

EDUCATIONAL SCIENCES

Theory, Current Researches and
New Trends

Assoc. Prof. Dr. Harun Şahin

EDUCATIONAL SCIENCES



ISBN: 978-9940-46-036-5



IVPE 2020

EDUCATIONAL SCIENCES

Theory, Current Researches and New Trends

Editor
Assoc. Prof. Dr. Harun ŞAHİN

Editor
Assoc. Prof. Dr. Harun ŞAHİN

First Edition •© October 2020 /Cetinje-Montenegro

ISBN • 978-9940-46-036-5

© copyright All Rights Reserved

web: www.ivpe.me

Tel. +382 41 234 709

e-mail: office@ivpe.me



Cetinje, Montenegro

PREFACE

Today's world is globalizing at a dizzying rate; increased knowledge with the change and development of science and technology; countries and their people with the need to learn and make them lasting.

Since the existence of human beings on earth, the phenomenon of learning emerges as an interactive and active process in which environmental stimuli at a certain level are employed, which are continuous under the pressure and effect of formal processes, by moving away from the effect of informal processes.

Although the responsibility of learning in the modern sense lies with the student, the increasing knowledge and complexity necessitated the planning, programming, design and arrangement of teaching activities. Today, while these activities are carried out by schools institutionally, teachers have undertaken activities such as providing learning, guiding, and guiding the learning in this process.

Thus, due to the changing nature of learning and the changing roles of the teacher, the need to raise individuals who can ask, question, solve problems, reconstruct knowledge in a unique way by associating their previous learning with their new learning has arisen.

Undoubtedly, countries and their societies have conducted numerous studies and researches in "Educational Sciences and Teacher Training" domain in the context of accessing information and enhancing learning socially and individually, by developing training programs for basic elements of education, namely students and teachers, within the scope of educational science and learning rules, to be able to adapt to contemporary developments.

It aims to bring together scientists who conduct sub-discipline studies and researches specific to the Basic Field of Educational Sciences and Teacher Training and to shed light on new discussions for a possible future research. There are 15 studies in the book created for this purpose. I would like to thank the authors who contributed to the creation of the book with their writings and my colleagues for their contribution as a referee in evaluating the scientific relevance of the studies to publication.

Assoc. Prof. Dr. Harun ŞAHİN

CONTENTS

PREFACE	I
CONTENTS	II
REFEREES	V
CHAPTER I	
Melih DİKMEN	
AN EXAMINATION OF THE ATTITUDE OF UNIVERSITY STUDENTS TOWARDS DISTANCE EDUCATION IN TERMS OF VARIOUS VARIABLES	1
CHAPTER II	
Aylin MENTİŞ KÖKSOY & Belgin LİMAN	
TEACHING APPROACHES USED in PRESCHOOL MUSIC EDUCATION	14
CHAPTER III	
Burcu KALKANOĞLU	
STUDENT OPINIONS ON HOME CONCERT XTREME SOFTWARE DESIGNED FOR COMPUTER BASED PIANO TEACHING	25
CHAPTER IV	
Ebru ŞEN & Çağrı ŞEN	
MUSICAL COMMUNICATION IN PERFORMING PROCESS: INFERENCES FOR INSTRUMENTAL MUSIC EDUCATION	44
CHAPTER V	
Ömer Gökhan ULUM	
SOCIO-ECONOMIC DISADVANTAGE AND ENGLISH IN TURKEY: MASLOWIAN PORTFOLIO THEORY	66
CHAPTER VI	
Tuncay ORAL & Aykut GÜNLÜ	
THE IMPACT OF THE COVID-19 PANDEMIC ON EDUCATION AND PSYCHOLOGICAL HEALTH	87

CHAPTER VII

H. Ömer TONTUS

**UNDAMENTALS OF ONLINE EDUCATION in
UNDERGRADUATE MOLECULAR BIOLOGY AND
GENETICS PROGRAMS.....103**

CHAPTER VIII

Münevver Mehtap KARAKAŞ & Şengül S. ANAGÜN

**A SCALE ADAPTATION AND APPLICATION STUDY FOR
SECONDARY SCHOOL STUDENTS' 21st CENTURY
SKILLS.....118**

CHAPTER IX

Seda OKUMUŞ

**EXAMINING SECONDARY SCHOOL STUDENTS' SENSE
OF RESPONSIBILITY IN TERMS OF GENDER AND GRADE
LEVEL144**

CHAPTER X

Burhanettin OZDEMIR

**EXAMINING THE MAIN AND INTERACTION EFFECTS OF
DIFFERENT FACTORS ON STUDENTS' PERFORMANCE
ON LANGUAGE TEST167**

CHAPTER XI

Elif Kübra DEMİR

COGNITIVE DIAGNOSTIC MODELS182

CHAPTER XII

Mehmet Uğur KUTLUER & Aylin MENTİŞ KÖKSOY

**POSITIVE EDUCATION AND SELF-DETERMINATION
THEORY: A REVIEW OF IMPLEMENTATIONS AND
INFLUENCES195**

CHAPTER XIII

Reyhan AĞÇAM & Pınar BABANOĞLU

**A SWOT ANALYSIS OF ENGLISH LANGUAGE TEACHER
TRAINING CURRICULUM209**

CHAPTER XIV

Reyhan ŞEKERCİ

**AN ASSESSMENT ON THEORY, RESEARCH AND
APPLICATION RELATIONS IN EDUCATIONAL
ADMINISTRATION222**

CHAPTER XV

Hasan GÜNEŞ

FORGOTTEN TURKISH TRADITIONS231

REFEREES

Prof. Dr. Zafer Gölen, Burdur Mehmet Akif Ersoy University, Turkey

Assoc. Prof. Dr. Harın Şahin, Akdeniz University, Turkey

Assoc. Prof. Dr. Nihada Delibegovic Dzanic, Tuzla Universityi Bosnia and Herzegovina

Assoc. Prof. Dr. Güray Alyörük, Aksaray University, Turkey

Assoc. Prof. Dr. Pınar Çavaş, Ege University, Turkey

Asst. Prof. Dr. Ece Kara, Süleyman Demirel University, Turkey

Asst. Prof. Dr. Ferdi Bahadır, Erzincan Binali Yıldırım University, Turkey

Dr. Kutay Uzun, Trakya University, Turkey

Dr. Ömer Bilgehan Sonsel, Gazi University, Turkey

CHAPTER I

AN EXAMINATION OF THE ATTITUDE OF UNIVERSITY STUDENTS TOWARDS DISTANCE EDUCATION IN TERMS OF VARIOUS VARIABLES

Dr. Melih DİKMEN

Fırat University, Elazığ, Turkey

e-mail: melihdikmen@gmail.com, Orcid ID: 0000-0001-7015-6236

1. Introduction

Being indoors in groups has become a big problem due to the COVID-19 outbreak. Although young people are less likely to get the virus than the elderly, their possibility of being carriers is seen as dangerous in terms of increasing the epidemic. For this reason, situations such as complying with social distance rules and compulsory quarantine in many countries around the world have become necessary. According to UNESCO's report, 87% of the student population in the world has been affected by the COVID-19 outbreak (UNESCO, 2020). Therefore, in this period, different ways of education and teaching methods were sought to adapt quickly to sustain education (Alvin et al.2020; Nassar et al, 2020). Distance education technologies, which were frequently used before the pandemic of COVID-19 (Kaysi & Aydemir, 2017), started to be used extensively to ensure continuity in education in many educational institutions around the world (Dikmen & Bağçeci, 2020).

Distance education is an educational model that includes the use of course materials and teacher-student communication using technological tools and equipment in order to ensure the continuity of education and training by offering flexibility in terms of time and space to students and teachers (Ağır, Gür & Okçu, 2007). In this education model, learning-teaching activities are carried out synchronously or asynchronously with a Learning Management System (LMS) created using specific software (Nichols, 2003). During the synchronously conducted teaching processes, teachers and students in different places come face to face in a virtual environment at a predetermined time interval. In the asynchronous teaching process, electronic materials such as animation, video, and presentation are shared. There is a dynamic interaction between the concepts of teacher, learner, and content in distance education processes (Moore, 1989). According to Kumar-Halder (2012), distance education activities are also important to increase the literacy rate of the population, to ensure that they are highly educated, and to transfer educational activities to existing illiterate and semi-literate individuals. Besides, Kaya (2002) and Fidan (2016) state that distance education technologies have many positive aspects such as removing barriers such as time and space,

making access to information independent, and facilitating lifelong learning. Many requirements must be fulfilled for the successful implementation of distance education (Nasser & Abouchedid, 2010). These are to prepare materials, to manage the necessary technological infrastructure to ensure the dissemination and sharing of information, and to ensure the professional development of teachers for the use of technology to continuously update the course contents. Although the requirements are fulfilled, there are several factors can jeopardize the success of distance education programs (Patterson-Lorenzetti, 2005). The needs and demographic characteristics of the individuals who are given distance education are a basic structure for the success of education and training. Also, it is stated that students have various expectations (frequency of communication, the scope of feedback, etc.) from educators in distance education lessons. These expectations of students must be fulfilled or shared before the teaching process begins (Stevenson, MacKeogh & Sander, 2006). Even if all these components are developed to fulfill the specified standards, the attitude and approach of the learner towards these environments has an important place in achieving the desired goals (Usta, Uysal, & Okur, 2016). The concept of attitude means "aptus" in Latin, in other words "ready for action" (Arkonaç, 2005). According to Kağıtçıbaşı (2010), attitude is the state of an individual's positive or negative reaction to a person, object, or event. Attitude is a concept that affects the cognitive, affective, and behavioral structures of the individual (Tavşancıl, 2006). Positive attitudes can contribute to online learning by helping individuals to manage their stress. According to Bernard, Brauer, Abrami, and Surkes (2005), individuals' beliefs can completely change the results of the work done. Bernard, Brauer, Abrami, and Surkes (2005) found that students' attitudes towards distance education are an important predictor of their success in classes. On the other hand, Muilenburg & Berge (2005) states that negative perceptions of individuals regarding their previous online learning experiences may negatively affect their desire to participate in a new distance education program. Negative attitudes cause individuals to decrease their motivation to learn, to decrease their level of satisfaction, and to abstain from class. Yenilmez, Balbağ, and Turgut (2017) state that learners' attitudes and approaches towards this education are one of the most important factors for the success of distance education activities.

Distance education has overcome some obstacles in terms of easy and fast dissemination of information. On the other hand, it can be said that distance education lacks some features of a successful teaching-learning process. Studies (Zhang & Fulford, 1994; Offir, Barth, Lev & Shteinbok, 2003) emphasize the importance of students' attitudes towards distance education in terms of efficiency of the teaching-learning process. For this reason, studies in the literature seem to constantly investigate the factors

affecting individuals' attitudes towards distance education. Especially in recent times, with the COVID-19 epidemic, the continuation of distance education and the direct involvement of individuals in this form of education may have led to different attitudes towards distance education. This research attempts to reveal and understand the attitudes of university students towards distance education in the COVID-19 outbreak. Accordingly, the research aims to examine the attitudes of university students towards distance education in the COVID-19 pandemic. In addition, students' attitudes towards distance education will be examined according to their gender, learning field, daily internet usage times, and internet usage purposes. When the literature is examined, it is seen that there are studies examining the attitudes of university students towards distance education. This research is thought to contribute to the literature both due to the COVID-19 outbreak we are in and in terms of some independent variables used in the research. In addition to all these, it is seen that there are studies in the literature (Antalyalı, 2004; Yıldız, 2011) that report positive attitudes of university students towards distance education, as well as studies (Gillies, 2008) that reach findings on the opposite situation. The findings of this research can be seen as important in eliminating the contradictory results in the literature.

2. Method

In this research, the attitudes of university students towards distance education were examined according to their gender, learning field, daily internet usage times, and internet usage purposes. In this aspect, the method of the research is descriptive survey model. Data collection tools were sent to students online over the Learning Management System (LMS). The scales are left open for 5 weeks towards the end of the 2019-2020 spring semester.

2.1. Population and Sample

The population of the research consists of students who take distance education courses at Fırat University. The sample consists of students selected from the population by random sampling method. The random sampling method is that the probability of sampling baseline units being selected is equal. In this context, the research was conducted on 320 students who took distance education courses at Fırat University in the spring semester of 2019-2020.

2.2. Data Collection Tools

In the research, the Attitude Scale towards Distance Education developed by Ađır, Gr, and Okđu (2007) and the personal information form created by the researcher were used as data collection tools. The Attitude Scale towards Distance Education consists of 2 subscales and 21

items in total. Subscales of the scale are named as "advantages of distance education" and "limitations of distance education". The items in the scale have been developed by grading from (1) (Strongly disagree) to (5) (Strongly agree) as a 5-point Likert type. Ağır, Gür, and Okçu (2007) stated that the Cronbach alpha coefficient they calculated to determine the reliability of the scale was .84. In this research, the Cronbach alpha coefficient for the scale of attitude towards distance education was determined as .93 and it was deemed appropriate to be used in the research.

2.3. Data Analysis

Statistical Package for Social Sciences 21 (SPSS 21) program was used to analyze the data in the research. Kurtosis and skewness values were examined to determine the normality distribution of the scale used in the research. It is determined that the kurtosis value of the Attitude Scale towards Distance Education is [-.546; .272] interval, and the value of skewness is [-.179; .136] range. According to Tabachnick and Fidell (2007), the values of skewness and kurtosis between [-1.5 and 1.5] can be accepted as an indicator of the normality of the distribution. When the kurtosis and skewness values of the scales were examined, it was seen that the normality assumption was fulfilled. In the research, homogeneity was also tested with the Levene test in comparison to independent variables. Independent Sample t-test was used in the intergroup comparisons of the independent variables including the binary group (for Levene $p > .05$). In the research, when comparing the independent variables including more than two groups, it was observed that the frequency numbers of some groups were below 30. Russell and Purcell (2009) state that parametric tests should not be used with groups of less than 30. Accordingly, the Kruskal Wallis H test, one of the nonparametric tests, was used. Descriptive statistical methods (number, percentage, mean, standard deviation) were used in terms of the whole scale and subscales of the Attitude towards Distance Education.

3. Results

In the research, the attitudes of the students towards distance education were examined firstly according to their gender. The findings obtained are given in Table 1.

Table 1. Students' Attitudes towards Distance Education According to Gender

Scales	Gender	N	M	SD	Levene test		t-value		
					L	p	t	sd	p
ATDE Overall	Male	173	2.99	0.86	.678	.411	.252	318	.801
	Female	147	2.97	0.81					

ADES	Male	173	3.12	0.94	2.691	.102	.287	318	.774
	Female	147	3.10	0.83					
LDES	Male	173	2.99	0.59	1.614	.205	.700	318	.485
	Female	147	2.94	0.65					

*p < .05

As can be seen in Table 1, students' attitudes towards distance education do not differ significantly according to their gender ($p > .05$). Accordingly, it can be said that gender is not a significant variable in attitude towards distance education.

Another situation to be examined in the research is the attitudes of students towards distance education according to their learning fields. However, there are important differences among the distribution of university students according to their learning field. As Russell and Purcell (2009) mentioned, parametric tests should not be used in group comparisons less than 30. For this reason, Kruskal Wallis H analysis, one of the non-parametric tests, was used to compare the attitudes towards distance education according to the learning field. The analysis results for this situation are given in Table 2.

Table 2. Examination of Students' Attitudes towards Distance Education According to their Learning Fields

Scales	Learning Field	N	M.R.	X^2	df	p
ATDE Overall	Quantitative	93	147.60	5.032	3	.169
	Verbal	164	171.78			
	Equally Weighted	51	150.49			
	Special Talent	12	148.92			
	Quantitative	93	152.91			
ADES	Verbal	164	167.46	1.954	3	.582
	Equally Weighted	51	154.83			
	Special Talent	12	148.29			
	Quantitative	93	146.15			
	Verbal	164	161.81			
LDES	Equally Weighted	51	173.36	5.374	3	.146
	Special Talent	12	199.08			

ATDE: Attitude towards Distance Education; ADES= Advantages of Distance Education Subscale; LDES= Limitations of Distance Education Subscale

As seen in Table 2, it was determined that the attitudes towards distance education of the university students participating in the research did not

differ according to the fields of learning ($p > .05$). Accordingly, it can be said that the learning field is not an effective variable in terms of attitude towards distance education.

Another situation to be determined in the research is to determine the attitudes of university students towards distance education according to their daily internet usage time. When the distribution of university students for daily internet usage was examined, it was observed that there were significant differences in the distributions among groups. Therefore, Kruskal Wallis H analysis, one of the nonparametric tests, was used. The results of the analysis made in this direction are given in Table 3.

Table 3. Comparison of University Students' Attitudes towards Distance Education According to Their Daily Internet Usage Times

Scales	Daily Internet Usage Time	N	M.R.	X^2	df	p
ATDE Overall	Less than 1 hour	49	176.19	3.106	3	.376
	1-3 hours	168	152.44			
	4-7 hours	82	165.33			
	More than 7 hours	21	169.48			
ADES	Less than 1 hour	49	179.39	4.540	3	.209
	1-3 hours	168	150.69			
	4-7 hours	82	166.98			
	More than 7 hours	21	169.62			
LDES	Less than 1 hour	49	152.52	3.431	3	.330
	1-3 hours	168	162.55			
	4-7 hours	82	153.01			
	More than 7 hours	21	191.95			

ATDE: Attitude towards Distance Education; ADES= Advantages of Distance Education Subscale; LDES= Limitations of Distance Education Subscale

As can be seen in Table 3, it was determined that university students' attitudes towards distance education did not differ according to their daily internet usage time ($p > .05$).

Students' attitudes towards distance education according to internet usage purposes, which is one of the other independent variables discussed in the research, were aimed to be examined. When the distribution of the groups regarding the internet usage purposes of the students was examined, it was seen that the number of frequencies in some groups was below 30. The results of the Kruskal Wallis H analysis made in this direction are given in Table 4.

Table 4. Comparison of university students' attitudes towards distance education according to internet usage purposes

Scales	Internet Usage Purposes	N	M.R.	X ²	df	p	Difference
ATDE Overall	Social media	102	133.77	24.762	6	.000*	
	Studying	84	195.43				
	Searching for Information	58	175.18				2>1 2>4
	Watching Video	42	156.36				2>5
	Listening to music	12	132.25				2>6
	Playing a game	14	133.54				3>1
	Voice or Video Conversation	8	139.38				
ADES	Social media	102	133.66	20.013	6	.003*	
	Studying	84	186.73				
	Searching for Information	58	178.12				2>1
	Watching Video	42	164.70				2>5
	Listening to music	12	126.96				3>1
	Playing a game	14	137.75				
	Voice or Video Conversation	8	167.69				
LDES	Social media	102	157.05	1.661	6	.948	
	Studying	84	166.13				
	Searching for Information	58	168.09				
	Watching Video	42	151.19				-
	Listening to music	12	150.88				
	Playing a game	14	165.29				
	Voice or Video Conversation	8	145.31				

ATDE: Attitude towards Distance Education; ADES= Advantages of Distance Education Subscale; LDES= Limitations of Distance Education Subscale

**p< .001; *p< .05

As can be seen in Table 4, while a significant difference was detected in terms of the scale of university students' attitudes towards distance education according to the purposes of internet usage and the advantages of distance education subscale ($p < .05$), no significant difference was determined in terms of the limitations of distance education subscale ($p > .05$). Paired comparisons were made to determine between which groups there was a significant difference. According to the findings, it is seen that students who use the internet for studying have higher attitudes towards distance education compared to those who use social media to watch videos, listen to music and play games. Besides, in terms of the whole scale, it was found that those who use the internet to search for information

have higher attitudes than those who use it for social media purposes. In terms of the advantages of distance education, it was determined that individuals who use the Internet to study have higher scores than those who use the Internet for social media and listening to music. Also, it has been found that those who use the internet to search for information have higher ADES scores than those who use it for social media purposes.

