of the at-risk students. These students were hesitant to showcase their weaknesses in front of peers, particularly those from immediate social circles, such as neighbors, relatives or friends. In other words, the fear of judgement and the desire to maintain self-image or reputation seemed to act as a barrier blocking them from seeking the academic support they mostly need. This finding highlights the complex interplay between personal emotions, communal norms and social dynamics in the context of academic support.

Moreover, to capture the views and perspectives of two other main stakeholders, surveys were developed and administered to tutors—senior students involved in teaching the remedial program, and tutees, students at risk who participated in this program. The findings from the tutor surveys revealed that the majority of tutors, 90 percent, believe that the at-risk students lacked motivation to attend the remedial classes, despite the tutors’ sincere efforts in

promoting the program. Despite the notable endeavors of the tutors to raise awareness among struggling students, 84 percent assert that their appeals went unnoticed, as attendance fluctuated and mostly remained low. Eighty-six percent of the tutors perceive that students at risk were hesitant to be taught by their peers, with shyness being identified as one of the main underlying causes. Ninety-two percent of the tutors either agree or strongly agree that shyness posed a significant challenge for the at-risk students. About three-quarters of the tutors believe that the label “at-risk” is responsible for the lack of motivation, which may have eventually led to demotivation. These survey results, showed in Table 1 below, corroborate the qualitative findings regarding the students’ feelings of shyness. The survey results also support the notion that the stigmatization label caused embarrassment for the at risk students, leaving them reluctant to attend the remedial sessions. This could be better understood within the context of a patriarchal society where men are expected to exhibit strength and women are expected to uphold social status, avoiding any acts that might diminish their standing among relatives and acquaintances (AbuOaf, 2020)

Table 1. Findings from questionnaire administered to tutors

QUESTIONS	STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE
I was regular to the tutoring sessions	25%	75%	0%	0%
I was motivated to tutor students at risk	36%	60%	0%	0%
Students attending tutoring sessions show improvement	21%	77%	2%	0%
Student turnout was low	21%	63%	15%	0%
Students were reluctant to be tutored by peers	17%	69%	10%	4%
Student motivation was affected due to the label, at-risk	6%	67%	25%	2%
Students face challenges related to shyness	19%	73%	8%	0%
Students show low motivation	10%	79%	8%	2%

Tutees were the second stakeholder whose views on the remedial program were sought. They were split into two categories, attending and non-attending

tutees. The questionnaires were administered to attending tutees, as those who were not, chose to remain under the radar. The attending tutees were asked to respond to such statements as “I was selected on the basis of my performance in class”, “peer tutoring sessions aimed to help me as an at-risk student”, “I was regular to the study group sessions”, “I was motivated to learn in the study group”, “I showed improvement after attending the sessions”, “I was reluctant to be tutored by peer students” and finally “I felt stigmatized to be called a student at risk”. These statements correspond to 1-7 column clusters shown in Figure 3 below. The findings from this survey confirmed that the majority of students attending remedial classes were labelled “at risk”.

During the data collection, I was under the impression that only the non-attending students labelled “at risk” were the ones that felt a sense of stigmatization, but the findings revealed that 50 percent of the attending students also felt the same feeling of stigmatization (see the results shown in the seventh cluster of columns in Figure 3 below). As to shyness, 60 percent of the attending tutees declared they had some reservations about being taught by peers. These quantitative findings assert the findings from the qualitative inquiry about at-risk students’ shyness to appear vulnerable in front peers.

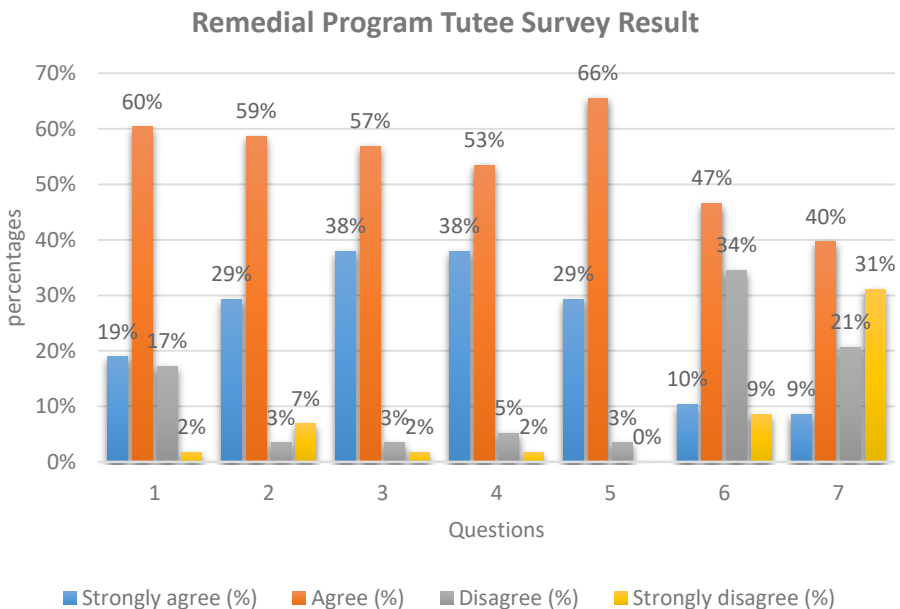


Figure 3. Findings from the remedial program tutee survey

Implementing and evaluating a non-remedial intervention

Following the evidence that indicates the remedial program is counterproductive and ineffective for the majority of struggling students, a decision was made to explore an alternative academic support system that does not involve referral and labeling. The SI model, widely recognized as a valuable academic support service (Buchanan et al., 2019), emerged as a suitable alternative. The SI's unique approach of integrating both subject matter instruction in a stress-free environment with an emphasis on developing effective study skills seems to hold great promise for all types of learners, including the struggling ones. Consequently, an SI program was created and evaluated for suitability and efficacy after one semester of its initiation. The data collection process followed a mixed methods approach, as illustrated in Figure 1 above. The individual and focus group interviews were conducted with the same participants, as they were the ones responsible for the preparation and implementation of the SI program. The surveys, however, were administered to ten tutors and 41 tutees involved in this enterprise.

The findings from the individual and focus group interviews revealed an overall satisfaction with the SI system. NVivo was used to analyze and thematize the respondents garnered from the interviewees and the following themes emerged, as illustrated in Figure 4 below. What follows is a discussion of these themes.

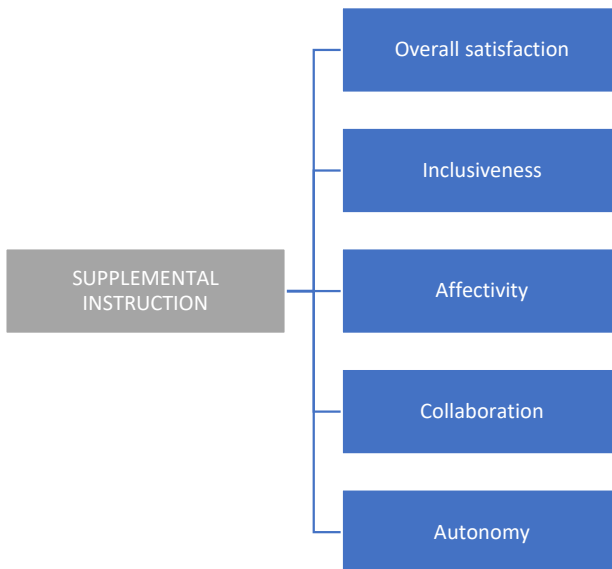


Figure 4. Findings from implementing SI

i. Overall satisfaction

The individual and focus group interviews disclosed a high level of satisfaction among the respondents with the initial outcomes of the SI program. It was recognized that the SI program has introduced a new experience that positively impacted students' perception of learning and academic support. Members of the focus group stated that the SI program adopted an inclusive approach that avoids segregation and diagnosis that were previously in place with the remedial program (focus group, personal communication, March 9, 2020). They also revealed that the use of collaborative learning, abled student leaders as guides and stress-free environment has revitalized student support and enhanced student motivation. When given the choice to either revert to the old remedial system or continue with the SI system, all respondents from individual and focus group interviews expressed their preference for the SI system, highlighting that reverting to the old system would be a regressive step towards ineffective practices.

ii. Inclusiveness

Contrary to the remedial system which is usually directed exclusively at struggling students, the SI system employs an open-door, inclusive policy that does not segregate or label students. The interviewees from both groups, individual and focus, believed that this is a great solution to the challenges posed by the remedial program. One of the interviewees stated that "the new SI program is open to everyone and that is the biggest difference" (L. N., personal communication, December 27, 2020), adding that "it is just a wider focus" (ibid.). A second interviewee described the program as "one of the best resources, with larger scope and reach" (I. R., personal communication, March 10, 2020), highlighting its inclusiveness and larger spectrum. A third interviewee from the focus group asserted that the SI program was open to all categories of students regardless of their performance, making struggling students less visible and less likely to be easily identifiable (focus group, personal communication, March 9, 2020). It seems therefore that with the SI system, struggling students are more eager to participate in the program, as they sure to avail of the anonymity they desire.

iii. Affectivity

The integration of subject matter instruction with study skills in the SI program seems to have affected the students' affective skills positively, such as their motivation, interest and attitude towards learning. During the interviews, it was revealed that the level of confidence among SI participants increased,

resulting in better class participation and completion of assignments. An interviewee expressed that they believe SI is instilling better study habits among SI attendees and that led to improvement in the students' learning abilities (L.N., personal communication, December 27, 2020). The focus group findings aligned with these observations. The members of the focus group stated that the new atmosphere created by the SI program was highly positive and conducive to learning (focus group, personal communication, March 9, 2020). They particularly mentioned their appreciation of such arrangements as the program setup, the learning space design (with round tables, allowing collaborative learning) and the selection and training of student leaders. They also noticed that the tutors themselves (student leaders) were "enthusiastic" and "excited" to be part of this new experience (focus group, personal communication, March 9, 2020). As students started displaying some change in attitude, it was reported that some math tutors attended English sessions as tutees and vice versa. Focus group respondents observed that code-switching between English and Arabic helped alleviate pressure and fostered uninhibited discussions between tutors and tutees, as well as among the tutees themselves. Language was no longer perceived as a barrier to learning during SI sessions, allowing for deeper assimilation and better understanding.

iv. Guided collaboration

Contrary to the remedial program that uses teachers or student teachers to lead remedial sessions, the SI program depend on student leaders whose role is not to teach but to guide and facilitate learning. Focus group interviewees noticed that students related more to student leaders than teachers or student teachers (focus group, personal communication, March 9, 2020). They disclosed that student leaders were trained to present themselves as role models and demonstrated how they managed to overcome challenges and achieve goals. They also revealed that student leaders were instructed to engage SI students in collaborative discussions on a given topic until a point of saturation is reached, thus allowing students to raise questions and discuss possible answers until no further questions are raised. The focus group members also noticed that the guided collaboration managed to create an incubator-like environment, helping students to correct and deepen their understanding (focus group, personal communication, March 9, 2020). In brief, the SI session was characterized as a supportive environment that fosters learning through guided collaboration.

v. Autonomy

The introduction of the SI program seemed to have developed a sense of autonomy among students. The focus group interviewees noticed that students no longer asked whether they should attend the sessions, they just attend out of their own volition (focus group, personal communication, March 9, 2020). During both the individual and focus group interviews, there was ample evidence that the SI program encouraged students to take charge of their own learning. One of the individual interviewees said that “the SI program is solidifying what they are already learning and I think that puts more responsibility on students to learn on their own” (N. L., personal communication, December 27, 2020).

Moreover, findings from the surveys corroborate the insights gathered from the interviews. The majority of the SI tutors rated the importance of SI as very high, assigning it a rating of 9-10 on a 1-9 scale. All tutors either agree or strongly agree that SI is beneficial to students, demonstrating a unanimous agreement on the positive impact of the SI program. When asked to rate the features of the SI program, the tutors rated ‘peer-to-peer learning’ in the first position followed by ‘collaboration’ and ‘participation’. In addition, the results of the tutee survey were not dissimilar from the tutor survey. A significant number of the tutees gave SI a rating of 10, signaling an exceptionally high level of satisfaction with the new intervention. The majority of tutees also rated ‘collaboration’ as the most rewarding feature of SI, followed by ‘task-based learning’ and ‘participation’. The tutees also reported improvements in various areas, including understanding, attentiveness, readiness for tests, interaction, confidence, and interest in learning, as illustrated in Figure 5 below. When asked whether they recommend SI to other students, all tutees, with no exception, expressed agreement. This overwhelming majority can tell how beneficial the SI program was to these tutees.

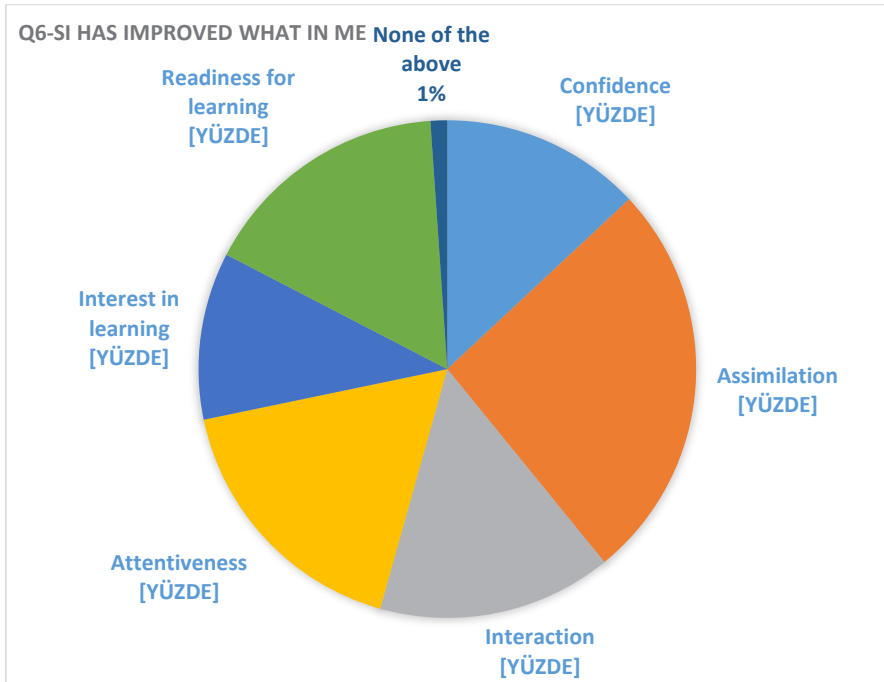


Figure 5. Areas improved following SI sessions

Conclusion

The investigation into a study case on remedial program that uses diagnosis and referral has uncovered its inadvertent promotion of segregation and the perpetuation of stigma among struggling students. The feeling of stigmatization was identified as one of the main factors leading to low motivation among struggling students, labelled “at risk”. This finding assures that the very program which is supposed to support these students is paradoxically defeating its own purpose. Moreover, the implementation of the SI program, with its emphasis on inclusion, non-labelling and autonomous learning, showed a notable impact on students’ behavior and affective skills. This study, therefore, provides evidence of the suitability of the SI model for pre-college students in Oman. While a long-term study on the SI model in the Omani context would provide more nuanced and thorough insights on its potential benefits, the current findings argues against the continuation of the traditional remediation programs that target struggling students exclusively and officially label them “at risk”. However, it is important to acknowledge the limitations of this study, which were twofold.

First, the sample size of both tutors and tutees in both stages of the study was relatively small, though those numbers were the only respondents that were readily available then. Second, the tutees who were believed to be significantly affected by labeling and consequently chose to shy away from remedial sessions were unreachable. Conducting interviews or surveys with these tutees could have provided deeper insights into their feelings about the program and the extent to which they were impacted by the label. Finally, building upon the findings of this study, it is recommended that future research explore alternative approaches to student academic support that embrace inclusivity and foster student empowerment.

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CHAPTER II

NATURE OF SCIENCE IN THE CONTEXT OF SCIENCE AND CHEMISTRY EDUCATION: A REVIEW OF CONSENSUS VIEW AND FAMILY RESEMBLANCE APPROACH¹

OYA AĞLARCI ÖZDEMİR

*(Asst. Prof. Dr.) Marmara University Atatürk Faculty of Education,
Department of Chemistry Education e-mail: oya.aglarci@marmara.edu.tr
ORCID: 0000-0003-2073-8734*

1. Introduction

In a changing world, people try to make sense of the universe and their experiences in many ways. Science is undoubtedly one of the most important ways to understand and adapt to new experiences. People need an adequate and informed understanding of science with the help of science education in schools. The primary goal of science education is to increase students' understanding of science and scientific knowledge. However, science education in the modern century has deeper purposes than this. Science education in our century aims to support students to learn science, scientific knowledge (e.g. scientific theories, concepts, and facts), and scientific studies, engage in science, scientific inquiry, and socio-scientific issues (Hodson, 2011). Science curricula around the world have evolved and developed based on these aims. In reviewing the historical evolution of science curricula in the United States, a breakthrough emerged in the 1960s and 1970s after the launch of the satellite Sputnik 1 in 1957 (Wissehr et al., 2011). At that time, science education primarily aimed to disseminate theoretical scientific knowledge to recruit and prepare a limited number of students for future professions in science and

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engineering. In the 1980s, science curricula throughout the world shifted to seek to address the abilities and needs of all citizens through science education (Eilks & Hofstein, 2017)—a change that inspired curriculum studies focusing on science, technology, and society in many countries (Eylon & Hofstein, 2015). In the 1990s, distinct differences emerged in the European and Anglo-American educational systems, causing shifts in school curricula. The European tradition focused more holistically on developing and maturing students' personalities and identities in science education, while the Anglo-American tradition aimed to introduce students to the basic concepts and principles of science and centered on defining key science learning areas (Fensham, 2015).

Scientific literacy is one of the main aims of science education all over the world (Roberts, 2007). Scientifically literate students are supposed to be knowledgeable enough about science and scientific methods to make defensible conclusions regarding matters of science (Saunders & Rennie, 2013). The Next Generation Science Standards (NGSS) published in 2013 describe three key dimensions of science education in the United States. Those are “disciplinary core ideas, crosscutting concepts, and scientific and engineering practices” (Herz et al., 2020). The national science curriculum in the United Kingdom strives to foster scientific knowledge, conceptual understanding of science, and comprehension of the applications and implications of science (Isaacs et al., 2020). Three areas are covered by the science curriculum requirements in Taiwan: scientific core concepts, the nature of science (NOS), and inquiry skills and scientific attitudes (Park et al., 2020). To help students acquire the understanding, information, and abilities necessary to form a scientific worldview, the Australian curriculum divides science into three interconnected strands: science understanding, science as a human effort, and science inquiry skills (Wernert & Thomson, 2020). The current science curricula of these countries generally include students' understanding of science and technology, NOS, and inquiry skills, and reform initiatives have stressed that changes are necessary to engage students in scientific practices (Namdar & Shen, 2016).

A sophisticated understanding of the NOS is necessary to enhance the scientific literacy of students. There are various definitions of the NOS and it is possible to say that one of the most frequently used and well-known definitions was given by McComas and colleagues. The NOS is a blended and hybrid area consisting of the philosophy of science, history of science, sociology of science, and psychology of science. This particular area aims to seek answers to some questions including what science is, how it functions and develops, how scientists work cooperatively and individually, and how society itself affects

and is affected by scientific studies (McComas et. al, 1998). From another perspective, the epistemology of science, science as a method of comprehending the world, or the moral principles and values behind the scientific inquiry and its advancement are all referred to as the NOS (Lederman, 2007).

Although scientists and researchers cannot agree on the precise definition of the NOS, related literature states that one of the most widely accepted views is the consensus view to explain the aspects of the NOS. These aspects of scientific knowledge are related to students' daily lives and basic features of science and therefore some scholars state that these aspects should be included in school science curricula. This view is mainly based on seven fundamental aspects of scientific knowledge explained below (Lederman et al., 2002):

- a. "Scientific knowledge is empirical (generated from observations of the natural world or based on those findings),
- b. Scientific knowledge is tentative (subject to change),
- c. Scientific knowledge is theory-laden (subjective; influenced by scientists' background, experiences, and biases),
- d. Observation, inference, and theoretical entities in science,
- e. Human inference, imagination, and creativity contribute to scientific knowledge in some ways (scientific knowledge involves the construction of explanations),
- f. The distinctions between scientific laws and scientific theories,
- g. Scientific knowledge is socially and culturally embedded".

Other alternative approaches to the consensus view of the NOS provide different aspects and features of scientific knowledge from various philosophical viewpoints (e.g., Allchin, 2011; Erduran & Dagher, 2014; Irzik & Nola, 2011; 2022; Matthews, 2012; Niaz, 2001; Osborne et al., 2003; Smith & Scharmann, 1999). Nearly two decades ago, Smith and Scharmann (1999) proposed some characteristics that would help distinguish scientific disciplines from less scientific fields. They stated that experts' views on the NOS might differ, and it can be a complicated process to make a distinction between science and pseudoscience and for students to acknowledge this. They proposed to use a set of descriptors (or characteristics) that can help to decide which questions or disciplines are more scientific or less scientific rather than setting a clear boundary on the definition of science. The characteristics which make a field more scientific are related to the objects and processes of study and values of science.

Using a Delphi technique, Osborne et al. (2003) have presented the results of an empirical study and aimed to answer the question of “What should be taught to school students about the NOS?”. Their findings showed that the following aspects were important to be included in school science curricula: “Scientific Methods and Critical Testing, Creativity, Historical Development of Scientific Knowledge, Science and Questioning, Diversity of Scientific Thinking, Analysis and Interpretation of Data, Science and Certainty, Hypothesis and Prediction, and Cooperation and Collaboration in the Development of Scientific Knowledge”.

Matthews (2012), on the other hand, argues that the aspects of the NOS should be revised and developed in terms of philosophical and historical approaches. He stated that the features of science should be discussed and questioned in school science curricula and science classrooms. The nature of scientific knowledge, as well as procedures, institutions, and the cultural and social settings in which scientific knowledge is produced, are among the features of science. Also, philosophical, epistemological, psychological, technological and economic features should also be introduced to the students. The features he proposes to be included in the teaching of the NOS are as follows: “Experimentation, Idealisation (laws contain idealized situations, they are not evident in nature), Scientific Models, Values and Socio-scientific issues, Mathematisation, Technology, Explanation, Worldviews and Religion, Theory Choice and Rationality, Feminism, Realism and Constructivism”.

The family resemblance approach (FRA- proposed by Irzik & Nola, 2011) has recently gained more attention in studies related to the NOS. This approach was developed by Wittgenstein (1958, cited in Irzik & Nola, 2011) to solve the generalization problem in philosophy. Family resemblance means that members of a family are similar in some characteristics and not at all in some aspects. But the problem is determining which similar traits might be unique to that family. In science, there are some features that are valid for all branches of science, but these are also included in other activities such as daily life activities. For example, a referee’s careful observation of a football match is not the same as observation in science. In fact, observation is a concept that can change even according to one’s expertise. For example, when a specialist doctor and someone without medical knowledge is considered to observe the same x-ray, the first observation can be evaluated in a scientific category. In addition, there are branches of science in which relevant data are collected without the need for observation. The same is true for inference. Cops make inferences based on evidence, but that doesn’t mean they do science. This approach is based

on the study of Irzik and Nola (2011) and was further developed by Erduran and Dagher (2014). Science is viewed as a cognitive-epistemic system and a social-institutional system in the FRA. The categories of the FRA to the NOS are “aims and values, methods and methodological rules, scientific knowledge, and scientific practices (practices of inquiry), scientific ethos, social certification and dissemination of scientific knowledge, non-epistemic social values, reward system-a recent category proposed by Irzik & Nola (2022), social organization, power structure, the economics of science”.

In the next two subsections, the aspects of the NOS (consensus view) and the categories of FRA are explained respectively. Some discussions from history of chemistry and science are presented to give examples to some of these aspects.

2. The Consensus View on the Aspects of the NOS

Lederman (2007) explained seven specific aspects of NOS that students in science education should understand about science and scientific knowledge (including scientific processes etc.). These aspects are discussed below with some examples from the field of chemistry and some discussions from different perspectives of science.

2.1. Scientific Knowledge is Empirical

Scientific knowledge is empirically grounded (generated from examination of the natural world or based on the observations and findings). Science is primarily based upon observations of the natural world and empirical data, and these sources ought to be supportive of scientific knowledge and concepts. Evidence must be present in order for science to function, both as a starting point for study and as a means of verifying findings. Natural phenomena are explained by scientific models, laws, mechanisms, and theories. There are several kinds of scientific knowledge, but they all contribute to the explanation of phenomena and are all based on the interpretation of empirical data. Deductions also help scientists develop scientific information (Bell, 2008). The combined use of historical, observational, and experimental approaches is common among scientists. The gathering and analysis of evidence is the foundation of each of these strategies. By its very essence, science is an investigation based on observation and experimentation. Belief in an authority's judgment does not demonstrate the veracity of scientific claims (McComas, 2004).

Chemistry is a branch that investigates the matter and its properties at macroscopic and submicroscopic levels (Zumdahl & Zumdahl, 2013).

Chemists usually specialize in different disciplines of chemistry such as nuclear chemistry, biochemistry, analytical chemistry, environmental chemistry, theoretical chemistry. For example, some chemists develop new drugs and cures for diseases, and study various properties (quality, stability) of those materials. Some chemists work in collaboration with other disciplines such as forensics to gather and investigate evidence in criminal investigations. Even in chemistry there are many different fields of study based on different methods. Discussing different methods as well as the empirical aspect of chemistry, such as the scientific methods of chemistry, the working areas of chemists, etc. can benefit teachers in teaching this aspect to students.