Within the scope of the research, it was aimed to determine the mean scores of the university students regarding the whole scale of attitude towards distance education and its subscales. Findings regarding this situation are given in Table 5.

Table 5. Descriptive Statistics on University Students' Attitudes towards Distance Education

Scales	N	M	SD
ATDE Overall	320	2.98	.834
ADES	320	3.11	.887
LDES	320	2.97	.621

ATDE: Attitude towards Distance Education; ADES= Advantages of Distance Education Subscale; LDES= Limitations of Distance Education Subscale

As seen in Table 5, it has been determined that the mean scores of university students for the whole scale of attitude towards distance education are at the level of $(2.98 \pm .834)$, the mean scores for the advantages of distance education subscale are at the level of $(3.11 \pm .887)$, the mean scores for the limitations of distance education subscale are at the level of $(2.97 \pm .621)$. Accordingly, it can be said that the attitude levels of university students towards distance education are at the "neutral" level.

4. Conclusion, Discussion and Suggestions

In accordance with the results of this research, it can be said that individuals' attitudes towards distance education are at the level of "neutral". In the research conducted by Ateş and Altun (2008), it is reported that the attitude is at the level of "neutral". Similar findings on university students are also encountered in the research conducted by Kışla (2005), Dick, Case, and Burns (2001). It is thought that this situation may be due to the rapid transition to distance education environments because of the COVID-19 outbreak, as well as the lack of knowledge and experience of university students in distance education and practices. According to Siaciwena (1989), Özgöl, Sarıkaya, and Öztürk (2017), distance education requires more effort and time than formal education. This is because more homework is given to compensate for the lack of regular contact with students. Especially during the pandemic process, frequent homework, and online quizzes for students to be included in the continuous Learning Management System (LMS) may have negatively

affected their attitudes towards distance education. In addition to this situation, it is thought that the student feels safe and has a positive attitude towards distance education due to situations such as lack of space and time. Therefore, it can be said that the intertwining of both positive and negative attitudes as of the process is effective in the neutral level of students' attitudes towards distance education. In the research conducted by Tuncer and Bahadır (2017), it is stated that distance education has not yet been implemented at the desired level and successfully. The findings of the researchers conducted to support the results of this study

In the research, it was determined that university students' attitudes towards distance education did not differ according to their gender. The findings of the research, conducted by Kumar-Halder (2012), overlap with this research. Similar findings were obtained in the studies conducted by Kışla (2005), Ateş and Altun (2008), Şimşek, İskenderoğlu and İskenderoğlu (2010). Contrary to these findings, Yenilmez, Balbağ, and Turgut (2017) found that male pre-service teachers' average scores were significantly higher than women in terms of attitude towards distance education. This situation is thought to be due to the different measurement tools used by the researchers. Tuncer, Berkant, and Dikmen (2017) determined that the data collection tools used in social sciences to measure the same variable revealed different results. To determine whether this is due to data collection tools or different variables affecting gender, a meta-analysis study can be conducted to consider gender as a moderator variable.

Another result determined within the scope of the research is that university students' attitudes towards distance education do not differ according to the type of field they study. In the literature, there is no research examining the attitudes towards distance education according to the type of field studied. In the studies conducted by Fidan (2016), Barış (2015), Yenilmez, Balbağ, and Turgut (2017), it was determined that university students' attitudes towards distance education differed according to their fields. In line with the findings of this research, it can be said that students whose education fields are the same have similar attitudes towards distance education. It is thought that a similar level of attitude towards distance education according to the field type of education may be due to the compulsory use of distance education practices in the COVID-19 pandemic.

In the research, it was observed that university students' attitudes towards distance education differed significantly according to their internet usage purposes. In accordance with the findings of the research, it is seen that students who use the internet to study and search for information have higher attitudes towards distance education. Similar findings were obtained in the research conducted by Yenilmez, Balbağ, and Turgut (2017). Accordingly, it is important to guide for university students to use the

internet for educational purposes such as studying and searching for information to increase their attitudes towards distance education.

In the research, it is seen that university students' attitudes towards distance education do not differ according to their daily internet usage time. Similar findings were found in the research conducted by Yenilmez, Balbağ, and Turgut (2017). Kurt and Özkan (2014) found that students' levels of satisfaction with the Learning Management System (LMS) do not differ significantly according to their daily internet usage time. Considering the findings of these researches, it is seen that although the internet usage times of the students differ from each other, the internet is mostly used for social media purposes. Therefore, it is thought that the time spent on the Internet less or more but not with the aim of educational purposes does not make a significant difference in terms of attitude towards distance education. The results of the Household Information Technologies Usage Survey of Turkish Statistical Institute (TÜİK) (2019) also support the findings of this research.

Future researches may address different independent variables in terms of attitude towards distance education. In addition, considering the results of this research, it is seen that university students mostly use the internet for social media purposes. Accordingly, in order to increase attitudes towards distance education it is important to organize activities and give information on conscious internet usage in universities.

References

- Ağır, F. Gür, H. & Okçu, A. (2007). Uzaktan Eğitime Karşı Tutum Ölçeği Geliştirmeye Yönelik Geçerlilik ve Güvenirlilik Çalışması. *Education Sciences*, 3(2), 128-139.
- Alvin, M. D., George, E., Deng, F., Warhadpande, S., Lee, S. I. (2020). The impact of Covid-19 on radiology trainees. *Radiology*. 296(2), 246-248.
- Antalyalı, Ö. L. (2004). *Uzaktan eğitim algısı ve yöneylem araştırması dersinin uzaktan eğitim ile verilebilirliği* (Yüksek Lisans Tezi). Süleyman Demirel Üniversitesi, Sosyal Bilimler Enstitüsü, Isparta.
- Arkonuç, S. A. (2005). *Psikoloji: zihin süreçleri bilimi*. Ankara: Alfa Yayınları.
- Ateş, A., & Altun, E., (2008). Bilgisayar öğretmeni adaylarının uzaktan eğitime yönelik tutumlarının çeşitli değişkenler açısından incelenmesi. *Gazi Üniversitesi Eğitim Fakültesi Dergisi*, 28(3), 125-145.
- Bernard, R.M., Brauer, A., Abrami, P.C., & Surkes, M. (2004). The development of a questionnaire for predicting online learning achievement. *Distance Educ.* 25(1), 1-47.

- Dick, G.N., Case, T.,L. & Burns, O. M. (2001, Aralık). Adopting distance education- what do the students think?, Proceeding of The International Academy for Informational Management (IAIM) Annual Conference: International conference on Informatics Education & Research (ICIER), 14-16 Aralık, New Orleans, LA.
- Dikmen, S., Bahçeci, F., (2020). Covid-19 Pandemisi Sürecinde Küresel Çapta Uygulanan Yükseköğretim Kurumlarındaki Uzaktan Eğitim Süreçleri Hakkında Durum Çalışması: Fırat Üniversitesi Örneği. *Turkish Journal of Educational Studies*, 7(2),78-98.
- Fidan, M. (2016). Uzaktan eğitim öğrencilerinin uzaktan eğitime yönelik tutumları ve epistemolojik inançları. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 31(3): 536-550.
- Gillies, D. (2008). Student perspectives on videoconferencing in teacher education at a distance. *Distance Education*, 29(1), 107-118.
- Kağıtçıbaşı, Ç. (2010). *Günümüzde insan ve insanlar sosyal psikolojiye giriş*. İstanbul, Evrim Yayınevi.
- Kaya, Z. (2002). *Uzaktan Eğitim*, 1. Baskı, Ankara, Pegem A Yayıncılık.
- Kaysi, F., & Aydemir, E. (2017). Uzaktan eğitim süreçlerindeki etkileşim boyutlarının değerlendirilmesi. *Sosyal Bilimler Dergisi (SOBİDER)*, 4(11), 778-790.
- Kışla, T. (2005). *Üniversite öğrencilerinin uzaktan eğitime yönelik tutumları*. (Yayımlanmamış yüksek lisans tezi), Ege Üniversitesi, S.B.E., İzmir.
- Kumar-Halder, U. (2012). A Study on Distance Learners' Attitude towards Distance Education. *Indian Streams Research Journal*, 2(7), 1-4.
- Moore, M. G. (1989). Editorial: Three types of interaction. *American Journal of Distance Education*,3(2), 1-6.
- Muilenburg, L.Y., & Berge, Z. L. (2005). Student barriers to online learning: a factor analytic study. *Distance Educ.* 26, 29–48.
- Nassar, A. H., Zern, N. K., McIntyre, L. K., Lyngge, D., Smith, C. A., Petersen, R. P., Horvath, K. D., & Wood, D. E. (2020). Emergency restructuring of a general surgery residency program during the coronavirus disease 2019 pandemic: the University of Washington experience. *JAMA surgery*, 155(7), 624-627.
- Nasser, R., & Abouchdid, K. (2000). Attitudes and concerns towards distance education: The case of Lebanon. *Online Journal of Distance Learning Administration*, 3(4), 1-10.

- Nichols, M. (2003). A theory of eLearning. *Educational Technology & Society*, 6(2), 1–10.
- Offir, B., Barth, I., Lev, Y., & Shteinbok, A. (2003). Teacher–student interactions and learning outcomes in a distance learning environment. *The Internet and Higher Education*, 6(1), 65-75.
- Özgül, M., Sarıkaya, İ., & Özürk, M. (2017). Students’ and teaching staff’s assessments regarding distance education applications in formal education. *Journal of Higher Education and Science*, 7(2), 294-304.
- Patterson-Lorenzetti, J. (2005). Distance education leaders and mental models. *Distance Educ. Rep.* 9(1), 4–6.
- Russell, B., & Purcell, J. (2009). *Online research essentials: designing and implementing research studies* (19nd ed.). USA: John Wiley & Sons.
- Siaciwena, R. M. (1989). Staff attitudes towards distance education at the University of Zambia. *Journal of Distance Education*, 4(2), 47-62.
- Stevenson, K., MacKeogh, K., & Sander, P. (2006). Working with student expectations of tutor support in distance education: testing an expectations-led quality assurance model. *Open Learn J. Open Distance Learn.* 21, 139–152.
- Şimşek, A., İskenderoğlu, T., & İskenderoğlu, M. (2010). Investigating preservice computer teachers’ attitudes towards distance education. *Procedia-Social and Behavioral Sciences*, 9(1), 324-328.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Experimental designs using ANOVA*. Belmont, CA: Thomson/Brooks/Cole.
- Tavşancıl, E. (2006). *Tutumların Ölçülmesi ve SPSS İle Veri Analizi*. (3. Baskı). Ankara: Nobel Yayınları.
- Tuncer, M., & Bahadır, F. (2017). Evaluation of the distance education programs according to student views that learned in these programs. *Journal of Educational Reflections*, 1(2), 27-36.
- Tuncer, M., Berkant, H. G., & Dikmen, M. (2017). Investigations of sample affect to scale findings in social researches. *Electronic Journal of Education Sciences*, 6(11), 1-10.
- TÜİK (2019). *Hanehalkı Bilişim Teknolojileri Kullanım Araştırması*. 28.07.2020 tarihinde http://www.tuik.gov.tr/PreTablo.do?alt_id=1028# sayfasından alınmıştır.
- UNESCO (2020). *COVID-19 Impact on Education*. <https://en.unesco.org/covid19/educationresponse>

- Usta, İ., Uysal, Ö., & Okur, M. R. (2016). Çevrimiçi öğrenme tutum ölçeği: geliştirilmesi, geçerliği ve güvenilirliği. *Journal of International Social Research*, 9(43), 2215-2222.
- Yenilmez, K., Turğut, M., & Balbağ, M. Z. (2017). Öğretmen Adaylarının Uzaktan Eğitime Yönelik Tutumlarının Bazı Değişkenler Açısından İncelenmesi. *Erzincan Üniversitesi Eğitim Fakültesi Dergisi*, 19(2), 91-107.
- Yıldız, E. (2011). *Web-Tabanlı senkron derslerin öğretmen adaylarının uzaktan eğitime karşı tutumları ve senkron teknolojileri kabulleri üzerine etkisi* (Yayınlanmamış yüksek lisans tezi). Balıkesir Üniversitesi, Fen Bilimleri Enstitüsü, Balıkesir.
- Zhang, S., & Fulford, C. P. (1994). Are interaction time and psychological interactivity the same thing in the distance learning television classroom? *Educational Technology*, 34(6), 58-64.

CHAPTER II

TEACHING APPROACHES USED in PRESCHOOL MUSIC EDUCATION

Assoc. Prof. Dr. Aylin MENTİŞ KÖKSOY* &
Dr. Belgin LİMAN**

Ege University, Izmir, Turkey
e-mail: aylinmentiskoksoy@gmail.com, Orcid ID:0000-0003-4549-0579

Niğde Ömer Halisdemir University, Niğde, Turkey
e-mail: belgin.liman@gmail.com, Orcid ID: 0000-0003-4965-2379

1. Introduction

Today, the need for science and education continues to increase each passing day. Human beings acquire new behaviors in the wake of being able to do the desired things physically, emotionally and mentally as a being experiencing these processes. Behavior change in humans requires a certain process, namely the completion and training of basic development processes. In this sense, preschool music education has special importance for the physical, emotional and mental development of children. Programs implemented according to the age groups and developmental levels of preschool children support permanent behavioral changes and learning. A qualified education received at an early age positively affects the cognitive and affective development of children. Children who receive preschool education are equipped with an education discipline appropriate for their ages and developmental levels.

For a child, singing, keeping rhythm, and acting according to music are actions they take instinctively. Music activities should be used in the lives of preschool children, as they support children's development areas and allow their own experiences. Furthermore, music activities have an important place in the life of preschool children due to the wide and stimulating environment they provide to children in creative children's activities (Mavesky, 2002 cited in Kuşçu, 2010: 1).

The goals of music education in preschool education are to assist the cognitive, affective, psychomotor and social development of children, to enable them to express their emotions, thoughts and impressions with music, an aesthetic language of expression, to reveal the creativity inside the child and to prepare them for elementary education by developing the native language (Özal Göncü, 2010: 355).

If children are nourished with good music from an early age, they will be adults who love and choose good music, and know how to take advantage of it even if they do not become musicians when they grow up.

Kindergarten should be an elaborate garden where an admiration for good music will be planted and its saplings will be grown. Little people can grow more physically and spiritually in such a garden, and they can achieve a

healthier personality development (Sun & Seyrek, 1993).

Music education given during the preschool period is a very effective method in making children gain certain concepts and values. These concepts and values are important in terms of mental, cultural, social, and intelligence development and understanding.

2. Mental Aspect

Preschool music education plays a positive role in the psychological development of children. Through music education, a considerable distance can be taken for children's socialization by making them understand what is good, correct and beautiful. Achieving mental satisfaction through music education, children have the chance to attain both a healthy mental development and a healthy personality structure (Akkaş, 1993: 10).

3. Cultural Aspect

Music is a way of expression, and expression is done through language. Musical expression can only be expressed with the language of music. Since music is the common language of human beings, the foundations of universal culture are established by understanding the communities living in the child's own country and other countries, and understanding their cultures. Through mass media, music expressing the emotions of people and reflecting the cultural characteristics of different societies has been spreading and being listened. In this respect, music can also be viewed as a cultural transmission. The child gets to know his or her own culture and traditions with music and dances, and thus his or her national feelings develop. As a product of culture, music carries all the cultural elements of the society in which it grows from and transmits them to the future continuously. From this aspect, music establishes a link between the past and the future, and connects generations. Due to the nature and disposition of human beings, music is far beyond being a means of enjoyment, joy and pleasure, it is a life style and a cultural product that means much deeper, deep-seated, comprehensive and meaningful relationships for them (Uçan, 1994: 133).

4. Social Aspect

Music education during the preschool period helps the child gain the habit of living happily with other children. When each child takes part in various musical activities, he or she will turn towards this goal in his or her group work, both individually and as a responsible group member. As a result, the child will socialize. Since group and collective work will give children the habits of collective work, being organized and disciplined, adapting to their environment and living happily together, children will enter the socialization process (Akkaş, 1993: 11).

5. Intelligence Development and Understanding Aspect

Music education in preschool will help the child to perceive and interpret life, and develop and train his or her creativity and thought system. It is an acceptable assumption that a rich musical education provided in preschool will not only help children develop their understanding of music and abilities but also will make it easier for them to understand the reasons for the problems they will encounter and the events they will go through. Furthermore, it can be expected that children will gain a better understanding of music if their lives are organized to develop gradually. Music is one of the basic elements of art education and an expression of mental processes (Akkaş, 1993: 11-12).

When children have difficulty expressing their inner life in words, they sometimes use music as a medium. The child who listens to music learns to be quiet, concentrate, recognize and distinguish sounds, and show respect by being quiet. With music education, it is ensured that children remember the music they listened to at different times, and establish cause and effect relationships between the subject and the music when there is a theme in the music they listen to. Thus, with music education, cognitive processes are being supported. Singing enables the children to learn to use their voice and helps them to understand the meanings of the words they do not know in the lyrics. Singing together helps children control their voices according to each other, put effort for a common unity, and enjoy sharing the same activity. In this way, children's linguistic, social and emotional development is being supported (Şen, 2007: 340).

In addition, musical activities affect the psychomotor development of the child. For example, through musical instruments, large and small muscle development of a child is supported. Instruments help develop concepts such as coordination, power and reaction speed, which are important in children's psychomotor development. The child's reaction to music with body movements, and the child trying to create dance figures appropriate to the music, accompanying music with his or her voice, and recognizing his or her voice contribute to his or cognitive and psychomotor development (Ömeroğlu, Ersoy, Tezel Şahin, & Turla, 2003: 17-18).

6. Study Purpose

Preschool music education has a very important place in the upbringing and development of creative individuals, and it should be presented with approaches whose effectiveness was proven through experiments. Dalcroze approach, Kodály approach, Orff Schulwerk approach and Suzuki approach are some of the approaches used in preschool music education. In this context, the purpose of this study to reveal the characteristics, similarities and various aspects of the aforementioned teaching approaches.

7. Method

The study employs the descriptive survey design. Literature review was conducted to obtain the data, and the characteristics, similarities and various aspects of the aforementioned music teaching approaches were revealed.

8. Teaching Approaches Used in Preschool Music Education Dalcroze Approach

The aim of this approach, developed by the Swiss composer and harmony teacher Emile Jaques Dalcroze (1865-1950), is to develop children's musical hearing ability, sense of rhythm and creativity with games and rhythmic gymnastics (Dündar, 2003: 2). The approach strengthens the children's self-confidence on the one hand, and on the other hand, helps them to be compatible. Dalcroze approach is appropriate for children of all ages (Tufan, 1995: 36).

The body is considered an instrument in the Dalcroze approach. Transforming the melodies and rhythms they hear with their ears into action with their body, the students interpret and feel the music with their entire body, not just with their ear from an instrument. This awareness is then reflected to the instrument performance and to the power of interpreting the pieces (Türkmen, 2016: 84 cited in Dalgın & Acay Sözbir, 2019: 43).

Apart from these approaches, new approaches are developed in music education and instrument training. Developed in England and Ireland, the Colourstrings approach was formed by using the Kodály approach. This approach is similar to the Kodály approach in terms of developing children's ears before instrument training and understanding the relationship between notes by using hand signals. After learning the basic principles of music, children learn violin, cello, piano and guitar (Heslop 1995, 12).

9. Kodály Approach

Zoltan Kodály (1882-1967) is a Hungarian educator, composer and musicologist. Kodály was particularly interested in the education of young children and believed that education should start as early as possible (Özeke, 2007: 113).

The knowledge and skills that children aged two or three acquire through singing, dancing, clapping hands and games are more related to ear training and singing. At the center of the Kodály principles is children's learning to sing through the folk music of their country. In this approach, which ranges from the perception of a sound to the writing of the note or interval heard, solfa syllables consisting of hand signals and note names are used. At the same time, teacher and family cooperation is important in this approach, which is also the pre-instrumental preparatory education (Tufan, 1995, 36).

The necessity of starting music education at a very early age, the idea that singing is the basis of music education and that it is closely associated with hearing skills, and the idea that individuals should take an active role in

music education, and that this can be supported by their own sounds, which is the instrument that they can use freely, forms the basis of the Kodály philosophy (Şimşek & Bilen, 2017). Kodály was particularly interested in the folk music of his own culture, believing that the native language is very important for children. He said that singing improves both ears and intelligence, and he believed that this way, he could develop literate children who could see with their ears and hear with their eyes (Boshkoff, 1991: 33). The goals of the Kodály method are to maximize the musical capacity of every child that all children have, to teach children the language of music and to make them read, write and produce in this language, to introduce children to the products of their own language and culture (folk songs, folk dances, etc.), to introduce them to world's greatest works of art, and to make them love music and life with confidence arising from a knowledge based on music while listening to, practicing and analyzing these music (Yıldırım, 2010: 142).

Kodály stated that music should be started at an early age, even nine months before the birth of the child. Kindergartens that provide education to students between the ages of 3-6 are the most appropriate environment for this musical education. Kodály emphasized the importance of the kindergarten by expressing that even the most careful education in the family cannot provide children the ability to get used to a community, which is given by the kindergarten (Kodály, 1974: 129 cited in Yiğit, 2000: 15-16).

10. Orff Schulwerk Approach

The first of the special teaching approaches used in music activities in preschool education is the Orff approach. Carl Orff lived between the years 1895-1982. His interest in music attracted the attention of his family, and after studying composition at the Munich Academy of Music, he started to direct orchestra (Tufan, 2011 cited in Ertekin & Küçükosmanoğlu 2016: 373).

Based on improvisation and allowing individuals to develop their creative potential in group activities, Orff Schulwerk, in short, is a holistic understanding of music education, in which music, movement and language elements are used together. According to Carl Orff (1932), Orff Schulwerk is not specialized education in music, but a musical education for non-specialists." Children and amateur adults can be included in the non-specialist group (Özevin, 2018). Actually, composer Carl Orff (1895-1982) developed Orff Schulwerk, his gift to contemporary music education, with a local goal in mind "for the children of Bavaria" (Haselbach, 2015). However, Orff Schulwerk went beyond target and spread to Europe, America, Asia and Australia. Although many years have passed since its emergence, Orff Schulwerk is still valid today (Özevin, 2018).

Carl Orff supported his principles called Orff Schulwerk with percussive rhythm instruments with melody or not melody, which are of great

importance in children's basic musical education and which allow them to make effective music in line with their own skills (Sungurtekin, 2005).

The Orff approach feeds from each society's own cultural values. Nursery rhymes, numeracy, rhymed lines, different hand games and dances are important materials (Çimşir, 2013).

Orff works are based on learning by doing and living, and the works involve a creative process that includes the preparation of the body with movements, the use of speech, the rhythm of sounds and the transformation of these rhythms into music. Play is indispensable at every stage of this process. In the activities, the natural interest of the child in play is benefited from, and children are allowed to add something from themselves (Şenol, 2013).

Music education with the Orff Schulwerk approach is one of the most valid methods used in early childhood education. This approach contains works appropriate for various developmental goals. These include works developing children's auditory and rhythm perceptions, walking, walking-stopping, tapping their rhythms by using the natural rhythm of speech, producing creative movements appropriate to the rhythmic structure of a selected text or of a rhyme and transferring them to the body percussion and then to the instruments, and weighing works with rhythm sticks. These applications play an important role in improving children's perception and concentration because in these activities, it is essential to imitate the teacher, follow friends, play in turn, listen to music carefully and internalize it. The child must follow the teacher carefully in order to imitate the given movements. The works done in the Orff Schulwerk approach are based on certain goals. These are:

- a) having musical experiences,
- b) being able to increase concentration,
- c) ensuring the awareness of the body,
- d) being able to establish hand, eye and body coordination,
- e) being able to do behaviors such as speaking, moving and playing together,
- f) being able to do creative work,
- g) being able to develop individual and joint work habits (Işın, 2008).

Orff's approach to music education is based on the natural behaviors of individuals that come from within, occur enthusiastically and spontaneously, and that the individual performs in a unique way using his or her whole body. Carl Orff's understanding of elementary music and movement education acknowledges that each individual has a unique talent addresses human beings with all their anthropological dimensions and enables them to learn with all their senses. All possibilities of learning are examined in a unity, the way to live a unity of music, language and movement is opened, and expression forms that differ constantly in music and dance are used

(Jungmaire, 2003 cited in Eren, 2012: 18).

Briefly, this approach, developed by the German composer Carl Orff (1895-1982), aims to develop child's sense of rhythm and creativity. Orff instruments, which are percussion instruments with melody or not melody, are easy to play for four and five-year-olds. Therefore, Orff instruments are the most preferred and used instruments in preschool (Özen, 2004: 61).

11. Suzuki Approach

Adopted in instrument teaching, the Suzuki approach is an education system developed by Shinichi Suzuki in Japan for violin. The Suzuki approach involves the upbringing of children as a whole through music. Dr. Suzuki aimed to make children realize beauty through musical perception and to make them respect people throughout his life (Kasap, 2005: 117).

When a child who grew up listening to music starts playing an instrument, he or she already knows many concepts. This approach is based on repetition and emulation. According to this system, the child listens to, plays and practices the piece he or she will play that week on the cassette every day under the supervision of his or her mother, outside the weekly course schedule and in addition to his or her other activities. With the Suzuki approach, thousands of children of the same age group are made to play the same piece together perfectly (Ali, 1987: 110).

Dr. Suzuki emphasized the development of the ear from the beginning of musical education. His most important message was "ear before eye and playing by heart before reading note". If ear training is done correctly, children will be able to grasp what a beautiful tone is and thus play like the most perfect musician. Suzuki recommended that children constantly listen to music in a musical environment provided by the teacher and family, as in learning native language. As children constantly listening to musical pieces every day will cause them to learn quickly, they will also make an effort to play like the artists in the examples they listen to. With this approach, children will be individuals with developed musical senses (Kasap, 2005: 120).

The goals of the Suzuki approach is to provide musical instrument training to children starting at the age of three or four, to have children listen to music constantly starting from birth, if possible, to switch to note training after starting instrument training, to repeat the given activities every day, to make music with others and in front of others in a natural way, to watch other children's lessons and have group lesson once a week, to ensure family cooperation, to create a positive learning environment, to provide opportunity for children to give concerts, to offer education at high standards provided by trained teachers, and to establish a social communication with Suzuki students from all over the world through the language of music (Tecimer, 2005: 117-118).

A child who is trained using this method can play the instrument by heart

even if he or she does not know it. Suzuki developed this approach by witnessing how well young children learn language and adapting this to the field of music. The institutions that provide education with this approach, which emphasizing the easiness of starting instrument learning at an early age, are still in Japan, England, Germany and the US. Education continues with the interaction of the teacher and the family, especially the mother (Çimen, 1995, 23).

12. Result

Rhythm is very important in Dalroze approach. Rhythm is movement. The root of all rhythms in music is the natural rhythms of the human body. According to Dalcroze, understanding and expressing music by using the whole body is the main element.

In the Kodály approach, it is essential that the child starts music education from birth. Kodaly stated that children love to play, and that dance is a kind of game for children. Often, songs are gamified. While the repertoire in this approach is selected from traditional folk songs, the teaching order is followed carefully. Children learn through active methods such as singing, clapping hands and dancing (<https://www.muzikogretmenleriyiz.biz/muzik-ogretim-yontemleri-ve-yaklasimlar>).

In the Orff Schulwerk approach, the main goals are having musical experiences, doing creative work, doing behaviors such as speaking, moving and playing together, ensuring the awareness of the body, and establishing hand, eye and body coordination. The starting point of this approach was a group work planned in 1924 to train a group of dancing musicians in movement and rhythm at the Munich Günther Dance School (Orff, 2003) Play is indispensable at every stage of this approach. Activities benefit from the child's natural interest in play, and children are allowed to participate spontaneously. The main goal is music education. It is the development of people who are suitable for active music. These people can sing, move, play instrument, improvise, and combine materials with original forms. In addition to appreciating the abilities of others, each individual learns to act collectively and contribute to the group with their confidence in their own abilities (Sökezoğlu, 2010: 52).

Suzuki approach is an education system developed for violin by Schinicki Suzuki in Japan. With this approach, the child listens to music from birth, so his ears are trained. A child who is trained using this approach can play an instrument by heart, even though he or she does not know it. Suzuki developed this approach by adapting it to the field of music after witnessing how well young children learn language. This approach emphasizes the importance of starting instrument training at an early age.

In conclusion, although the teaching approaches used in preschool music education are different from each other in terms of method, content and

application, the common feature of all of these approaches is to endear music, to popularize music education by making people understand its importance, and to improve music education.

References

- Akkaş, S., (1993). Okulöncesi Eğitimde Müzik, *Gazi Üniversitesi, Mesleki Eğitim Fakültesi*, Ankara.
- Ali, F. (1987). *Müzik ve Müziğimizin Sorunları*. İstanbul: Cem Yayınevi.
- Boshkoff, R., (1991). "Lesson". *Music Educators Journal*, Vol.78, No.2
- Çimen, G. (1995). Piyano Başlangıç Metotlarına Genel Bakış, *Mavi Nota Müzik ve Sanat Dergisi*. 16. Trabzon: Selva Yayıncılık.
- Çimşir, Ö., (2013). Eğitimci eğitimi ve iletişim. K. O. Köçak ve N. Laslö (Ed.). *Müzik, Oyun ve Dans Üzerine Makaleler* (ss: 37- 45). Ankara: Müzik Eğitimi Yayınları.
- Dalgın, M., & Acay Sözbir, S., (2019) Okul Öncesi Dönem Müzik Etkinliklerinde Uygulanan Yöntem, Teknik ve Yaklaşımlar, *Fine Arts (NWSAFA)*, D0225, 14 (1) : 39-59.
- Dündar, M., (2003). Müzik Öğretmeni Yetiştirmede Alanda Eğitim. *Gazi Üniversitesi Gazi Eğitim Fakültesi Dergisi*. 23(1): 59-67.
- Eren, B., (2012). Müzik Eğitiminde Kaynaştırma Uygulamaları ve Orff-Schulwerk, *Trakya Üniversitesi Eğitim Fakültesi Dergisi*, Cilt 2. Sayı 2. 14-25.
- Ertekin, N, M., ve Küçükosmanoğlu, O., (2016). Müzik Eğitiminde XX. Yüzyıldaki Öğretim Yaklaşımlarının Karşılaştırmalı Olarak İncelenmesi, *Eğitim ve Öğretim Araştırmaları Dergisi Journal of Research in Education and Teaching*. (<https://www.muzikogretmenleriyiz.biz/muzikogretim-yontemleri-ve-yaklasimlar>) erişim tarihi 09.09.2020'dir.
- Haselbach, B., (2015). Orff'schulwerk'in Getirdiği Çözümler Üzerine. *Andante Dergisi Eki: Türkiye'de Müzik Eğitimi ve OrffSchulwerk*, Ss: 9- 10.
- Heslop, C., (1995). *Primary Colours*, London: Music Teacher (March).
- İşın, D. (2008). *Okul Öncesi Müzik Eğitiminde Uygulanan Orff Yaklaşımlarının 5-6 Yaş Grubundaki Çocukların Ritimsel Becerilerine Etkisi*. Yayımlanmamış Yüksek Lisans Tezi. Gazi Üniversitesi, Eğitim Bilimleri Enstitüsü, Ankara.

- Kasap, B.T., (2005). Suzuki Okulu Metodu. *İnönü Üniversitesi Eğitim Fakültesi Dergisi*, Vol:6, No:9.
- Kuşçu, Ö., (2010). Orff – *Schulwerk* Yaklaşımı ile Yapılan Müzik Etkinliklerinin Okul Öncesi Dönemdeki Çocuklarının Dikkat Becerilerine Etkisi, Yayınlanmamış Yüksek Lisans Tezi, Konya: Selçuk Üniversitesi, Sosyal Bilimler Enstitüsü.
- Orff, C. (2003), *Hareketten Doğan Müzik*, Orff Info 3, s.2, İstanbul.
- Ömeroğlu, E., Ersoy, Ö., Tezel Şahin, F, & Turla, A. (2003). *Müziğin Okul Öncesi Eğitimde Kullanılması*, Kök Yayıncılık, Ankara.
- Özal Göncü, İ. (2010). Okul Öncesi Eğitimde Müzik Eğitiminin Temel Sorunları. *Kastamonu Eğitim Dergisi*, 18(2), 355- 362.
- Özeke, S., (2007). Kodály Yöntemi ve İlköğretim Müzik Derslerinde Kodály Yöntemi Uygulamaları. *Uludağ Üniversitesi Eğitim Fakültesi Dergisi*, Vol. 20, No.1.
- Özen, N., (2004). Çalgı Eğitiminde Yararlanılan Müzik Eğitimi Yöntemleri. *Gazi Eğitim Fakültesi Dergisi*, Vol. 24. No.2.
- Özevin, B., (2018). Humanistic, Artistic and Pedagogic Aspects of Orff-Schulwerk Music and Dance Pedagogy Orff-Schulwerk Müzik ve Hareket Eğitiminin İnsani, Sanatsal ve Pedagojik Yönleri. *Journal of Human Sciences*, 15(1), 8-23.
- Sökezoğlu, D. (2010) *Ritim, Hareket ve Şarkı Öğretimi Temelli Müzik Eğitiminin 7-11 Yaş Grubu Çocuk Yuvası Öğrencilerinin Sosyal Gelişimleri Üzerine Etkisi* (Afyonkarahisar İli Örneği). Gazi Üniversitesi Eğitim Bilimleri Enstitüsü, Yayınlanmamış Doktora Tezi, Ankara.
- Sun, M. ve Seyrek, H., (1993). *Okul Öncesi Eğitiminde Müzik*. İzmir: Mey Müzik Eserleri Yayınları.
- Sungurtekin, Ş., (2005). *Orff Çalgılarının Okul müzik eğitimindeki yeri ve okul öncesi eğitim kurumlarındaki uygulamalarının değerlendirilmesi*. Yayınlanmamış Yüksek Lisans Tezi Uludağ Üniversitesi, Sosyal Bilimler Enstitüsü,. Bursa.
- Şen, Y., (2006). Okulöncesi Dönemde, Çocuğun Gelişiminde Müziğin Önemi., *Atatürk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 337-343.

- Şenol, A., (2013) İstanbul Anadolu Yakasındaki Anaokullarında Altı Yaş Grupları ile Orff-Schulwerk Uygulamaları, K.O. Koçak, N.Laslo, *Türkiye'de Orff-Schulwerk Müzik, Oyun ve Dans Üzerine Makaleler* 89-95, Ankara: Müzik Eğitimi Yayınları.
- Şimşek, P.R. and Bilen, S., (2017). Reaching the Effective Music Literacy: Kodaly Method Etkili Müzikal Okuryazarlığa Ulaşmak: Kodaly Yöntemi. *Journal of Human Sciences*, 14(4), 4308-4319.
- Tecimer Kasap, B., (2005) Suzuki Okulu Metodu, *İnönü Üniversitesi, Eğitim Fakültesi Dergisi*, Cilt:6, Sayı:9, 115- 118
- Tufan, S., (1995). *Grup Piyano Eğitimi*. AGSL Sempozyumunda Sunulan Bildiri. Trabzon: Mavi Nota Dergisi.
- Uçan, A., (1994) *Müzik Eğitimi*, Müzik Ansiklopedisi Yayınları, Ankara.
- Yıldırım, K., (2010). Kodaly Yönteminin ilköğretim Öğrencilerinin Keman Çalma Becerisi Üzerindeki Etkileri. *Batı Anadolu Eğitim Bilimleri Dergisi* (BAED), Vol:1. No:2.
- Yiğit, E. F., (2000) *Müzik Eğitiminde Kodaly Metodunun Rolü*, Dokuz Eylül Üniversitesi Eğitim Bilimleri Enstitüsü, Yayınlanmamış Yüksek Lisans Tezi, İzmir.

CHAPTER III

STUDENT OPINIONS ON HOME CONCERT XTREME SOFTWARE DESIGNED FOR COMPUTER BASED PIANO TEACHING

Asst. Prof. Burcu KALKANOĞLU

Trabzon University, State Conservatory, Musicology Department, Trabzon,
Turkey

e-mail: kalkanogluburcu@gmail.com, Orcid ID: 0000-0003-3696-5907

Introduction

Being a requirement in today's digital world, use of technology is rather common in terms of its capability of accessing to every field, and ensuring rapid and easy transmission of data. With its ability to make learning easier and more permanent, technology is observed to have a great amount of contributions to the field of education. In order for these functions to fit the purpose, technology must be used as a tool in education.

Education, behavior, and skill development are defined as the process of acquiring knowledge-skill and attitude. With the activation of the acquired skills, technology creates functional structures required to have a command of the natural environment. In the light of these definitions, educational technology refers to the functionalization of the process of learning and teaching, by means of involving the relevant knowledge and skills required to have control over education and learning (Alkan, 2011).

The activities performed during the process of learning are crucial in terms of ensuring the durability of the information learned. Besides, it is known that a learning activity which involves more than one sense organ becomes more permanent. Educational environments that enable the active use of these sense organs are achieved with the support of computers (Gülbatar, 2016).

Abbreviated as CBI, computer based instruction is a method of teaching which is based on the use of a multimedia software by one or more students for educational purposes (Engin, Tösten&Kaya, 2010).

Computer based instruction helps teachers educate their students in different ways. For instance, it introduces new materials, teaches the lessons, runs tests for new skills, reviews, and makes corrections, when

¹This article was produced from part of his PhD thesis titled "Research On Impacts Of The Computer-Assisted Piano Learning On The Student Performance (Home Concert Xtreme Example)" directed by Prof. Dr. Aytekin Albuz.

necessary. From basic to the most advanced level, computers are capable of teaching every single thing from every difficulty level. Although there are no limitations to the variety of subjects that can be taught by computers, there are certain specialties (Bitter, 1989). These specialties include language teaching, social sciences, science and mathematics, music education, etc. Computer based instruction is used in these and many other fields, and it is still in progress. CBI has started to be used in every field of education and it provides an easier and more efficient learning.