2.2. Scientific Knowledge is Tentative

Although scientific information is dependable and long-lasting, it is not always absolute or certain. Scientific ideas and laws, as well as all other types of knowledge, are subject to change. These modifications may result from new data, intellectual and technological improvements, reinterpretations of existing data in light of novel theoretical developments, cultural and societal developments, or changes in the focus of ongoing research projects (Lederman et. al, 2002). Yet, a lot of students do not understand the tentative nature of scientific knowledge (such as changing of theories). According to Sumranwanich and Yuengong (2014), some students held the opinion that established theories could not be modified.

From the perspective of scientific philosophy, the tentativeness can be justified by principle of falsification. By tests and observations, hypotheses and theories would be developed and evaluated against findings and observations. A scientific assertion that has not yet been completely disproved by actual research or observations may be given temporary approval. However, a theory can never be proven to be 100 per cent accurate or validated because it is impossible to test every single possible particular scenario using empirical data (Popper, 1963). Consequently, since there is always some residual uncertainty in research, any scientific theory should be viewed as provisional (Mueller & Reiners, 2022). In the case of laws, this also applies. To be valid, a law must encompass all instances of the phenomenon it seeks to explain.

Atomic theory and models are a good illustration of how tentative science can be. Combining the disciplines of physics, chemistry, and mathematics, atomic theory describes the nature of atoms and matter. Over time, the atomic model has changed and developed. Between 1898 and 1903, English physicist J. J. Thomson researched electrical discharges in cathode-ray tubes that were

partially evacuated, and the tests resulted in a possible explanation of the compound of atom. He was able to comprehend that all atoms must contain electrons with the results of experiments using cathode ray tubes. Atoms were understood to be electrically neutral. In light of this, Thomson postulated that atoms must possess a positive charge to balance the negative charge.

According to Thomson's theory, an atom is made up of a diffuse cloud of positive charge with random placements of negative electrons. The plum pudding concept envisioned the atom as a spherical shape of positive charge with electrons dispersed throughout like plums in a pudding (a favorite English dessert). However, Thomson's design wouldn't hold up for very long. To test Thomson's plum pudding theory, one of his students, Ernest Rutherford, supplied further information about the composition of an atom. Alpha particles were fired against a thin piece of metal foil as part of the experiment. If Thomson's model were correct, according to Rutherford, the alpha particles should easily penetrate the thin foil, similar to cannonballs passing through gauze. He believed that the alpha particles would only experience very slight path deflections when they passed through the foil. The experiment's outcomes, meanwhile, were quite different from what Rutherford had predicted. Although the majority of the alpha particles entered the detector directly, some were reflected and many were deflected at extreme angles. Rutherford was greatly surprised by the outcome. He compared this result in his work to shooting a cannon at a piece of paper and having the shell bounce back at you. Rutherford was persuaded by these discoveries that the plum pudding theory of the atom could not be correct. The atomic model had to be modified once Rutherford discovered the nucleus. He proposed a model in which the electrons orbit the positively charged nucleus (Zumdahl & Zumdahl, 2013). Rutherford's idea prompted additional queries concerning atomic structure. Students will better comprehend the tentativeness of science if the changes to atomic models are explained with reference to the scientists and history of science.

2.3. Scientific Knowledge is Theory-Laden

Contrary to popular belief, science does not start with unbiased observation (Chalmers, 2013). Two researchers/observers examining the same data may interpret what they observe in different ways. Theoretical and disciplinary commitments, convictions, past knowledge, education, experiences, and objectives of science professionals all have an impact on their research. All of these preexisting conditions create a mindset that influences the issues scientists look into as well as how they look into them, what they look at (and don't look

at), and how they interpret what they see. This personality or mindset, which can also be collective, explains how theories play a role in the development and/or construction of new scientific knowledge. Despite popular assumption, science never begins with unbiased observations. The motivation for, direction of, and meaning obtained from observations (and investigations) are always formed from questions or problems that are derived from specific theoretical viewpoints (Lederman et al., 2002). However, an important feature of science is that the ideas and interpretations of scientists are evaluated by other scientists through various methods (e.g. peer review process) for the validity and reliability of scientific knowledge (McComas, 2004).

One of the important misconceptions related to this aspect is that scientists should be objective. However, scientists are not at a different level of objectivity from people in other professions. They are obviously careful in their evaluation of evidence and in the process of reaching conclusions. In this case, one might think that this misconception is valid, it is possible to say that this is not true (McComas, 1998). Every human being looks at what is happening around him/her through his/her own perspective (this might refer to one's own paradigm). Two people can look at the same object and perceive different things. This is because not only the sense organs determine the objects seen. Knowledge, experience, expectations and theories also determine what and how the observer sees. Although observers look at the same object, they might interpret what they see differently as a result of their experiences (Chalmers, 2013). What these people see depends on their knowledge, their experience and the theories they believe in. In this case, contrary to what the inductive perspective claims, science does not start with observation. There are theories before observation (Chalmers, 2013). According to Inam (cited in Yeşiloğlu et al., 2010), being fully objective can only be possible by looking from the point of absolute objectivity. At the point of absolute objectivity, it is possible to examine both the observing eye and what the eye sees. The eye cannot see the relationship between itself and what it sees from the outside. It is not possible to go outside of the reality observed by the eye and look from there. That is why there cannot be absolute objectivity, because the observers will remain within the whole. Reliability in science can be achieved through openness and non-deception.

2.4. Observation, Inference, and Theoretical Entities in Science

A scientific literature person should be able to understand and determine the difference between inferential and observational facts and findings.

Observations are statements that describe natural facts that can be perceived right away by the senses (or their extensions) and about which observers can easily come to agreement. For example, a researcher conducting a chemistry experiment might observe a precipitate in the beaker when mixing two solutions. Whereas inferences are claims made regarding scientific phenomena that are not immediately perceptible. For example, to explain that it is a chemical change after observing the precipitate is an inference. Understanding the crucial difference between observation and inference is necessary to make sense of the numerous inferential and theoretical concepts and phrases that are used in the scientific fields. The traditional distinction between “descriptive” and “explanatory” knowledge is key to conceptualizing the connections between observation and inference. While descriptive knowledge aims to determine a phenomenon’s state and classify it, it also contains theoretical assumptions (often of “similarity”). When we go to more comprehensive, abstract, and insightful reconstructions that place the phenomenon in a broader context with the intention of going beyond the description and “doing something else,” explanations become possible (e.g. relating, comparing; Sarıtaş et al., 2021).

Teachers who want to emphasize the difference between observation and inference can design experiments in which different physical and chemical changes can be observed in chemistry class. For example, they can design different experiments with heat and conduct experiments on the melting of ice, the burning of magnesium ribbon, the burning of sulfur, the melting and burning of sugar. In each experiment, students are asked to record their observations. They can then ask their students which type of reaction is the relevant reaction (inference). To answer this, students should review their knowledge of what physical change and chemical change are. Then, in class discussion, students can discuss what they have observed (e.g. light, color change, change in the structure of matter) and their inferences about it. In this activity, it is also possible to emphasize the role of science based on experiments and observations. However, it is important that even though observations are descriptive and viewed as neutral “statements of facts” in school science education, many statements in textbooks and explanations and statements during class discussions have a strong hybrid descriptive-explanatory quality. For example, an observation statement about red or blue color of litmus paper in a solution will make sense in context (whether it is reacted with acidic or basic solution – the paper turns red in acidic solution, blue in basic solution).

2.5. The Creative and Imaginative Nature of Scientific Knowledge

The development of scientific knowledge is based on observation of the natural phenomena and involves scientists' imagination and creativity. Science is not purely a rational and objective activity. It is a human product. Scientific explanations and theoretical constructs require creativity and imagination of scientists. Scientific concepts such as molecular models, biological species or black holes are not copies of reality but theoretical models created by scientists (Lederman et al., 2002; Lederman, 2007). The process of constructing scientific knowledge involves elements of creativity as much as in the arts, and creativity plays a major role in the process of drawing conclusions from the evidence collected (McComas, 2004). The creativity and imagination of scientists have played a role in many developments in the history of science. Examining current studies on the discovery of the structure of DNA (biology), the periodic table and the classification of substances (chemistry), nanotechnology research (chemistry, medicine, physics) can raise students' awareness of creative processes in science. In high school chemistry education, students might tend to think that they should have a correct answer and conclusion; therefore, scientific studies should be planned and conducted in structured way. Inquiry activities and open-ended experiments in collaborative working groups could help students to see science as being comprised of imaginative and creative processes.

2.6. Scientific Theories and Laws

Scientific theories are internally consistent, well-established, and heavily supported systems of explanation. Large collections of seemingly unconnected observations in multiple fields of study are explained by theories. More significantly, theories play a significant part in creating research challenges and directing ongoing investigations. It is not impossible to directly test theories. Laws, on the other hand, are descriptions of correlations between observable phenomena. Theories and laws are two distinct types of knowledge, and they do not interconvert (Lederman et al., 2002).

2.7. The Social and Cultural Embeddedness of Scientific Knowledge

Science is a human endeavor practiced in cultural settings and scientists are part of that specific culture. Therefore, scientific knowledge can be seen as a product of science and culture. There is a two-way interaction between the components of science and culture. Politics, economics, philosophy, and

religion are among the cultural components (Lederman et al., 2002). Social factors are among the most important factors which can support or, conversely, hinder the exploration of scientific issues.

Chemistry teachers might refer to the story of Antoine Lavoisier; that can serve as an example of the significance of social reputation and importance in the pursuit of science. Lavoisier gained a reputation as a chemist by conducting a number of studies on the properties of the air. He established his laboratory in the Paris Arsenal after being chosen as the commissioner to oversee the gunpowder industry. He showed the superiority of the combustion model over the phlogiston hypothesis on the basis of his studies there, and he also gave oxygen its name. Lavoisier worked as a tax collector and a lawyer in addition to his chemistry endeavors. Therefore, he was a rich person independent from scientific studies. He was put to death by the guillotine because of his business transactions, which led to him being labeled after the French Revolution as a wealthy landowner who took advantage of the underprivileged. As a result, political factors led to the end of a renowned chemist's career and life (McComas & Kampourakis, 2015).

3. An Instructional Activity to Introduce the Aspects of Nature of Science to Pre-Service Chemistry Teachers

An activity will be introduced to teach the aspects of NOS described above to a group of pre-service chemistry teachers in this section. In the activity titled "History of Thermometers", the topics of heat, temperature and the invention of thermometers were brought together with NOS aspects. The activity was developed and used in the author's doctoral dissertation (Ağlarıcı, 2014). The aim of this activity was to develop pre-service teachers' views on the NOS and to introduce them to the historical development of an apparatus that they frequently use in laboratory courses. The imagination and creativity of scientists, the theory-laden and tentative nature of scientific knowledge were discussed with the participants and these NOS aspects were outlined in the class discussion. The concepts of heat and temperature are confused and incorrectly used interchangeably in everyday life. For example, when a patient's body temperature is measured with a thermometer, incorrect sentences such as "The body heat is very high" can be heard (in the Turkish context heat is often used instead of temperature in everyday usage). For this reason, various questions were asked and examples were given to the pre-service teachers to distinguish these concepts. Then, pre-service teachers examined the properties

of a thermoscope, which was designed for basic temperature measurements and resembled a primitive thermometer. The thermoscope does not have the grading system found in a thermometer, and as such, it only shows the temperature change in a system-whether it is getting cold or hot. Then, the differences between a thermoscope and a thermometer are analyzed. Various thermometers and the differences between them are also discussed. The scientists who invented the thermoscope and thermometer (Galilei Galileo, Santorio, Duke Ferdinand of Tuscony, Fahrenheit, Celsius, Kelvin) and their works were explained. 20 pre-service teachers participated in the activity. At the end of the activity, pre-service teachers were asked to answer various questions related to the activity. Their answers were analyzed by content analysis and frequencies and percentiles were calculated. In the first question, the pre-service teachers were asked what changes would occur if they were using a thermoscope instead of a thermometer in daily life. The majority of pre-service teachers (n=9, 45%) stated that there would be problems related to human health in this situation. They stated that if thermoscopes were used instead of thermometers that measure even sensitive differences, there would be health problems that could lead to deaths due to high fever. A pre-service teacher expressed her/his thoughts on this issue as follows:

“The normal temperature of the human body is 36.5°C. Above this temperature, the individual is sick. Some critical temperatures can cause death. Without thermometers, these temperatures could not be precisely measured. Human death could not be controlled.”

In addition, 7 pre-service teachers (35%) stated that temperature cannot be expressed with precise numbers and 6 pre-service teachers (30%) stated that many technological devices related to temperature cannot be designed. A pre-service stated her/his thoughts as follows:

“Many conveniences in our daily lives would not exist. Many devices that work with cold and heat would not be so advanced. We would not be able to express temperature in numbers. Maybe we would use a different expression.”

In the next question, they were asked to think about how the use of thermoscopes would affect science and scientific studies. Regarding the changes that will take place in science, the pre-service teachers used the examples of human health and weather-related problems; the same as the examples they gave in their previous answers. Their reasoning for this is that uncontrolled febrile diseases will affect the development of medical science and the weather will affect the development of meteorology. They also stated that science and

technology would not be as advanced as it is today (n=10, 50%) and that it would not be possible to carry out reactions in chemistry in which temperature plays a critical role (n=9, 45%). A participant expressed her/his opinion on this issue as follows:

“We could not measure air temperature or sea water temperature. We could not know at what temperature matter melts, freezes, evaporates and condenses. Chemistry as a scientific discipline would not have advanced so far. Because reactions requiring certain temperatures could not be carried out so precisely.”

The next question asked why scientists invented different thermoscopes and thermometers. A large number of pre-service teachers (n=9, 45%) cited the subjectivity of scientific knowledge and different perspectives as reasons for this situation. They also stated that scientists’ desire to do better (n=8, 40%) and to measure temperature accurately and precisely (n=5, 25%) could lead them to different designs.

The last question in the activity asked how imagination and creativity affect scientists during their scientific studies. 11 pre-service teachers (55%) stated that imagination and creativity helped scientists to develop their ideas in measuring temperature and even to think about the most extreme points from time to time. In addition, 8 pre-service teachers (40%) stated that scientists developed different types of thermoscopes and thermometers with different features thanks to their imagination and creativity.

In this activity, pre-service teachers realized the role of imagination and creativity in the creation and development of scientific knowledge. They also expressed the important role of the changeable and theory-laden nature of science in the development of scientific knowledge. They stated that the subjectivity of scientists (study aims, education, past experiences) led them to design different thermoscopes and thermometers in the same period.

4. The Family Resemblance Approach to NOS

There are four categories of science as cognitive-epistemic system: “aims and values, methods and methodological rules, scientific knowledge, and scientific practices (practices of inquiry)”. In addition, science as a social-institutional system consists of seven categories: “professional activities, scientific ethos, social certification and dissemination of scientific knowledge, social values, social organizations and interactions, political power structures, and economic factors/financial systems” (Erduran & Dagher, 2014; Kaya et al.,

2017). Reward structure is a recent category proposed by Irzik and Nola (2022). These categories are explained below with their definitions in the FRA literature.

4.1. Science as Cognitive-Epistemic System

4.1.1. Aims and Values

A set of purposes is related to aims and values in that it seeks to be fulfilled by the results of scientific effort. According to the RFN paradigm, science has epistemological, cognitive, cultural, social, political, and ethical perspectives and values. Scientific studies are guided by cognitive-epistemic values. The ideals of the social and cultural environment set boundaries for science as a scientific endeavor. Politics, which through laws can either promote or impede the advancement of scientific knowledge, also dominate this field. Values can affect the choice of theory. They affect methodological choices and interpretations as well as how scientists interact with their surroundings. Empirical sufficiency, correctness, and explanatory power are epistemic values that have a significant impact on how knowledge develops and grows. The epistemic objectives can be seen as being connected to educational objectives that deal with the construction of knowledge, evaluation of knowledge, and revision procedures. So, in relation to the science curriculum, the epistemic dimension of the purposes and values might be referred to as a “knowledge” category. This category is related to a number of values, including objectivity, innovation, and accuracy. The cognitive goals and ideals can be promoted as those modes of thought that emphasize the most important principles of scientific reasoning and can be seen as parts of “reasoning”. Related topics include changing convictions and critical scrutiny are a few instances from a prior conversation. Social characteristics include aspects of science like answering people’s needs, decentralizing power, and being truthful (Erduran & Dagher, 2014, Kaya et al., 2017). In science education, students are expected to understand scientists’ objectivity and their methods to avoid prejudice and bias. In this context, it is suggested to analyze the works and biographies of scientists with social and epistemic/cognitive values and aims that can inspire students in scientific studies. For example, the life story and interviews of Aziz Sancar, Nobel Prize winner in chemistry, will present the values and purposes of science to Turkish students in a concrete way. Another example might be related to the discovery of insulin. It was called a death sentence for patients with diabetes before it was discovered. The scientists working collaboratively during the studies (discovered by Sir Frederick G.

Banting, Charles H. Best, and JJR Macleod at the University of Toronto in 1921 and it was purified by James B. Collip) and their relentless efforts set a good example to aims and values of science.

4.1.2. Scientific Practices

Basically, classification, observation and experimentation are some of the methods and skills that scientists use in the scientific process. One of the main activities in science is observation. Direct observations of phenomena in the natural and physical world are made by scientists (e.g. observation of plants, biological species).

Classification is also important in scientific studies. The elements' periodic table is a unique example of how classification is used in chemical research. Teachers can provide examples of classification by including the development processes of the periodic table and the works of scientists who played a role in its development in chemistry lessons.

Experimentation is another important scientific practice in scientific inquiry. In contrast to the traditional activity, known as the “cookbook” approach, in which students are told to follow predetermined processes, experimentation can be positioned as a scientific practice. Science experiments don't follow a set of established rules. To conduct studies and handle research difficulties, scientists frequently develop novel methods and approaches. Discussions among scientists must include the identification of the applicable and appropriate experimental methodologies, these are just as important as the data, models, hypotheses, and laws. At this stage, it will be important to emphasize the similarities and differences between the demonstration or cookbook style experiments that students do in their science classrooms and the experiments that include crucial aspects such as intervention, innovation, and invention or production in scientific studies (Erduran & Dagher, 2014, Kaya et al., 2017).

4.1.3. Scientific Studies

Theories, laws, and other types of scientific knowledge are important, along with how they have helped to advance science as a whole (Erduran & Dagher, 2014). Theories, models and laws evolve and progress as the evidence on the relevant subject accumulates, all contributing to scientific understanding. At the same time, at some extreme points where the evidence cannot be explained and the scientific process is blocked, there is a need for new types of knowledge

that lead to a new paradigm (Kaya et. al., 2017). In chemistry education, atomic theories and models, law of the conservation of mass as examples of this area can help students understand different scientific studies in scientific processes.

4.1.4. Methods and Methodological Rules

There is no single type of scientific method in the development of scientific knowledge. On the contrary, scientific studies are carried out with different scientific methods. Therefore, obtaining and using empirical findings is one of the important scientific methods that initiate the scientific process. Students must be informed about the range of possible questions and methods of inquiry in order to support the development of comprehensive understanding of scientific technique in science education (Erduran & Dagher, 2014; Kaya et al., 2017).

4.2. Science as a Social-Institutional System

The social and institutional systems of science include a set of social structures and institutional and economic balances that form the background of the scientific process. Irzik and Nola (2014) have underlined four components of science as a social-institutional system: “professional activities, scientific ethos, social certification and dissemination of scientific knowledge and social values”. Members of a scientific community share epistemic practices, aims and values, methodological commitments, and a body of knowledge as well as engaging in the same types of professional activities, processes of social certification and dissemination of knowledge. Based on the FRA framework, Erduran and Dagher added three categories: “social organization, power structure, and financial system (replaced by economics of science as the former was too narrow and somewhat misleading)”. In a recent study, Irzik and Nola (2022) added another category (12th category); the reward system of science. These can be intellectual and non-intellectual reward. The first one comes from inside sources; it is motivated by a desire to understand the nature and is made up of the sense of accomplishment and satisfaction. The three categories of non-intellectual rewards are social, professional, and material. Gaining high status in society and receiving respect and acclaim from the scientific community are examples of social rewards. The goal of professional rewards is career advancement. Finally, material rewards can take the form of money, more expansive laboratory space, improved equipment, etc. A reward as famous as the Nobel Prize can occasionally result in instant fame, high position, and significant financial benefit (Irzik & Nola, 2022).

5. Concluding Remarks

Educational practices involving a consensus approach that include the seven aspects of the NOS have been ongoing in the science education literature for many years (e.g. Akerson et al., 2000; Kucuk, 2008; Khishfe & Abd-El-Khalick, 2002). The consensus approach provides many teachers with content and roadmap aligned with science topics to implement and follow in science classrooms. However, some researchers argue that this may be a list that needs to be memorized and may be insufficient for describing major scientific disciplines with different characteristics and methodological approaches (Irzik & Nola, 2022). The FRA approach provides a very comprehensive and broad framework for teaching NOS. It is emphasized that branches of science can have similar and different characteristics, like family members, and that scientists are greatly influenced by the social and institutional characteristics of science, which can often be related to rewards, economics, and politics (Erduran & Dagher, 2014; Irzik & Nola, 2022; Kaya et al., 2017) When teaching science or chemistry at the middle or high school level, it may not initially make sense for a student who does not have a career goal in science to understand the economics of science or the reward system. However, it can provide motivation and support to students who may or may not have a career goal in STEM field, support their development, especially in STEM fields, or even direct an uninterested student to science.

The consensus view of NOS has been used as the basis for a significant number of researches on NOS instructional views, however preliminary studies in science education outline how pre-service teachers learn to teach the NOS from the FRA standpoint (Voss et al., 2023). The authors; Kaya et al. (2019) and Cullinane and Erduran (2022) led optional courses for pre-service teachers on NOS from an FRA perspective. After the intervention, preservice teachers were more outspoken about certain pedagogical techniques, such as the use of technology and debates in science classrooms, according to Kaya et al. (2019)'s study of interviews with preservice teachers conducted before and after the intervention. The NOS pedagogical competence of preservice teachers engaged in a course that includes multiple weeks of NOS education was investigated by Saribas et al. (2019). The pre-service teachers created lesson plans for the course, one for a group and one for an individual, both focusing on a socioscientific issue. When the researchers looked at which FRA categories were covered in the lesson plans, they discovered that preservice instructors typically covered the following topics: goals and values, methodology, scientific knowledge, and

social values. The FRA categories related to political and financial systems were not discussed by pre-service teachers. As can be seen from the relatively limited number of instructional studies on the FRA approach, there is a need for studies on FRA such as developing teaching materials or investigating the material development processes of teachers and prospective teachers and probing out their views. Research and development on the FRA approach to NOS in science education are expected to benefit from further transforming FRA for instructional use and enhancing new educational implications (Kaya et al., 2019).

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CHAPTER III

TEACHING EFL VOCABULARY TO YOUNG LEARNERS AT THE PRESCHOOL LEVEL THROUGH PBL¹

FATMA KİMSESİZ¹ & M. YAVUZ KONCA²

¹ (Asst. Prof. Dr.), Kırşehir Ahi Evran University, School of Foreign Languages, Department of Translation & Interpreting,
E-mail: fatmakimsesiz@ahievran.edu.tr,
ORCID: 0000-0001-6758-7393

² (Asst. Prof. Dr.), Ağrı İbrahim Çeçen University, School of Foreign Languages, Department of Translation & Interpreting,
E-mail: ykonca@hotmail.com,
ORCID: 0000-0001-9533-3630

Introduction

The preschool period is regarded as a milestone in the educational basis of individuals (Morrison, 2004). Therefore, it is an area of focus that deals with the cognitive, physical, emotional, and language development of children to disclose and support their abilities. For this purpose, the execution of a well-designed curriculum is essential to accomplish the missions of preschool education (İnan, 2012).

Preschool children are known to be energetic and tend to channel this energy into physical activities. They enjoy engaging in activities that include construction, such as modelling a store, a park, or a school. Interaction reinforces their learning. With their limited attention spans, young learners exhibit curiosity for what is going on around them. Within this context,

1. This chapter is produced by Fatma KİMSESİZ from her doctorate dissertation entitled “The Effect of Project-based Learning in Teaching English Language to Children in Preschool Education”, supervised by Asst. Prof. M. Yavuz KONCA (Ph.D. Dissertation, Atatürk University, Erzurum, Türkiye, 2017).

Senemoğlu (1994) suggests that children should be provided with opportunities that foster their self-awareness and self-acceptance. It is essential to engage learners with diverse practical experiences that cover music, dance, and visual or verbal materials for holistic development. Thus, it helps children socialize and enhance their cognitive abilities, problem-solving skills, and cooperation with others. What is more, young learners have the potential to plan activities, employ logical reasoning, and utilize their imagination for play. They may not interrogate the reason for participating in an activity, yet they are more liable to lose interest in challenging tasks. Similarly, they can understand better through motion and hands-on activities, yet need repetition for consistent learning due to their short attention span. Children can often blur the lines between reality and imagination (Scott & Ytreberg, 1990). Concerning the individual differences among children, Cameron (2001) clarifies that classroom activities should be adopted to accommodate learners' linguistic, psychological, and social development. Besides, a learner-centred approach is advocated that considers the needs of the learners while adhering to the curriculum, with the child-centred curriculum design (Cameron, 2001). Hence, the designation of a conducive learning environment is essential to accomplish teaching goals in consideration of the developmental stages of learners.

What counts as a significant issue in L2 learning for young learners is vocabulary development. Vocabulary serves as the foundation for comprehensive language learning, so it is crucial to develop a functional vocabulary in L2 instruction. It is largely accepted that to form coherent sentences, one should combine words and functions (Cameron, 2001). In this process, understanding the variable facets of knowing a word is regarded as an initial step in L2 learning. As a constructivist approach, project-based learning (PBL) is renowned for its student-centred methodology through which students actively engage in a pre-designed form of project implementation for focusing on a specific theme or problem (Helm & Katz, 2001). In foreign language learning, the integration of PBL is not new. Providing a real-life model in language teaching, PBL engages learners in the activities and tasks through collaboration (Thomas, 2000).

Following these premises, this chapter aims to elaborate on teaching vocabulary to young learners in a project-based learning design. The steps and strategies for an effective project implementation are introduced focusing on vocabulary teaching for young learners. Plus, related implications are yielded based on the efficient strategies for teaching vocabulary to young learners. To put this framework into practice, a sample project overview is revealed

for planning vocabulary teaching activities based on project design in the Appendix part.

Teaching English to Young Learners

The acquisition of L2 has extensively taken interest within the scope of foreign language learning. It is widely accepted that age and environment are crucial factors that influence language learning (Morrison, 2004). When teaching a foreign language in formal instructional settings, the environment should be tailored to accommodate the age factor.

First language acquisition is accomplished through consecutive acquisition of patterns in a native context. On the other hand, foreign language learning takes place in a non-native context and is affected by a number of factors. As identified by Gass (2013), foreign language learning deals with learning a non-native language in the native context of the individual. As addressed by Gass (2013), whether the target language is learned in a formal or informal setting also matters. Formal L2 learning, which takes place in the classroom environment, is maintained through the implementation of several methods and techniques guided by appropriate principles for young learners. Yet, informal L2 learning is attained naturally in an authentic context provided by the interaction between the interlocutors. Another important issue that is worth mentioning is whether the target language is learned simultaneously with the native language or sequentially after the settlement of the native language. This condition makes a difference in terms of the level of accomplishment (Lightbown & Spada, 2013; Saville Troike, 2006). The fact that infants and toddlers speak the language they hear around them substantiates the idea that the environment has a great impact on language learning and development (Morrison, 2004). Children when reared in linguistically rich environments show that there is a connection between language acquisition and exposure. Despite their lack of inhibition, children display more courage in speaking a new language and are most likely to get a more native-like accent (Gass, 2013).

Although the controversy over “the earlier the better” in L2 learning still goes on, several researchers favour the notion that foreign language teaching should begin as early as possible (Cameron, 2001; Singleton, 2001). As stated by Singleton and Ryan (2004), the context of learning and the exposure span has a great impact on language proficiency. Relatedly, there is evidence that children follow a similar path when learning a second language as they did once

to acquire their native tongue. This assertion was also supported by McLaughlin (1978) who equated L1 learning with L2 learning based on the sense that the developmental patterns followed by learners both in L1 and L2 mostly occur simultaneously. As claimed by Krashen et al. (1979), the process of foreign language education is realized in 3 distinct units which examine the syntactic and morphologic outcomes if time and exposure remain consistent or learners are naturally exposed to a second language during early childhood.

Foreign language teaching for young learners entails the consideration of several elements among which the age factor manifests itself as an outstanding aspect. Hence, distinct approaches, methods, and techniques are required for an efficient instruction process. As advanced by Haznedar (2003), teaching an L2 to young learners expands their understanding of events, fosters their appropriate and tolerant behaviour, exposes them to diverse cultures, and encourages them to reflect on their own cultures. As argued by Bayyurt (2013), in consideration of the disparity between young learners and adult learners, activities that capture learners' attention should be focused. Within this context, the implementation of task-based, theme-based, content-based, or project-based designation is reported to be useful in teaching English to young learners. As formulated by Bayyurt (2013), it is significant for language teachers to possess the necessary skills and qualifications for developing appropriate instructional and evaluation strategies in teaching English to young learners. As a foundation for an effective teaching syllabus, Bayyurt (2013) also advocates the use of content-based instruction which is maintained through the conjunction of other subjects such as science or social sciences.

Age Factor in Language Learning

Rocca (2007) uses the metaphor of “the bridge between L1 acquisition and adult L2 learning” to describe foreign language learning at early ages since it is covered by the critical period of childhood after a well-established native language. Although the period during which a foreign language is acquired is vague in terms of child language development, as framed by Gass and Selinker (2001), the ages between five and nine constitute the basis, during which the native language is also settled. Based on the same issue, Long (2007) directed that there seem to be two or more sensitive periods for language learning. The first period is reported to range from birth to the ages between four and seven for phonology, lexis, and collocation. The second is reported to exist from birth to the teen ages for syntax and morphology. Within this scope, the divergence

between the accomplishment levels of young and adult language learners highly depends on the critical period (Long, 2007). Focusing on the perceptible potency of pronunciation at early ages, Long (1990) concluded that children can speak a target language with a native accent if they begin learning an L2 by the age of six, but not exceeding the age of 12. As asserted by Flege (1999), if language learning begins after the critical period, the production of a foreign accent is more likely to occur. Based on these explanations, Cook (2013) suggested that beginning to teach a foreign language to young learners is crucial for further accomplishment.

Looking through the issue from a different perspective, Bialystok and Hakuta (1999) claimed that young learners find pleasure in learning a language. The development of children is shaped by social factors that provide them with a nourishing environment, simplified input, training opportunities, cooperative peers, and various other supportive elements. Similarly, Flege (1999) accounted for the source of success on linguistic and cognitive factors, rather than age. To compromise, the focus should be on what is expected as an outcome of foreign language learning at an early age. As directed by Singleton (2001), children who initially begin learning a foreign language around the preschool period perform better than those who start in adulthood. Yet, it is also asserted that the latter seems to be more advantageous since they may be rapid in learning (Cook, 2013). As a result, it still remains ambiguous whether the difference stems from factors related to social, cognitive, or linguistic influences.

The distinction between the cognitive abilities, skills, and interests of children, adolescents, and adult learners has a shaping role in the selection and organization of language instruction. Harmer (2001) focuses on the cognitive differences between these age groups and addresses that rather than individual words, young learners primarily focus on meaning, often learning indirectly through sensory experiences. As explained by Cameron (2001), children are more eager and active for learning compared to adults and they tend to please their teacher rather than their peers. On the other hand, teenagers may display enhanced learning capacity as they are engaged in interesting activities. Effective classroom management can overcome challenging issues related to their beliefs and behaviours toward learning a foreign language (Harmer, 2001). As for adults, although the idea of games and songs is still pertinent, they are most likely to learn through abstract thinking (Harmer, 2001). They are more inclined to perform disciplined studying routines, possess more specific learning goals, and are motivated to attain them compared to teenagers. Based on the

assumptions of the critical period for language learning, functions that centre on language improvement are also addressed in the curriculum designed for preschool education in Turkiye (MoNE, 2006).

Teaching vocabulary to young learners

Teaching vocabulary to young learners is an area that integrates a number of factors basically for word learning. Cook (2013) identifies knowing a word as encompassing information about the meaning, lexical, functional, and pragmatic aspects, as well as pronunciation and spelling. Rather than traditionally memorizing vocabulary lists with their L1 equivalents through rote learning, L2 learners are expected to use vocabulary items appropriately in the sentence, pronounce them correctly, and comprehend their meaning, apply modifications when necessary, based on their collocational, orthographic, pragmatic, connotation, metalinguistic, and cultural usage and significance (Cameron, 2001). In other words, word familiarity entails an understanding and skill of using the words accurately in terms of meaning and grammar within their functional and cultural contexts. As illustrated by Tomasello (2003), learning a word is just like a mini-linguistic lesson where objects are pointed out enabling children to associate words with what they hear or see around. Furthermore, children learn words by mapping them onto objects, and their learning is enhanced through repetition when they interact with the people or objects around them. Acknowledging the influence of their native language, Cameron (2001) suggests that children's native language background should be considered to determine the potential challenging and/or facilitative aspects. In addition, a range of techniques that facilitate vocabulary building and ensure long-term retention need to be employed since learning a new word is a process, but not a simple task that should be done within a limited timeframe.

Another significant factor that determines the target words is their frequency of usage (Cook, 2013). Based on this perspective, focusing on high-frequency words plays a vital role in vocabulary building. The ease of demonstration and the appropriateness of word meaning are also significant for the selection of vocabulary items at the initial stage (Cook, 2013). As stated by Tomasello (2014), nouns can be introduced at the early stages of foreign language teaching since children tend to learn them more frequently than other types of words.

Children's vocabulary development is greatly influenced by their native language and conceptual development (Cameron, 2001). As explained by Paradis (2007), learning vocabulary in an L2 is distinct from the process in the native

language since children have already acquired cognitive maturation based on an existing lexicon in their native language that supports their understanding of conceptual-lexical mappings. Moreover, as their conceptual knowledge expands, they perform better with vocabulary usage. Learning a word also entails time and exposure to different contexts. As a result, these aspects point out that learning a foreign language is affected by the time allocated for language learning and the span or type of exposure to the target language in syntactic, morphological, or other associated levels.

Vocabulary learning also covers the learning of chunks and formulaic expressions in the target language (Cameron, 2001). This also requires an understanding of the target language culture. In advancing language skills and knowledge, words serve as fundamental units. According to Paradis (2007), the activities in which students are engaged in the classroom context serve as the basis for the primary source of input. Hence, providing children with extensive exposure to a variety of vocabulary usage is significant for increasing their lexicon. When processed by logical thinking, formal education fosters children's knowledge and vocabulary acquisition. Notably, learners' skills of categorization, labelling, comparison, and contrast are developed through logical thinking. Hence, exposure to relevant and meaningful words will also enable them to infer meaning from a given context. In this respect, it is significant to focus on high-frequency words that encompass a substantial portion of common words in written and spoken discourse through incidental, regulated, or peripheral learning (Nation, 2001). With reference to whether vocabulary learning should be explicit or implicit, Nation (2001) points to implicit learning as providing learning with unconscious ample opportunities through repeated exposure. Cameron (2001) implies that the development of vocabulary acquisition does not occur spontaneously; rather, it is affected by learners' expanding conceptual understanding as they encounter different experiences in their daily lives. Concerning this, young learners benefit from concrete vocabulary, the utilization of words in novel contexts, and the learning of words as cohesive sets.

Another issue that is worth mentioning is that learners' vocabulary development is influenced by the typological similarities and differences across the target language and the source language. The effects of transfer can potentially manifest in the L2 learning process. As highlighted by Contrastive Analysis Hypothesis by Lado (1957), linguistic resemblances and disparities between L1 and L2 have a great influence on language achievement. In this sense, vocabulary development can also be affected by the similarities that facilitate

learning and the differences that impede or delay learning. Research provides evidence supporting the facilitative role of cognates in vocabulary learning in a foreign language (Kimsesiz, 2012; Patterson & Pearson, 2004). As suggested by Cook (2013), children tend to react more receptively to learning a foreign language in informal settings that are accompanied by natural language learning situations. Moreover, instead of abstract units, employing concrete objects is preferable for instructional purposes. Audio-visual and situational teaching techniques are considered to be favourable as they offer children tangible visual information through real objects, pictures, cards, and related materials during the initial stages of L2 learning.

Project-Based Learning

PBL dates back to the practical methods of Dewey to ensure learning by doing (Thomas, 2000). Centring the students at the heart of learning, PBL developed as a learner-centred teaching method based on the principle that students learn better when they actively participate in the learning process. In light of advancements in cognitive science, the shift towards learner-centred approaches, and the opportunities presented by modern technology in education, an increasing interest was drawn to the integration of PBL in education.

In PBL, learning conditions are organized around projects where a driving question is posed, and activities are designed as a means to solve the problem. The culmination of this process results in the presentation of a tangible product to real audiences (Thomas, 2000). In terms of content, a project design needs to be meaningful and possess an educational purpose for students (Larmer & Mergendoller, 2010). According to Blumenfeld et al. (1991), a driving question that impedes learners from investigation and an artifact that is the concrete result of the process are two essential components of projects. In the context of foreign language instruction, PBL aims to provide an authentic model in which language acquisition occurs naturally through engaging students in the implementation of the projects. In PBL, both teachers and students work on the projects in collaboration. The project coverage is framed, the activities and tasks are planned, the materials are provided, and the process is maintained through cooperation. In the end, “a product” is prepared and the process is evaluated from all aspects (Thomas, 2000).

Initially, PBL was introduced into the L2 instruction process to promote learner-centred teaching by Hedge (1993). In foreign language instruction, PBL builds a direct relationship between language learning process and designation

of projects in language courses (Legutke & Thomas, 1991). The procedure of PBL covers designing and planning the process, examining the problem, seeking for solutions, and reporting what has been found through a variety of unique or collaborative tasks (Beckett, 1999). In PBL, learners actively participate in collaborative real-world scenarios in which learning is structured around projects (Thomas, 2000). PBL is also applicable to other disciplines such as mathematics, social sciences, science, and fine arts (Katz & Chard, 1989). In PBL, investigating solutions for authentic problems is also covered over an extensive period (Blumenfeld, et al., 1991; Katz & Chard, 1989).

There has been a growing interest in the application of PBL in early childhood education (Trepainer- Street, 1993). As formerly stated, the approach entails collaborative efforts between students and teachers. Drawing a line for further steps, the evaluation of the process is also reflected based on what they have accomplished and learned. Centring constructivist and discovery learning, activities involved in project implementation incorporate “hands-on” tasks, interdisciplinary themes, field trips, and investigations in a laboratory (Thomas, 2000). According to Katz (1992), PBL is significant, particularly for stimulating learners to think, imagine, question, and investigate. As outlined by Katz (1992), an effective project approach entails the administration of criteria such as addressing learning goals, featuring an engaging topic or question, relating to real or ideal aspects of students’ lives, being attractive, and being capable of generating interesting inquiries. It is also essential for project work to be managed in a classroom or school context. PBL encourages learners to direct an autonomous, creative, and productive way of learning throughout the process and enhances both cooperative and individual work among children (Erdem, 2002). As established by Hamurcu (2003), learners are stimulated through PBL for achieving significant, cognitive, and self-control skills and for using technology.

It is reported both by teachers and students that PBL is a more favourable instructional method compared to traditional approaches (Thomas, 2000). Beckett and Slater (2005) introduced two essential elements of the Project framework, namely “the planning graphic” and “the project diary”. The planning graphic encompasses language form and function, the topic content, and various skills to permit them observe, classify, predict, infer meaning, solve the problems, perform measurement, and others. On the other hand, the project diary also covers the aspects of the planning graphic, yet it focuses on documenting the activities undertaken throughout the project work.

As stated by Blumenfeld et al. (1991), students engage in authentic problem-solving environments that bridge the gap between school applications and real-life situations in PBL. As noted by Beres (2011), learners participate in a variety of content areas and instructional units through PBL implementation. PBL aims to enhance student motivation for learning and mastery of knowledge and skills by modelling learner autonomy, collaborative learning, and performance-based assessment (Blumenfeld, 1991). To encourage students, diverse and challenging features can be incorporated so that students' active participation is fostered authentically.

PBL entails children being active participants from the beginning to the end. Through PBL, children are provided with cognitive development in problem-solving and gaining social skills (Trepainer-Street, 1993), establishing collaborative relationships (Blumenfeld, et al., 1991), and analytic thinking (Thomas, 2000).

Following the ideas of children, the teacher could adapt the content or steps in a project for an efficient outcome. To describe this process, Blumenfeld et al. (1991) uses the "master-apprentice" metaphor to mirror the relationship between the teacher and the students phrasing that:

«The master-apprentice relationship is used as an analogy for the teaching-learning situation...like masters, teachers should scaffold instruction by breaking down tasks; use modelling, prompting, and coaching to teach strategies for thinking and problem-solving; and gradually release responsibility to the learner» (Blumenfeld et al., 1991, p.371).

As directed by Chard (1999), teachers can gauge student interest and experience once they are ready for the project. According to Katz and Chard (1989), adequate guidance and feedback should be supplied for children based on their performance in implementing PBL. The process should be designed well, and the assessment schedule needs to be relevant employing suitable assessment techniques for children such as a checklist, rubric, or observation. According to Blumenfeld et al. (1991), portfolio assessment, interviews with children, and analysing learner discourse can supply teachers for guidance and feedback.

The related research that focused on the implementation of PBL yielded promising results in terms of the effectiveness of PBL in foreign language teaching (Beneke, 2000; Çabuk & Haktanır, 2010; Fragoulis & Tsiplakides, 2009). In a comprehensive study, Beneke (2000) explored the benefits and challenges of using PBL. After completing a one-credit course on the Project Approach,

five teachers from three different types of part-time early childhood education programs participated in the study. The findings indicated that teachers reflected enthusiasm for the approach and consistently integrated it into their curriculum. Furthermore, the study provided direction for lesson planning, involved parents, facilitated the collection of assessment samples, accommodated children with diverse abilities, and augmented a well-rounded, hands-on curriculum. Plus, teachers considered the approach to be quite valuable.

In a study that connected theory with practice, Fragoulis and Tsiplakides (2009) conducted project work on teaching EFL in Greek public primary schools. Fifteen 6th-grade students participated in the study, dedicating two hours per week for six months. The teachers were provided with a tool for implementing PBL effectively in the L2 learning context of a full-day school. Consequently, the teachers, who were involved in the project work, expressed their appreciation for the experience they gained.

Çabuk and Haktanır (2010) conducted a study to provide an example of a well-designed project applicable to all grades and to discover ways of integrating PBL into the Turkish Kindergarten Curriculum. 23 preschool children and a group of three pre-service teachers participated in the study. The study was conducted about a specific theme “buildings” in three stages. In the first stage, the research questions were identified; in the next stage, data collection was managed through onsite observations, interviews, and data collection tasks suitable for the age group; and in the final stage discoveries were examined and the reports were prepared to share with families. The researchers and teachers involved in the project were impressed by the children’s enduring attention in making inquiries about the topic, highlighting the importance of interest, experience, and environment for children’s success. It was also reported that children displayed active engagement and a definite improvement in their knowledge of the theme.

Teaching Vocabulary through Project-based learning

This part addresses consequential steps in designing a project-based activity specifically for teaching English vocabulary at the preschool level. Firstly, the process needs to be planned to cover all the stages of implementation. The selection of the theme, the target words, and the strategies that will be utilized in the process need to be identified in detail. Linked to this step, the themes and the target words should be relevant and meaningful for the learners’ level and interest. In terms of scheduling, a weekly plan for each week should be designed

in a way to incorporate lesson goals, functions, and the content of the tasks each day. The roles of both the teacher and the learners need to be specified based on the implementation procedure. After the determination of the techniques and steps, the topic should be introduced to students. Next, the steps are taken based on the stages involved in PBL. The target words are expected to be acquired during the process of implementation. The stages in PBL are itemized in the table below.

Table1. *The Steps in a Project (adapted from the descriptions by Erdem, 2002; Thomas, 2000)*

The Steps in a PBL Implementation	
1	Problem Identification
2	Identification of the information for comprehending the problem
3	Purpose definition
4	Group Forming
5	Designation of the work schedule and the steps
6	Generation of the measures and identification of the assessment instruments
7	Identification of the resources data gathering
8	Generation of potential solutions
9	Examination of the solutions
10	Assessment of the process
11	Reporting the findings
12	Project presentation

The project is conducted under the guidance of the teacher. The aim of the project theme is determined in a way to improve learners' critical thinking, problem-solving, and collaboration skills. The duration of the project is designed, and ample time is allocated for each stage in the project throughout the process. The project begins with the students being presented with a driving question, to which they are asked to provide answers. Based on their responses, the students and the teacher collectively decide to design a product on a specific theme. Additionally, the students are also introduced to the vocabulary related to the project. In the second stage, students are provided with the materials for the project and these materials, and their intended purposes are introduced. During this stage, the labels of the materials are repeated while working on the pieces. In the third stage, students carry out predefined tasks pertaining to the aim of the project with the leadership of the teacher. In the fourth stage, the

students collaboratively design the “artifact” with the directions and guidance of their teacher. Finally, when the product is ready, students get prepared for the presentation of the showcase of the project to the visitors or spectators in the classroom. Employing appropriate instruments, the teacher also assesses the student’s understanding and usage of the vocabulary items that were formerly specified as target words.

For the organization of the project design, the key knowledge and understanding, success skills, critical thinking or problem-solving strategies, collaboration reflections, the project summary pertaining to each stage, the driving question, entry event are all determined. What is more, the formation of the product and making it public is also important in scheduling the procedure. The resources with reference to the facilities of the school/classroom and materials need to be identified. Furthermore, as previously emphasized it is essential for the projects to be meaningful and to carry an educational purpose for the learners. Hence, learning targets and outcomes, instructional strategies for learners, and checkpoints for assessment should be pre-stated in the planning phase. For learning outcomes, it is essential to keep track of the learner’s knowledge, understanding, and competences required for completing products. As a final and cycling step, assessment is significant for checking to learn, ensuring students are on track, and evaluating the project work.

Assessment in Early Childhood

Assessing young children in early childhood is challenging due to a variety of assessment tools and instruments (Slentz, 2008). The assessment encompasses multiple domains such as social, physical, linguistic, emotional, and cognitive development and enables the teachers to gain comprehensive insights into children’s development (Cameron, 2001). As a result, a plethora of assessment instruments is employed to collect reliable and valid data that subsequently work for curriculum planning. As emphasized by Morrison (2001), assessment aids in the collection of information about children’s overall development, learning abilities, health, behaviour, and academic progress. According to Nunan (2015), the assessment provides valuable information to teachers, educational institutions as well as parents to trace learner development in specific areas. Once designing and implementing assessments, learners’ age, language learning content, theories, teaching methods, and objectives need to be considered to ensure the reliability and consistency of assessment information.

In early childhood education, the primary aim of assessment is to gather comprehensive data about children to keep up with their learning and development. As addressed by Slentz (2008), the main goal in administering assessment is obtaining detailed information about learners' behaviours, abilities, preferences, and interactions. Within this framework, Nunan (2015) modifies additional purposes of assessment, covering feedback on progress, identifying learners' strengths and weaknesses for curriculum planning, documenting achievements, and fulfilling accountability requirements. Most importantly, assessment serves as an evaluation tool for program effectiveness. Employing suitable assessment practices for young learners enables teachers to be accountable to parents, the education system, and the learners themselves based on their achievements and development on certain issues of pedagogy.

Conclusion

This review sketches teaching English vocabulary to young learners at the preschool level through the implementation of PBL. The early years of children are regarded as the milestone of learning in all aspects of development. The cognitive, physical, emotional, and language development of children is of concern during the preschool period. So, a well-prepared curriculum is significant to support children uncover their potential at the preschool level (İnan, 2012). As a part of these goals, great emphasis is drawn on language development for young learners. Although the debate whether "the earlier the better" for L2 learning continues, a great deal of researchers focuses on strategies and approaches for improving foreign language for young learners (Cameron, 2001; Morrison, 2004). High consumption of language learning could be associated with vocabulary building, which is a substantial and integral part of foreign language instruction for young learners (Gass, 2013). In this sense, exposure to the target language, active engagement of learners, and motivation are important driving factors of learning (Helm & Katz, 2001). Connecting authenticity and learner engagement, PBL provides learner-centred teaching (Hedge, 1993) with a direct relationship between language learning and organizing projects (Legutke & Thomas, 1991). Through a well-established program in PBL for teaching vocabulary, it is possible to focus on certain vocabulary items by engaging children in almost all phases of the project work. As they participate, as they deal with the stages of implementation, and as they present their project at the end of the process, they will be exposed to the target words. This condition

will not only help them attain the related vocabulary but also provide them with repeated usage of authentic language.

Pedagogical Implications

In the light of the literature, it is reflected that , organizing a well-planned project implementation is essential for successful language learning outcomes. As a learner-centred approach, PBL is a significant contributory *factor* to the development of vocabulary acquisition in the L2 learning process through the authentic exposure directed during the implementation. Several elements need to be considered when designing activities for young learners. As modelled by Blumenfeld et al. (1991), before embarking upon a project-based design, teachers should carry a comprehensive understanding of the field of study and display proficiency in the content of the project theme. Moreover, they need to use engaging strategies for illustrating the content, as well as the ability to manage the stages of the project effectively. The teachers also need to have pedagogical content knowledge about teaching English to young learners to be able to adjust classroom activities according to the age and interests of young learners (Cameron, 2001).

The setting is also another crucial factor that nourishes the practicability of the activities and tasks in the projects. As suggested by Harmer (2001), the classrooms for language learners had better be bright, colourful, and engaging, and for the stimulation of their imagination, activities such as puzzles, drawing, games, physical movements, and songs can be incorporated. As fostered by Cameron (2001), children should be accommodated with classroom activities that support their linguistic, psychological, and social development. Last but not least, the project approach entails collaboration among both parties. Hence, arranging learning conditions based on projects should integrate both the teacher and the students actively as the implementation pf PBL requires considering all contributing factors for successful outcomes in foreign language instruction.