In music education, information technology was initially handled as a single subject and the following studies focused on the software developed in the field of composition. Synthesizers and mixers opened new horizons for composers by offering new sounds and different ways of practice. Then, the computer-controlled piano was designed which was developed for the performance. This technology is a tool that was designed to enable efficient practices in the field of composition and real time performance. Computer based hearing education also started to be used together with computer based learning software, which were designed in a way that can replace conventional education environments for subjects, such as harmony and history, and offer an interactive learning environment (Tomita& Barber, 1996).

Skills such as performance, composition, hearing, and recording are achieved through electronic hardware and computer software. These hardware and software are also used for educational purposes and have turned into a multifunctional and efficient tool in music education.

The software designed in line with the targets of music education changes and develops the educational structure (Koç, 2004). Musical software, which have spread in many fields, appear as programs used in computer based instruction. These software create new perspectives for music education with fields such as ear training, music theory, and instrument training. A computer environment planned by the teacher and developer is adjusted according to the skill and target behavior of the student. These software offer various options and provide different study environments. Therefore, computer plays a vital role in music education researches (Deihl&Radocy cited by Andaç, 2016).

Being one of the keystones of music education, instrument training is also rather useful for computer based instruction. There are numerous software available that are designed for instrument training. One of these programs is Home Concert Xtreme, which is also identified as “Intelligent Interactive Music Software”. Home Concert Xtreme is a music software designed for piano education. Developed by TimeWrap Technology, the software was designed as a program for interactive and one-to-one learning. The reason why Home Concert Xtreme was chosen is because it

has established a system that aims to achieve an extensive learning in piano education. Besides the visual/audial warnings, which make learning easier and more efficient, the program also allows the student to make progress by means of having the student play the piece step by step. In this respect, Home Concert Xtreme was determined as the suitable software for the study. The most outstanding aspects of the program is that it has automatic page turner and the MIDI accompaniment is an extremely advanced tool.

Since computers cannot listen to the melodies and process them most of the time, this sometimes becomes a problem in terms of accompaniment. This is due to the fact that computers are straight and they do not perform changes on the music unless the otherwise is commanded. This may break the coordination between the computer and student, in the case of little mistakes. Besides, the simultaneous slowdowns and accelerations of the student together with the accompanying part during the performance cannot be achieved with computers (Andaç, 2016).

However, this is not the case for the MIDI accompaniment application of Home Concert Xtreme. Because, the most outstanding aspect of this MIDI accompaniment, which is called “Intelligent MIDI accompaniment”, is its ability to follow the whole piece while playing it and to take form accordingly. This only steps in on “performance mode”, since it achieves a systematic progress in performance mode, after having accomplished learning in a constant rhythm.

With the change occurring in conventional production, technology has become a determinant. In this case, music education and teaching are also expected to change accordingly. However, it was found that music education institutions are left behind of this change (Bayraktar, 1989).

It was observed that courses on music technology, which can allow pre-service music teachers to keep up with rapid changes and developments occurring in this field, do not exist among compulsory field courses (Yüksel and Mustul, 2009).

Additionally, Kalkanoglu and Albuz (2019) assert that technology is used as a tool in music education like in many other fields; and add that such a technology that is capable of easing the process of teaching and learning, increasing motivation of the students, offering practicality, and saving time has a vital importance not only for the learner but also for the teacher.

As Bayraktar (1989) stated, “constant and rapid development and change is the characteristic of our age. Even a few examples are enough to show how big the change is. Music education institutions must be equipped with these innovations before it is too late, and the programs must be supported in the light of this idea” (p.162).

Within this context, the Home Concert Xtreme software, which is a software designed for teaching computer based piano, was evaluated and students were asked for their opinions on computer based piano training. In the light of the above-mentioned, the problem statement of the research was identified as “What are the student opinions on Home Concert Xtremesoftware designed for computer based piano training?”

Purpose of the Study

In terms of being the compulsory instrument in music education, piano education has an important position. Accurate playing is one of the subjects to be considered in piano education. One of the most prominent issues in piano education is when a student does not duly practice a given piece and therefore fail to achieve a fluent performance. This is usually caused when students are unable to practice piano outside the class or fail to accomplish learning carefully. Purpose of this study is to research student opinions on Home Concert Xtremesoftware designed for computer based piano training.

Significance of the Study

The study is considered significant in terms of raising awareness on the use of technology in music education and providing its widespread. Besides, it is believed to make contributions to future studies.

Assumptions

It is assumed that responses given by the participating students during research will reflect the truth. It is also assumed that the adopted method is suitable for the purpose and subject of the study.

Limitations

The study is limited to:

- Semi-structured interview questions prepared;
- The HCX software used in piano education;
- Opinions of 8 individuals, who studied at GUGFE Department of Fine Arts Education Division of Music Education and formed the study group before;
- Czerny Etude Op.139 and Haydn Divertimento in C Major XIV:-4 Chapter II used in the application process of the research.

METHOD

Research Model

The study is composed of quantitative and qualitative research methods. An experimental study was conducted in order to obtain quantitative data.

In qualitative section, on the other hand, students in the experiment group were applied a semi-structured interview form, in an attempt to interpret the obtained data better and enhance the research.

Descriptive study model was adopted in the study, which is a qualitative research method for situation determination. Case study is also referred to as sample case study. It has different names in literature, and is defined as “Case Study” in English literature (Yin, 2003). It differs from other types of studies in terms of focusing on the questions “how” and “why” (Yıldırım & Şimşek, 2013). According to Creswel (2014), case study, which is a qualitative research approach, refers to the analysis of one or more cases through data collecting tools that contain multiple sources such as observations, interviews, reports, and document, and identification of cases and the themes related to them. Internal case study method was adopted in the research, which is a type of case study. The purpose is to have a better understanding on the case.

Study Group

Study group of the research is composed of students taking piano course at Gazi University Gazi Faculty of Education Division of Music Teaching in 2017-2018 academic year spring semester. The study was conducted on a total of 8 students classified as the experiment group (n=4) and control group (n=4). Selection of students was limited to those who obtained a final grade of 80-100 at the end of semester.

Table 1. Distribution of the 1st Year and 2nd Year Undergraduate Students of Gazi University Gazi Faculty of Education Division of Music Education

Name of the Group	Number of Students According to Years	Number of students taking final exam	Number of students who obtained a grade of 80-100
1 st Year Undergraduate	46	43	27
2 nd Year Undergraduate	45	40	30
Total	91	83	57

As seen in Table 1, there are a total of 46 1st year students, while this number is 45 for the 2nd year students. Number of 1st year undergraduate students who took the final exam of piano course in 2017-2018 fall semester is 43. 3 of the students could not take the final exam due to not

having attended the course. The number of 2nd year undergraduate students who took the exam is 40 since 5 of the students could not take the exam due to the same reason. Number of the 1st year students who obtained a grade of 80-100 was identified as 27, whereas this number was 30 for the 2nd year students. To select students who can play the pieces determined for the research on the same level, the pieces they played at the end of semester were taken into consideration. Selection of students in this group were based on volunteerism, as well as the criteria on grade and level. Therefore, study group of the research consisted of 8 students: 2 of them being the 1st year undergraduate students and the other 6 being 2nd year. Qualitative data of the study focused on the opinions of 4 students only from the experiment group.

Home Concert Xtreme



Home Concert Xtreme was designed by TimeWarp Technology company which develops interactive software for musicians, music instructors, students, and those who are interested in music.

Software developed by TimeWarp Technology are:

- Home Concert Xtreme
- Classroom Maestro
- Internet MIDI
- SuperScore

In 2010, Home Concert Xtreme (HCX) was given the Frances Clark Keyboard Pedagogy Award by MTNA (Music Teacher National Association), which is an association that awards individuals or groups who have made contributions to the field of keyboard pedagogy.

Content of Home Concert Xtreme involves the “Intelligent Accompaniment” system. Thanks to this system, MIDI accompaniments can take form according to the performance of the user. The program has 3 different modes: Learn Mode, Jam Mode, and Performance Mode.



Figure 2. *Learn Mode*

Learn Mode: This is the first stage of the software. When hit a wrong note, it does not proceed and stops. The wrong note is displayed on the keyboard available on the screen, in red. The correct note, on the other hand, is displayed in green. This feature allows the correct playing of the notes and rhythm patterns.



Figure 3. *Jam Mode*

Jam Mode: It allows an uninterrupted playing on a designated tempo, as well as a fluent and continuous performance based on a constant MIDI accompaniment, regardless of expressions and dynamics. This feature enables the integrity and continuity of the piece. Jam Mode can also be used for sight-reading exercises.



Figure 4. *Performance Mode*

Performance Mode: Following the other two stages, this feature sticks to the dynamics of the piece with its “Intelligent Accompaniment” system. If the player slows down or fastens during a certain part of the piece, the accompaniment follows accordingly and stays faithful to the interpretation of the performer. This allows the full achievement of the performance.

Collecting Data

A semi-structured interview form was prepared for the study, in order to obtain students’ opinions and ideas on Home Concert Xtreme.

Semi-structured interviews must involve open-ended questions in an attempt to make sure that participants express their own ideas based on their perception. Therefore, each question must be flexible and the interview must be prepared with differently-structured techniques (Merriam, 2013). For qualitative data, a semi-structured interview form was prepared to be applied to students in the experiment group. Questions were submitted for the approval of specialists and took their final form.

Ipad Air 2, Lightning to USB Camera Adapter, Yamaha Silent piano were used for the application. For Home Concert Xtreme software, TimeWarp Technologies was contacted. The software and MIDI

accompaniments of the pieces to be used in the study were sent to me free of charge by Shana Kirk, who is from the marketing and support team of the company. They also provided technical assistance when needed.

Research Process

The two pieces determined for the experimental aspect of the study were composed of three stages for both groups. Stages for the experiment group were identified as Learn Mode, Jam Mode, and Performance Mode, whereas they were identified as the First Stage, Second Stage, and Third Stage for the control group. The pieces used in the study, which were determined based on specialist opinions, were C. Czerny op.139 No:19 and J. Haydn Divertimento in C Major XIV- 4 Chapter II. The application process lasted 9 weeks. A pretest was applied in the first week, which was followed by the application process during the other 8 weeks. After having completed the experimental process, opinions and experiments of students from the experiment group during the application of Home Concert Xtreme were taken, by using the semi-structured interview form prepared for qualitative data.

Data Analysis and Interpretation

“Semi-structured interview form” was applied to the study group for qualitative data. Obtained data were evaluated in categories, by using the content analysis method.

Structured interview asks predetermined questions to individuals being interviewed. Answers to these questions were also categorized beforehand (Arslanoğlu, 2016).

Table 2. Stages followed in the analysis of the data obtained from the interview form

Transcription of the interview data
Arrangement of the interview data
Coding of the interview data
Determination of themes (category) and arrangement of codes
Expression of the themes under the interview questions
Description of the data according to the codes and themes
Writing the research results

Findings

Findings and Discussions Related to the Student Opinions on the Function of Home Concert Xtreme (HCX)

To seek an answer to this problem, responses given in the semi-structured interview forms that were applied to experiment group (n=4) students were analyzed respectively. Besides, a sample student answer was provided for each code.

Question 1: “Did you find Home Concert Xtreme (HCX) software useful? Please explain briefly.”

Table 3. Opinions of Students on the Usefulness of HCX

CATEGORY	CODE	STUDENTS
Opinions of students on whether Home Concert Xtremewas useful or not	It is a useful program.	D1,D2,D3,D4
	It contributed to my continuity.	D1
	It is a detailed application that can be easily used.	D2
	It allowed me to perform a more practical and quick sight-reading and reduced my mistakes.	D3
	It helped me practice on a tempo that I want and memorize it.	D4
	Prepared me for live performances in a short time.	D3
	It allowed me to practice with accompaniments by which I got to learn the piece easily and in a different way.	D4

When Table 3 is analyzed, it can be found that all students in the experiment group found Home Concert Xtreme useful. Additionally, student D2 stated that HCX is a detailed software that can be used easily; student D3 said it reduced his/her mistakes contributed to a more practical and quick sight-reading and prepared for live performances in a short time; student D4 expressed that s/he was able to practice on a desired tempo, and fully learned the pieces in a way that was not usual.

D3: “I found the program rather useful because I think it reduced my rate of mistakes, allowed me to perform a more practical and quick sight-reading, and prepared me for live performances in a shorter period of time”.

D4: “It is a very useful program. First, it helped me practice the piece in a tempo I wanted and then made my learning permanent. The performance mode allowed me to practice the piece in a tempo I wanted as well, but this time with an accompaniment. This way, I was able to learn the piece more easily and did it in a way that was not usual”.

Question 2. What are the differences between the methods of conventional piano teaching and the one conducted on HCX software? Please explain briefly.

Table 4. Differences between the methods of conventional piano teaching and the one conducted on HCX software

CATEGORY	CODE	STUDENTS
Differences between the methods of conventional piano teaching and the one conducted on HCX software	HCX is more motivational.	D3
	HCX provided accompaniment while playing the piece and eased the nuances.	D4
	Ability to sight-read the piece faster with HCX when compared to conventional piano teaching.	D3
	The opportunity to play the piece with an accompaniment on HCX, once you learn the piece in terms of rhythm and make no mistakes.	D4
	Reducing the mistakes to zero level.	D1, D2
	Gaining the habit of using metronome on HCX	D1
	HCX allows you to realize the mistakes you make.	D1

Table 4 demonstrates that students identified differences between the methods of conventional piano teaching and the one conducted on HCX. Student D3 said HCX was more motivational and provided the ability to sight-read the piece faster when compared to conventional piano teaching; student D4 stated that with its accompaniment feature, HCX eased nuances and it introduced the accompaniment once the piece is learned in terms of rhythm and with no mistakes; student D1 and D2 said HCX reduced mistakes down to zero level; and D1 stated that the software helped him/her realize the mistakes and gain the habit of using metronome.

D1: “It helped me realize my mistakes during regular practices. It almost eliminated the possibility of not realizing my false notes. At the same time, it helped me gain the habit of using metronome, which I was not able to acquire during my conventional piano education”.

D2: “Time management becomes an issue in conventional piano education. One may not understand when s/he practices correctly or incorrectly. HCX, on the other hand, went into action when I played correctly and brought the level of mistakes to zero”.

Question 3. Do you think HCX was useful during the initial sight-reading? If yes, please explain briefly.

Table 5. Student Opinions on the Impacts of HCX While Sight-Reading the Piece

CATEGORY	CODE	STUDENTS
Student opinions on whether HCX was useful during the sight-reading of the piece	It was useful.	D1,D2, D3, D4
	It was helpful in note following.	D1
	It is a detailed and user-friendly application.	D2
	It has the options of separate sight-reading as left-hand or right-hand.	D3
	The software helps you play the notes and rhythms correctly during sight-reading.	D3, D4
	Ability to sight-read in a short time.	D3

Table 5 shows the student opinions on whether Home Concert Xtreme was useful while sight-reading the pieces. All students agreed that it was useful; while student D1 said it facilitated note following; D3 and D4 said it helped them play the notes and rhythms correctly during the process of sight-reading; and student D3 stated that it has the options of separate sight-reading as left-hand or right-hand and that it helps you sight-read the piece in a short time.

D3: “As a student with attention deficiency, I think HCX had great contributions to my playing. There are several features that helped me play the notes and rhythms correctly, during sight-reading (strips following the notes, accompaniments etc.). These features allowed me to have a better command of the piece and forced me to concentrate. This way, I was able to sight-read the piece in a shorter time. I did not feel the negative effects of my attention deficiency”.

D4: “Yes, it was. I already had the option of sight-reading the right and left hand. This enabled me to learn more slowly, yet efficiently. Then, I was able to adjust the rhythm accordingly while practicing in both hands. The piece automatically stopped whenever I made a mistake. This helped me realize my mistakes and highlighted the parts I need to focus on.

Question 4. Do you think HCX had any contributions in terms of motivation towards piano? Please explain briefly.

Table 6. Student Opinions on the Contribution of HCX in Terms of Motivation

CATEGORY	CODE	STUDENTS
Student opinions on whether Home Concert Xtreme had any contributions in terms of motivation	I definitely think so.	D1,D2,D3,D4
	Ability to learn the piece in a short time by practicing it easily and correctly.	D1
	Feeling how much of a progress you have made in the piece.	D1
	Feeling that you get efficiency while you are practicing piano.	D1
	Allowing you to play the whole piece without any distraction	D2

Playing with more confidence with the help of additional elements.	D3
Offering an entertaining practice.	D4

Table 6 reflects the student opinions on whether HCX had any contributions to motivation. Students D1, D2, D3, and D4 agree that it certainly did. Additionally, student D1 stated that it allowed him/her to learn the piece in a short time by means of practicing it easily and correctly, s/he made progress, and felt the efficiency; student D2 said s/he was able to play the whole piece without any distraction; student D3 asserted that s/he played with more confidence thanks to the additional elements available in the software; and D4 stated that it was an entertaining practice.

D1: “It showed me that I could accomplish an overestimated task easily and shortly with the help of adequate planning and practice. I never felt like I was not getting efficiency throughout the practice. This is an important factor to me. Besides, it helped me realize how much progress I made in the piece I was practicing”.

D3: “I think it has increased my motivation towards piano. Additional tools in the software encouraged me to play with more confidence, too”.

Question 5. How effective were the MIDI accompaniments in HCX, on your performance? Please explain briefly.

Table 7. Student Opinions on the Effectiveness of the MIDI Accompaniments in HCX Software in terms of Performance

CATEGORY	CODE	STUDENTS
How effective were the MIDI Accompaniments in HCX on the performance?	Helping to stay in the rhythm and facilitating the analysis	D1
	Better interpretation of the piece.	D2
	Ability to listen to the accompaniment and piece at the same time.	D3
	Entertaining.	D4
	Playing piano with an accompaniment for the first time.	D1
	Playing the piece with more enthusiasm, together with the accompanying orchestra.	D4

As it can be seen in Table 7, students expressed their opinions on the effectiveness of MIDI accompaniments available in HCX, in terms of performance. Student D1 said MIDI accompaniments helped him/her stay in the rhythm and analyze the piece, and therefore experienced playing piano pieces with an accompaniment for the first time; student D2 said s/he was able to perform the piece better; D3 said s/he could follow both the accompaniment and the piece; and D4 said playing with an accompaniment was fun and together with the accompanying orchestra, it helped him/her play the piece with more enthusiasm.

D1: "I believe the accompaniments give a metronome effect in a musical sense. I also think it allowed me to stay in the rhythm even in passages I was not fully familiar with and helped me analyze the piece. I had never had the chance to practice piano pieces with accompaniment. I believe this experience made valuable contributions".

Question 6. Do you think playing with accompaniment has contributed to your musical skills? Please explain briefly.

Table 8. Student Opinions on the Contribution of Playing with an Accompaniment to Musical Skills

CATEGORY	CODE	STUDENTS
Student opinions on whether playing with an accompaniment contributed to their musical skills	Yes, I think so.	D1, D2, D3, D4
	Highlighting musical sentences.	D1
	Performing the piece better and more easily.	D1,D2
	Revealing musical talent.	D2,D4
	Preparing for a real performance.	D3

As demonstrated in Table 8, students D1, D2, D3, and D4 agree that playing with accompaniment had a positive impact on musical skills. In addition to that, student D1 said it highlighted the musical sentences; D1 and D2 said they were able to perform the piece better and more easily; student D3 said it prepared him/her for a real performance; and D2 and D4 said it revealed musical talent.