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Internet Sources

URL 1: <https://www.pblworks.org/what-is-pbl>

APPENDIX A (adapted from <https://www.pblworks.org/what-is-pbl>)

PROJECT DESIGN OVERVIEW		
Name Of Project:		Duration:
Course:	Teacher:	Grade Level:
Key Knowledge and Understanding		
Success Skills	Critical Thinking/ Problem Solving:	Collaboration:
Project Summary	<i>On the first day, ...</i>	
	<i>On the second day, ...</i>	
	<i>On the third day, ...</i>	
	<i>On the fourth day, ...</i>	
	<i>On the fifth day, ...</i>	
Driving question		
Entry event		
Products	Team/Individual:	Specific contents and skills to be assessed:
Making products public		
Resources needed	On site people, facilities:	
	Materials:	
Notes:		
Final Products (presentations, performances, products, and/ or services)		
Learning Outcomes/Targets (Knowledge, understanding & success skills needed by students to successfully complete products)		
Checkpoints/ Formative Assessments (to check for learning and ensure students are on track)		
Instructional Strategies for all Learners (provided by teacher, other staff, experts, includes scaffolds, materials, lessons, aligned to learning outcomes and formative assessments)		

CHAPTER IV

COMPARISON OF MUSIC THERAPY IN POLAND AND TURKEY FROM PAST TO PRESENT

AYLIN MENTİŞ KÖKSOY¹ & KATARZYNA MILEK²

¹(Assoc. Prof. Dr.) Ege University,
Faculty of Education, e-mail: aylinmentiskoksoy@gmail.com
ORCID: 0000-0003-4549-0579

²(Dr.) Gnieznienska Wyzsza Szkola Milenium w Gnieźnie,
e-mail: katarzynamilek@op.pl
ORCID: 0000-0003-4603-4604

1. Introduction

Music is a tool, an impulse, an impression, a cause of emotions, a motivation for action, a deterrent in activity, a background for many activities, and a source of special quality for high sensations. It is always present everywhere, especially in today's world where music is intertwined with the unusual and the everyday. It can be attributed to universality as an art, as its accessibility and universality are present everywhere in the world, independent of state borders. The advantages of music are widely known for promoting cognitive and emotional development, encouraging attitudes, releasing expression, and relaxation. Music allows you to express yourself to others and get familiar with your own possibilities, and your inner self (Stachyra, 2012; p. 14).

Music is generally perceived by the public as an entertainment vehicle. However, music is an art that expresses emotions and thoughts with sounds or expresses sounds within the framework of order and aesthetic understanding. Understanding that music is not only an entertainment vehicle but also a concept that reflects the human soul, emotions, and thought worlds has provided many scientific studies on the effects of music on people (Gençel, 2006). Music,

known as the food of the soul, has become an important tool that has been used in the treatment of physiological and psychological problems throughout history and has been at the center of treatment practices. The most striking factor in music becoming such an important tool is undoubtedly the power of music to affect people psychologically (Bonde and Wigram, 2002; Gouk, 2017; as cited in Sezer, 2019). The use of music for therapeutic purposes since ancient civilizations has influenced the emergence of the concept of “Music Therapy.” The concept of therapy is used in Greek to mean “serving, caring for the patient, finding a solution” (Doğan, 2006). Music therapy in psychiatry has become an element of the treatment program for developing social relationships, restoring self-confidence, physical exercises, and increasing motor control and concentration (Özçevik, 2007). The AMTA (American Music Therapy Association) defines music therapy as “the clinical and evidence-based use of music interventions in a therapeutic relationship by a credentialed professional who has completed an approved music therapy program to achieve personalized goals” (Horowitz, 2004). In his research, Horowitz examined studies on music therapy conducted in recent years and found that music has positive effects on human health, affects people’s activities, and has a positive cognitive effect on people. These effects of music on people have encouraged its use in wider areas, especially in the treatment of not only psychological but also other disorders in many fields.

The purpose of this study is to compare the stages of music therapy usage in Poland and Turkey since its inception and compare the similarities and differences of music therapy between the two countries.

2. Methodology

2.1. Research Model

This study is a cross-national comparative education research. Comparing one’s own country with other countries is the most commonly used method by researchers. For instance, in the historical comparison model, either the dates of two events are compared or a comparison is made to demonstrate the differences shown by both countries over time. In short, comparative research is an analysis and comparison of existing differences. This study is a qualitative study and the research design is a survey model from qualitative research models. The research approach is a horizontal approach from comparative education approaches (Türkoğlu, 1984; as cited in Güzel, Karataş & Çetinkaya, 2010).

2.2. Data Sources and Analysis

Document analysis, a qualitative research method, was used to collect data in this study. According to Yıldırım and Şimşek (2011), document analysis is the detailed analysis of written sources about the researched subject. Document analysis includes finding sources, reading, note-taking, and evaluating them for a specific purpose, and helps to clarify the presence of alternative thoughts and ideas (Çepni, 2010). Printed scientific sources such as theses, books, journals, and articles related to music therapy in Poland and Turkey were used as data sources in this study. The similarities and differences between both countries were compiled, compared, and interpreted as a result of this comparison.

3. Findings

Firstly, information about the history and development of music therapy in Poland was provided from the sources reached in the research. Then, information about the history and development of music therapy in Turkey was provided, and the similarities and differences between the two countries were examined.

3.1. Music Therapy in Poland

In Europe, during the positivist era, therapeutic practices helped people with emotional problems and mental illnesses. This trend gradually diminished the importance of music, along with the development of pharmacology and treatment in pharmacological areas. The roots of contemporary trends in music therapy are at the beginning of the psychological approach to humans: psychoanalysis, humanistic psychotherapy, and behavioral psychotherapy.

Interest in music therapy in Poland began in the 1950s in the fields of therapeutic practice and scientific thought. Psychiatrist Professor Adrian Demianowski described the effect of music on neurotic disorders, drawing attention to changes in patients' moods, noticeable relaxation, and the decrease of negative moods and emotional tensions. He also talked about the role of music in psychiatry. Henryk Gaertner was also an interesting figure and a pioneer of music therapy. According to some reports, he investigated the relationship between physiological parameters and the variability of blood pressure depending on the music patients listened to. He was a philologist of the Polish language, a medical doctor, and a trained pianist. He was interested in the use of music in pain management (Śliwka, Jarosz, & Nowobilski, 2006).

The climax of the activities of the pioneers of music therapy in Poland was the interest in music therapy as an academic field. It started relatively late in the 1970s with the effective efforts of musicology professor and composer Tadeusz Natanson and psychiatry professor Andrzej Janicki to include music therapy in academic subjects. Professor Tadeusz Natanson describes the influence of art as follows:

1. Enriching a person's emotional area by affecting their inner life and soul;
2. Influencing people in preparing for life through the close connection between aesthetic experiences and other important experiences in life;
3. The communicative aspect of music art is seen as a specific need for music in human life and all societies;
4. Values contributing to cognitive, mental, and intellectual development (Natanson, 1979).

T. Natanson should be recognized for his approach to music therapy, which sees music as one of the most understandable art forms due to the necessity of rational factors in perception, as well as for showing how music is influenced by strong emotional stimuli and how it reduces meaning. This makes music accessible and understandable for everyone and is especially important in understanding the therapeutic role of music. Music therapy can help patients establish contact with their environment, effectively resist illness, build self-esteem, understand the meaning of life, cope with suffering, and finally, promote emotional and intellectual development (Natanson, 1979; p. 49).

The co-founder of the first music therapy department in Poland believed that music therapy should be a scientific field that answers the question of which type of activity – which music and which behavior – should be used to meet a person's needs. Music therapy is effective when therapy is done with music. In 1972, Natanson founded the Music Therapy Department at the State Higher School of Music in Wrocław, where he served as director. The department was converted into an institute in 1983. The first steps towards music therapy in Poland were also taken by Professor Andrzej Janicki, a psychiatrist who collaborated with Professor T. Natanson. The founder of the first Music Therapy Institute in Poland also established the Interdisciplinary Music Therapy and Music Education Department at the branch of Silesian University in Cieszyn in 1983. He is an active member of the World Federation of Music Therapy and the

International Music Therapy Research and Publication Working Group during his scientific activities (Lazowski, 2012).

The work of music therapy supporters to find ways to impact a patient's psychophysical well-being and functioning has led to the development of a certain form of this art therapy in our country. This form is closely related to the historically shaped music perception culture, various theoretical approaches, and the traditions and customs preferred in a given country. The definition of music therapy with distinctive regional characteristics is also related to this. In Poland, music therapy is defined as a therapeutic process that involves the intentional use of music forms that lead to changes, the formation of new strategies, coping with conflicts, and the patient's ability to deal with emotional tension. The responsible person for this process is a music therapist who has appropriate preparation and competence. The music therapy process consists of three components: the session participant, the therapist, and the music. This form of therapy definitely requires a person who conducts therapy to be aware, knowledgeable, competent, and prepared for music and therapy. The success of music therapy carried out by unskilled individuals is the result of coincidental experiences in the art field of music, rather than a therapeutic action.

Polish music therapy thought and the widely developed music therapy owes much to Dr. Elżbieta Galińska, who started to deal with regulatory music therapy. It is a type of music therapy that includes relaxation and physiological regulation elements. He brought in Christoph Schwabe, a lecturer at the Postgraduate Medical Education Center in 1987, who was interested in a method rooted in German psychotherapy. He supported the use of music in various areas of medical treatment. C. Schwabe was interested in group dynamics-oriented music therapy. Unlike regulatory music therapy conducted in group conditions, he focused on the relationships within the group and the needs of the group but only focused on the individual's emotions. Elżbieta Galińska turned to psychotherapy-focused music therapy. She received music education, so after completing her psychotherapy education, she attached great importance to promoting the idea of music therapy at the Neurosis Department of the Psychiatry and Neurology Institute.

Warsaw currently independently manages the Music Therapy Studio and regularly conducts regulatory music therapy courses that focus on the emotions of the person receiving therapy (<https://www.muzykoterapia.org.pl/zyciorys>, 2023).

The Polish Music Therapists Association, which brings together music therapists, defines music therapy in terms of its holistic impact on the individual.

Music therapy is defined as a process organized by a qualified therapist using music or its elements to improve the health and support the development of an individual with mental, emotional, intellectual, physical, and social problems (Konieczna-Nowak, 2013).

There are different techniques of music therapy, which are classified as follows:

- Natural music therapy, which uses sounds from the surrounding nature.
- Spontaneous music therapy, which uses an expression of emotions.
- Clinical and diagnostic music therapy, which is used by medical professionals.
- Adapted music therapy, which is used as a relaxing element.
- Prophylactic music therapy, which is used for relaxation or activation (Wójcik-Standio & Standio, 1999).

After more than thirty years of developing music therapy in Poland, an increasing number of music therapy models are being distinguished. One of the most popular is based on musical improvisation with the session participant. They aim to express themselves, release emotions, and, above all, develop communication. This model has a basis for creative music therapy. Background music is not used during the session since it allows the therapy to be adapted to the participants' needs and abilities. This type of therapy works well for both children and adults, as well as for individuals with autism, mental disorders, intellectual disabilities, or various emotional problems. It is a therapy for non-verbal functioning individuals.

Ewelina Konieczna emphasizes that music therapy is a psychosomatic regulation. Its remarkable effects on the body's physiological functions are increasingly being utilized. The healing properties of music on the human body can be seen in somatic parameters such as blood pressure, heart rate, eye pupil size, muscle weakness, or pain level (Galińska, 1997).

The goal of any music therapy is to change the patient's interior in one of the following ways: mental and physical or only mental. During a music therapy session, we distinguish between active or receptive actions. Activity may involve singing, playing an instrument, moving with music, or improvisation. Receptive actions highlight listening to music, relaxation, and visualization. Each form of music therapy can be either individual or group-based. Music therapy can be used individually according to a therapeutic program developed for a patient, as

long as it leads to satisfactory results, enhances self-esteem, and eliminates fears. Group therapy triggers collaboration and social interactions within a group, improving the quality of interpersonal relationships and reinforcing appropriate behavior (Śliwka, Jarosz & Nowobilski, 2006).

The practical activities of using music therapy and the theoretical efforts of increasing numbers of university scholars have helped spread the idea of using the method. Standards have been developed for the use of music therapy, and their aims may be:

- Developing the emotional aspect - eliciting desired emotions, moods, and situations, and controlling emotions;
- Impact on personality development - influencing attitudes, experiences, and creative activities;
- Shaping communication and relationships between people - particularly initiating contacts and arousing the readiness to make contacts;
- Effective, positive impact on psychophysical functionality;
- Impact on psychophysical activity and muscle tone;
- Enriching diagnosis and diagnostic methods;
- Stimulating physiological and biochemical changes in the body (Galińska, 1990).

E. Galińska defined the areas of effect of music therapy methods as follows:

- Psychosomatic - affecting the physiological functioning of the body and regulating mental mechanisms;
- Psychological - associated with the emotional, cognitive, and communicative aspects of functioning;
- Psychomotor - stimulation-related, such as the treatment of motor skills and motor disorders;
- Pedagogical - its effect on children and adolescents with psychophysical disorders and educational issues (Galińska, 1997).

Depending on the assigned functions of music in therapy, the following methods are used:

- Educational - based on Schultz's autogenic training with behavioral approach, they are used to reduce psychophysical tension.

Reciprocal-imagery and emotionally activating - therapy that affects images, formations, and intensities, initiating images and associations, discussing

mental and organic reactions during therapeutic sessions, and encouraging the release of blocked energy.

— Relaxing - used to relax, calm down, and consists of music reception and music creation.

— Creative - therapy that involves improvisation in movement, vocal, and instrumental expression.

— Communicative - social therapy that triggers cooperation and interpersonal relationships, teaches empathic behavior and includes drama, psychodrama, and theater therapy.

— Reflective - provides opportunities for contemplation, considering the strong need for aesthetic experiences.

— Mobilizing - considering the need for movement, dance, and initiating gestures, especially in many diseases and conditions, where there is a need to release and initiate meaningful movements. This activity dynamicizes and directs the processing of stimuli from the environment toward the expected goal (Śliwka, 2006).

Applied music therapy is primarily concerned with supporting and stimulating functions responsible for accessing and receiving stimuli from the environment, especially auditory stimuli, in cases of disturbed mental functioning, as in unwanted psychophysical tension. It plays an important role in therapy where the experience of social relations is required (Dobson, 1999). Its purpose is always to promote well-being, mood, relaxation, and imagination. Emotional experiences affect cognitive activity. Therefore, it can be applied to all age groups (Krzywoń, 2008). In many diseases and disorders, there is a need for liberation, meaningful gestures, and initiating movements. During this activity, the process of perceiving and processing stimuli from the environment is dynamized and directed toward the expected goal (Lewandowska, 2001). Music therapy is used not only for sick people but also to activate emotional, cognitive, and social resources as a way of enhancing well-being (Stachyra, 2014). It is recommended for limited access to stimuli in psychiatry, emotional instability, disorders, and deficiencies resulting from patients' social problems (Wilczek-Rużyczka, 2007). In Poland, studies have been conducted on the use of music therapy in schizophrenia treatment over the last twenty years. This type of therapy is increasingly used in the treatment of various disorders, including neuroses (Borecki & Ochmanowska, 2005). Contemporary achievements in

researching the effectiveness of music therapy methods include studies on the analgesic effect of music and the use of music in the rehabilitation of heart patients. Professor Wojciech Pośpiech and Professor Jacek Kubicki should be added to the group of distinguished music therapists in Poland. They are the creators of an original program that involves appropriately organized music for conducting procedures in heart patients without anesthesia. Due to the parameters that determine blood pressure, heart rate, pupil size, muscle weakness or pain level, metabolic and respiratory rate, sensory perception, and changes in the nervous system and endocrine system, the program is of utmost importance (Natanson, 1979: 173).

In the field of medicine, A. Ochwanowska conducted research on the effects of music therapy on post-mastectomy women in postoperative rehabilitation (Ochwanowska, Ochwanowski, & Gałuszka et al., 2005). Interesting studies include the use of music for anesthesia during dental procedures (Kucharski, 2005). The theoretical discourse in psychotherapy presents many cases regarding the use of music therapy. A. Janicki, who made generalizations, considered that almost all chronic illnesses require the inclusion of this therapeutic area's treatment methods, although it cannot replace pharmacological treatment, it is extremely effective in improving health in individual cases. Music therapy is designed for a wide range of communities, including those with mental disabilities, physical disabilities, and mental, developmental, and emotional disorders (Kucharski, 2005).

Alternative to traditional healing methods, new applications of music therapy are still being investigated.

4. Music Therapy in Turkey

Music therapy in Turkey has a history as old as Turkish history itself, dating back approximately 6,000 years. The Turks first learned about music therapy from the Persians and Arabs. Ibn Sina, in his book "Kitabu's-Shifa", said that one of the best and most effective ways to treat patients is to increase their mental and spiritual strength, provide them with the courage to better fight disease, play the best music for them, and bring them together with loved ones. Other doctors of the time who were interested in both medicine and music, such as Farabi, Safiddin Barid, Hoca Nasir Musa, Keyhusrev, Abdulmumin Safi, and Shuuri, believed that music therapy had positive effects on human psychology and that the rhythm, meter, and modes of the music listened to affect a person's pulse (Uzel, 1991; as cited in Kayım, 2017). Since the way the Turks applied

music therapy varied depending on the period they lived in, Turkish music therapy practices need to be examined in three stages: music therapy in the Central Asian Turks, music therapy after contact with Islamic civilization, and music therapy during the Seljuk and Ottoman periods.

4.1. Music Therapy in Central Asian Turks

The development of music cultures in Turkish history corresponds to the stages of formation. Central Asian Turkish music, which has a history of 8000 years and is widely accepted by most scientists, began with the appearance of Turks in history (Utebay, 2020; p. 62). Especially, the archaeological findings indicate that the Altai Turkish culture played an important role in the formation of this culture starting from 3000 BC (Güner, 2007). Dancing figures painted on rocks around the Mülçe River in the Çerçen region of Hoten in Eastern Turkistan dating back to 6000-8000 BC were found. In the same region, flutes were depicted on rocks between 2000 and 3000 BC. In excavations conducted in the central region of Uzbekistan, sculptures dating back to the 1st and 3rd centuries AD were found, showing the existence of musical instruments. The most commonly used musical instruments in this region were balaban, dutar, dombra, tambur, and cross flute, while the double-reed zurna was preferred in the city of Fergana (Güvenç, 2002). Altai Turks became pioneers of Turkish music culture starting from the 3000s BC. Altai people left their homeland 1000 years later to interact with neighboring tribes and spread their own music culture to other regions, playing an important role in shaping Central Asian Turkish music (Karahana, 2006: 12). In ancient Turks, there were epic literary works containing mythological elements. Hieroglyphs including musical instruments and dance figures uncovered in archaeological studies serve as evidence for these works. In the surroundings of Maveraünnehir, a model of an artist called "Ozan" who played kopuz and sang songs began to emerge (Kuloğlu, 2009: 4). There is information indicating that the Turks influenced the music culture in China when they arrived there before Christ (Utebay, 2020). Central Asian Turks were one of the civilizations that first applied music therapy to mental patients. There were healers called "Kam" and "Baksi" who used both music and dance to treat many diseases during this period. These healers used musical instruments such as kopuz, dombra, hirak kopuz, and şangobız to produce a sound that evoked good spirits and eliminated bad ones, thus treating diseases. Later, the sound of water was also used in addition to these instruments (Güner, 2007; Kabalak, 2017; Kipay, 2018; Akt. Sezer, 2019, p. 23).

4.2. Music Therapy in Islamic Civilizations

In the history of Islamic civilization, particularly the Sufi tradition, music has been practiced, used, and defended. Sufis have mentioned that mental and emotional illnesses can be treated with music. Great Turkish-Islamic scholars and physicians such as Zekeriya Er-Razi (854-932), Farabi (870-950), and Ibn Sina (980-1037) laid the scientific foundations of music therapy, particularly in the treatment of psychiatric disorders. Farabi attempted to explain the relationship between music and physics and astronomy in his work, "Musiki-ul-kebir" (Somakçı, 2003, pp. 131-140).

According to Farabi, the effects of Turkish music modes on the soul are classified as follows:

1. Rast mode: Gives pleasure (joy and peace) to the person.
2. Rehavi mode: Gives a sense of eternity to the person.
3. Kuçek mode: Gives sadness and grief to the person.
4. Büzürk mode: Gives fear to the person.
5. Isfahan mode: Gives movement and a sense of security to the person.
6. Neva mode: Gives pleasure and freshness to the person.
7. Uşşak mode: Gives a sense of laughter to the person.
8. Zırgüle mode: Induces sleep in the person.
9. Saba mode: Gives courage and strength to the person.
10. Buselik mode: Gives power to the person.
11. Hüseyni mode: Gives peace and comfort to the person.
12. Hicaz mode: Gives humility (humbleness) to the person.

Farabi also showed the psychological effects of Turkish music modes according to time:

1. Rehavi mode: Effective at false dawn.
2. Hüseyni mode: Effective in the morning.
3. Rast mode: Effective when the sun is two spear-lengths high.
4. Buselik mode: Effective at midmorning.
5. Zırgüle mode: Effective around noon.
6. Uşşak mode: Effective at noon.
7. Hicaz mode: Effective in the afternoon.
8. Iraq mode: Effective at dusk.
9. Neva mode: Effective in the evening.

10. Büzürk mode: Effective after sunset.

11. Zirefkend mode: Effective during sleep time.

12. Iraq mode: Effective in the late afternoon (Altınölçek, 1998; Somakçı, 2003; Haque, 2004; Ak, 2006; Isgandarova, 2015; Sezer, 2019).

According to Ibn Sina, “sound” is essential for our existence. Sounds that are arranged in harmonious order and adjusted in a certain way have a very deep effect on the human soul. The effect of sound is enriched by human art. According to Ibn Sina, changes in tone of voice indicate human moods. It is not our hearing that makes us enjoy music compositions, but our ability to perceive various suggestions from that composition. Therefore, the regular harmony of sounds, the regular and orderly beats, and the harmonious rhythms deeply captivate the human soul (Grebene, 1978; Somakçı, 2003). In conclusion, during the Islamic civilization era, Turkish-Islamic physicians such as Er-Razi, Farabi, and Ibn Sina used both medicine and music therapy to treat psychological illnesses. These methods were developed and applied by both Seljuk and Ottoman physicians until the 18th century (Terzioğlu, 1972; cited in Somakçı, 2003; p. 135).

4.3. Music Therapy in the Seljuk and Ottoman Periods

The first serious music therapy in Turkey was seen during the Ottoman Empire, but prior to Anadolu, in Central Asia, Shaman musicians known as “Baksı” conducted various healing practices for different illnesses. Baksıs still continue these practices among Central Asian Turks today (Güvenç, 1985; cited in Giray, 2008; p. 55).

In the Seljuk and Ottoman periods, the general name for healing centers was called Darüşşifa. “In Turkish-Islamic civilization, especially in the Seljuk and Ottoman periods, health and education institutions that were established within the foundation tradition, where patients were treated regardless of who they were and without expecting any reward, and practical and observational health information was given, were called “Darüşşifa” (Karlıkaya, 1999: 17). “The first Darüşşifa structures were built by Turkish rulers in Syria and Egypt, and the most beautiful examples began to be given in Anatolia from the 12th century onwards” (Cantay, 1992: 35). Throughout history, music therapy, which shamans practiced individually, has evolved into an institutional system during the Seljuk and Ottoman periods. “It is seen that the Turks who used the books of scientists such as Razî, Farabî, Ibn Sina, Hasan Şuurî, and Gevrekzade Hasan Efendi, which explain their research and results, applied their first serious

music therapy studies during the Seljuk and Ottoman periods” (Erer & Atıcı, 2010: 30).

Long before the practices in Europe, the Ottoman Turks were treating mental patients with medicine and music therapy in hospitals established in Damascus, Cairo, and Bursa. Sources mention that mental patients were treated with music therapy in the hospital built by Seljuk Turkish Atabey Nureddin Zengi in 1154 in Damascus (Ak, 2006).

The main Seljuk and Ottoman healing centers that applied music therapy were as follows: Kayseri Gevher Nesibe Hospital (1206), Sivas Divriği Darüşşifası (1228), Amasya Darüşşifası (1309), Istanbul Fatih Darüşşifası (1470), Istanbul Süleymaniye Medical School and Hospital (1556), Istanbul Enderun Hospital and Edirne Sultan II. Bayezid Darüşşifası (1488) (Yücel, 2016). Apart from these, significant healing centers that served during the Seljuk and Ottoman periods also provided services.

5. Conclusion

In Poland, efforts to incorporate music therapy into academic subjects began relatively late in the 1970s, thanks to the effective efforts of musicology professor and composer Tadeusz Natanson and psychiatric professor Andrzej Janicki. Interest in music therapy began in the 1950s in Poland in the fields of therapeutic practice and scientific thought. Tadeusz Natanson made very important contributions to the development of music therapy. In 1972, he founded the Music Therapy Department at the State Higher School of Music in Wrocław. In 1983, the Department was transformed into an Institute. The first steps towards music therapy in Poland were also taken by Professor Andrzej Janicki, a psychiatrist who collaborated with Professor T. Natanson. The founder of the first Music Therapy Institute in Poland established the Interdisciplinary Music Therapy and Music Education Department at the branch of Silesia University in Cieszyn in 1983. During his scientific activities, he was also an active member of the World Music Therapy Federation and the International Music Therapy Research and Publication Working Group (Lazowski, 2012).