D2: “Yes, I think so. You have the solo in the pieces you play. That is why, one can get carried away and reveal the musical talent. This way, you get to perform the piece much better”.

D3: “Yes, I believe it affects. It made me feel like I was playing in a concert with accompaniment; in other words, prepared me for an actual performance”.

D4: “Absolutely. Having an accompaniment helped me render nuances and allowed me to think musically. Because I was not able to pay attention to the notes while there was an ongoing accompaniment in the background. They were already learned. It was time to focus on how to upgrade my performance by listening to the orchestra”.

Discussion, Conclusion and Recommendations

In the study, Home Concert Xtreme, which is a software used for computer based piano training, was applied to students in the experiment group through selected pieces, which was followed by the application of semi-structured interview form. A content analysis was conducted on data obtained from the application, where the experiment group students

provided positive opinions on Home Concert Xtreme. It was observed that the introduction of students to computer based approach of piano training for the first time and practicing with a schedule appropriate to this approach was different and exciting. The impacts of features, available in the software, on students' success and motivation were supported with qualitative data.

According to the opinions of the students about the extent to which MIDI accompaniment in the Home Concert Xtreme program has an impact on performance; MIDI accompaniment helped analyze the work by staying in the rhythm, thanks to MIDI accompaniment, the works could be interpreted better and it was more fun to work with them. In addition, students made statements expressing that for the first time they had the experience of playing the piano with accompaniment and that they played the song more eagerly. As it can be understood from these expressions, it has been understood that MIDI accompaniment contributes to both motivation and understanding the character of the work better and playing expressively. The answers given by the students to this category were found to be positive.

In his PhD thesis titled "The effects of computer-assisted keyboard technology and MIDI accompaniments on group piano student's performance accuracy and attitudes", Ajero (2007) investigated the performance and attitudes of students who received piano education. The data obtained from the pretest and posttest were evaluated according to the rhythm and interval criteria, and it was concluded that the use of MIDI accompaniment and Guide Mode in piano education had a positive effect on student development. This research is in line with this article in terms of method and result; it also supports the benefits of MIDI accompaniment on the student.

Students' opinions about whether the Home Concert Xtreme program contributed in the deciphering phase of the piece were positive. In accordance with opinions of the students, it has been revealed that HCX is a program that allows to sight reading in a short time. In addition, the students stated that there is an option to sight reading the right-left hand separately and it is a program that facilitates following the notes. Based on these statements, it is concluded that the features in the program make a great contribution to the students in the sight reading of the piece.

Tsangari (2010) proposed an interactive software to improve sight reading skills of pianist in his thesis titled "An interactive software program to develop pianists sight reading ability". In the research, the piano software until 2010 has been examined and it has been determined that only one of them has section about sight reading; however, it was emphasized that some software can be used as a tool to improve sight

reading with instant feedback features. Tsangari also included the HCX program in this research. As stated in the conceptual framework, the HCX program facilitates sight reading and supports the development of sight reading skills.

Student views on whether the HCX program contributed motivationally were generally positive. Sight reading a work is a troublesome process for many students. Carelessness of some students leads to incorrect study of notes and rhythm patterns on the studied work. Looking at the statements taken from the opinions of the students in the experimental group, it is understood that similar problems can be solved easily thanks to the HCX program. In addition; it can be said that the program contributed significantly to motivation as a result of expressions such as playing the works until the end without distraction, feeling that they can make progress and gain efficiency, play more confident thanks to the auxiliary elements and make the work process fun.

In his PhD thesis titled “The effect of SmartMusic on student performance”, Nicholas (2014) aimed to examine the effects of “SmartMusic” program, which is one of the interactive music exercise software, on students’ work habits and motivations. As a result of this study, it has been determined that the SmartMusic online study program makes it easier and more enjoyable for students to practice at home; it has also been revealed that it has a positive effect on students’ work habits. It has been observed that they use their working time in a better quality by contributing to the increase of their motivation.

It is seen that students' opinions about whether playing with accompaniment contributes to musical skills are positive. Students stated that playing with accompaniment helped to understand musical sentences, enabling the interpretation of the work easier and better, preparing it for a real performance and revealing the musical talent. It is understood that it contributes significantly to the development of students by offering them the opportunity to understand and interpret the work being studied, to offer students who do not have the opportunity to play in front of chamber music or orchestra, to perform as a lively performance.

In their research titled “The effects of live accompaniment, intelligent digital accompaniment and no accompaniment on musicians performance quality” , Sheldon, Reese and Grashel (1999) investigated the effects of live accompaniment, intelligent digital accompaniment and no accompaniment playing on the performance quality of university students. This research utilizing the Vivace program consists of a 6 week experimental period. As a result of the experiment, student performances were evaluated based on tone quality, intonation, rhythm, technique, interpretation and articulation criteria; performance scores of the groups

were compared. While the lowest scores in the tone quality criterion are determined in groups working with no accompaniment and live accompaniment; the highest score was determined in the group working with intelligent digital accompaniment. In this study, intelligent digital accompaniments, one of the most important features of the HCX program, were used and important findings were obtained in this regard. The benefits of MIDI accompaniment on students are also supported by this research.

When the overall outcome of the content analysis which was carried out on the semi-structured interview form applied to experiment group students after the application is considered, it can be concluded that Home Concert Xtreme has positive effect on students in terms of; Allowing them to play the notes and rhythm patterns with no mistake, being user-friendly and functional, displaying each detail, and preparing them for an actual performance with the help of MIDI accompaniments; Ensuring a faster sight-reading when compared to conventional piano teaching; Having them gain the habit of using metronome with the help of the software, and increasing their motivation; Allowing them to sight-read the piece in a shorter time; Having the options of right-hand and left-hand sight-reading, and making the process of following notation easier; Helping them feel that they are making progress and getting efficiency from the piece; Easing the piece analysis by means of staying in the rhythm of MIDI accompaniments; Helping them understand the musical sentences better and therefore perform pieces better; Offering them the opportunity to play pieces with accompaniment for the first time; Increasing their motivation.

In line with these results; Piano labs can be created in institutions that provide music education, and students' ties with technology can be strengthened. The development of students and their progress in a short time can be achieved through Computer Assisted Education. Turkish software can be developed for piano education. Music software can be used not only in vocational education institutions but also in self-contained music education, preschool music education and professional musicians.

References

- Ajero, M. (2007). *The effects of computer-asisted keyboard technology and MIDI accompaniments on group piano student's performance accuracy and attitudes*. Doctoral Dissertation, University of Oklahoma Graduate Collage, Oklahoma.
- Alkan, C. (2011). *Eđitim teknolojisi*. Ankara: Anı.
- Arslanođlu, İ. (2016). *Bilimsel yöntem ve araştırma teknikleri*. Ankara: Gazi Kitabevi.
- Creswell, J. W. (2014). *Araştırma deseni nitel, nicel ve karma yöntem yaklaşımları* (S. B. Demir, Çev.). Ankara: Eđiten Kitap.

- Kalkanođlu, B., Albuz, A. (Haziran, 2019). Bilgisayar destekli piyano öğretiminin öğrenci performansı üzerindeki etkilerinin araştırılması (Home Concert Xtreme Örneđi). *Eđitim Alanında Araştırma ve Deđerlendirmeler*, Gece Kitaplığı, Ankara, s.5- 23.
- Koç, A. (2004, Nisan). *Günümüzde bilgisayar destekli müzik yazılımlarının müzik eğitime katkıları*. 1924-2004 Musiki Muallim Mektebinden Günümüze Müzik Öğretmeni Yetiştirme Sempozyum'unda sunulmuş bildiri, Süleyman Demirel University, Isparta.
- Merriam, S.B. (2013). *Nitel araştırma desen ve uygulama için bir rehber*. S.Turan (trans. Ed.). Ankara: Nobel.
- Nicholas, B.D. (2014). *The effect of smart music on student practice*. Doctoral Dissertation, Kennesaw State University, Kennesaw, Georgia.
- Tomita, Y.& Barber, G. (1996). New technology and piano study in higher education: getting the most out of Computer-Controlled Player Pianos. *British Journal of Music Education*,13(2), 135-141.
- Tsangari, V. (2010). *An interactive software program to development pianists' sight reading ability*. Doctor of Musical Arts, University of Iowa, Iowa.
- Yıldırım, A. & Şimşek, H. (2013). *Sosyal bilimlerde nitel araştırma yöntemleri*. Ankara: Seçkin.
- Yin, R. K. (2003). *Case Study Research Design and Methods* (3. Baskı). London: Sage Publications.

CHAPTER IV

MUSICAL COMMUNICATION IN PERFORMING PROCESS: INFERENCES FOR INSTRUMENTAL MUSIC EDUCATION

Dr. Ebru ŞEN * & Dr. Çağrı ŞEN **

* Sinop University, Sinop, Turkey
e-mail: esen@sinop.edu.tr, Orcid ID: 0000-0003-4691-576X

** Sinop University, Sinop, Turkey
e-mail: csen@sinop.edu.tr, Orcid ID: 0000-0003-0776-5025

1. Introduction

Art is one of the freest creativity fields of humankind and it can be accepted as one of the most extensive and functional types of communication. Art has multidimensional manners of effect and exposure due to these characteristics. When a message contained in a piece of art is associated with the society, it does not make any sense individually. This is because, each society's process of communication with arts, artists, and pieces of art are different and various compared to each other (Aydm, 2009, pp. 223, 230, 248, 249). A piece of art stimulates emotions, thoughts, and impressions in the framework of local, regional, temporal, historical, social, and cultural relations, and it leaves an aesthetic mark on receiver through them at the end of a communication of art (Uçan, 1994, p. 32).

According to Hargreaves, MacDonald, & Miell (2005, p. 1), music is one of the fundamental channels of communication as it provides people with a way of sharing their emotions, intentions, and meanings. According to Limb (2006, p. 229), when the music and the language we speak in acoustic terms, which have great similarities to each other, are addressed, it is seen that both of them are transmitted through variable frequency sounds that aim to transmit different message structures ranging from abstract to concrete. Based on this idea, language is used to transmit emotions in interpersonal communications, while the element of musical sound substitutes for language in musical communication.

The tools that creates the sound element has an important place for presenting a musical idea. It can be said that these tools are the major elements that are used by performers for communication purposes. Musical instrument is one of the tools that is used by performers to create the sound element in communication process. Further, there is a process of instrumental music education process before a performer delivers an activity of performance on an instrument. Knowing the processes and concepts that are related to communication in instrumental music education and transferring these processes to the stage of performing will beyond doubt increase the quality of instrumental music education.

The study firstly mentions the basic concepts and elements of the general communication process, and then includes conceptual explanations in order to form the theoretical framework of the research. The elements and concepts that were defined in the scope of the theoretical framework were addressed in detail and synthesized into the field of music, while adapting the general communication to a specific field. Thus, the general communication process was adapted to the field of music and a model of “Musical Communication Process” was created. Each element of the model and the relationship among the elements were addressed and discussed in musical performance process.

2. Communication

The concept of “communication”, which derives from the Latin word “communicare”, means transfer of knowledge, emotions, thoughts, attitudes, and behaviors to others in all manners. Meanings such as transmitting, sharing, and giving that lie behind the word of communication indicate the purposes of this concept. Fundamentally, communication is to generate information/message and then to transfer and share it between a source and a target. In this process, any meaning containing knowledge, ideas, emotions, and thoughts can be transferred by all possible means. In brief, anything to which people can attribute a meaning is communication for people (Altıntaş & Çamur, 2005, p. 5; Baltaş & Baltaş, 1994, p. 19; Tutar & Yılmaz, 2005, p. 16).

The process of communication begins when source organizes a message, in other words, when the source encodes the message comprehensibly, and thinks how to send it to receiver. The message is encoded for the target to perceive it, and is sent to the receiver through a channel. The receiver must be able to perceiving the transmitted message, in other words, must be able to decoding the encoded message. The target perceives and interprets the message, and sends his/her reaction through feedback, basing on this interpretation. Then, the source checks to what extent the message has been correctly perceived basing on this reaction. Communication is achieved at the end of this process (Tutar & Yılmaz, 2005, pp. 27–40).

2.1. Basic Elements of Communication

2.1.1. Source: The unit that transmits a message to target. Sender has the most important responsibility in this process, starting the communication process by encoding a message as the source of the message. Receiver attributes a meaning to the message that is transmitted by the sender through certain symbols, and this meaning is generally shaped based on the personality, cultural background, and knowledge of the receiver. The information in the message affects the behavior that is expected from the receiver, as it determines how the message is encoded.

For this reason, the unit that acts as a source must in the first place be well informed and know how to encode a message, and how words and symbols make sense for the receiver (Tutar & Yılmaz, 2005, pp. 21, 28, 31).

2.1.2. Message: Message is the signal or signals, which are sent by the sender to the receiver and which act as stimuli. In other words, it is the state of emotions, thoughts, and wishes of the source, which is translated into symbols upon encoding. A message can be verbal or nonverbal. However, a symbol does not make any sense individually. The sender and receiver attribute meanings to the symbols. The message has an important role in terms of determining the type and effectiveness of communication, since it is the first element that is perceived by the receiver during communication (Tutar & Yılmaz, 2005, pp. 30-31).

The message is generated for the receiver to perceive the emotions and thoughts that are sent from the source, by means of his/her sense organs. Besides, perception is the process of organizing and construing the information and stimuli, which reach the brain through the sense organs. The more sense organs of the receiver are targeted by the message, the higher the perception is achieved (Altıntaş & Çamur, 2005, p. 17).

2.1.3. Receiver: Receiver, as known as target, is the unit that decodes and interprets the meaning of the message that is encoded by the source, and it is one of the fundamental elements of the communication process. Since the content of the message, which forms a basis for communication, has meanings that are attributed by the source person, the receiver should make efforts to understand the source while decoding the codes in the message (Baltaş & Baltaş, 1994, p. 28). However, each receiver decodes the message not according to the perception of the sender, but according to his/her own perception and interprets it uniquely (Roebuck, 2000, p. 33). Each receiver has a specific encoding process, even though it receives the same messages from the same sources. Therefore, impressions and interpretations of the persons may differ as a result of each communication process (Altıntaş & Çamur, 2005, p. 15).

Encoding is defined as translating knowledge, thoughts, and emotions into a ready message that is convenient for transmission. The source encodes what he/she wants to transfer, using the symbols that can be understood by the receiver, and translates them into a message. Further, decoding means interpretation and construe of a message by the receiver. Encoding is performed by the source and decoding is performed by the receiver. Accordingly, efficiency of communication depends not on the message reaching the receiver, but on the message reaching as aimed and making a behavioral change on the target (Tutar & Yılmaz, 2005, pp. 34, 35).

2.2. Side Elements of Communication

2.2.1. Communication Channel: The path through which the message is transmitted from the source to the target. The channel is any tool that conveys the signal to the receiver. It can be something physical like a sound or body, technical like a telephone, or societal like a newspaper or a school. Both the communication skill of the source and the tool that is used to transmit the message have a great importance to ensure a complete communication (Tutar & Yılmaz, 2005, pp. 30, 36).

2.2.2. Communication Medium: The physical and psychological properties of the medium, where communication occurs, have a substantial effect on construing and interpreting the message that is tried to transmit. Properties such as the size, shape, color, lighting conditions, temperature, silence of the space and the number of the persons in the space can affect the communication to occur in such medium (Altıntaş & Çamur, 2005, pp. 19-21).

2.2.3. Noise: In some cases, the message that is sent and the message that is interpreted can be different from each other. Because, there are many physical, psychological, and physiological factors that involve in the communication process (Cüceloğlu, 2002, p. 92). For this reason, in order to make sure that the receiver focuses on the message, all the distracting factors must be eliminated and the noise must be minimized (Roebuck, 2000, p. 33). Noise, in a wide definition, is the factors that cause a difference between the sent message and the received message. In other words, noise is the physical, psychological, and physiological factors that hinder the perception of the message as it is sent from the source (Cüceloğlu, 2002, pp. 74–75).

2.2.4. Feedback: Feedback is the response message that is sent by the target unit in reply to the message sent by the source unit (Cüceloğlu, 2002, p. 71). The continuity of communication is ensured when the receiver decodes and interprets the message and sends a feedback by encoding a new message (Altıntaş & Çamur, 2005, p. 24). The element of feedback in the communication process attracts the interests of the individuals in all types of communication at the most. Because, the effect that is created by the message on the receiver and the place of the receiver that is gained in the process by joining in the communication become only clear by means of feedback (Baltaş & Baltaş, 1994, p. 32).

3. Body Language in Communication

Body language, rooted in the depths of brain, means that body presents its own standing against a situation in a code. It is thought that the common signals related to body language in different cultures are defined in the limbic system located in the depths of brain. For this reason, it is believed

that body language is universal and common (Altıntaş & Çamur, 2005, p. 18; Baltaş & Baltaş, 1994, p. 30). Body language appears with various attitudes such as several gestures, facial mimics, and postures. There are also gestures and facial mimics that are valid in certain cultural groups, but are not universal in the cultural structure. These expressions, which bear the evaluations of an individual on his/her situation during an interpersonal communication, are named as nonverbal messages. Previous research show that during face-to-face communication processes between persons, 35% of the messages are transmitted through vocal channels and 65% of the messages are transmitted through non-vocal channels. Insufficient body language reduces the effectiveness of communication, and when it is more than necessary, it is an obstacle for communication (Baltaş & Baltaş, 1994, p. 30; Tutar & Yılmaz, 2005, pp. 34, 62, 63, 65).

Thinking that a good listener takes into consideration not only what the person s/he communicates says; but also what s/he does with his/her face, hands, arms, and body, it can be said that looks, speech, attitudes, and behaviors must be consistent with what is said in the communication process (Guilane-Nachez, 2003, p. 121).

4. Musical Communication

In the simplest terms, musical communication is the process of conveying emotions and thoughts to the audience by means of construing and then organizing them with musical sounds (Uçan, 1994, p. 30). Musical communication process contains a musical connection that consists of the elements ranging from the composer to the composition, and from the performer to the audience, and these elements complement each other (Çalgan, 2019, p. 38). According to Gürsoy (2009, p. 167), the interaction between the audience and the musicians, which can also be named as a kind of symbiotic relation (to feed off each other/mutual advantage), creates an environment that allows music to go beyond its natural borders and to reach high consciousness by growing spiritually.

According to Cook (2000, p. vi), music is not a concept that is only enjoyable to listen. On the contrary, it is deeply buried in the culture of society. As there is no culture without a language, so there is no culture without music. Since music is produced in society, its roots are inside the society and it has a close relationship with the culture. Its content and style are determined by the composers, and its meaning is determined by the society. Once a composition is presented to its audience at the end of this process, a common bond starts to arise in between them (Yıldırım & Koç, 2008, pp. 28, 29).

It can be said that there is no extensive definition for musical communication, since it has a complex and multidimensional structure. However, musical communication process requires three main

components. Firstly, the process begins with a musical message where the idea of the composer is encoded in notes, then the performer encodes this message from the notes to acoustic signals, and finally it is encoded from the acoustic signals into the thoughts of the audience. In this respect, musical communication process follows a chain of events extending from composer to performer, and from performer to audience (Kendall & Carterette, 1990, pp. 131-132).

In this study, a “Musical Communication Process” model was designed based on the general structure of the basic communication process (See: Image 1). The model is created by addressing the musical performance process, and it shows the message exchange in detail, which occurs in the circle of the composer (the creative source), the performer (the source), and the audience, in the process of conveying a musical composition to the audience, in company with the side factors that affect the process.

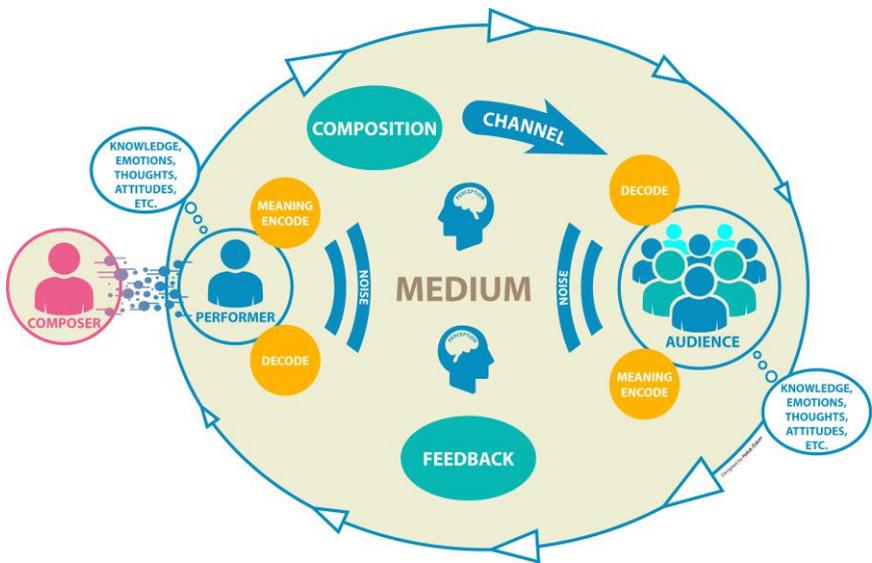


Image 1: Musical Communication Process
(This image was created by the authors.)

As seen in Image 1, it is appropriate to state that musical communication process essentially consists of two separate layers. The first one is the structural layer that is delivered through the composition of the composer, and the second one is the expressive layer that is added through the performance of the composition by the performer. However, the musical communication process becomes integrated by associating these two layers with each other, applying them, and transmitting them to the audience (Kopiez, 2002, pp. 522, 523).

When mentioning about a musical communication with respect to displaying a performance, from the perspective of the performer, the

beginning of the process is the time when the idea of giving a concert arouses. For example, concert posters and invitations are the written and visual communication tools that constitute the beginning of the communication process between the performer and the audience.

The main elements in the musical communication process and some of the factors affecting them can be explained as follows:

4.1. Composer (Creative Source): As the first step for transmitting a musical composition to the audience, composer can be indicated as the creative source at the top of the communication network. However, considering the performing process, if the composer of the composition is not its performer at the same time, s/he falls outside the communication medium. In spite of this, composer is the person who starts musical communication. The communicative power of a musical composition depends on the ability of the composer to process his/her cognitive and affective accumulations inside musical communication elements (Uçan, 1994, p. 31).

4.2. Performer: Performer can also be expressed as the re-creative source and is an important factor to transmit the musical ideas to the audience in musical communication process. For this reason, performers are in the position of the single source of the musical communication process, since they convey the musical message of the composer, which contains composer's emotions, thoughts, and impressions by rendering the message as if s/he is recreating it (Uçan, 1994, p. 33).

Performer is a creator who actualizes the relations between the heritages of the audial tradition s/he comes from and what is shown in musical notes, thanks to his/her own sensitivity of feeling and dreaming (Meyer, 1956, p. 199). Written music must be recreated by the performer on the basis of the music. The quality of performance depends on the technical skills of the performer, the insights on the musical meanings that are expressed, and comprehension of the composer's music style (Anderson & Lawrence, 2013, p. 175).

According to Alaner (2003, p. 293), presentation of a musical composition is the equivalent of using words to express oneself and to make a claim. While a performer is rendering a musical composition, s/he presents his/her personal understanding (knowledge, emotions, thoughts, attitudes, etc.), too. The quality of a musical performance reflects the musical understanding and musicianship of the performer. For this reason, when the performer wants to transmit a message, the meaning s/he attributes to this message is shaped according to his/her knowledge, cultural background, and emotional world, as the performer is in the position of re-creator of the musical composition. In other words, correct transmission of the message's content that is used in the musical

communication with the receiver is determined depending on how the performer encodes the message. Therefore, as the source of the message, the performer must know how to encode the message and must know well the meaning of each musical element or symbol. According to Davidson & Broughton (2016, p. 575), it is clear that making music is essentially a social effort. Performer establishes an effective communication with the audience, either in a solo or in a collective performance. For this reason, a performer must be a talented communicator at the same time.

4.3. Composition: “Message”, which one of the main elements of the basic communication process, corresponds to the element of “composition” in the process of musical communication. Melody, rhythm, tempo, nuance, and harmony, which are the basic elements of music, are a part of the message that is expected to give through musical communication (Çuhadar, 2006, p. 495). Accordingly, these musical elements are utilized while the composer, who is in the position of creative source, attributes a meaning to the message, and then while the performer, who is in the position of re-creator, encodes the message.

Before the phase of conveying the meanings that are attributed by the composer to the message to the audience, the performer makes preliminary preparations to transmit the message correctly. The performer not only applies the symbols encoded by the composer in the messages in the same way, but also s/he adds his/her own experiences, impressions, and designs with respect to them. Therefore, at the time when the message reaches the receiver, the knowledge, emotions, thoughts, and impressions lying in its meaning do not contain only the ones that belong to the composer, but they also contain the ones that belong to the performer, who can later be called as the re-creator of the composition (Uçan, 1994, p. 33). In case the meanings that are attributed to the composition reach the audience correctly, it is possible to mention about a high-quality musical communication process. For this reason, once the performers achieve the meaning of the composition at first, they must convey the message to the audience through the most correct musical symbols.

4.4. Listener: Listener can be described as “the person who witness the composition of art”, and s/he is the consumer at the same time and establish a relationship with a musical composition only through the performer (Aydın, 2009, p. 249; Çalgan, 2019, p. 34). A listener is passive during the performance, but when s/he perceives the music, it makes him/her active. Therefore, the activity of hearing that is involved by listeners during a musical performance can also be accepted as a performance. However, it is not a physical situation that appears in the face of the performance of the music, but it is a cognitive and affective contribution to the meaning of the music, which contains the personal understanding of listeners (knowledge,

emotions, thoughts, attitude, etc.) (Frith, 1998, p. 203; Yıldırım & Koç, 2008, pp. 46, 47).

According to Anderson & Lawrence (2013, p. 175), listener is one of the most important connection points in the chain of events included in the musical communication process. The main function of listener is to receive, interpret, and respond to the music. In this line, since it is difficult to perceive the pieces of art due to their complex structures, it can be said that listeners should be well-educated, beyond the pleasure they take (Çalgan, 2019, p. 34).

According to Kerchner (2014, p. 15), music listening is the basis of the musical behaviors, and it is possible to develop the skills related to listening. Listening with due care and attention is the key for the musical communication and interaction. The more the listener is aware of the musical communication channels and has experiences on the musical communication types, the higher the power of communication will be. For instance, if the listeners know who will exhibit the musical performance they will watch and if they know the genre of the musical performance, this can be shown as a precondition at the beginning of this communication flow. Nevertheless, the listener must make efforts to understand the content of the source, thereby the content of the message, and must be able to perceive and interpret the codes in the message (Uçan, 1994, p. 35).

4.5. Channel: Musical communication channels are any kinds of tools, methods, and techniques, which are used to present the musical composition to the listener and which appeal to at least one sense organ. In other words, a channel is the way to present the musical composition, in that musical statement, to the listener. Musical communication channels that are used by the composers to transmit their pieces to the listeners can include the followings: The symbols that forms the musical statement, the tools that allow transmitting these symbols through sound or image, voice or instruments of the performers and any methods and techniques they prefer while using them (Uçan, 1994, pp. 28, 34, 35).

4.6. Medium: All of the conditions that surround the performer, the listener, the musical statement, and the musical channel and that ensure achievement of musical communication process can be named as medium. The spaces where musical performance is exhibited can be examined in the musical communication medium. All psychical and psychological stimuli belonging to such kinds of media may affect the listeners and performers positively or negatively at the time of a concert. The size and shape of the concert hall, the color and lighting, temperature, silence of the medium, the number of persons in the space, etc. are examples for such kind of stimuli. Should the medium be organized before the concert knowing such kind of factors; it will ensure conducting the musical communication process

properly from the perspective of the performer and the listener. Today, it is seen that for many music events, spaces are chosen according to the genre or properties of the performance and besides, efforts are made to increase the expression power of music with the use of visual elements.

4.7. Noise: It is important to prevent all factors that can be considered as physical noises and to ensure silence in order to achieve correct perception of the message and to allow the listener to understand what is expressed in the message in the process of musical communication. Because, physical noises distract attention and complicate listening and ensuring silence is probably the most essential requirement of all. As the sounds are meaningful for expressing the music, so silence is effective for creating such expression. According to Yıldırım & Koç (2008, p. 65), silence means listening to existence and also being aware of existence. Silence is the first moment of consciousness and the absoluteness of existence. It is because; we become conscious of our senses through silence. Silence is the manner of self-proclamation of the existence in a way.

John Cage's composition named "4.33", which was designed to create awareness for the importance of silence in music, is one of the best examples for this concept. The total length of the composition that consists of three silent parts with different lengths is exactly equal to 4 minutes and 33 seconds. In this composition, the pianist takes his/her seat next to the piano and indicates the beginning of the performance by closing down the piano's fallboard. S/he follows the chronometer without playing any note. S/he indicates that the first section has ended by opening the piano's fallboard at the end of the section. Then, the second section begins and the performer follows same actions in this process; and finally the third section is also presented in a similar way, then the composition is ended.

The barriers that are included in the group of physiological noise, which can be seen in the persons in the musical communication network, will also affect the communication process negatively. Because, it is highly possible that there will be a blocking while the performer encodes meanings into the musical statement or while the listener decodes the coded message. On the other hand, the factors such as overexcitement or fear are important determinants in the musical communication process, as they affect musical performance negatively and are in the group of psychological noise. The factors such as prejudices, negative thoughts, attitudes, or emotional status of the listener are also types of psychological noise, which can have negative effects on the musical communication process.

4.8. Feedback: Feedback is the reaction of the listener to the musical statement that is transmitted to him/her. The reactions that are exhibited by the listeners during or at the end of a performance determine the

effectiveness of the musical communication process. After the listener decodes and interprets the message reaching him/her, s/he gives a feedback by encoding a new message. Besides this, the performer checks the integrity of the meaning that is encoded by the listener, by means his/her musical message that s/he transmits through the composition (Altıntaş & Çamur, 2005, p. 24). In other words, the performer perceives whether his/her message is understood or not through the feedback of the listener, and s/he further perceives to what extent it is understood, if it is understood, or what is understood and is not understood. A musical communication process that does not leave any effect on the receiver means that it has failed. However, it is not sufficient for the musical communication to make an effect on the receiver in order to fully actualize; at the same time, the listener must give a feedback as a positive reaction (Uçan, 1994, p. 37). Events such as applauses of the audience, presentation of flowers to the performer after the concert, or call for an encore, which is a rhythmic applause delivered by the audience to call the performer back to the stage for an admired performance, can be examples for such kind of feedback.

5. Body Language in Musical Communication

The quality of the communication channels in a musical performing process also determines the quality of the musical communication. For example, if the communication channels are aimed for multiple sense organs of the individuals simultaneously, the communication will be more effective. It is also possible to address performer's body as a tool of communication in musical communication. The body movements, as well as various gestures and facial mimics that are exhibited during performing process are among the factors that will affect musical communication negatively or positively.

Musical performance is production of certain sounds with the intention of having certain effects (Mark, 1981, p. 312). Musicians perform a great many of individual practices in order to develop their musical skills before a performance and they concentrate on many targets and skills during these practices. The list of these targets and skills may usually include technique, sight-reading and interpretation, expression, as well as the practices such as improvisation and memorization. However, the number of musicians who make efforts to improve meaningful body movements and facial mimics practically is an issue of concern.

According to Lehmann, Sloboda, & Woody (2007, pp. 165, 166, 167), who emphasize that the musical skills such as sight-reading, improvisation, and expressive playing are not sufficient for a musician to succeed, music performers' physical appearances and attitudes on the stage affect the opinions of the listeners on the quality of the music. On the other hand, body movements of the musicians during a performance have important

communicative purposes. The gestures that attract the biggest attention generally appear at key expression times in music, and they can be more effective than the sound for informing the audience of the emotional intention of the performer.

Davidson & Correia (2002, p. 237), who indicate that there is a close relation between music and body movement, argue that humans learned how to combine music and gestures at the oldest stages of the life. They exemplify this argument with a child who sings and jumps around while playing with its father, or a mother who shakes her baby gently while whispering a lullaby. Further, Kerchner (2014, p. 52) states that gestures facilitate students to feel the musical sounds and their associations in their bodies and to know them during the process of music education, and at the same time they increase students' awareness on music in perceptive and affective terms.

According to Davidson & Correia (2002, p. 237), all musicians use their bodies in order to get into interaction with their musical instruments while making music. Body movements play an important role for creating, delivering, and perceiving a musical performance. Certain movements, gestures and facial mimics act as explanatory and symbolic hints in a musical performance, and show the focal point of the performer clearly either it is included in the content of the musical statement or it is aimed to make a show for the audience. Thus, the thoughts and concerns are transmitted to the audience through body language.

According to Davidson (2002, p. 147), it is important to achieve the correct mental and physical purpose and to ensure conveying this purpose in body freely in order to create a fluent and meaningful performance. However, when the audience does not have the sufficient musical experience in terms of listener characteristics, they only base on the visual information, and they cannot distinguish between the musical intentions and the audial information. For this reason, the musical meaning that is embodied and unveiled is perceptively useful and seems comprehensible to the audience (Davidson & Correia, 2002, p. 242).

It can be said that a performer who displays a musical performance can only ensure an efficient musical communication with the audience as much as s/he can allow the sounds to live and breathe inside his/her body. On the other hand, it can also be indicated that a live musical performance is a social communication that gives information to the visual system of the audience, just as encountering with the other people does (Davidson, 1995, pp. 105, 107). In fact, there is a great and important difference between recorded music and live performance, since the audience focuses on both visual and audial information. For this reason, live performance is

considered as a musical communication (Yamamoto, Fujii, & Miyake, 2003, p. 330).

According to Lehmann et al. (2007, pp. 168, 169), it is seen that the body movements exhibited by successful musicians have various functions and meanings. It can be said that these musicians believe their movements are the best way of achieving the expected sound in terms of rhythmic accuracy, timbre, and intonation, and they reflect this to the audience. Therefore, the visual hints that are given by a musician through physical gestures and facial mimics can be an important way to transmit certain meaningful messages during a live performance. This is because, stage performances have live visual elements, and the use of such elements gains a meaning at that exact moment.

The body and facial movements performed by musicians while displaying a performance provide the audience with some visual information about the sounds that are produced by the musicians. Thus, it can be said that the visual elements in a performance are strong tools of communication and they determine the degree of the audience's feedback, since they have an effect on what the audience hears (Davidson & Broughton, 2016, pp. 582-583).

The János Jankó's "Caricature Series of Franz Liszt at the Piano" that was published on April 6, 1873 in the caricature magazine named *Borsszen Jankó* in Hungary can be shown as an example for the effect and importance of body language in musical communication. Many body movements, gestures and facial mimics of the famous piano virtuoso Franz Liszt, from the beginning to the end of the concert, were described in these illustrations (Davison, 2001, pp. 204–205; Jankó, n.d.; Kramer, 2002, p. 88; Lehmann et al., 2007, p. 170; Leppert, 2002, p. 213).

The illustrations of Liszt clearly show the power of the performer's body movements and facial mimics during a musical performance in semantic and communicative terms for the audience. On the other hand, it can be said that the meaningful motions on body and face affect the flow of the performance.

The descriptive depiction by Schumann & Ritter (1891, pp. 145-146) about the stage performance of Liszt is quite interesting: "It is an instantaneous variety of wildness, tenderness, boldness, and airy grace; the instrument glows under the hands of its master. ... But he must be heard, and also seen; for if Liszt played behind the scenes, a great deal of the poetry of his playing would be lost."

It is known that Liszt would write vibrato on the piano notes from time to time. Although the vibrato movement does not change the sound of the piano, it is remarkable that it puts forward the importance of visual

information in order to emphasize the communicative effect of a musical performance on the audience. Liszt was a theatrical performer, and he must have realized that when the audience sees a finger shaking over the piano keyboard, it could lead them to believe they really hear a vibrato, so using his body, he embodied the musical meaning that he wanted to transmit to the audience (Doğantan Dack, 2011, pp. 254-255).

According to Lehmann et al. (2007, pp. 171, 173), performance is affected by physical appearance, stage behavior, and body movements. Many musicians do not spend much time on body movements for their performances or do not think about how their physical appearances affect the opinions of the audience on their musical skills, when they prepare for a concert or recital. Because, musicians actually face enough challenges in the process of rehearsals, in which they exercise until making the piece ready for performance. However, the quality of the music and the other presentation properties that will determine the concert experience of the audience are both affected by how the musicians prepare for a performance. Therefore, the audience can easily perceive to what extent a musician is ready for the concert or to what extent s/he is self-confident.

6. Music and Emotional Communication

The questions about the music and the emotions engage the humanity since the ancient ages. For example, it is known that Ancient Greeks argued that certain musical properties are associated with certain emotions (Juslin & Persson, 2002, p. 220). Composers and performers of all cultures, theorists of different schools and styles, aestheticians, and the critics of many different genres are agreed that music has meaning and this meaning is in some way transmitted to listeners and to those who share the music (Meyer, 1956, p. 1). According to Kerchner (2014, p. 133), music appeals to emotions directly and more than language does. Music does not need translation, because it directly affects the bodies, spirits, emotions, and minds of the listeners and performers.

The sub-skills related to emotional communication, among all of the sub-skills that comprise musical performance, are usually considered as the most difficult ones to describe and to identify. Therefore, performance of a musical piece is very important for shaping emotional expressions (Juslin & Persson, 2002, p. 219). According to Juslin & Timmers (2010, pp. 886, 925), emotion itself is not presented in a musical performance, but the expression that derives from the other non-verbal ways of communication is presented. The important point here is not what the performer feels, but what is transmitted to the listener.

According to Juslin & Persson (2002, pp. 222, 225), there is a natal code for aural emotion communication. Professional artists convey their emotions to the listeners using this vocal code that is used in vocal

expression. If musicians will apply this natal code to their own performances, they should understand the parallelism between the human voices and musical instruments, and learn the sufficient technique to express the emotions in compliance with the vocal codes. According to Juslin & Laukka (2000, p. 177), emotions constitute the core of musical communication for a performance; and thus, music education processes must also contain information on the relation between musical performance and emotions. However, since educators tend to spend more time and make more efforts on the technical aspects in music education compared to effective or aesthetics aspects, even though their importance and necessity are known, the expressive aspects of the performance are neglected. Therefore, students can focus on these effective aspects that are mentioned in their art development quite late and it takes time for young musicians to stimulate an emotional meaning in listeners (Juslin & Persson, 2002, pp. 220-221). Juslin & Persson (2002, p. 229) stated that there is a need for a pedagogical model that may emphasize the importance of establishing an efficient communication with the audience by giving them guidance to develop expression in music education, and they recommended to deliver the theory of emotional communication as a useful lesson in music education.