After more than thirty years of developing music therapy in Poland, an increasing number of music therapy models are being distinguished. One of the most popular ones is based on musical improvisation with the participant during the session. They aim to facilitate self-expression, release emotions, develop communication, and above all, create a foundation for creative music therapy. Since the background music is created during the session, it is not used during

the therapy. This allows the therapy to be adapted to the needs and abilities of the participants. This type of therapy works well in both children and adults, as well as for people with autism, mental disorders, intellectual disabilities, and various emotional problems. It is a therapy for people who function without words (Stachyra, 2014). Over the last twenty years in Poland, studies have been carried out on the use of music therapy in the treatment of schizophrenia. This type of therapy is increasingly used in the treatment of neuroses with various disorders (Borecki & Ochmanowska, 2005). The idea of music therapy in Poland and the widely developed music therapy owe much to Dr. Elżbieta Galińska, who became interested in regulatory music therapy. It is a type of music therapy that includes relaxation and physiological regulation elements. By previously exploring a method rooted in German psychotherapy, he brought Christoph Schwabe, who became a lecturer at the Postgraduate Medical Education Centre in 1987. He supported the use of music in various fields of medical treatment. Warsaw currently independently manages the Music Therapy Studio, and organizes regulatory music therapy courses focusing on the emotions of the person undergoing therapy (<https://www.muzykoterapia.org.pl/zyciorys>, 2023). In Poland, the use of music therapy even reaches medical services for somatic illnesses. This therapy is used by patients with oncological and cardiological disorders. They work wonders in working with patients with psychiatric illnesses and also with patients in vegetative or minimal consciousness states. Patients informed about therapeutic classes are those with mental, eating, and personality disorders, traffic accidents, and neurological problems after Parkinson's disease (Natanson, 1979). Currently, studies related to music therapy are being conducted in many fields in Poland.

In contrast to Poland, music therapy has a history as old as Turkish history, dating back approximately 6,000 years. Turks first learned about music therapy from Persians and Arabs. Starting with Central Asian shamans and continuing through the Seljuk and Ottoman periods with contributions from scholars such as Ibn Sina and Farabi who were knowledgeable about music, music therapy was applied in many centers. Ottoman Turks were already using music to treat mental patients with medicine at hospitals they established in Damascus, Cairo, and Bursa, long before the European practices. Sources mention the treatment of mental patients with music at a hospital established by Seljuk Turkish Atabey Nureddin Zengi in Damascus in 1154 (Ak, 2006). In Poland, however, these practices did not begin until the 1970s for patients with schizophrenia, autism, and other mental disorders. Music therapy was very effective during

the Seljuk and Ottoman periods, as well as in Islamic civilization, starting with the Central Asian Turks, but it began to lose popularity in the 1900s and there were no institutions providing academic education in music therapy until the 2000s in Turkey. Although we have a civilization that was the first to apply music therapy in a hospital environment in history, it is evident that we are not in a very satisfactory situation. In Turkey, studies conducted in clinical settings regarding the use of music therapy are insufficient compared to countries like Europe and America, and there is no academic education available in this field. “Due to a lack of sufficient academic experts to provide education in the country, a certification program cannot be opened” (Kayım, 2017, 53). While music therapy is used for oncological and cardiological disorders in Poland, music therapy studies on cancer patients began in 2007 at Ege University in Turkey to investigate the effects of music on chemotherapy side effects and anxiety levels. In the early 21st century, Turkish Treatment Music Application and Research Group TÜTEM, Turkish Music Research and Promotion Group TÛMATA, Music Therapy Application and Research Center MÛTEM affiliated with Üsküdar University, Music Therapy Association MÛZTED in Ankara established by a group of researchers in 2014, and except for the Traditional Complementary and Alternative Medicine Practices Department under the Ministry of Health, there is no official institution or private clinic dedicated to music therapy. However, in recent years, there has been an increase in music therapy applications in some private clinics, albeit not in a laboratory setting. However, there is no study on substance abuse treatment among these studies. Most of these studies and the resulting articles are about some studies conducted on patients with autism, cardiology, palliative care, and cancer. Most of these studies are literature reviews, and some are at the clinical level. In addition, the Traditional Complementary and Alternative Medicine Practices Department has been established under the Ministry of Health (Uçaner, Jelen, 2015, 39-40).

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CHAPTER V

ASSESSMENT APPROACHES OF MIDDLE SCHOOL MATHEMATICS TEACHERS: IN THE CASE OF WRITTEN EXAMS

SAVAŞ BAŞTÜRK

(Prof. Dr.), Sinop University, Turkey

e-mail: sbasturk@sinop.edu.tr

ORCID: 0000-0003-1978-2682

1. Introduction

Evaluation has a broad meaning and involves the cooperation of many disciplines. In general, many researchers consider evaluation as an approach or process to indicate the value of an object or work, to predict the effectiveness of an action, product, process, program, institution, or system, to appreciate a person's talent or achievement (Cardinet, 1986; Gronlund, 1985; Hadji, 1992; Louis, 1999; Scallon, 1999). Some researchers use different terminologies to express the concept of evaluation. This differentiation emerges in the evaluation of the program and the evaluation of the student's learning. Despite this distinction, there is a growing consensus that evaluation is a process of collecting data from many and varied sources for decision making. In Anglo-Saxon sources, it is seen that a distinction is made between the terms that indicate program evaluation and the evaluation of learning, and the term "evaluation" is used for evaluation for the program and the term "assessment" for the evaluation of learnings (Baribeau, 2015).

In assessment, the purpose is one of the most important elements that determine the type of assessment. Different purposes have given rise to different types of assessment. For example, "diagnostic assessment" that is used to collect data on what students previously know about the topic, "formative assessment" that is aimed to develop the learning (Black & Wiliam, 1998) and consists to follow students' progress and to led to understand the gap between what they know and what they are expected to know (Horoks & Pilet, 2015), and finally

“summative assessment” that consists to confirm what each student knows, can do, and is generally realized at the end of each learning unit. According to Horoks and Pilet (2015), assessments are approached in terms of their understanding of national or international exams, their validity in determining students’ levels, interpretation of students’ results in the context of their education, the status of grades given to students, and the impact of assessments on students and their standing at school. The quality of assessment has an impact on the quality of teaching. Quality assessments are expected to lead to quality teaching. Therefore, it is important that the information collected in the context of the assessment is valid and reliable (DeLuca & Klinger, 2010; Pastor et al., 2020).

Although there are many measurement and assessment methods, traditional ones (such as written exam, oral exam) still continue to be the most commonly used dominant methods. Of course, for any method it is not possible to say that it is the best or not. Each has its own advantages and disadvantages. For example, one of the best methods to measure composition skills would be the written exam. It is possible to talk about the indisputable superiority of multiple-choice questions when an objective and rapid assessment is required for a large mass. Assessment made in the laboratory environment gain importance in the measurement and evaluation of understanding in empirical-based lessons (Lunetta et al., 1981; Tamir, 1974). On the other hand, we must accept the fact that we do not depend too much on the type of question. As Jolly (2010) noted, it has been demonstrated in many studies that the form of the question is of limited importance and that it is the content of the question that almost completely determines what the question tests. Certainly, this does not mean that question forms are always equivalent to each other. Some information cannot be measured with multiple-choice questions, and some information cannot be measured best with open-ended questions.

Although many complementary measurement and assessment methods such as project, portfolios, diagnostic branched trees, etc., tend to become widespread in recent years, they are still not found in the tool kit of many teachers. Therefore, in the present study, we aimed to determine the assessment perspectives of middle school teachers in the context of written exams.

1.1. Components of Teacher knowledge: Assessment knowledge

The importance of studies of defining teacher knowledge together with its components cannot be denied in determining the quality of formation to be given to pre-service teachers in education faculties. Shulman (1987), who was

one of the first researcher in this subject, identified the components of teacher knowledge such as subject content knowledge, general pedagogy knowledge, curriculum knowledge, knowledge of learners, knowledge of constructing educational context and environment, knowledge on philosophical and historical aims of education, pedagogical content knowledge (PCK). With this classification, the pedagogical content knowledge is started to evaluate as a separate component from the general pedagogical knowledge.

Within the scope of this research, the assessment knowledge component of pedagogical content knowledge is of particular interest to us. After PCK was defined as a separate component by Shulman, many researchers defined assessment knowledge as a component of PCK (for example, Hashweh, 2005; Magnusson et al., 1999; Tamir, 1988). Despite its obvious importance for learning and teaching, it is difficult to say that this component can find an enough place for itself in teacher training programs (Akkoç et al., 2009; Dwyer, 1994; Gelbal & Kelecioğlu, 2007).

Tamir (1988) considers assessment knowledge in two categories: knowledge of which dimensions are important to evaluate in teaching the course and knowledge of the methods by which the teaching given can be evaluated. The first one asks to know the dimensions of student learning that are important to evaluate within a unit. For example, if the curriculum emphasizes problem-solving skills rather than simply expressing knowledge, it is expected that the teacher should be aware of this and use appropriate measurement and assessment methods for this dimension (Baştürk & Dönmez, 2011). Knowing why mathematics is taught to students and to determine whether it is realized or not also requires knowing which methods will be used in the most effective and efficient way. That is the second dimension of assessment knowledge which consists of the knowledge of the methods by which the teaching given will be evaluated.

1.2. The Purpose of the Study

It is possible to define teaching as an action that includes all the activities that the teacher does to enrich the learning of his students. Therefore, we can define mathematics teaching as preparing a lesson plan, choosing appropriate teaching materials, showing students how to solve problems, answering their questions, and determining and interpreting their performance (Ball et al., 2008). In this context, variables such as what the teachers wanted, summarized, or ignored in the students' answers, the comments, and explanations they made,

the reminders they made or asked from the students, the choice of activities they used in the lesson and the choice of exam questions, can be useful to determine their assessment approaches (Glorian-Perrin, 1996).

Assessment, in a way, means assessing the value of students' learning. From this perspective, examining teachers' assessment perspectives means identifying what they consider when appreciating the value of students' learning. As underlined by Horoks and Pilet (2015), at this point, the question of learning arises: what do we assess in a student's production? Learning or simply the state of knowledge at a given moment. Assessment only requires the existence of a measurement result. It already includes the comments made on this result. In that case, collecting information and making decisions by interpreting them constitute the assessment dimension (Black & Wiliam, 1998). In other words, it is the interpretation of successes and failures and the search for consistency from the perspective of the teacher and the student. For example, while the teacher questions what his/her students have learned and its relationship with his/her teaching, the student thinks about what s/he has learned and how he can progress (Horoks & Pilet, 2015).

The purpose of study was therefore to reveal that the middle school mathematics teachers' perspectives of assessment by means of written exams. It was tried to determine their thoughts about written exam, how they prepared them, when preparing a written exam what they pay attention to.

2. Method

This study, which aims to determine the assessment perspectives of middle school teachers in the context of written exams, is a case study from qualitative research methods. According to Gustafsson (2017), case studies aim to understand complex situations and are qualitative research in which information is gathered about the case or cases in a certain time interval and themes are created for these situations. Ethics committee approval was received for this study from the ethics committee of Sinop University (Date: 17.11.2022, Number: 2022/196).

2.1. The Participants

The participants of the study were determined by purposive sampling method and consisted of 14 mathematics teachers working in various middle schools. The teacher with the least professional experience had 3 years of experience, while the one with the most had 22 years. The average of the

experiences is 11. All the teachers have taught in almost every class of middle school. It can therefore be asserted that the teachers selected for the research group were suitable for the research subject in terms of both the experience and the grade levels they taught.

Participation in the research was on a voluntary basis. The subjects were given rationale for their participation in the study. They were assured that their responses would be anonymous and confidential. Although the faculty graduated from is not a variable that we consider in the research, let's share this information in order to get to know the study group better: 9 of the teachers participating in the research were graduates of the mathematics department of the faculty of arts and sciences, while 5 of them were graduates of the faculty of education.

2.2. Data Collection and Procedures

In the study, data were collected using a semi-structured interview form prepared by the researcher. By getting permission from teachers, the interviews were applied during the visits to the teachers' schools. The interview questions' content validity was established by a panel of experts consisting of three faculty members in the department of Mathematics Education.

In the interview form, there were 9 open-ended questions. To give brief information about some of them that are important in the context of the research problem, the first question aimed to find out the demographic characteristics of the teachers such as professional experience year, name of graduated university, teaching for what grade levels etc. In the second question, the teachers were asked to indicate the first words that comes to mind of teachers when saying assessment. The next question asked them to indicate with their reasons which assessment method they use in lessons. In another question, we wanted to know their thoughts on how to assess math skills in a best way and which assessment method is better in their opinion. The fifth question consisted of five sub-questions. While preparing a written exam, some subjects such as their expectations, the resources they use, the variables that affect the choice of questions, etc. were interrogated. In the next question, teachers were asked to say reasons if a student fails their written exam, while another question interrogated how they used their written exam results for their teaching.

Each interview was recorded and endured about 15-20 minutes. The recorded interviews were decrypted and then analysed. The transcript of the data consists of 24 pages and 5773 words. To characterize patterns and categorize answers, interview descriptions were subjected to content analysis, one of the

qualitative analysis methods, and interpreted. According to Cohen et al. (2007), content analysis is a process of summarizing and describing the basic contents of the information and the messages they contain. After all the coding is completed, systematic content themes or categories were created from the codes with the sessions that were carried out as panels. Conflicts encountered were resolved by discussion, and in this way, a high degree of common agreement on coding and category was achieved (Lincoln & Guba, 1985).

3. Results

Below are the findings of the analysis of the answers given by the teachers to the semi-structured interview questions. In addition, quotations from the answers of some teachers are included in order to ensure the (internal) reliability of the research and the reader's better understanding of the quantitative data. In order to preserve the originality of the answers, the grammatical errors in the quotations are given as they are without correction.

3.1. Teachers' First Conceptions of Assessment

The first words that comes to mind of teachers, when saying assessment, is important in terms of understanding how many they attach meaning to it. The results introduce that when saying assessment, the teachers consider exams (7 teachers), considering success of students (2 teachers), classical written exams (2 teachers), difference in students' intelligence level (1 teacher), and assignment of a number or a symbol to a characteristic of an object or event (1 teacher). Below are excerpts from the answers of some teachers:

Exams come first, of course. I think the quickest way to determine the level of the class, at least, in the first place is the examination of answers given to the exercises or a small exam (Teacher 1).

Assessment is the observation of a quantity or quality and the expression of observation results by numbers or symbols (Teacher 5).

Since in the Turkish education system we measure the level of students through exams, they first come to my mind (Teacher 3).

Measurement indicates the amount of a variable, i.e., a description. An assessment is a judgment, i.e., a judgment, indicating whether this amount is sufficient or not. I would like to explain it through

my profession. Through the results of examinations, we see that how much of the achievements we have made throughout the year. According to the degree of achievement of the goals we have set for learning, we consider the student to be successful or unsuccessful (Teacher, 9).

In the first comment, the first thing that comes to mind is the exams. The teacher says that the quickest way to determine the level of his students is through exercises and their answers to a small exam. The second comment is the description of the assessment, by observing a quantitative or qualitative feature, and expressing the result in numbers or symbols. In the third comment, the first thing that comes to the teacher's mind is exams, because exams take an important place in determining the level of students in the Turkish education system. In the last comment, the teacher compares measurement with assessment and explains how it is applied.

As a result, the participant teachers' understanding of assessment is mostly based on exams, written exams and student level determining. Some teachers define measurement and assessment and express the difference between them. That shows that they are able to state what the measurement and assessment is on a concept basis.

3.2. Frequently Used Assessment Techniques in Courses

Regarding the assessment methods that teachers used in their courses, they are very and varied. Mainly written exams (10 teachers), multiple-choice tests (8 teachers), true-false tests (4 teachers), gap filling tests (3 teachers), question-answer technique (3 teachers), oral exams (3 teachers), subject screening tests (2 teachers) and project and performance assignment (2 teachers) are used by the teachers. Here are some typical answers given by the teachers during the interview:

When solving the questions throughout the course, I use the method of question-answer. I also use test including multiple-choice questions, and classical methods such as written exams (Teacher 10).

I use tests including multiple-choice, true false, gap-filling questions. Regard to activities in classroom, I use oral exam techniques. In fact, I try to use all kinds of assessment techniques (Teacher 2).

Generally, for all topics I reinforce students' understanding by solving exercises. Later, at the end of each chapter I do a screening exam covering all subjects of this chapter. (Teacher 1).

I use classic exams, i.e., written exams and multiple-choice question test. I pay attention to variable time interval and variable ratio schedules because I do not focus only on the result in an exercise solving, but how to achieve this result. My most preferred method is multiple-choice questions because I can test many learning objectives with a measurement tool. Variable time interval and ration encourage the student to study continuously (Teacher 8).

In the first comment, the teacher states that s/he uses the question-answer method during the lesson. In addition, s/he uses multiple-choice questions and classical written exams. The second comment reveals multiple-choice, true-false and gap-filling tests as assessment method. Besides, the teacher also uses oral exams. In the third comment, the teacher indicates that by solving the exercise, s/he strengthens students' understanding. In addition, after each subject, s/he does screen tests. In the last comment, measurement and evaluation techniques used by the teacher are written exams and multiple-choice tests. S/he mostly prefers multiple-choice tests the reason for this is the high content validity of such tests. In her/his opinion, applying a variable-spaced and variable-rate assessment approach motivates students more.

As a result, assessment methods used frequently by the participant teachers are written exams, multiple-choice, true-false, and gap-filling questions. There is a limited number of teachers using complementary assessment techniques.

3.3. Best Method of Assessing Mathematical Skills

We asked the participant teachers to tell us about their ideas on how best to measure mathematics. The reason why we ask this type of question is that received answers will provide important information about their understanding of assessment. Most of the teachers answer these questions by saying open-ended questions (7 teachers). For a significant number of the teachers, the way is to ask questions and call on students on the blackboard (6 teachers). In some teachers' opinion, students' practices on the blackboard are the best way to assess mathematical skills (4 teachers). Other thoughts on the subject are listed as follows: using many techniques (2 teachers), using multiple-choice questions (2 teachers), true-false questions (1 teacher), and class participation (1 teacher). All this is reflected in the following excerpts:

The mathematical skill can be measured even with students' answers and their participation in the class. Generally, students with a high level of math skills love more course and participate in it. I think it is best measured with the class participation and student responses (Teacher 1).

Since in classic questions we can see students' procedures and methods used, the math skills are best measured by them (Teacher 3).

Math skill is best measured with the classic question and question-answer method. Because it is the best way to measure the student's ability to perform operations (Teacher 5).

I think the best method is measuring by doing application. I call on each student on the board and ask them to solve question. I give a minus (-) to those who do not want to go to the blackboard, but I do not give a minus (-) to those who cannot solve it. Therefore, they all want to go to the blackboard. They do not forget the questions we have solved together on the board (Teacher 7).

In the first comment, the teacher indicates that the best methods to assess student's mathematical skills are answers given by them to questions and their class participation. S/he also states that this situation can be often observed in good students. The next comment expresses as a best way classic questions, i.e., open-ended questions. In the next comment, like the previous comment, the teacher underlines open-ended questions and question-answer method. S/he believes that students' operation skills in mathematics can be better observed in this way. In the last comment, the teacher associates the best method with making students practice on the blackboard. In her/his opinion, this method increases the permanence of what is learned, in students.

As a result, the teachers believe that the best methods to assess mathematical skills are to ask questions, especially open-ended questions and make students practice with questions on the blackboard.

3.4. Biggest Expectations from Students When Preparing a Question for Written Exam

The distribution of the answers when we ask the teachers to state what their greatest expectations from students in a written exam are as follows. The results introduce that teachers expect their students to get high marks from the exam (6 teachers), know topics covered in the course (6 teachers), solve questions solved in the course (3 teachers), try to solve questions (1 teacher), and be able

to understand what they read (1 teacher). The following excerpts illustrate very well our analysis on the teachers' responses:

My biggest expectation from students is that they try to do all exam questions, even if they cannot. Because at the end of each unit I do quizzes and solve a lot of questions in the classroom, I expect them to have an idea at least (Teacher 7).

I would expect them to answer the majority of questions, because I do the logical explanation of everything during the course, and I solve many questions (Teacher 14).

My biggest expectation is that there are few students who get bad grades from the exam (Teacher 3).

The greatest expectation in the exams is that students can solve questions related to the taught subjects and question types that we solved in the course (Teacher 4).

My biggest expectation would be to measure the extent to which students learned what I did during the course. I want my students to learn in the best way and get high score in exams (Teacher 6).

In the first comment, the teacher asks students to try solving all exam questions. S/he explains the cause of this expectation with many questions s/he solved in class and the quizzes s/he made. In the second comment, since s/he solves many questions and logically explains everything in class, the teacher's expectation is that students can solve the vast majority of exam questions. The third comment reveals the teacher's desire to have a small number of students who receive bad scores in the exam. In the next comment, the teacher especially asks students to solve questions based on taught subjects, and similar to those solved in class. In the last comment, the teacher indicates that his/her biggest expectation is to see whether students have learned or not. Moreover, s/he asks students to learn in the best way and get high score in exams.

As a result, in exams the teachers expect students to get high scores, to answer all questions about the subjects taught in the course, and to solve questions similar to the types of questions solved in the course.

3.5. Utilized Resources When Preparing Exam Questions

When their responses were analysed to determine the type of resources used to prepare the exam questions, the main sources used by the teachers

to prepare questions are as follows: Supplementary resources such as test books, question banks (9 teachers), textbooks (9 teachers), internet resources such as EBA (5 teachers). At the same time, there are also teachers who use own resources (2 teachers), questions from previous exams (2 teachers), and student notebook (2 teachers). All this is reflected in the following excerpts:

Textbook, my own resources, I use good questions published on the internet (Teacher 2).

I benefit from the virtual environment, textbook, test books, my annual plan (Teacher 3).

I ask questions from student's notebook, question banks, textbooks, and original questions I writherr (Teacher 8).

Resources of Ministry of Education and questions in previous years in national examinations (Teacher 5).

In the first comment, the teacher states three resources to prepare exam question. These are as follows: textbooks, personal resources, and internet. Similarly, in the second comment, textbook, test books, and annual plan are mentioned as exam question database. While the next comment adds student notebook to them, the last one indicates resources of Ministry of Education and questions of national exams held in previous years.

As a result, it can be asserted that the most important sources that teachers refer to in preparing exam questions are textbooks, test books, question banks and questions of national exams held in previous years. These resources choices lead us to think that the anxiety of preparing students for national exams is one important variable playing a role in the choice of questions for the written exams.

3.6. Factors Influencing the Choice of Questions

As for the variables that affect teachers in choosing questions, the results of analysis are as follows: what taught in the course (8 teachers), learning objectives (5 teachers), choosing the appropriate questions for each level (3 teachers), questions requiring comment (2 teachers), for students who worked from different sources (1 teacher), comprehensive questions (1 teacher), including basic knowledge (1 teacher) and questions based on

solution method (1 question). Excerpts from typical answers of some teachers are given below:

We take new sources and examine them. There must be questions that everyone can do when choosing questions for the exam. There must be intermediate-level questions and upper-level questions. Namely, the questions that students who studied the subject from many sources can do should be placed in the exam (Teacher 4).

I pay attention that the questions are closely related to gains. I especially take care not to ask what children do not learn or see in the classroom (Teacher 2).

I always ask questions about every topic taught in class. In my choice of questions, I take care to choose questions including basic knowledge and requiring to students' own interacheeon (Teacher 7).

In the first comment, the teacher reveals an assessment principle and says that questions suitable for each student's level should be included in the exam. At the same time, s/he underlines that there should be questions in the exam for students studying from different sources. While these different sources, s/he refers to test books for national exams. In the second comment, the teacher states that the main point he pays attention to is the achievements and s/he does not hold the students responsible for anything he does not teach in the classroom. In the last comment, the teacher emphasizes the content validity and states that s/he asks questions from every subject in the exam. On the other hand, s/he states paying attention to choose questions that require basic knowledge and students' own interpretations.

In conclusion, the teachers give attention to preparing exam questions by considering what they teach in the course and the achievements they must teach to their students. In addition, student level and the anxiety of preparing students for national exams are among the variables that play a role in question selection.

3.7. Asking Questions from outside Textbooks or Student Notebook

When the teachers are asked whether in exams, they ask questions that are not in the textbook or the student's notebook, we see that most of them answered "no" to this question (12 teachers), and only 2 teachers answered positively. In the excerpts below, some teachers' views on the subject are given:

I do not ask the same questions I solved in class. By making some changes on them I try to ask questions requiring students to make comments. I do not go beyond the curriculum (Teacher 14).

I do not ask many questions, but, as I can, I try to ask enough. Because I think that everything, I taught in class is important and needs to be learned by students. I need to ask enough questions in order to get the correct feedback on my teaching (Teacher 2).

I certainly do not ask questions that I did not solve or show in class. However, I ask questions that students can comment on (Teacher 4).

In the first comment, the teacher indicates not asking the same questions (from textbook or student notebook), but by making some minor changes, asking questions that require students to comment and doesn't not go beyond the achievements. The next comment underlines that the exam is the feedback of the teaching given. Therefore, it is stated that what is done in the classroom is important and should be known by the students. In the last comment, the teacher indicates not asking questions she didn't not solve in class, but she also states caring about asking questions that require students to make comments.

As a result, the teachers consider exam as a means of testing whether what they have taught or done the lesson is learned. At the same time, it is seen that they are not very willing to ask questions not solved in the course or not included in the textbook. This can be interpreted that they seem to have an achievement-oriented assessment approach.