7. Result, Discussion, and Recommendations

It is considered that it is helpful to allow individuals to gain communication skills that are thought to be effective in increasing the performance of performers, addressing these skills also in the process of music education. Kerchner (2014, p. 52) emphasizes that body movements in musical a performance will help students show their emotional reactions, in addition to what they hear aurally and perceptively. In this sense, particularly from the early phases of instrumental music education, it should be ensured that students focus also on body movements that are in harmony with music and bear expressive meaning, to provide them with physical and mental freedom besides playing techniques. It will also contribute to developing music students' musical perceptions to lead them to feel musical sounds physically and to get involved in music with their movements while expressing musical sounds.

According to Woody (2000, p. 20), it is possible to teach music students that their performances will not really be effective unless they do experience strong feelings and emotions that they wish to transmit to listeners. In this sense, the ability to express and know emotions in music are the skills that are very important for providing students with musical behavior and they are so valuable that they cannot be neglected in educational processes (Juslin & Laukka, 2000, p. 177).

Music educators should develop methods for students to make music with suitable emotions and expressions (Ebie, 2004, p. 415). Further, strategies that are used to teach the effective skills of musical performance must raise attention to the subject. According to Juslin & Persson (2002, p. 221), these strategies may include topics such as verbal instructions, various modelling styles, and self-control procedures. Woody (1999, p. 331) states in his study that music educators widely use the teaching strategy about modelling in effective musical performance teaching. In addition to this, he also asserts that there is an association between the correct verbal descriptions and instructions of the teacher and ability of a student to imitate the dynamics related to expression successfully. Accordingly, a music educator should use the topics that are based on verbal descriptions in his/her audial and visual modelling that are practiced for his/her students to imitate.

In the study of Shoda et al. (2007), it was seen that visual information about performer has an important effect on listener; however, visual information does not always leave a positive effect. At this point, it can be stated that it is necessary to use gestures and body movements in harmony with composition. Thus, it can be said that a performer who achieves such a harmony will be watched with interest and admiration, and on the contrary, any movements that conflict with expression of composition will cause a negative impression. For this reason, it should be considered necessary to address these topics while preparing for a musical performance.

It could also be helpful to examine the visual data and information about performance in music education. For instance, taking a record during instrument lessons can provide students with an advantage, allowing them to receive feedbacks for what the performers transmit to the audience through their body movements and to seem more natural on their instruments gradually (Davidson, 1993, p. 112).

It was concluded in the study by Juslin (2000) that professional musicians are more effective in transmitting the emotions of music compared to amateur musicians. This result can be justified by the fact that professional musicians could integrate instruments with their bodies thanks to their ability of resolving, understanding, and interpreting a musical composition, and thanks to their technical skills. It is normal that there are certain individual differences in transmitting musical expressions among professional musicians, which is one of the results of the study. This is because; each musician may perform the same composition differently basing on his/her own musical understanding. This creates the style of a performer and therefore, listeners take different pleasure from each performer.

The movements of professional musicians during their performances can be recorded by means of precision cameras that are produced thanks to the technological developments. The locations and movements of each body joints can be recorded three-dimensionally in a very short time. This method can provide important data on how a musical performance that can occur in high speeds is coordinated (Palmer, 2013, p. 406).

Consciousness of listener has an important place in musical communication process, and it will allow a more efficient musical communication to occur. In this sense, informing listeners of musical communication process and its elements is considered as important as informing performers of these concepts. Listeners should be informed of the types of feedback and the behaviors related to these types, which allow a performer to interpret to what extent a musical message is understood; listeners should even be motivated to exhibit behaviors in this direction (Uçan, 1994, p. 41).

Even if all other elements in musical communication process bear appropriate conditions for efficient communication, negative conditions of the medium may affect communication negatively. In this sense, it is important to make the media of musical communication convenient and suitable before a performance or during a performance, in order to ensure proper functioning of the process. Those who are involved in a musical communication process should be aware of this point.

It can be said that the research studies will also be a guide for performers. It can be anticipated to organize activities such as symposiums in order to increase the number of such research. “The Inaugural International Conference on Music Communication Science” held in 2007, “The Second International Conference on Music Communication Science” held in 2009 in Sydney, Australia, and “Proceedings of the International Conference of Communication Science Research” held in Surabaya, Indonesia in 2018 can be shown as relevant examples. New and creative research subjects especially on contribution of body movements to musical expression, and on listeners’ perception of them may emerge.

According to Yaylacı (2006, p. 189), emotional intelligence is an individual’s skill of benefiting from his/her emotions in his/her interpersonal relations. Individuals with high emotional intelligence play the role of a source for establishing and spreading a social relation network with their emotional support quality, as if creating a magnetic emotional attraction area in their environments. Accordingly, musicians with high emotional intelligence, impressing their audience and pulling them into music in the media where they perform the music, in a sense take the lead to establish the symbiotic relation between audience and musician, as stated also by Gürsoy (2009, p. 167). These opinions may give raise to the

idea of addressing also the concept of emotional intelligence in musical communication process and conducting studies in this direction.

As a result of the evaluations thus far, some recommendations are set forth for instrumental music education in order to conduct musical communication process efficiently at the phase of performing:

- It is necessary to conduct studies on expressing emotions of the music, in order to gain students musical behavior from the starting phase of instrument education.
- Educators should provide modelling for the emotions and expressions of the played composition to be felt and for a performance to be displayed for these, and convenient methods should be used for the students to acquire emotions and expressions of their own. In this direction; the strategies such as imaging, mapping, and storifying, etc. towards embodying the music can be utilized.
- Body exercises towards emotions and expressions of the compositions to be played should be included in instrument education lessons. These body movements, which are meaningful and suitable for the expression of music, should be conducted together with instrument practices. Practices of attention and concentration can be performed for the coordination of these; the students can be guided to involve in trainings such as drama, dance, etc. Further, breathing exercises should also be a part of instrument education.
- In instrument education lessons, the compositions played should be resolved musically, and the emotions of the composition should be construed.
- Performers should have cognitive control on the composition in order to make the musical communication process effective. Memorization of the compositions to be performed before the performance will contribute to this mentally.
- Overcoming the technical challenges of a composition with mental repetitions practiced before the performance will affect the musical communication process during the performance. Therefore, the phase of performance should not be proceeded before solving the technical challenges in a composition.
- Musical communication process and its elements should be addressed and discussed from time to time in instrument education lessons. Supporting this, students should be given the opportunity to play before audience from the starting phase of instrument education, and they should be motivated to follow concerts and discuss their impressions.

These activities should be evaluated in terms of musical communication processes.

- Making examinations and discussions and increasing studies on musical communication will ensure that this field is developed and placed on a theoretical basis. Then, the subject of musical communication can be included in music education programs as a lesson. Thus, it can be applied in various branches of the field of music.
- Various training activities can be organized in order to draw attention to the subject of musical communication and to inform educators and students of this subject. Applied studies and research can be performed in this subject.

References

- Alaner, B. (2003). Anlam içinde müzik yapmak. *Cumhuriyetimizin 80. Yılında Müzik Sempozyumu*, 290–296. Malatya: İnönü Üniversitesi.
- Altıntaş, E., & Çamur, D. (2005). *Beden Dili: Sözsüz İletişim* (3rd ed.). İstanbul: Aktüel Yayınları.
- Anderson, W. M., & Lawrence, J. E. (2013). *Integrating Music into the Elementary Classroom* (9th ed.). Boston: Cengage Learning.
- Aydın, M. Ç. (2009). Sanat ve sosyoloji ilişkisi üzerine. In M. Ç. Aydın (Ed.), *Sanatlar ve Toplumsal Etkileşim* (pp. 223–265). İstanbul: E Yayınları.
- Baltaş, Z., & Baltaş, A. (1994). *Bedenin Dili* (8th ed.). İstanbul: Remzi Kitabevi.
- Çalgan, K. (2019). *Büyük Müzikçileri Nasıl Bilirdiniz?* İstanbul: Boğaziçi Yayınları.
- Cook, N. (2000). *Music: A Very Short Introduction*. New York: Oxford University Press.
- Cüceloğlu, D. (2002). *Yeniden İnsan İnsana* (27th ed.). İstanbul: Remzi Kitabevi.
- Çuhadar, C. H. (2006). Müziksel zekâ. 486–497. Denizli: Pamukkale Üniversitesi.
- Davidson, J. W. (1993). Visual perception of performance manner in the movements of solo musicians. *Psychology of Music*, 21(2), 103–113. <https://doi.org/10.1177/030573569302100201>
- Davidson, J. W. (1995). What does the visual information contained in music performances offer the observer? Some preliminary thoughts. In R. Steinberg (Ed.), *Music and the Mind Machine: The Psychophysiology and Psychopathology of the Sense of Music* (pp.

- 105–113). Berlin, Heidelberg, New York, London, Paris, Tokyo, Hong Kong, Barcelona, Budapest: Springer-Berlin Heidelberg.
- Davidson, J. W. (2002). Communicating with the body in performance. In J. Rink (Ed.), *Musical Performance* (pp. 144–152). New York: Cambridge University Press.
- Davidson, J. W., & Broughton, M. C. (2016). Bodily mediated coordination, collaboration, and communication in music performance. In S. Hallam, I. Cross, & M. Thaut (Eds.), *The Oxford Handbook of Music Psychology* (2nd ed., pp. 573–595). Oxford: Oxford University Press.
- Davidson, J. W., & Correia, J. S. (2002). Body movement. In R. Parncutt & G. E. McPherson (Eds.), *The Science and Psychology of Music Performance: Creative Strategies for Teaching and Learning* (pp. 237–250). New York: Oxford University Press.
- Davison, A. (2001). *Studies in the iconography of Franz Liszt* (Ph.D. dissertation). The University of Melbourne, Australia.
- Doğantan Dack, M. (2011). In the beginning was gesture: Piano touch and the phenomenology of the performing body. In A. Gritten & E. King (Eds.), *New Perspectives on Music and Gesture* (pp. 243–266). Farnham: Ashgate Publishing.
- Ebie, B. D. (2004). The effects of verbal, vocally modeled, kinesthetic, and audio-visual treatment conditions on male and female middle-school vocal music students' abilities to expressively sing melodies. *Psychology of Music*, 32(4), 405–417. <https://doi.org/10.1177/0305735604046098>
- Frith, S. (1998). *Performing Rites: On the Value of Popular Music*. Harvard University Press.
- Guilane-Nachez, E. (2003). *İletişim mi? Kolay! İstanbul: Sistem Yayıncılık*.
- Gürsoy, A. B. (2009). Nardis Caz Kulübü'ndeki performans ve izleyici ritüelleri. In M. Ç. Aydın (Ed.), *Sanatlar ve Toplumsal Etkileşim* (pp. 157–170). İstanbul: E Yayınları.
- Hargreaves, D. J., MacDonald, R., & Miell, D. (2005). How do people communicate using music? In D. Miell, R. MacDonald, & D. J. Hargreaves (Eds.), *Musical Communication* (pp. 1–25). New York: Oxford University Press.
- Jankó, J. (n.d.). Jankó János: Liszt Ferenc. Retrieved 24 December 2019, from http://kepregenyumuzeum.blog.hu/2011/10/23/janko_janos_liszt_ferenc

- Juslin, P. N. (2000). Cue utilization in communication of emotion in music performance: Relating performance to perception. *Journal of Experimental Psychology: Human Perception and Performance*, 26(6), 1797–1812. <https://doi.org/10.1037/0096-1523.26.6.1797>
- Juslin, P. N., & Laukka, P. (2000). Improving emotional communication in music performance through cognitive feedback. *Musicae Scientiae*, 4(2), 151–183. <https://doi.org/10.1177/102986490000400202>
- Juslin, P. N., & Persson, R. S. (2002). Emotional communication. In R. Parncutt & G. E. McPherson (Eds.), *The Science and Psychology of Music Performance: Creative Strategies for Teaching and Learning* (pp. 219–236). New York: Oxford University Press.
- Juslin, P. N., & Timmers, R. (2010). Expression and communication of emotion in music performance. In P. N. Juslin & J. A. Sloboda (Eds.), *Handbook of Music and Emotion Theory, Research, Applications* (pp. 883–950). New York: Oxford University Press.
- Kendall, R. A., & Carterette, E. C. (1990). The communication of musical expression. *Music Perception: An Interdisciplinary Journal*, 8(2), 129–163. <https://doi.org/10.2307/40285493>
- Kerchner, J. L. (2014). *Music Across the Senses: Listening, Learning, and Making Meaning*. New York: Oxford University Press.
- Kopiez, R. (2002). Making music and making sense through music: Expressive performance and communication. In R. Colwell & C. Richardson (Eds.), *The New Handbook of Research on Music Teaching and Learning: A Project of the Music Educators National Conference* (pp. 522–541). New York: Oxford University Press.
- Kramer, L. (2002). Franz Liszt and the virtuoso public sphere: Sight and sound in the rise of mass entertainment. In *Musical Meaning: Toward a Critical History* (pp. 68–99). California: University of California Press.
- Lehmann, A. C., Sloboda, J. A., & Woody, R. H. (2007). *Psychology for Musicians: Understanding and Acquiring the Skills*. New York: Oxford University Press.
- Leppert, R. (2002). The concert and the virtuoso. In J. Parakilas (Ed.), *Piano Roles: A New History of the Piano* (pp. 184–223). London: Yale University Press.
- Limb, C. J. (2006). Kohlear implantla müziğin algılanması. *Current Opinion in Otolaryngology & Head and Neck Surgery* (Turkish Edition), 1(4), 228–233.

- Mark, T. C. (1981). Philosophy of piano playing: Reflections on the concept of performance. *Philosophy and Phenomenological Research*, 41(3), 299–324. <https://doi.org/10.2307/2107454>
- Meyer, L. B. (1956). *Emotion and Meaning in Music*. Chicago: University of Chicago Press.
- Palmer, C. (2013). Music performance: Movement and coordination. In D. Deutsch (Ed.), *The Psychology of Music* (3rd ed., pp. 405–422). San Diego: Academic Press.
- Roebuck, C. (2000). *Etkili İletişim* (A. C. Akkoyunlu, Trans.). İstanbul: Doğan Kitap.
- Schumann, R., & Ritter, F. R. (1891). *Music and Musicians: Essays and Criticisms*. London: William Reeves.
- Shoda, H., Nakamura, T., Draguna, M. R., Kawase, S., Katahira, K., & Yasuda, S. (2007). Effects of a pianist's body movements on listeners' impressions. 143–146. Australia: Sydney.
- Tutar, H., & Yılmaz, M. K. (2005). *Genel İletişim Kavramlar ve Modeller* (5th ed.). Ankara: Seçkin Yayıncılık.
- Uçan, A. (1994). *İnsan ve Müzik İnsan ve Sanat Eğitimi*. Ankara: Müzik Ansiklopedisi Yayınları.
- Woody, R. H. (1999). The relationship between explicit planning and expressive performance of dynamic variations in an aural modeling task. *Journal of Research in Music Education*, 47(4), 331–342. <https://doi.org/10.2307/3345488>
- Woody, R. H. (2000). Learning expressivity in music performance: An exploratory study. *Research Studies in Music Education*, 14(1), 14–23. <https://doi.org/10.1177/1321103X0001400102>
- Yamamoto, T., Fujii, N., & Miyake, Y. (2003). A musical communication between a player and a listener and its model. 330–335. <https://doi.org/10.1109/CIRA.2003.1222111>
- Yaylacı, G. Ö. (2006). *Kariyer Yaşamında Duygusal Zekâ ve İletişim Yeteneği*. İstanbul: Hayat Yayınları.
- Yıldırım, V., & Koç, T. (2008). *Müzik Felsefesine Giriş* (4th ed.). İstanbul: Bağlam Yayınları.

CHAPTER V

SOCIO-ECONOMIC DISADVANTAGE AND ENGLISH IN TURKEY: MASLOWIAN PORTFOLIO THEORY

Asst. Prof. Dr. Ömer Gökhan ULUM

Mersin University, Mersin, Turkey

e-mail: omergokhanulum@gmail.com, Orcid ID: 0000-0001-7685-6356

1. Introduction

English is the prime language of global affairs, and there is a significant relation between English proficiency and international financial investments. The global average of English proficiency score remained steady, however many countries experienced significant declines among which Turkey took its place according to the results of EF English Proficiency Index¹. This index inquires how and where English proficiency is improving all over the world. The index has evaluated the scores of 2.3 million adults who took its English tests in 2018. Based on the results of the index, Turkey was found to be the 79th among 100 countries, being in the very low proficiency band. There is a clear relationship between a society's needs and the desired goals. This study was designed to identify the factors contributing to failure in English as a foreign language success. In a similar vein, the study examined the relationships between needs being met and language success. The informants were informed about the English proficiency of Turkey stated in the mentioned index, as well as the Maslow's hierarchy of needs. Then, they were asked to interpret the issue by means of their own experiences. In order to probe the related issue, the paper made use of phenomenology— an approach to evidently illuminate the third-person's experiences. This study showed that without fulfilling basic needs in the learners, it is not possible to teach English to the individuals at a disadvantage on a socio-economic level. Therefore, basic needs of the learners should be fulfilled so that they could focus on learning a second language that has never been survival in their lives.

EF English Proficiency Index (2019) published a ranking of 100 countries and regions by their English skills. This index states that there are more than a billion speakers of English as a first or second language. Further, hundreds of millions more use English as a third or fourth language all over the world. For international companies, newly graduates, researchers and scientists, and tourists, competency of English widens horizons, diminishes obstacles, and boosts data traffic. Thus, the motivation of learning English has never slowed down or come to an end.

¹Available at <https://www.ef.com/wwen/epi/>. Accessed 03 January 2020.

The demand for English competency has highly exceeded the supply. Competency in English stands as a great advantage since it is highly beneficial in global relations. Such relations may support people to get better jobs or, to establish or develop their own businesses. Global relations are carried out by English speaking global citizens through eagerness, interaction, and shared responsibility beyond national borders as stated by EF English Proficiency Index which inquires how and where English competency is advancing all over the world. In order to structure the 9th edition of the EF English Proficiency Index, previous years' tests results of 2.3 million test takers were assessed. The test was implemented by EF English Proficiency Index as well. They found out that 11 countries' proficiency enhanced greatly. However, four countries encountered huge declines. And yet, more nations are observed in the Very High Proficiency level this year compared to before. EF English Proficiency Index (2019) also declares that English proficiency rate and modernization are parallel to each other. They also discovered correlations between English and various measures of investment in Research and Development (R&D) - defined as research and technological development (RTD) in Europe which functions to enhance creative practices carried out by companies or states in creating or improving modern services or products.