3.8. Asking Questions on Each Topic

To the question of whether they asked questions from every subject, the teachers answer as follows: as much as possible (6 teachers), yes (6 teachers), and no (2 teachers). The excerpts given below allow to understand what they mean by these short answers:

Of course, I ask questions all topic I taught. The exam should have content validity. Otherwise, students can complain by asking why they learned this topic (Teacher 4).

Yes. As far as possible, I try to ask questions on each topic. If I cannot ask in this exam, I certainly ask in the next exam. Otherwise, students do not work (Teacher 11).

I try to ask questions from most of topics, if not all of them. The more the exam includes learning objectives, the more it is valid. (Teacher 1).

In the first comment, the teacher underlines the content validity and states that not asking questions on every topic may cause the students to doubt why they learned about this topic then. The second comment states that it is important to ask questions from every subject as much as possible in order to keep students working. In the last comment, as in the first comment, it is underlined that for the validity of the exam, questions should be asked from a large proportion of the topics, if not from all of them.

As a result, the teachers state that it is necessary to ask questions, as possible as, from every subject in order to ensure that the students study. At the same time, it can be said that they are aware of the importance of content validity in assessment process.

3.9. Reasons for Failure in Written Exam

There is a relationship between their learning performance and students' attributions of success or failure. Similarly, there is a relationship between teachers' attributions of their students' success and failure and the behaviour patterns they develop against them. Therefore, it seemed important to us to determine which reasons teachers attribute for student failures in written exams. The results reveal that teachers mostly attribute student failure in written exams to inadequate study (6 teachers), indifference to the course (5 teachers), and level of readiness and deficiencies in subjects (4 teachers). At the same time, some teachers consider that negative attitude toward mathematics (2 teachers), poor listening (2 teachers), and teacher-centred reasons such as inadequate or incomplete teaching (2 teachers) are failure causes. The quotations from teachers' typical answers are presented below:

If I ask questions similar to those I solved in class and the student fail in the exam, I search the problem in the student. The reason for this is, that the student does not work sufficiently and that s/he has some shortcoming in the topics (Teacher 10).

I think that prejudice against mathematics is an important reason. This significantly reduces interest and motivation for the course. I think I can teach math to everyone, as long as s/he has no prejudice against mathematics (Teacher 2).

If a student has failed in my class, I think that he did not listen or was very indifferent to the lesson (Teacher 4).

If a student failed in my class, the reasons can be as follows: Not studying, not fully understanding basic subjects, lack of regular repeating, lack of obligation to repeat class, passing class with average, starting to work a few days before the exam (Teacher 11).

In the first comment, the teacher attributes exam failure directly to the student if s/he cannot solve the questions already solved in class. In her/his opinion, the student fails due to his/her inadequate work and shortcomings. The second comment reveals the prejudice against mathematics as failure cause. The teacher states that this situation reduces the interest and motivation of the students for the course, and that s/he can easily teach mathematics to any student who has no negative attitude toward mathematics. In the next comment, the teacher attributes student failure to his/her poor listening and indifference. In the last comment, the teacher reveals a number of reasons for failure such as not working, lack of basic mathematical concepts, lack of regular repetition, starting to work a few days before the exam etc.

Consequently, in the teachers' opinion, the most important causes for failure are that student does not work adequately, is indifferent to the course, and his/her level of readiness is insufficient. In other words, the teachers think that well studying and listening to the lessons play an important role in the success or failure of a student.

3.10. Using Exam Results for Teaching

The mere purpose of the exams is not only to assess students' performance. They also give the teachers ideas about the effectiveness of their teaching activities and inform them at which points they need to improve their instruction. Regarding how they benefit from exam results, the teachers indicate that they use them for determining students' deficiencies (6 teachers), reviewing, changing, and diversifying their teaching techniques (6 teachers). In addition, there are also some teachers who distribute supplementary test questions (3 teachers) and make supplementary lessons to students according to their exam results (1 teacher). Here are some typical answers given by the teachers during the interview:

Looking at the exam results, I think I have used the right teaching techniques. In case of failure, I try to develop new teaching techniques according to the student profile. I find new activities for students. I perform tests in order to determine the level of students (Teacher 14).

We analyse our written exam results in detail. We look at how many points each student gets, and in which questions s/he fails. After this analysis, if we detect incomplete or incorrect learnings, we reteach gains in a different way in the classroom (Teacher 9).

From the exam results I determine who has problems in which subject. In general, if most students have a problem in the same subject, I change my teaching technique and reteach it again (Teacher 1).

I use exam results. If a student has a problem related to the present class, I give her/him supplementary test questions, but if the problem is related to the previous classes, I advise her/him. Students in difficulties usually have problems with four operations, operation priority, rooted numbers, exponential numbers, equations. Even if they understand the subject, they can make mistakes while doing operations (Teacher 7).

In the first comment, the teacher indicates that s/he develops new teaching techniques by considering students' level in the case of failure. Placing new activities and performing levelling tests are other strategies identified by the teacher. The second comment reveals that the written exam results are analysed in a detailed way and that the students' deficiencies and inaccuracies detected are tried to be solved by teaching the subjects again with different teaching methods. In the next comment, the teacher indicates that s/he benefits from exams in the context of seeing where the students have problems, and if the majority experiences the same difficulties, s/he teaches the subject again by changing his/her teaching method. The last comment expresses that student cannot perform the operations even if they understand the subject due to their shortcomings in some basic concepts. The strategies that the teacher develops depends on whether the student's difficulty is due to previous or current classes.

As a result, the teachers use the results obtained from exams to shape their courses. This is realized by teaching the subject using another method again and giving additional test questions to the students.

3.11. Suggestions for the Examination to be prepared by a Novice Teacher

The underlying reason for asking such a question is that the teachers' recommendations about written exam to be prepared to a novice teacher are important in terms of revealing what they attach importance to this issue and determining their beliefs about assessment. The main recommendations of the teachers are as follows: Being faithful to the learning objectives (8 teachers), preparing appropriate exam to students' level (7 teachers), asking questions from all the gains (5 teachers), asking clear and understandable questions (4 teachers), placing questions to students at different levels (2 teachers), and preparing a distinctive exam (2 teachers). All this is reflected in the following excerpts:

First, s/he should not ask questions on topics that s/he did teach and are not included in learning objectives. S/he should not be content with single learning objective. There should be questions related to many objectives in the scope of examination (Teacher 1).

I would like to say that s/he should not get away from learning objectives very much, that the sentences should be clear and understandable, that s/he should not teach at far below or far above level of student, and that s/he should prepare exam questions according to topics s/he taught in the course (Teacher 2).

Epecially, there should be reliability, usefulness, and validity in an exam. The purpose of an examination is to distinguish the students who know and do not know. Providing healthy feedback to students is essential. I advise novice teachers to motivate students by asking questions addressing to reveal their lacks, and to see assessment to be a system where they evaluate themselves and procedure (Teacher 6).

I say that the questions should be clear and understandable. It is needed to ask questions that include all topics and are appropriate to the level of the class. I also recommend her/him not to ask questions based on memorization (Teacher 14).

In the first comment, the teacher advises the novice teacher not to ask questions other than gains and try to ask questions from each gain. In the next comment, there are similar suggestions to the first. The teacher recommends the new colleague to be faithful to the gains and place clear and understandable

questions. S/he also underlines that exam questions should be limited to what is done in the course. The third comment refers to the characteristics that an exam should have in the context of measurement and evaluation principles such as reliability, usefulness, and validity. S/he also highlights that there are several messages a teacher will get from the exam. The last comment also underlines the importance of clarity and comprehensibility of questions in a written exam. In addition, the teacher states that content validity and asking appropriate questions to class level are concepts that need special attention.

As a result, asking questions that are appropriate for learning objectives and grade level play important role in the teachers' exam preparations. On the other hand, the clarity and comprehensibility of the questions and the high content validity of the exam are among the other issues taken into consideration by the teachers.

4. Conclusion and Discussion

In this study, the assessment perspectives of middle school mathematics teachers were tried to be determined with the help of a semi-structured interview form in the context of written exams. A qualitative approach was adopted in the research and no generalization concerns were carried. For this reason, the findings are limited to the answers given by the teachers participating in the research to the questions.

The participant teachers' understanding of assessment is mostly based on exams and student's level determining. Although the teachers approach the formative assessment approach by expressing that they change their teaching methods and reteach in case of failure of the student in a subject, their "instant" assessment approach seems summative assessment. Written exams, multiple-choice, true-false, and gap-filling questions are among assessment methods used frequently by the teachers. There is a very limited number of teachers using complementary assessment techniques. This can be interpreted as either that the teachers are not aware of these methods, or they are not sufficiently convinced of the benefits of using them. Indeed, in the literature, it is stated that teachers have problems with the assessment practices in the curriculum; they see themselves as more inadequate in this regard compared to other dimensions of the program; There are various studies in which they state that they need training on assessment (Gözütok et al., 2005; Şimşek & Kılcan, 2022; Yapıcı & Demirdelen, 2007; Yaşar et al., 2005)

The teachers believe that the best methods to assess mathematical skills are to ask questions, especially open-ended questions and make students practice with questions on the blackboard. These results show that the teachers believe in the importance of asking verbal questions in the classroom in order to reveal their mathematical skills, and that they use open-ended questions to maximize the effectiveness of verbal questioning, as many authors believe (Chin, 2007; Lee & Kinzie, 2012; Tofade et al., 2013). On the other hand, although open-ended questions have many benefits, some studies (Al-Absi, 2013; Kanellos & Nardi, 2009; Kwon et al., 2006) report that teachers mostly prefer closed-ended questions in their mathematics lessons. One of the reasons for this is that teachers have difficulties in evaluating different answers from students to open-ended questions. On the other hand, in exams the teachers expect students to get high scores, to answer all questions about the subjects taught in the course, and to solve questions similar to the types of questions solved in the course. The teachers consider exam as a means of testing whether what they have taught or done the lesson is learned. At the same time, it is seen that they are not very willing to ask questions not solved in the course or not included in the textbook. It is possible to say that these results show that teachers are closer to a success-indexed assessment approach. It is a known situation that teachers are faced with some institutional and parental constraints while performing their profession. As in many countries, the pressure of national exams is increasing day by day in Turkey, which puts students in a competitive mood. It can be asserted that the reflection of this in teachers is the understanding of success-oriented evaluation.

The most important sources that teachers refer to in preparing exam questions are textbooks, question banks, test books and questions of national exams held in previous years. So, the anxiety of preparing students for national exams is one important variable playing a role in the choice of questions for the written exams. As stated before, national entrance exams (high school entrance exam for middle school students) are vital exams in the Turkish education system, like other national exams (Basic Proficiency Exam and Field Proficiency Exam for high school students) (Baştürk, 2011a, 2011b). These are exams consisting of multiple-choice questions and often require special preparations. The high number of students who are successful in these exams is a source of prestige for schools, administrators, and teachers, and increases the preference of schools by parents. Due to the multiple-choice structure of these exams, time constraints (about 1.5 minutes for each question), competitiveness, etc., the shortest and most practical procedures to solve the questions comes to the fore rather than the

long ones. All these lead teachers to books prepared for this exam and not to use middle school textbooks. Therefore, it is understandable that teachers prioritize these resources in written exams.

In the teachers' opinion, the most important causes for failure are that student does not work adequately, is indifferent to the course, and his/her level of readiness is insufficient. In other words, the teachers think that well studying and listening to the lessons play an important role in the success or failure of a student. We think that this interpretation of student mistake limits the possibilities of exploiting it. In the context of developments in mathematics teaching, the positive understanding that student mistake heralds the emerging knowledge has developed (Astolfi, 1997; Brousseau, 1983; Charnay, 1986; Deblois, 2006). Generalizing mistake comments such as lack of knowledge, not listening well, not studying enough is far from providing much benefit to teachers in the context of formative assessment and is also not very productive in terms of developing effective strategies (Baştürk, 2009). These cannot go beyond retelling, repeating the topic, telling the missing knowledge, and explaining the mistake to the student. When the cause of mistake is evaluated as learner-centred in this way, the strategies developed against mistake are also learner-centred. However, the cause of the mistake cannot be reduced to the learner alone. The sources of mistakes are many and varied and require in-depth reflection, by considering many variables. They should be evaluated in conjunction with many dimensions such as environment, student, teacher, knowledge, student-knowledge relationship, teacher-student relationship, teacher-knowledge relationship, etc. (Deblois, 2006; René de Cotret, 1988).

Studies on teachers' reactions to mistakes mention two general strategies, adaptive and maladaptive, to organize the occurrence of the mistake-reaction moment (Soysal, 2023). Maladaptive strategies are closed-ended strategies that do not allow collective correction or improvement of the mistake (Tulis, 2013). A teacher with such a strategy maintains the first-knowing role in dealing with mistakes or does not share his epistemic authority with students. Correcting the mistake is a task undertaken by only the teacher. Adaptive strategies, on the other hand, are open-ended and conditional. The teacher looks for alternative ways to deal with the mistake with persuasive dialogs. In correcting the mistake, the student and the teacher share a role. Mistakes are tried to be corrected in the classroom with the cooperation of these two (Tulis, 2013).

The teachers use the results obtained from exams in order to shape their courses. For cases where students are unsuccessful, this is realised by teaching the subject using another method again and giving additional test questions to the students. Although it is not possible to interpret how the first strategy was realized with our current data, we consider it a positive situation. It would be interesting to observe this more closely with studies that will focus on teachers' classroom practices and to determine how teaching methods have changed and they are adaptive or maladaptive. However, the other strategy seems to us to be a reflection of the preparation for the national exams we discussed above. Asking the same type of questions to be solved over and over so that the student memorizes the question patterns is one of the commonly used strategies in preparing for national exams (Baştürk, 2011b).

As expected, asking questions that are appropriate for learning objectives and grade level play important role in the teachers' exam preparations. On the other hand, the clarity and comprehensibility of the questions and the high content validity of the exam are among the other issues taken into consideration by the teachers. It is considered as a pleasing element that these basic elements of assessment are expressed by teachers.

5. Recommendations

The following suggestions can be given in the context of the research results:

- The findings of the present study are limited to the analysis of teachers' responses to the semi-structured interview form. For this reason, it is thought that the studies to be carried out in the context of analysing the materials used by teachers for measurement and evaluation and examining in-classroom practices will provide a better understanding and discussion of the results of this research.

- It is seen that the tools used by the teachers participating in the research for assessment are more traditional. These are more result-oriented methods. It should be ensured that teachers know and use complementary measurement and assessment techniques through in-service training.

- The effective and efficient use of assessment results in teaching is very important and this is possible with effective assessments. However, it is seen that teachers' perceptions and strategies of student mistake are limited. It is clear that such strategies cannot be the solution to every student mistake. For these

reasons, there is a need to develop teachers' student mistake approaches to be more adaptive, shaping, and structural in learning.

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CHAPTER VI

A CULTURAL COMPARISON OF A LOCAL AND A GLOBAL EFL TEXTBOOK FROM HORIBE'S CULTURAL PERSPECTIVE

MONIREH AZIMZADEH YİĞİT¹ & EMRAH DOLGUNSÖZ²

*¹(Asst. Prof. Dr.) Bayburt University,
English Language Education myigit@bayburt.edu.tr
ORCID: 0000-0003-1598-1457*

*²(Assoc. Prof. Dr.) Bayburt University,
English Language Education emrahdolgunsoz@bayburt.edu.tr
ORCID: 0000-0002-1277-2177*

1. Introduction

Regular and consistent evaluation of educational materials such as coursebooks inhabits invaluable insights for developing a better instructional perspective and practice. In English language teaching (ELT) coursebooks are vital parts of language practice in the classroom which helped both instructors and guided learners. Sheldon (1988) described ELT coursebooks as the heart of any ELT practice and thus stated that coursebook designers should pay intense attention to the content of these materials. The utmost priority should be given to learner needs, the learning process and the context. Researchers in the area of coursebook evaluation paid utmost attention to the potential value of the coursebooks by making judgments on contents from various perspectives (Tomlinson, 2003). In this study, we adopted Horibe's Cultural Model by focusing on the cultural aspects of two different EFL coursebooks and aimed to reveal the type of cultural content by evaluating different parts.

Learning a language is not only a process of learning syntax and grammar, to fulfill target language competence, culture is also a component that should be learned. Target culture enables better communication and provides pragmatic

competence which is vital to be aware of how to use language in different social contexts. In this way, intercultural competence is fostered and the target language turns into an efficient tool for meaningful communication. In English as a foreign language context (EFL) in which English is practiced solely in a language classroom but not in social life, coursebooks used in EFL classrooms become more important since it is the major source of target language culture acquisition. More than just ink and paper, coursebooks become tools for conveying target culture by providing content related to cultural topics and social contexts (Kobia, 2009) and they can open new cultural perspectives.

Horibe (2008) stated that in the traditional ELT model, students were asked to learn about the target countries' cultural contents. But as English was considered an international language, students were not asked to learn about the target culture. He also stated that although the traditional view of teaching target culture was not valid nowadays, the important role of teaching cultural content in language classes should not be neglected. To teach cultural content in the EIL context a novel and a comprehensive frame is required. Based on arguments on teaching cultural content in language classes in the last three decades, Horibe recommended a model of teaching cultural content in language classes into three classifications: "Culture in the pragmatic sense", "Culture as social custom" and "Culture in the semantic sense" (2008). Using the Horibe's cultural model, the main purpose of this study is to detect and compare the cultural content in EFL textbooks "Sunshine" published in Turkey (local) and "English Unlimited" published in the UK (global) which are both used in EFL instruction in Turkey.

2. Textbook Evaluation in ELT

One of the essential components of English language classes is textbooks since they serve numerous roles in English language teaching courses. They help teachers as well as learners in the language-learning process. They may or may not motivate learners and teachers based on their content. Textbooks are one of the major resources for transmitting knowledge to students in an organized manner. Indeed, the assessment of textbooks is crucial to determining whether or not they are appropriate for use in language classes. Evaluation of textbooks has gained interest among educators and those who are in charge of developing curricula since the 1960s. The goal of textbook evaluation has expanded from just focusing on assessment outcomes to gathering detailed data and making decisions about all facets of the curriculum. (Dudley-Evans, 1998). As a result, textbook evaluation is essential for developing a textbook that meets

the needs of students. The chance to evaluate textbooks allows instructors, managers, administrators, and material developers to decide which textbooks to recommend to their students. Moreover, assessing the textbooks gives the instructors the chance to learn about the benefits and drawbacks of a specific textbook and make an appropriate selection. Additionally, it is beneficial to compare the textbooks' potential strengths and shortcomings to adapt them according to our students' needs. The fact that evaluating textbooks is essential for teacher development and teachers' career advancement is another purpose for textbook assessment. It aids them in achieving beneficial insights into the overall nature of the textual material, which is reliable, comprehensive, and experiential. According to scholars (Cunningsworth 1995; Ellis 1997), textbook evaluation aids teachers to achieve beneficial insights into the overall nature of reliable, comprehensive, and experiential text material. They can also learn how to properly motivate students and give them feedback, as well as acquire a significant amount of experience in the field of teacher development. Moreover, they can become acquainted with a large number of published educational materials. Text evaluation provides a great opportunity for a teacher to develop an evaluative outlook while teaching.

3. Horibe's Cultural Model and Textbook Evaluation

The current study adopted Horibe's Model to examine cultural content in the related coursebooks. In this model, Horibe (2008) tried to define the role of culture in the current EFL pedagogy. He manifested three cultural dimensions to explain culture; "culture as a social custom", "culture in the pragmatic sense" and "culture in the semantic sense". Culture as a social custom encompasses socio-cultural aspects (i.e. daily life, festivals, literature and art, customs and traditions) signifying daily routines, lifestyle, celebrations, local customs, and festivals such as Navruz, Easter or Halloween.

The second dimension, culture in pragmatic sense by Horibe (2008) refers to the line where culture is blended by language use. This dimension tried to explain how culture affects language use and interpersonal communication. This dimension is significant since it is required to fulfill social interaction and mutual understanding in various daily situations such as a sense of humor or formal/informal interaction.

The last dimension in Horibe's model, culture in the semantic sense, covers the meaning of expressions both at word level and sentence level and the way we perceive cultural themes. It remarks the role of cultural themes regarding

semantics. In this dimension, lexical access can manifest a new window for the learners, and affect their opinions and thoughts. A brief summary can be seen in the Table 1.

Table 1. Codes and Categories in Horibe's Cultural Model

Culture as social custom	Culture in the pragmatic sense	Culture in the semantic sense
<ul style="list-style-type: none"> • Social issues • Traditions • Celebrations • Sports • Everyday life • Art • Literature • Food • History 	<ul style="list-style-type: none"> • Conversational patterns • Speech acts • Pragmatic norms in communication 	<ul style="list-style-type: none"> • The semantic meaning of language

Source: Horibe, 2008, pp. 244-248

3.1. Previous Studies on Textbooks and Cultural Content

Since textbooks are the only and most important source of acquiring intercultural competence in the EFL context, their cultural design has a major role in predicting culture acquisition. Hence local EFL textbook designers are required to be very sensitive while including cultural topics in their textbooks. The cultural content in EFL coursebooks has been scrutinized in several studies. Dehbozorgi et. al., (2014) examined the cultural topics included in EFL textbooks "English Files", "Top Notch" and "Four Corners" used at schools in Iran. This study adopted Lee's (2009) and Chen's (2004) models to examine little "c" and big "C" culture dimensions. In their study, they also utilized Cortazzi and Jin's (1999) culture components (target source, and international culture model) and Aliakbari's (2004) neutral culture category to examine the cultural evaluation of each coursebook. This mixed-method study revealed that both little "c" and big "C" were commonly included in the three textbooks. However, all three textbooks included higher frequencies of the little "c" component when compared to the big "C" component. Additionally, they revealed that little "c" rate in the coursebook "Top-Notch" was higher than the rate in the two other books. On the other hand, little "c" rate in the coursebook "Four Corners" was found to be inadequate. A recent study by Nikou and Soleimani (2016) focused on cultural themes in

Iranian and Turkish high school EFL coursebooks. They adopted Ramirez and Hall's (1990) model to detect and examine cultural topics. Their results showed that both Iranian and Turkish EFL textbooks had serious cultural caveats to help students to acquire intercultural competence. They recommended that several modifications in the textbooks were required to achieve desired cultural content (p.646). In another study, Arslan (2016) focused on cultural elements in Turkish EFL textbooks used for 3rd and 4th-grade students in primary schools. The results revealed that cultural topics in the 3rd-grade textbook are denser when compared to the 4th-grade textbook. Additionally, the study concluded that cultural items were not distributed fairly in both of the textbooks pointing out that target and international cultural items were included more than native culture items.

In a more recent study, Azimzadeh and Özkan (2020) aimed to scrutinize cultural topics included in EFL textbooks used in high schools in Iran. In this study, Kachru's (1985) model was adopted to examine origins of the cultures embedded in EFL coursebooks. The results revealed that the native cultural topics in Iranian textbooks were dominant. In another recent study, Horibe's Model was adopted by Azimzadeh (2020) who explored cultural topics in three Iranian high school EFL textbooks. The study concluded that among the three aspects of culture represented in Horibe's (2008) model, culture as social customs dominated the cultural content of all these three EFL textbooks. Recently, by using Kachru's Model, Azimzadeh and Dolgunsöz (2022) aimed to examine and compare cultural items in two local course books used for 9th-grade students in Iran and Turkey. Their results showed that cultural items in the Iranian textbook revolved around native culture and only a few cultural topics from expanding circle countries (i.e. Russia, China) were included. For the Turkish textbook, they found out that the Turkish textbook included several cultural items related to inner-circle countries with little emphasis on native culture.

The consensus of these studies was that local EFL textbooks had several cons related to intercultural competence and culture acquisition. Commonly, an approach to achieving the desired balance between native culture, international culture, and target culture representations could not be achieved. Additionally, Horibe's Model which may reveal different cultural dimensions was rarely adopted in previous studies. The current study aimed to examine and compare the cultural content in an intermediate Turkish coursebook titled "SunShine English" and another global coursebook by Cambridge University Press "English Unlimited" by adopting Horibe's 3 cultural model components; Culture as a

social custom”, “Culture in the pragmatic sense” and “Culture in the semantic sense”.

4. Method of the Study

This study adopted a qualitative design carried out with content analysis to examine cultural content in two textbooks. The content analysis was based on different components of the textbooks such as images, dialogues and exercises.

4.1. Materials

Table 2 below summarizes two textbooks that were analyzed through content analysis.

Table 2. Textbook information

	Sunshine English (Local)	English Unlimited (Global)
<i>Publisher</i>	Cem Web Ofset AŞ, ANKARA	Cambridge University Press/UK
<i>Published year</i>	2019	2011
<i>Level</i>	B1	B1
<i>Total number of pages</i>	167	165
<i>Analyzed components</i>	Reading texts, speaking, listening, writing parts, pictures, and exercises	Reading texts, speaking, listening, writing parts, pictures, and exercises
<i>The number of pages analyzed</i>	87-99 126-138	6-13 46-53

4.2. Data Analysis

Two English-language textbooks, *Sunshine English* and *English Unlimited*, were analyzed in this study. *Sunshine English* consists of 167 pages, and *English Unlimited* contains 165 pages. Since this study tried to explore cultural elements in two textbooks, two lessons that contained more cultural content were selected. Lessons 7 and 10 from *Sunshine English* and lessons 1 and 6 from *English Unlimited* were chosen for the study. All parts of the textbooks, including reading texts, speaking and listening parts, writing instructions and exercises, pictures, and various exercises, were analyzed. Listening parts were transcribed and then evaluated using the 11 steps of content analysis outlined by Cohen et al. (2007).

5. Findings and Discussion

5.1. Cultural Themes in Turkish EFL Textbook *Sunshine English*

Table 3 shows cultural subjects which were represented in the Turkish EFL Textbook *Sunshine English*.

Table 3. Cultural Themes in Turkish EFL Textbook *Sunshine English*

Unit Number	Unit name	Culture as social custom	Culture in the pragmatic sense	Culture in the semantic sense
7	Facts about Turkey	Traditions Celebrations History Social issues Literature Everyday life Sports Food Art	Conversational patterns, Speech acts Pragmatic norms in communication,	-
	<i>total</i>	45 93.7%	3 6.3%	-
10	Values and Norms	Celebrations Traditions Literature Social issues Everyday life Food History Art Sports	Pragmatic norms in communication, Conversational patterns Speech acts	The semantic meaning of language
	<i>total</i>	10 (45.4%)	3 (13.6%)	9 (40.9%)

Table 3 indicates that the 7th unit of the Turkish EFL Textbook, *Sunshine English*, has items of “culture as social custom” (93.7%) and “culture as pragmatic sense” (6.3%) ”Culture as social custom” is dominant in this section.

Examples of culture as social custom (45.4%), culture in the pragmatic sense (13.6%), and culture in the semantic meaning (40.9%) are included in the 10th unit. The cultural contents of this unit were dominated, as in unit 7, by culture as social custom (45.4%).

Table 4. *Aspects of Culture in Turkish Textbook Sunshine English*

Unit/Chapter	Code/Codes	Category/Categories
7. Facts about Turkey	History Pragmatic norms in communication	Culture as social custom Culture in the pragmatic sense
10. Values and Norms	Semantic meaning Pragmatics norms in communication Social issues	Culture as social custom Culture in the pragmatic sense

Considering the dominance of culture as social customs in this unit of the Turkish EFL textbook, there are pictures of historical places such as Anitkabir, the Çanakkale Martyrs Memorial, and Topkapi Palace in terms of culture as social customs (unit 7, pages 89-94).

Regarding culture as pragmatic sense, there are two dialogues in the 7th unit of the Turkish English textbook. The first one is a lecture from an architecture class in which an instructor gives a presentation about Anitkabir. He gives information about the location, designers, and materials used in the building of this mausoleum.

Hello, everyone! Last week, we talked about an important momentous Tajmahal in India. Today we look at Anitkabir. Anitkabir was built for the founder of the Turkish Republic Mustafa Kemal Ataturk. All right let's start.....(p.90.)

Similarly, there exists a dialogue between a tourist and an agent at a tourist information desk in Istanbul in the 7th unit of the textbook. The dialogue is an information-seeking dialogue in which one of the participants, a tourist, seeks information about historical sites in Turkey.

*Agent: Hell, and welcome to Istanbul. How may I help you?
Tourist: Thank you. What are the must-see attractions in Istanbul?
Agent: Let me tell you that you should see Topkapi Palace.....
(p.94)*

There are two adjacency pairs in the dialogue, both of which are question-answer types. Furthermore, a turn-taking process can be viewed as speakers recognizing when to begin or end a turn in a conversation. The dialogue aims to present historical places in Turkey.

Another example of pragmatic sense in the 7th unit is the listening part. In this part, students are taught how to remark a word in English.

Listen to the underlined words in the following sentences and tick the correct box.

Strong weak

1. She was angry with her students.
2. I was lost in that foreign city.
3. I'm from Okinawa, Japan (p.95).

Regarding culture as a social custom in unit 1, there existed pictures and quotes from famous people such as Yunus Emre, Mevlana Celaleddin-i Rumi, and Mahatma Gandhi such as “*We love all the created for the sake of the Creator. Yunus Emre or Either seem as you are, or be as you seem.*” Mevlana Celaleddin-i Rumi (unit 10, p.128).

Representations of culture in a pragmatic sense can also be seen in the 10th unit of the Turkish EFL textbook. Three examples of culture as pragmatic sense can be seen in the textbook. One of them is a lecture from a sociology class.

Teacher: Good morning, everybody. Are you ready to listen to your friends' presentations?

Student 1: This is our favorite activity because we are real night owls and crazy about films, especially film series. Now I will tell you what you need for a fabulous night.....

Teacher: “Thank you, Neytin.” Sounds amazing

Another example of culture as pragmatic sense in Unit 10 is a phone dialogue between two students who are talking about their presentation on values and norms at work.

Ahmad: Hey Gloria. How are you? Have you finished your presentation about the values and norms of a work?

Gloria: Hi Ahmad. I am ok. Thank you. No, I have not finished it yet. How about you?.....(p.134)

Gloria, one of the participants, is involved in an information-seeking procedure in the dialogue above as she seeks out information regarding their presentation. Again, adjacent pairings take the form of question-and-answer

exchanges. “That’s true,” “You’re right,” and “Sure” are examples of comments made by two participants to demonstrate their interest in one another’s conversations. The speakers switch once the other has finished her sentence, which is a sign of turn-taking in the dialogue.

In another exercise in the listening part, there are presentations of / i: / and / aɪ / sounds with examples.

Read the sentences aloud. Be careful with the sounds. Then, listen and check.

*/ i: / **Either** Jack or Jill will be responsible for bringing snacks to the party.*

*/ aɪ / We cannot hire her because she can speak **neither** French nor German. (p.135)*

Presentations of semantic sense can be found in the 10th unit of the Turkish EFL textbook as well. There are symbols for trust, honesty, commitment..... (p.127).

5.2. Cultural themes in the English Unlimited coursebook

Table 6 represents cultural subjects that were presented in the *English Unlimited* coursebook.

Table 5. Cultural Themes in English Unlimited coursebook

Unit No	Unit name	Culture as social custom	Culture in the pragmatic sense	Culture in the semantic sense
1	Media around the world	Media, Literature, History, Food	Conversational patterns	The semantic meaning of language
	<i>total</i>	23 (74%)	3 (9.6%)	5 (16%)
6	Let me explain	Everyday life	Conversational patterns	The semantic meaning of language
	<i>total</i>	2 (10.5%)	10(52.6%)	7 (36.8%)

Table 6 shows that the 1st unit of the *English Unlimited* textbook has demonstrations of “culture as social custom” (74%), “culture as pragmatic sense” (9.6%), and “culture in the semantic sense” (16%), but there are many instances of “culture as social custom” (74%) so that this category dominates the cultural contents of the unit.

In the case of unit 6, there exists “culture as social custom” with 10.5%, “culture as pragmatic sense” with 52.6%, and “culture in the semantic sense” with 36.8%. Unlike Unit 1, there are many examples of culture as pragmatic custom (52.6%), thus this category dominates the cultural contents of the unit.

Table 6. Aspects of Culture in Unlimited coursebook

Unit/Chapter	Code/Codes	Category/Categories
1. Media around the world	Media, Literature, History, Food, Conversational patterns, Semantic meaning of language	Culture as social custom, Culture in the semantic sense, Culture in the pragmatic sense,
6. Let me Explain	Everyday life, Conversational patterns, Semantic meaning of language	Culture as social custom, Culture in the pragmatic sense

In terms of culture as social custom, in the 1st unit of English Unlimited, there are pictures of TV and radio programs, books, and TV shows from different countries (p. 6). In the speaking part, learners are asked to talk about different aspects of culture, such as eating habits, greetings, and hospitality. (p.9)

Three examples can be found in the 1st unit of English Unlimited considering culture in the pragmatic sense. The first one is a dialogue between Paul and Rebecca, who are talking about what’s on TV.

Paul: What are doing?

Rebecca: Hm? Reading. Another Agatha Christie.... Murder is Easy.

Have you read it?

Paul: No, no. Is it any good?

Rebecca: Well, I’ve read it three times, so I know exactly what’s going to happen.....(p.7)

Dialogue is an information-seeking type of dialogue in which Paul and Rebecca argue about reading a book or watching TV. Adjacency pairs can be detected in the conversation in the form of question-answer exchanges. Similarly, turn-taking is evident in the dialogue, as speakers switch roles whenever the other has finished speaking.

Similarly, there is another dialogue in which people share their ideas about books and TV shows.

AIKO: I love TV. When I was not so busy, I used to watch it all the time. I remember, when I was fourteen or fifteen, I used to love these drama shows, which were always on at 9 pm on Monday nights on Fuji TV.(p.10)

Likewise, the last example is about an Argentinean talking about an experience he had in Egypt.

Frederico: some years ago, I worked for a company in Egypt, and on the first weekend we all went out for the day.....(p.11)

Besides, in an exercise, students are asked to underline the letters that make a /f/ sound in the given words. (p.13)

In terms of culture as semantic sense in unit 1, there are symbols representing different TV channels, such as the Fuji Television Network or BBC World News. (p.1)

Considering culture as a social custom in the 6th unit of English Unlimited, there are examples of advising people to save money in different cultures. For example, in the reading part, a woman named Kath Kely gives some recommendations on how to live on 1 pound a day.

“At 47, Kth Kelly made a sudden decision to change her life. Out one evening with friends, Kath- who was sharing a house and working as a part-time language teacher- complained that she could not afford a wedding present for her brother Danny.....she continued to see her friends, but gave up going to cafes and pubs to see them...”(pages 47-47)

Likewise, in the listening part, there is a radio program giving advice on how couples should manage their money.

Jörg: well, we know that many marriages break down because of financial issues, so it is important to manage money in the right way because the consequences can be very serious.....it is a very good idea to have a joint account.

10 examples of culture as pragmatic sense can be found in the 6th unit of the textbook. The topics of the dialogues are managing and saving money, a conversation between two old friends, playing Mahjong, and instructions for using a piece of equipment.

LIU YING:So, Jen you put all the tiles in the middle, face down so you can't see the pictures, and 'twitter'.

Jen: Sorry, I'm lost. What does 'Twitter' mean? Isn't it some sort of website?

LIU YING: Well, yes, but in Mahjong it just means you mix all the tiles up- like shuffling cards- and 'Twitter' is the sound the tiles make when you move them around. It sounds like the birds in the trees.

Jen: Ah, nice!

LIU Ying demonstrates how to play Mahjong in this information-seeking type of dialogue. The conversation contains adjacency pairs in the form of question-and-answer exchanges. In the dialogue, turn-taking is also present. Two participants will comment on each other's speech to demonstrate their interest in it, such as "Ah, nice!"

Concerning culture as semantic sense in the sixth unit of English Unlimited, there is a Chinese game called Mahjong in the speaking part. There are different tiles and special symbols exit on each tile that represent different meanings such as different dragons (a red dragon) or winds (the east wind) in this game.

6. Conclusion

We carried out this study to pinpoint some cultural differences in two EFL textbooks: a local ELT textbook used for 11th-grade students in Turkey and an international ELT textbook that was sold in the global market. Various components of the two books such as texts, dialogues and exercises were analyzed and the results revealed a number of differences in terms of cultural content regarding Horibe's cultural model. The analysis of the Turkish English language textbook, Sunshine English, based on Horibe's model showed that culture as social custom was inflated in the Turkish EFL textbook. Several representations of people's celebrations, social activities, daily life, art, and literature can be noticed in the textbook. On the contrary, in the English Unlimited textbook, culture as social custom as well as culture as pragmatic sense dominated the cultural contents of the textbook. Different samples of people's everyday lives, literature, history, and diverse dialogues can be seen in the textbook. In this perspective, local Turkish textbook needs a number of improvements, especially regarding pragmatic aspects of cultural knowledge. For pedagogical implications, we can recommend some pedagogical improvements for the Turkish coursebook as follows:

- The coursebook can include more contextual dialogues on different occasions
- More daily life examples both in native and target culture can be added
- More different types of short dialogues can be included
- Text may blend native and target cultural themes and contexts

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CHAPTER VII

THE RELATIONSHIP VIA NUTRITION AND MENTAL DEVELOPMENT BY THEIR FEATURES

AYBER ACAR

*(Dr.), KTO Karatay University, College of Health Sciences,
e-mail: ayber.acar@karatay.edu.tr,
ORCID:0000-0003-2784-8098*

1. Introduction

A balanced nutrition, healthy communities, the most effective in terms of public health is a factor. Keep with the daily movement and feature of doing business depending on the human body energy, but it is achieved by a balanced and adequate nutrition. According to society nutrition suppress the feeling of hunger in order to food intake does not satisfy abdomen. Actually, briefly nutrition might say, hunger-related suppression of the human constitution, change dead cells, microorganisms' renovation, carried out in order to maintain his life and meet the energy needs of a chain of activities.

Mental development and development functions of children, although inheritance of genetic and environmental factors at neutrinos effect and its big role should not ignore. Certainly, as a result of scientific research and studies, children mental development and functional changes is primarily a genetic inheritance, but also to adequate nutrient and rich food supplements have a positive impact on mental development in open literature. At each year, birth of Babies with reason or unreason's as yet unknown circumstances and certain illnesses, and babies attended with us in the certain illnesses will continue for many years among infants. As we have pre-stated, the reasons for these types of diseases, particularly a large extent could not be determined. However, a balanced nutrient especially, large issues at the top of the low birth weight and mental retardation, visual function impairment, cerebral palsy, autism, et al., the presence of a connection between the thought-provoking but rather is a

matter to be ignored. The frequency of these diseases are approximately 3.0-3.5 kg of weight infants and higher birth weight was 0.6-0.8% in weight infants, infants with birth weight of 1.5 kilograms below the statistical value of this ratio approximately increased to 20%.

As a result of different processes of diagnosis and treatment of post-natal diagnosis may like process consists of the previous illnesses of the brain begins forming processes, ie a kind of brain diseases, laying the foundation of this happening when it occurs. In other words, the formation of brain cells are taking place at womb divisions while much of the brain cells about 70-75% is completed before birth.

At this stage of the embryo the formation of the placenta which is required for nutrition feeding of the embryo to develop yet completely dependent on the mother's health and nutrition (Crawford MA., 1993). At this stage, the nutrition of the embryo live in feeding structure is not yet exist for the formation of the placenta is completely dependent on feeding and mother's health (Crawford MA., 1993).

This also sufficiently accurate and stable feeding of mother is directly affected. What is the right and balanced nutrition for these items? Present study, briefly considered the most essential nutrients such as fatty acids, vitamins and minerals focused on the precision.

2. Effects on Mental Development of Nutrient Elements

2.1. Fatty Acids

As mentioned, healthy people, healthy community thus public health reminds us nutrition, so nutrients declare us to continue our lives and ensure food groups. First one is fats. Fats especially fatty acids is one element of the essential nutrients necessary for life. In cases of natural nutrients and components, naturally founded and intake in the human organism by nutrients or unsaturated fatty acids intake to body. Shortly, fatty acids recognize the chains of 4-24 carbon atoms and organic acids. Due to molecule structure of double bonds, a saturated or unsaturated fatty acid is divided into two parts. According to the number of double bonds in unsaturated fatty acids contain one double or multiple double bonds. Saturated fatty acids that cause an increase in dietary cholesterol in the blood are known. Single double-unsaturated fatty acids effect cholesterol a bit level. Poly-double bounded to fatty acids decreased cholesterol levels, such as lipoprotein and triglyceride levels took down. Special

functions in the body due to be performed and which is accepted as significant amounts of polyunsaturated fatty acids in breast milk is higher than that of cow's milk. Valuable acceptable specific functions of polyunsaturated fatty acids cannot be synthesized at body so mother milk's higher than cow's milk. In addition, mother's milk take in active role brain development fatty acids with alpha-linolenic acid (ALA), and synthesized it eikosapentenoic acid (EPA) and dekozahekoenoic acid (DHA), although there were not these fatty acids in the composition of cow's milk (Baysal A., 1995). Therefore, the baby mother's milk form first proper nutrition before birth and after birth proper nutrition of mother of baby avoid serious sense of diseases continue a lifetime. Rapid brain development in baby's, during the last period of pregnancy, particularly the formation of the nervous system and more improvement steps in the formation of fats and fatty acids and takes an important role in affecting the quality of oils hence the mother's milk to meet with the entire development of baby directly (Gokmen H, Koksal G., 2001). More than half of the brain and the brain constitute formed lipids and the components of the lipids (Sanders TAB, Naismith DJ., 1979). In a study, babies feds of mother milk's lipid and DHA is synthesized by lipid components, additional food of DHA has higher blood concentration than those fed with infant formula was observed (Sanders TAB, Naismith DJ., 1979). In another study, longer duration of mother milk's and by keeping period of synthesized content of lipids, DHA was observed that significant progress in levels (Makrides M. Et al., 1995; Bjerve KS. et al., 1993).

As a result, the mother well, right and balanced neutrinos have important effects on mother milk's to baby nutrients as a result of premature birth or babies born in the normal time so brain and the functions of developments (Anderson JW. Et al., 1999).

Naturally, nutritional deficiency and nutritional disorders was determined to effect on visual functions, learning performance and also mental development (Uauy D. et al., 1994). Besides this study, many studies have been made. In another study of premature (preterm birth) infants the content of EPA and DHA-rich fish oil containing nutrients are given and notice of a strong improvement in visual function of infants identified (Wainwright PE., 2000). Although these fatty acids and substances synthesized from them yet, mentioned up to now when questioned how much oil is required in a form which is focus of these studies and a researcher who studies international organizations do not give answer to this question is still. But this is also a fact that babies, especially as a result of research and development of brain and nerve function, unsaturated

fatty acids and material synthesized has proven to be seeing positive effect of them (Uauy D. et al., 1994). Fatty acids is very important center, satisfied form mother milk's to babies. But absence of mother's milk and food products produced by companies equivalent to the mother milk, lipids synthesized ALA supplements made sense. In addition, the time for neonates and premature and separately formulated with ALA into DHA, with DHA and AA as formulated by arrangement (Uauy R, Hoffman DR., 2000).

Another study of infants below the age fed nutrients program include AA and DHA, which controlled with fatty acid content of foods is very low when compared with infants fed with the observed development of troubleshooting skills. But some of the studies and changes in perspective, though cause and effect relationship effects on yet. Therefore, it is also a fact that the mother and balanced nutrition with the right nutrients from mother to baby through all kinds of oils and fats in the mental development of components and their functions can not be ignored. Here we can say that the babies should be given the first six months of exclusive mother milk, the mother and child both adequate and balanced diet should consider itself (Willatts P. et al., 1998; Scott DT. Rt al., 1998; Wainwright PE., 1997).

2.2. Vitamins

Some part of the research also nutrients based on the onset of dementia as the first signs of the beginning little forgotless and related with dementia seen as the factors underlying the origin and damage to brain tissue in the later stages of Alzheimer's disease and Parkinson's disease, such as the century causes the formation of the nervous system related disorders more accurately. These are briefly explained, dementia, and social skills of a person's daily needs, is a progressive loss in ways that affect their daily functions feature of the nature of the disease is progressive (Acar, A.,2012).

A person with dementia, memory, thinking, reasoning, determination of the time and place, reading comprehension, speech, daily functions, such as making simple tasks is most prevalent. Deficiencies in performance of the socio-cultural time it makes it impossible to maintain the patient's daily living activities. In this case, the patient's such as bathing, eating a day to meet all the needs will require by someone else. Therefore, according to studies done at world, and the increasing largely population in United States towards the end of 2010 the largely population expected to be approximately 45-50 million, increasing disorders in the largely in mind and mental functions, and expected to grow to serious proportions. With the advent of the age of the most important cause of declining

mental function, decreased oxidative stress and the amount of antioxidants, so antioxidant status in the elderly is associated with memory and mental functions must be evaluated (Meydani M., 2001). A brief introduction to do Oxidative stress and antioxidants; Free radicals, reactive molecules that occur during the transformation of food energy by using oxygen. Oxygen molecules essential for living organisms, although the source of free radicals known as a metabolic intermediate products and is highly reactive. Lipid molecules known as reactive oxygen metabolites, such as protein and DNA damage cell components by them. Antioxidant defense systems to control the formation of free radicals, aerobic organisms and prevent the harmful effects of these molecules to be developed to do the task. But it means does not always a use full. At this point, the antioxidant defense system could not prevent the effect of free radicals and oxidative stress so defined as cases arise.

This state can also be defined as corrosion. UV rays, drugs, fat oxidation, immunological reactions, radiation, stress, smoking, alcohol, and biochemical reactions in the body such as the formation of free radicals can occur in many ways (Table 1). The resulting free radicals, including atherosclerosis, heart disease, cancer, cerebrovascular diseases, neurodegenerative diseases, diabetes, acute renal failure, lung disease, emphysema, bronchitis, and age-related degenerative disorders such as alcoholic liver disease also contribute to the formation of pathological conditions involving.

Table 1. Sources of free radicals and antioxidants

Intermolecular Free Radical	Antioxidant Resources
Excessive Alcohol Consumption	Enzymes
Use of Smoke	Protein
Electromagnetic Radiation	Selenium
Sun Rays	Ascorbic Acid (Vitamin C)
Chronic Inflammations	Tocopherols (Vitamin E)
Excessive iron overload	Carotenoids
Excessive physical exercise	Flavonoids
Thiol Aging	Glutathione
Birth Control	Coenzyme Q and Derivatives

Showing the protective properties of antioxidants, especially seen in cases with decreased level of oxidative stress in the body metabolism faster than harm (Kalmijn S., 1997).

Arise as a result of normal metabolism known as free radicals, oxidative stress, the present lack of antioxidant molecules, especially with the formation of harmful damage to the organism. The brain contains a certain amount of protective antioxidant properties contained high amounts of polyunsaturated fatty acids are very sensitive organ to oxidation. Increase at antioxidant capacity and oxidative stress, cancer, diabetes, cataracts, cardiovascular and cerebrovascular diseases such as reducing the incidence of many diseases, prevents or slows the decline of mental functions. In a study on the elderly, adequate vitamin E intake was positively affected mental functions. Not shown as the main reason is the increasing effect of vitamin deficiency plays a role in vitamins (Ortega RM. et al, 2002). For example, vitamin E deficiency major factors leading to loss of mental function, albeit that a strong association between vitamin E status, especially in the elderly, prevention of insufficiency concluded to evaluated (Ortega RM. et al, 2002). Insufficient dietary intake of antioxidants in clinical studies for the type of mental functions and the functions to be associated with Alzheimer's and Parkinson's disease was reported to occur. Demented patients with Alzheimer's and vitamins A, C, E and beta carotene (provitamin A), ie, the precursor of vitamin is A ingredient. Stored in the liver and converted to vitamin A when needed; parkinsonian patients compared to healthy subjects in the vitamin C and lycopene levels were significantly lower. For this reason, reduction in the level of antioxidants in patients with dementia, of increased oxidative stress, an indication that you've suffered the loss of mental function (Meydani M., 2001) is a powerful antioxidant carotenoid lycopene, a member of the family. Lycopene tomato watermelon, pink grapefruit and foods such as take place. The medical and clinical studies have also recognized that the workers, the elderly (≤ 73 years) and very elderly (> 73 years) individuals, plasma-tocopherol (vitamin E), vitamin C and b-carotene (vitamin A) levels and memory was found strong relations between them ((Meydani M., 2001; Perring WJ. et al., 1997; Ortega RM. et Al., 1997). There are many B vitamins under the title of B-group vitamins. B group vitamins, carbohydrates, proteins and fats in the body is required to use. Cereals, dried beans and B-group vitamins in foods of animal origin, are present in certain proportions. Vitamin B6, an important co-factor for the development of the central nervous system. For this reason, can affect brain development and mental functions. Recent animal studies pregnancy and lactation periods of vitamin B6 deficiency of N-methyl-D-aspartate receptor function were changed. This material glutamatergic neurotransmitter system plays an important role in learning and memory-making tour of the lower receptor (Guilarte TR., 1993).

Elevation of blood homocysteine levels in recent years also focused on the effect of the elderly neurophysiological functions. Homocysteine is mandatory for the production of proteins in our body which is one of the amino acids methionine group in a final product of degradation. And B group vitamins play an active role in the body which are produced continuously from the blood are removed by chemical reaction. Therefore, non-homocysteine related metabolic disorders, risk factors, blood homocysteine levels in people who carry enough vitamins and nutrients contained within the normal range. High levels of the amino acid homocysteine increase the risk of Alzheimer's disease and dementia was reported (Ortega RM. et al, 2002). The 28 individuals aged over 60 in a study examining the nutritional status of the brain functions, electroencephalographic (EEG) indicators and the B group vitamins, thiamin, riboflavin, and iron were found in terms of relations between nutritional indicators. Even a slight deficiency of thiamin, caused a reduction in brain function, EEG responses in the elderly with young people to be similar enough iron in area, but also force the disclosure of such data that were not ignored completely. However, the role of nutrition in the elderly in maintaining brain function in a normal way has been proposed to explain that there is no need for further studies (Tucker DM., 1990).

2.3. Minerals

Minerals, in the body in a certain extent, growth, development and healthy life, which is needed for many important tasks and essential nutrients. Although very small amounts in our bodies, very important tasks. Iron, zinc and minerals such as iodine is effective on mental development (Demircioglu Y, Yabanci N., 2003).

2.3.1. Iron

One of the most frequent nutritional problems at developing countries, iron deficiency (anemia), children with attention, learning and school success is negatively affected. Children with iron deficiency anemia, decreased attention, which in turn affect the stated of learning (Pekcan G., 1984). Anemia, the amount of hemoglobin by age and sex to remain under the criteria adopted by the World Health Organization. Anemia during two years at intelligence test decreased, is caused school children difficulty detection. Many studies of iron deficiency anemia, mental and developmental disorders in children, iron therapy was not returned to complete back of abilities. In a study of adolescents during pregnancy and lactation iron-poor diet program applied when babies are three

months, brain iron concentrations were measured and found to be lower. In some studies the relationship between iron deficiency and mental disorders in different anatomical and neurochemical changes result is detected (Pollitt E., 1994).

2.3.2. Zinc

In recent studies, the effect of zinc on the growth of the nucleic acid metabolism, protein synthesis or produced by the liver growth hormone, as well as the relationship between different biological activities and carrying out low molecular weight (7000-11000) group, the peptide is thought to accrue by increasing the production of somatomedin (Soner G., et al., 1989).

Hair zinc levels in children who attend primary school with positive correlations between reading ability (Penland JG., 2000).

2.3.3. Iodine

Iodine is a mineral that is required for the production of thyroid hormones. The addition of iodine salts Dinnerware, made compulsory by law are met through the ministry of health, the consumption of iodized salt to meet requirements. When insufficient iodine, cretinism in children, thyroid disorders seen in adults. Iodine deficiency, a major cause of preventable mental retardation. The most dramatic and negative impact of insufficient iodine intake, the child from the womb after 12 weeks of the fall is seen on the developing embryo. Soliton as a result of iodine deficiency of thyroid hormone, affects the normal development of brain and nervous system. As a result, a baby is doomed to life-long disabilities can come to the world. Even though the first years of life of the individual brain development affects the normal functions of thyroid insufficiency (UNICEF, 1998; FAO/WHO, 2001; Demircioglu Y., Yabanci N., 2003).

3. Conclusions and Recommendations

Nutrition, as well as physical health, and life-long embryo until the end of labor, also affects the mind and mental functions. Dietary unsaturated fatty acids with application program, iron, iodine and adequate and balanced amounts of antioxidants increases taken in ways that boost mental functions.

With the birth mother's milk, beginning and continue to receive mental development in infants and children also in the future than those fed mother milk is better than receiving. For this reason, the first 6 months of exclusive mother

milk to give babies earnestly recommended. Looking at the work done in recent years, the decline with age, the most important cause of mental functions is increased oxidative stress and antioxidant levels are believed to be falling (Acar, A., 2015). Application programs in nutrition, especially in older individuals, or as additional medication to take adequate amounts of antioxidants is prevented the reduction in mental functions. Throughout life, a rich source of antioxidants such as vitamins, minerals, the amount of material with a high consumption of fresh vegetables and fruits should be considered. Threatening the millions of children, malnutrition, in an effort to developing countries, adversely affect educational systems. An effective education of about healthy nutrients for prevention of malnutrition should be given by public. As a result, quality basic education in achieving the desired effects of nutrition on brain development and mental functions should not be ignored.

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CHAPTER VIII

USING CULTURAL UNDERSTANDINGS TO IMPROVE TEACHING IN OMAN

MARIELLE RISSE

(Assoc. Prof. Dr.), Dhofar University, Oman

m_risse@du.edu.om

ORCID: 0000-0002-3174-1181

Overview

The idea that the “right way” to teach is the way one was taught is very deeply ingrained. When I do orientation sessions for new teachers, I am sometimes surprised that, while teachers know that there will be many cultural differences when they move to a new country, they occasionally expect that students will behave exactly as in their home culture.

The result is that teachers can get caught in tough binary of thinking: either I have to accept this unwanted behavior or the students have to change. This might lead to misunderstandings, then escalate to anger on both sides. When I suggest that teachers make small adjustments, the response is often, “so I have to let students get away with this wrong behavior?”

No, I think teachers should have control of their classrooms, but insisting on creating your own (foreign) culture in an Omani classroom is not possible. Small adjustments can create a positive classroom atmosphere by taking in account local understandings.

For example, when students come late to class in some cultures, they should knock on the door and ask permission to enter. In other cultures, students should apologize and explain why they are late; another scenario is that students enter quietly without speaking to or looking at the teacher. When a teacher from a culture in which apologies are expected is confronted with Omani students who simply walk in and sit down, they can become annoyed and call out to the student.

This may create a problem as the student might feel unfairly persecuted for being made the center of attention. As students have explained to me many times, “students feel shy if the teacher makes all the students look at them.”

In talking about situations like this, I recommend teachers write their late policy on the syllabus, on-line teaching program and announce it in class, then talk to the student after class about the penalties for coming late. In one conversation with a teacher who was confronting this issue, they said, “But the student needs to apologize to me! You are telling me that I should allow them to be disrespectful!”

This reminds me of the Rita Mae Brown quote, “The definition of insanity is doing the same thing over and over and expecting different results.” Asking for student apologies for weeks on end and getting angry when an apology is not forthcoming doesn’t help the teacher, the students or the classroom atmosphere.

Allowing students to come in late without noticing them, then enforcing a specific penalty saves time and prevents frustration. Talking to a student at the end of class permits the teacher to continue the forward momentum of the lesson. And if the student starts to dispute about the penalty, the fact that it is time to leave the classroom gives a natural break to the argument. A teacher can say, “I am happy to discuss this more but now I have to teach another class. I will be in my office at 1pm.”

Culture and Pedagogy

When thinking about education I consider the most helpful definition of culture is that it encompasses the objects, actions and beliefs of a set of people who are grouped together by both themselves and others. When I teach classes specifically on culture, I always emphasize to students that they belong to many sets, hence many cultures. For example, a woman might be within the categories of student, sister, Muslim, Omani, artist, daughter, member of her tribe, resident of her neighborhood and that each set carries within in emic and etic expectations of actions (behaviors), objects (for example, clothing) and beliefs.

I have lived in five different countries and what often happens is that locals consider that manifestations of their culture, both simple (what’s the usual time to eat lunch) and complex (what are the steps to getting married) are lucid and natural. On the other hand, a newcomer might be bewildered and confused about how to navigate even easy tasks such as giving a proper greeting or writing a memo.

In Oman, foreign teachers need to both try to understand Omani cultures and be clear about the implicit and explicit effect of their background, experiences and education. It might be self-evident to a teacher that *of course* work can be turned in up to a week late, but students might believe that work might be submitted weeks or month late. Hence the articulation of expectations is vital when trying to minimize misunderstandings.

The “Third” Option

What I call the “third” option means finding a middle way between a teacher acting exactly as if they were teaching in their home country and allowing students to make all the classroom decisions, which might be antithetical to good learning practices.

The comment I hear often is that “students need to change” but often the issue is cultural perceptions. Sometimes when I suggest that teachers need to adjust I hear comments such as “So I should let students be rude?” or “I should let them do what they want?”

The answer to those questions is “no” but, to me, the most important issue is creating an effective learning environment, not recreating the exact behavior that teachers are accustomed to at home. Attempting to reconstruct another culture inside an Omani classroom will probably leave teachers and students equally frustrated.

Another way to look at this is to remember that that your decisions are in your hands; what is *not* in your hands is other people’s perceptions and reactions to your choices. You can say I am doing X action for Y reason and this choice means that I am Z. But that might only work among people from your culture; there is no validity in saying that all people must understand that X action means Z. In another culture, X might give a meaning of A.

In one teacher’s culture, a student talking back is seen as rude; but in another culture it can mean the student is positively, actively participating in creating meaning. In one culture, students not looking teachers in the eye is considered polite, in another culture it is rude.

For example, Omani students might ask for a mock exam. In some classes that is a good idea but in other classes, perhaps the teacher doesn’t think it’s necessary which makes students upset. This can lead to situations in which the teacher doesn’t think a practice exam is useful, but gives one to keep students quiet. Or the teacher refuses and the students complain later that their low score was the result of not having a practice exam.

The solution is teachers can make a few, small changes by addressing the root of the problem, thus restoring classroom balance and positivity. Students often ask for a mock exam because they are scared about exams, especially if it is the first class with that teacher. Students may have had teachers who changed the date of the exam, put a new style of question on the exam or asked about topics that hadn't been covered in class. If teachers look at the issue in terms of 'my students are fearful' instead of 'my students are rude,' solving the dilemma becomes easy.

When I am getting students ready for my poetry midterm, I literally draw a rectangle on the whiteboard with a series of 10 squiggly lines, one underneath each other. Then I say, "This is what your test page will look like, these lines are a poem, one of the poems we studied in class, but you won't know which poem." Then I draw a few more lines underneath spaced a little apart and say, "These are the questions. they will not be true/ false or multiple choice. You have to answer in a complete sentence. You won't know which vocabulary words will go with which poem. For example, for 'Skylark' the questions might be about the narrator, setting atmosphere and finding a metaphor. Or the questions might be about the characters, exposition, rhyme scheme and diction."

Then I say, "I don't know how many pages there will be but this is what the vocabulary question pages look like. At the end of the exam there will be questions to compare and the poems to compare will be in the text will be included. And there one or two questions of analysis, for example I will give you two poems and ask you which one is better and why." If a student again asks for a mock exam, I go through the entire small speech again.

I am not advising to give or not give mock exams. My advice is that when students start to clamor and insist that they don't understand, explaining something clearly, then repeating the exact same words is often effective. Omani students may show fear in ways that can be read as anger or disrespect; when teachers respond with annoyance, the classroom atmosphere can deteriorate. When teachers show that everything is in hand, for example that they know exactly how the exam will be set up and are willing to share that information, students can stay calm.

The Importance of Understanding Cultures: Five Main Points

In this section I will discuss five common cultural constructions within Oman which can affect student's behavior. I am specifically not talking about

any particular subject of study, but issues related to classroom management and creating a positive, pro-learning atmosphere.

Understanding Cultural Constructions within High Context Cultures

Oman is a high context culture meaning that most learning about proper social behavior is done by observation, not explicit instruction. When a teacher also comes from a high context culture that has different definitions of what good students do, this can lead to unintended confusion. It is much easier when teachers use low context techniques such as explaining all expectations clearly with written explanations and detailed rubrics.

The more organized and confident a teacher is at the start of the semester, the easier it is to create a positive learning environment. To use Krashen's terms, when a teacher appears confused or uncertain in high context cultures, students' affective filter is up, meaning that they students might be anxious to focus on learning.

Worrying about new concepts or new types of assignments can block students from being able to work effectively, so teachers should clarify exactly what is expected. For example, one teacher asked students to do presentations but did not specifically say that students would be interrupted with questions. When the first student was asked a question mid-presentation, they froze up and were unable to answer, nor could they finish the presentation. The rest of the class immediately developed sore throats with raging headaches and stated that they were not able to do their presentations.

Understanding Cultural Constructions of "Power" and "Authority"

Some teachers come from cultures in which teaching is very authoritarian. Teachers speak - students listen. Students do not have the right to question what a teacher is doing or why, much less complain about grades or that they have been treated unfairly. Also, some teachers have the idea that since many Omani cultures are based on tribes, that there are very top-down, repressive cultures, e.g. sheikhs speak and people obey.

This is not the case. Sheikhs might have the *last* word but it is their duty to listen

as part of the understandings within tribes is that the person without power gets to state their case, sometimes emphatically and at length. Also, a good sheikh will not issue commands, but talk in an intelligent way so that the people will agree with him or at least agree to follow a specific course of action.

Oman has many cultures which are oral-based, meaning people talk far more than they read or write. The powerplay of shutting people down without listening to them is rarely used. Further, refusing to discuss an issue can be perceived as being weak. The thinking is: if a person can't listen and/or debate, maybe it's because the person knows their case is not defensible. Someone who can't support their position will try to run away from conversations. Thus a common model of a person in authority is a person who listens and explains their thinking. It is also necessary that their words and actions match each other.

Students expect that their reasons/ excuses will be listened to

Because of this cultural constructions, an Omani student might come to complain or plead for a change in the rule several times. This can frustrate teachers who come from backgrounds in which students should not repeatedly ask for something. In this case, the American communication strategy such as saying "I'm sorry" to defuse a tense situation is helpful, as is setting limits such as saying, "I'm sorry, I would love to discuss this with you but I have to go to class now, I will be back in 1 1/2 hours and if you are busy then, I will be in my office tomorrow morning at 9am."

If a student continues to speak, as teacher can restate with questions which will break up the flow of complaints and force students to refocus: "Did I tell you that I wanted to continue the conversation? Did I tell you that I had a class at that time? Did I tell you when I would be back in my office? Did I tell when I would be in my office tomorrow?" The problem is deferred and not escalated.

When a student comes during office hours, I usually write down the exact time they start to speak and let them talk for ten minutes. Then I interrupt and say, "I have listened for 10 minutes, now I would like you to listen for 1 minute." If I am not going to grant the student's request to change the rules, I will explain WHY I have that rule, then say, "if you would like to continue to talk, that's fine, but unless you have NEW information, I need to do some work." Then I will listen for a few moments, if the student is simply restating their objections, I will start doing desk work such as e-mail and entering attendance without asking the student to leave my office.

Teachers need to explain their reasoning

In some cultures, teachers can make blanket declarations, but it's easier for students in Oman to have foreign teachers explain the class rules in a clear manner both orally and in writing on the syllabus and on-line teaching program.

One example is that I carefully describe how I grade tests. I turn the cover page over so I don't see the student's name. Then I grade all of the first pages together so I can see if students are having any particular problems with one question or if several students have answers that are too similar. Then I re-shuffle the papers and grade all of the 2nd pages, without looking at how a student did on their first page. When I have finished all the pages, I add up the scores and record the grade. I believe the reason I receive very few complaints or petitions about final grades is that I take the time to make sure students know exactly what I am doing with their tests. This allows them to feel more confident that I am being as fair as I can.

A second example happened one semester in which I was given a class to teach and I planned the syllabus alone, thinking I was the only one doing that class. During the add-and-drop period, a second section needed to be opened, but I didn't know that had happened, nor did the other teacher know I was also teaching the same course. A few weeks into the semester, the fact that the two sections had different assignments became clear and there was some worry that students would complain that my class would be perceived as being more difficult. I said that I felt there would not be any problems because I had spent a lot of time explaining what work I was assigning and *why* I chose to ask for that work. By taking the time to say why I felt the homework was helpful, students did not feel that they were being treated unfairly.

Do not make false threats

When talking to new teachers, I often give the example of a child crying for a sweet while a parent says no. After a few moments, the parent gives in and hands over the sweet so the child stops crying. The parent has now *taught the child to cry*. My point is: don't teach your students to create problems.

Think through realistic assessments and policies for your classes which you can defend. If you need to change something, do it explicitly in front of the whole class, write it on your on-line teaching program and make sure you have a built-in support ready to go. For example, "I was not marking who came to class without the course book but this is turning out to be a problem as many students are coming unprepared, and then bothering other students to share books. This means it's harder to some students to take notes. So, now I will be checking to see if you have your book and marking that as part of your class participation grade. If you forget your book at home, please come to my office before class and I can lend you a photocopy to use."

A related topic is that making broad threats only shows students that you cannot be trusted and invites students to attempt to change your mind on ALL aspects of your class. Saying “if you talk during the exam, I will take off 5 points” is not helpful. A teacher who tells students to come to class on time, but then arrives late is teaching students not to trust their words. Some teachers come from cultures in which older people are not expected to always follow their advice, but in Oman the idea of “do as I say, not as I do” can lead to classroom difficulties.

Understanding Cultural Constructions of “Magic Words”

Tied to the above discussion about power, some cultures work with what I term “magic words,” meaning that a teacher can simply say “this will not happen” and (like magic) it does not happen in a manner reminiscent of Gandalf blocking the Balrog by saying, “You cannot pass.” This construction does not work in Oman.

Simply telling students “do not...” will not work effectively. Words have to be connected to specific actions. For example, for a midterm exam, stating “do not cheat” is not useful. A teacher needs to think through the problem and create concrete steps to prevent cheating such as making sure students are seated apart from one another, writing tests with essays questions or having different versions of the test.

Another example is that many students like to solve exam questions in pencil, then go over their answers in pen. This creates a whole series of problems. First, to do this, students will need a pencil, eraser and pen. First year students often forget one of those three things, then create havoc by asking loudly to borrow an eraser, etc. Also, some students will not start re-writing until the very end of the exam time, so that you are trying to take exams as students are trying to erase and re-write. If you take the exam still written in pencil, the students are upset and if you give them extra time to re-write, then the other students are upset because they feel that the pencil-using students got extra time.

The way to deal with this is not to say “don’t use pencils” but to be very clear: “If I see a pencil in your hand, I will take it out of your hand.” Then make sure there is blank space on the exam. Once the exam starts, teachers need to walk around and take pencils away from students but at the same time, point out the blank space and say, “if you don’t like your answer, cross it out and write a new answer here.” Or if students complain that they circled the wrong answer on a multiple-choice question, ask them to use an arrow to point to the correct answer.

The combination of words, actions and making sure that students know you have thought through the ramifications creates a quiet exam.

Understanding Cultural Constructions of “Patience”

There is a strong Omani emphasis on covering/ hiding feelings and emotions. I believe this is connected to the fact that most Omanis live in multi-generational family homes with 20 or more people. Living in close quarters with so many relatives, creating a peaceful environment is important. This is on contrast to other cultures in which living in nuclear families or alone is common.

Living with so many people requires high levels of patience. For example, if several people want to go on a picnic but one child is sick, the family may delay plans so as not to leave two or three members at home.

Further, in many Omani cultures, getting angry is seen as something that children, not adults, do. A proper adult will not lose their temper but always stay in control of their emotions. Specifically, in the *qara* tribes that I work with, it is sometimes seen as a game to try to make another person irate. If a person yells, then they have “lost” as they don’t have the power to stay calm. Other conceptions of “patience” include not rushing to judge behavior. This means it is usual in Omani cultures to give people second chances and to look at their intentions, not only their actions.

Self-control

Sometimes when I explain the values of patience to teachers, I am told, “But students yell at me! They are not patient” There are a couple of issues at play. One is that the belief that the older the person, the better they should behave, so that a student who loses his temper might think, “I am yelling because I am young, but this teacher is older than me and should not yell at me.”

Sometimes a student is mad because of perceived unfairness, a teacher is requiring something that other students have not done or that other teachers do not ask for (such as coming to class on time). Or a student might be testing the teacher to try to get the teacher annoyed enough to say something wrong, which the student can then use as against the teacher.

So staying calm is absolutely vital. Sometimes the best choice is to explain that you cannot continue the conversation now for X reason, but that you are available to talk at Y time, giving you both some breathing room.

Sometimes you can plan ahead for how to avoid tense situations. You will know that X type of event might induce panic (and hence anger), so you can

figure out how to keep a calm atmosphere. For example, the end of exams can be a difficult time for students who do not know the answers. Perhaps, they have been sitting and starting at the exam for over an hour, but when the times comes to give in the paper, they can get upset, try to quickly write something and yell if a teacher tries to take their exam paper. Handled wrongly, the situation can end in tears and/or fury.

Therefore, I make plans to ensure a smooth ending without me having to raise my voice, much less grab a paper away from a student. First, I give verbal warnings about the time such as “you have one hour.” I make those as clear and short as possible, not: “now dear students I want you to know that we have finished half the time and you have one hour remaining.” Simple, short statements are best.

When there is 10 minutes left, I say “you have to finish now, there are ten minutes.” And then when the time is finished, I don’t say, “the time is over, give me your papers.” I say, “time to finish” and then give a count-backwards from 10: 10 - pause - 9 - pause - 8 - pause, etc. When I get to “zero,” I start talking (sometimes singing) very loudly, “let’s go home - let’s go have ice cream - time for tea,” etc. It’s silly and distracting. If someone refuses to hand over their exam, I stand next to them and talk very loudly about how I really want to leave and go have an ice cream. The fact that I am talking loudly means they can’t concentrate; they quickly give up and hand over the paper. The students might be unhappy with how they did on the test, but they do not feel attacked or antagonized.

Sometimes it is not possible to plan ahead. Suddenly you are confronted with inappropriate behavior and you have to decide on the fly what to do. In one lower-level class, I had a group of ten boys who were enjoying themselves by coming late, not bringing their books and often asking to leave class to go to the bathroom. During one class, one student asked to leave and as soon as he came back, a second male student asked to go to the bathroom. When he came back, immediately a third male student asked to go. All the men were giggling and I had a decision to make about how to address this silliness. I decided that patience was the best option. So I let the third student leave and continued the lesson. Eventually seven male students left the room in turn, but I stayed on topic, having students read and answer questions without giving any of my attention to the bad behavior.

At the start of the next class, I had the students open their books, then I said, “before we start, I want to talk about myself for a moment.” This got everyone’s

attention as students usually like to hear teachers tell personal stories. Then I said, “I am a university professor; I am here to teach university students. I am not interested in teaching children. If I wanted to teach children, I would go and teach in a kindergarten. And I am also very uninterested in childish behavior. You are all grown up people; if you don’t want to come to class, don’t come to class. If you are in my class, then you need to act like an adult, as I am not here to teach children. Are there any questions?”

The students all understood my point and sat silently. Then I immediately started to ask questions about the reading to get students talking and involved in the class. The male students who had misbehaved sat and glowered, but many other students responded so I started the class without focusing on the angry ones.

Note that in my remarks I focused on myself; I did not refer to any specific student or the action of asking to go to the bathroom, nor did I call the students “children.” This meant that students could not respond/ complain by saying that I had singled out one particular student or question who was I to say that they had needed or not needed to go to the bathroom. During the rest of the semester, a few male students asked to leave, but there was never a repetition of that kind of ridiculousness.

Believing the Best of a Person

A second issue related to patience is that Omanis often believe a person, especially a younger person, should be forgiven the first time they make a mistake, even if it was a deliberate transgression. Thus Omani students might breezily say “first time/ last time” when, for example, they have cheated on an assignment. A teacher from a culture which believes “do it right the first time” might feel insulted by a student who is not taking a problem seriously. One way to handle these situations is to make a great show of writing down the student’s name and what happened, then saying, “this was your ONE chance to make a mistake. And I have noted it, so if it happens again, then the consequences are...”

Judging on intentions not actions

Something that has really helped me as a teacher in Oman is that I spent two summers learning Arabic from Omani teachers. Being a student in an Omani-led classroom gave me a lot of insights into how teaching and learning is conceived of in Oman.

I was once, painfully slowly, trying to say a sentence in my Arabic grammar class but the Omani grammar teacher kept trying to help by interrupting me with hints. I got really frustrated and yelled “STOP!” He walked to the corner, turned his back to the class and raised his hands over his head (punishment for misbehaving school kids). The other American and European students were appalled but the Omani teacher was not angry with me because he perceived my intention in yelling was to express my exasperation with myself, not an attempt to be rude to him. The *action* of yelling was rude, but there was *no intention* to be rude so we kept a good relationship.

From his comments in class it was clear that, to him, it was less rude to shout from frustration than to play with a cell phone in class or sit silently seething. I was making mistakes and inappropriately yelling, but at least I was trying to speak and learn so I was judged positively.

Some students might work out of the same framework. For example, students might whisper questions to each other while a teacher is talking. If a teacher assumes the talking is social (not class-related), the teacher might become angry, making the students also angry as their intention was not to disrupt the class but to understand something. As always, staying calm is the best idea. A teacher can stop talking, look at the students and ask quietly, “is something not clear?”

Understanding Cultural Constructions of “Shame”

In some cultures, involving students in the lessons is seen as a method of improving learning, thus teachers might ask students to write something on the board or use a student’s name in a sample sentence. This can create issues because Omani students are often uneasy when they are singled out, especially in first year university classes. Having special attention paid to one student can also be problematic as many Omanis have very strong memories.

One former student told me how a teacher had made a comment to her about her new purse, then a few days later used that student’s name in a sample sentence about someone who likes to go shopping. That student assumed the teacher was making fun of her and felt unhappy in the class for the rest of the semester. I am sure that the teacher never connected a compliment about a purse to a grammar example but the former student believed that the teacher remembered every comment made to every student and had used her name on purpose.

This is why I suggest that teachers never use their students' names in example sentences (you can ask your students for a name of someone not in the class) and be careful about personal comments, even if they are compliments.

Further, if a teacher wants students to write on the board, bring six white board markers and have six students (same gender) write at one time for the first few days, then have four write, then two, then it's fine to ask one student to write.

Or if a teacher wants to have students do presentations, first ask all students to stand in the front of the class and say one simple sentence. The next day ask them to say two simple sentences on an easy topic such "your favorite food." In this way, you can gradually get the students accustomed to talking in front of the class so that presentations will go smoothly.

One teacher asked students at the end of presentation to evaluate their own work. When another student gave a positive evaluation of their work, the teacher said that they were wrong and the presentation was not well done. Then all the other students refused to do any kind of evaluation of their work. A simple way around this is to ask students to write a short response to their presentations listing one aspect that they think they did well and one aspect that they could improve on.

Conclusion

All people have strong memories of their school days. Sometimes these memories become an inviolate template, so that teachers think "X was a great teacher and she did Y so I must do Y also" or "I was a good student and I did Z, so all of my students must also do Z." Sometimes when teachers say "this is the 'best' way to do it," they actually mean "this is the way my parents did it," "this is what I am comfortable with," "this is what is usual in my culture" or "this is what I learned from my teachers."

This might be useful if the teacher is working in their own culture, but such generalizations may not be helpful when working in a foreign country. Actions that might be seen as beneficial, such as using a student's name in a sample grammar sentence, might be problematic in Oman where students might resist having their name used in public. In this chapter I have advocated for what I call "the third option" meaning that teachers make small adjustments, stay patient and try to amalgamate Omani cultural understandings in order to create environments for effective learning.