2. Literature Review

2.1. English and Labor Productivity

The incomes that people can manage are based on their education level (Lai, Yu, & Woo, 2020). If an educated individual becomes more wealthy compared to those uneducated, isn't the same situation true for countries? The degree of output based on per hour worked in a country seems to be depending on the educational success of its people (Stevens & Weale, 2004). A person's success is clearly based on their well-fare state (Chiu, et al., 2016). There is a crystal relation between prosperity and success, since success is affected by specific states of the person: a starving man or an uneducated person would have fewer options compared to a wealthy or an educated person (Sen, 1985). Further, a person in a free atmosphere would use a larger set of available functionings and perform more adequately compared to those in a closed society. The effect of economic development on a country's human dignity is also based on other societal conditions. A significant constituent here is the function of the income distribution, both at micro and macro levels (Olaniyan & Okemakinde, 2008). The micro level refers to personal or household expenditures which foster human development and respond to the daily requirements of people than do government policies. On the other hand, at a macro level, the dispersion of the boosted income as a result of economic development will also bear a

powerful effect on human development (Cacciatore, Killian, & Harper, 2016). As impoverished households consume a bigger part of their income on personal possessions which precisely foster better education, economic development whose profits are given more to the poor will have a bigger effect on human development, by means of enlarged food consumption besides on education (Ranis, 2004). Since it is not effortlessly attainable, education may be interpreted as an economic good and therefore has to be distributed. For the economists, education functions both as a consumer and capital good since it serves to a customer and also serves for the production of other services or goods. While functioning as a capital good, education can be utilized to promote human capital hinting on that the promotion of skills is a significant facet in production practices. It is extensively believed that education provides developed citizens and supports promoting the life standard of a society. Thus, affirmative social transformation is prone to creating qualitative citizenship. This growing belief in education as a component of transformation in numerous developing countries has given way to a huge investment in it (Olaniyan & Okemakinde, 2008).

2.2. Ranking of English Proficiency

EF English Proficiency Index (2019) clarifies that English proficiency goes on diminishing in countries on the borders of the Europe continent. As the index states, the English proficiency in Turkey has diminished in the previous years which may be attributed to the fact that Turkey's eagerness to join the EU has weakened and other concerns have come out. Another reason may be based on that English education at schools is structured totally on Grammar Translation Method rather than integrative communication skills, with the content given in Turkish. The mentioned index also declares that Turkish students generally have to take a year of intensive English preparatory courses before university since their English proficiency is not sufficient enough for the department where they plan to study. However, these preparatory programs may not respond to the required English proficiency since the customary traditional methods still continue. The pursuing figure clarifies the state of English proficiency of Turkey among European countries (EF English Proficiency Index, 2019). The chart below provides a list of European countries ranked by the GDP per countries in 2019.



Figure 1 English proficiency index

2.3. Maslow's hierarchy of needs

In his classification of hierarchy of needs terminology, Maslow (1943, 1954) stated that each person is motivated to attain specific requirements. Once a need is attained, a man desires to attain the next one. And this process goes on and on. McLeod (2007) clarified the first and most common form of Maslow's hierarchy of needs with five motivational requirements, generally characterized as a pyramid of hierarchical levels which is illustrated in the Figure 3.



Figure 2 Maslow's Hierarchy of Needs

However, Maslow's (1943, 1954) five leveled hierarchy model has been developed to cover both cognitive and aesthetic needs as well which is displayed in Figure 4 (Maslow, 1970). This eight-stage classification can be split into deficiency and growth needs in that the first four are generally defined as deficiency needs, and the next four are interpreted as growth needs. Deficiency needs result from deprivation and motivate individuals if unavailable. Further, the eagerness to attain such needs will become more severe, the more they are denied. The longer a man stays without food, the hungrier he is (McLeod, 2007).

MASLOW'S MOTIVATION MODEL

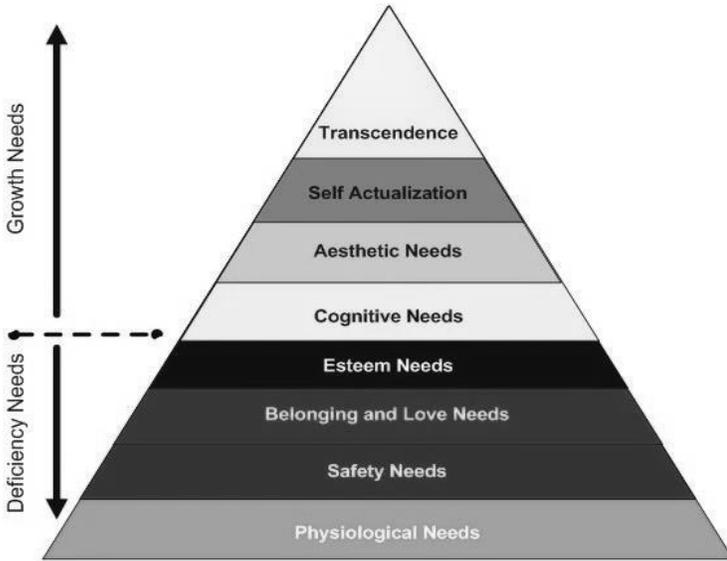


Figure 3 Developed Version of Maslow's Model

Maslow and Lewis (1987) firstly put forward that people have to satisfy lower level needs before passing to higher level needs. Yet, they then declared that fulfilling a need is not ‘an all or a none occurrence’, confessing that the initial explanation may have been misunderstood in that a need has to be a hundred percent fulfilled before the following need appears (McLeod, 2007). Once a deficit need is more or less fulfilled it will disappear, and the actions will be automatically pursue the following group of needs which turn into conspicuous needs. On the other hand, growth needs go on being felt and may become more severe once they are engaged (Maslow & Lewis, 1987).

2.4. Maslowian Portfolio Theory

The traditional approach of unquestionably keeping each investment inside one circle cannot take each individual investment target into consideration one by one. Thus, it is naturally the average of all aims of a human, in many circumstances interpreted by what the investors perceive and long for and not by what a human actually needs. It is crystal clear that this traditional approach does not properly work for humans. Maslowian Portfolio Theory deals with human needs and endeavors to harmonize investments with human needs and include needs one by one. This theory is based on a normative approach in that it endeavors to state

how humans should invest (De Brouwer, 2011). The pursuing figure illustrates the mentioned approach.

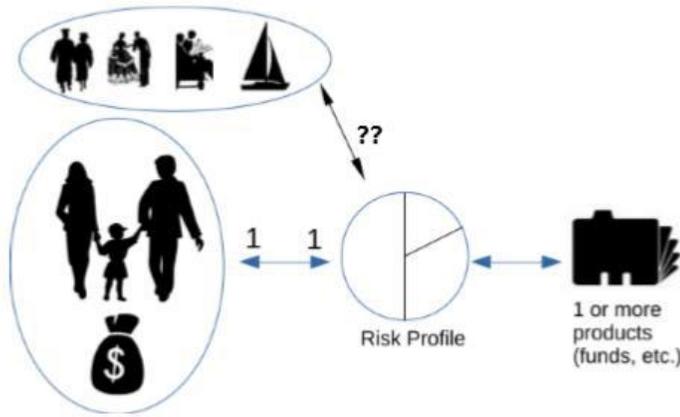


Figure 4 The Traditional Approach

3. Method

This study is descriptive and qualitative in nature. Secondary descriptive statistics and models were used to analyse the views of the participants and the data obtained. Success index of Turkish in English education was shown to students in order emphasize the importance of Maslow hierarchy needs in teaching English in Turkey. A semi-structured interview form was composed to elicit the views of the learners. The interview form was composed of 10 questions which asked them to express their opinions by taking Maslow hierarchy needs into consideration. The participants were shown Maslow hierarchy needs model, which helped them to understand their situation in the schools. By considering this model, the participants were asked to interpret their own situation while learning English.

3.1. Setting and Participants

The setting of the study is comprised of a vocational high school in Adana, Turkey. The school is located in a disadvantaged area, the suburbs of an overcrowded city hosting around a million refugees from Syria. 10 EFL students whose socio-economical background is too poor participated in the study. The sample of the study is structured on convenience sampling since the setting is highly convenient for the researcher (Farrokhi & Mahmoudi-Hamidabad, 2012).

3.2. Semi-structured interviews and procedure

In order to perceive the mental constructs of the students on their situation between their low English success and socio-economical state, the researcher developed 5 semi-structured interview questions by means of searching the related literature and previously utilized interviews. The informants, whose one of the weakest school subject was English, were told about the state of Turkey in the index and they were illuminated about the Maslowian theory. After this warm-up activity, their ideas were elicited through the semi-structured interview questions. Inter-coder reliability was utilized for the interview. For the coding reliability of the interview, Kappa Coefficient for Inter-coder Reliability was counted and it was discovered that the coding process was highly reliable ($K = .884$, $p < .001$).

4. Findings and Results

Table 1 represents the country and region scores on changes in English skills over the past year. As the mentioned index (EF English Proficiency Index, 2019) clarifies, any change bigger than two points—positive or negative—reveals a significant shift in English ability. The 8th edition employed test data from 2017, and the 9th from 2018.

Table 1 Country and Region Scores on Changes in English Skills over the Past Year

Country	8 th Edition	9 th Edition	Score Change
Netherlands	70.31	70.27	-0.04
Sweden	70.72	68.74	-1.98
Norway	68.38	67.93	-0.45
Denmark	67.34	67.87	+0.53
Singapore	68.63	66.82	-1.81
South Africa	66.52	65.38	-1.14
Finland	65.86	65.34	-0.52
Austria	63.13	64.11	+0.98
Luxembourg	66.33	64.03	-2.30
Germany	63.74	63.77	+0.03
Poland	62.45	63.76	+1.31

Portugal	60.02	63.14	+3.12
Belgium	63.52	63.09	-0.43
Croatia	60.16	63.07	+2.91
Hungary	59.51	61.86	+2.35
Romania	60.31	61.36	+1.05
Serbia	60.04	61.30	+1.26
Kenya	—	60.51	New
Switzerland	61.77	60.23	-1.54
Philippines	61.84	60.14	-1.70
Lithuania	57.81	60.11	+2.30
Greece	58.49	59.87	+1.38
Czech Republic	59.99	59.30	-0.69
Bulgaria	57.95	58.97	+1.02
Slovakia	58.11	58.82	+0.71
Malaysia	59.32	58.55	-0.77
Argentina	57.58	58.38	+0.80
Estonia	63.73*	58.29	-5.44
Nigeria	56.72	58.26	+1.54
Costa Rica	55.01	57.38	+2.37
France	55.49	57.25	+1.76
Latvia	57.16*	56.85	-0.31
Hong Kong, China	56.38	55.63	-0.75
India	57.13	55.49	-1.64
Spain	55.85	55.46	-0.39
Italy	55.77	55.31	-0.46
South Korea	56.27	55.04	-1.23

Taiwan, China	51.88	54.18	+2.30
Uruguay	53.41	54.08	+0.67
China	51.94	53.44	+1.50
Macau, China	52.57	53.34	+0.77
Chile	52.01	52.89	+0.88
Cuba	50.83*	52.70	+1.87
Dominican Republic	54.97	52.58	-2.39
Paraguay	—	52.51	New
Guatemala	50.63	52.50	+1.87
Belarus	53.53	52.39	-1.14
Russia	52.96	52.14	-0.82
Ukraine	52.86	52.13	-0.73
Albania	51.49	51.99	+0.50
Bolivia	48.87	51.64	+2.77
Vietnam	53.12	51.57	-1.55
Japan	51.80	51.51	-0.29
Pakistan	51.66	51.41	-0.25
Bahrain	—	50.92	New
Georgia	52.28	50.62	-1.66
Honduras	47.80	50.53	+2.73
Peru	49.32	50.22	+0.90
Brazil	50.93	50.10	-0.83
El Salvador	47.42	50.09	+2.67
Indonesia	51.58	50.06	-1.52
Nicaragua	47.26	49.89	+2.63
Ethiopia	50.79	49.64	-1.15

Panama	49.98	49.60	-0.38
Tunisia	47.85	49.04	+1.19
Nepal	—	49.00	New
Mexico	49.76	48.99	-0.77
Colombia	48.90	48.75	-0.15
Iran	48.29	48.69	+0.40
U.A.E.	47.27	48.19	+0.92
Bangladesh	48.72	48.11	-0.61
Maldives	—	48.02	New
Venezuela	46.61	47.81	+1.20
Thailand	48.54	47.61	-0.93
Jordan	47.10	47.21	+0.11
Morocco	48.10	47.19	-0.91
Egypt	48.76	47.11	-1.65
Sri Lanka	49.39	47.10	-2.29
Turkey	47.17	46.81	-0.36
Qatar	48.19*	46.79	-1.40
Ecuador	48.52	46.57	-1.95
Syria	46.37	46.36	-0.01
Cameroon	42.45*	46.28	+3.83
Kuwait	45.64	46.22	+0.58
Azerbaijan	45.85	46.13	+0.28
Myanmar	44.23	46.00	+1.77
Sudan	—	45.94	New
Mongolia	44.21*	45.56	+1.35
Afghanistan	43.64	45.36	+1.72
Algeria	44.50	45.28	+0.78

Angola	43.49*	44.54	+1.05
Oman	45.56	44.39	-1.17
Kazakhstan	45.19	43.83	-1.36
Cambodia	42.86	43.78	+0.92
Uzbekistan	42.53	43.18	+0.65
Ivory Coast	—	42.41	New
Iraq	40.82	42.39	+1.57
Saudi Arabia	43.65	41.60	-2.05
Kyrgyzstan	—	41.51	New
Libya	39.64	40.87	+1.23

*The country was not included in the 8th edition, thus this score is taken from an earlier edition.

As it is clarified in Table 1, any change bigger than two points—positive or negative—reveals a significant shift in English ability. Thus, it is easily understood that Luxembourg represents a decline (-2.30) between the 8th (66.33) and 9th (64.03) editions. On the other hand, Portugal displays a progress (+3.12) between the first (60.02) and next (63.14) editions. Similarly, Croatia presents a rise (+2.91) between the initial (60.16) and pursuing (63.07) editions of the index. Further, Hungary displays a rise (+2.35) between the 8th (59.51) and 9th (61.86) editions. When looking at Lithuania, an increase of +2.30 is clearly observed between the first (57.81) and the next (60.11) editions. However, a large decrease of -5.44 is observed between the 8th (63.73) and 9th (58.29) editions in terms of Estonia's situation. On the other hand, Costa Rica represents an increase of +2.37 between the 1st (55.01) and 2nd (57.38) editions. By looking at the score of Taiwan, China, a rise of +2.30 is observed between the 8th (51.88) and 9th (54.18) editions. Yet, a decrease (-2.39) is simply shown between the first (54.97) and second (52.58) editions regarding Dominican Republic. Bolivia also bears an increase of +2.77 between the 8th (48.87) and 9th (51.64) editions. Moreover, Honduras shows a rise (+2.73) between the initial (47.80) and following (50.53) editions. Besides, El Salvador displays an increase (+2.67) between the 8th (47.42) and 9th (50.09) editions. In a similar vein, Nicaragua represents a decrease of -2.63 between the 8th (47.26) and 9th (49.89) editions. On the other hand, Sri Lanka owns a decrease (-2.29) between the initial (49.39) and following (47.10) editions. For Cameroon, an increase of +3.83 is seen between the first (42.45) and next (46.28)

editions. However, a decrease of -2.05 is observed between the 8th (43.65) and 9th (41.60) editions for Saudi Arabia.

Looking at the situation for Turkey, it is clearly observed that there is a decrease of -0.36 between the 8th (47.17) and 9th (46.81) editions. Further, by looking at the table Turkey comes 79th among 100 countries in the related index. The following table represents the results of semi-structured interview questions directed to the informants.

Table 2 Students' Perceptions on their low English Performance

Theme	Code	f	%
	Lack of opportunities	10	41.67
Reasons for own EFL performance	Low motivation	7	29.17
	Other priorities	5	20.83
	Domestic violence	2	8.33
Total		24	100.00
	Poor economy	10	40.00
Reasons for Turkey's low EFL performance	Other priorities	8	32.00
	Uselessness of English	7	28.00
Total		25	100.00
	High technological equipment	10	41.67
School Setting	Unmotivated teachers	9	37.50
	Crowded classes	5	20.83
Total		24	100.00
	Lack of any opportunity	10	45.45
Home Setting	Financial problems	10	45.45
	Domestic violence	2	9.10
Total		22	100.00

	Financial support	10	35.71
Solution	Clear future	10	35.71
	Change of priorities	8	28.58
Total		28	100.00

When the students clarified the reasons for their own EFL performance, majority of them (41.67%) stated the lack of opportunities, while 29.17% of them put forward low motivation. Further, 20.83% of the informants suggested other priorities, whereas only a minority (8.33%) represented domestic violence. Further, when it comes to the reasons for Turkey's low EFL performance, poor economy emerged with a percentage of 40.00, while other priorities appeared with a percentage of 32.00. On the other hand, uselessness of English was observed to be emerged with the lowest frequency (28.00). Table 2 refers to school setting by displaying a high emergence (41.67%) for high technological equipment, as well as showing a percentage of 37.50 for unmotivated teachers. Besides, a percentage of 20.83 was observed for crowded classes. When referring to home setting, lack of any opportunity (45.45%) and financial problems (45.45%) appeared as the most emerged items. On the other hand, domestic violence (9.10%) emerged with the lowest percentage of occurrence. Lastly, for solution, the highest percentages were observed for financial support and clear future (35.71% for each). Furthermore, change of priorities emerged with a percentage of 28.58. Related remarks of the students exemplify the given themes:

- We cannot afford even our simplest needs. We do not have the required atmosphere both at home and at school to develop ourselves. (Lack of opportunities)
- I have no desire to learn English, because I do not think it will make me acquire anything. (Low motivation)
- Who cares English? We have other priorities such as surviving. (Other priorities)
- People are easily wounding or murdering each other in my close environment. This is so common in my neighborhood. (Domestic violence)
- I believe that economically prosperous countries are successful in education. (Poor economy)

- Turkey has got other priorities such as finding a solution for the unemployment problems. That's why no one cares English in Turkey. (Other priorities)
- English has not that many uses in our country. People do not see it important to learn English, because they are rushing to earn their bread. (Uselessness of English)
- Although we do not have even a chair or a carpet to sit on at home, we have high technological equipment such as a priceless smart-board in our classroom. (High technological equipment)
- Our teachers are not eager to teach us since we are poor and live in a dangerous suburban area. (Unmotivated teachers)
- Our class is too crowded and it is so noisy. (Crowded classes)
- We live in a tenement and it seems as if it is about to collapse. We do not have the required furniture. We only have some old and broken furniture. (Lack of any opportunity)
- I cannot see the future promising. I only ask for the required opportunities to have a successful education. (Clear future)
- We should exchange our priorities. We should be initially supported by a healthy environment to survive. (Change of priorities)

5. Discussion

The findings of the study show that Turkey has severe socio-economic disadvantages (Du Plessis & Mestry, 2019), which causes English education not to be efficient because although schools have sophisticated smart boards and technology, learners' socio-economic disadvantage seems to hinder their learning because learners have difficulty (Tawodzera & Themane, 2019) in fulfilling their basic needs from Maslowian perspective. When learners step outside schools, they have to struggle to meet their basic needs to survive (Larekeng, Yassi, Najib, & Badaruddin, 2019). Therefore, English cannot be the mere solution to help them survive and learn it at advanced level. British Council reports (as stated in Byrne, 2013) also show that Turkey has been unable to produce an effective and efficient learning system. The reports (Fisher, 2009) also show that there is a direct relationship between economy and English learning. Turkish scholars also mention that Turkey experiences serious difficulties in teaching English, and they emphasize the importance of English as a global language (Bayyurt & Akcan, 2015;

Bayyurt & Altınmakas, 2012; Doğançay-Aktuna & Kiziltepe, 2005; Kırkgoz, 2005; Koksall & Şahin, 2012). However, they tend to ignore basic needs of English learners as well as teachers. Unless both learners and teachers overcome socio-economic disadvantage, it seems unlikely that they can focus on learning English or another foreign language. It can be interpreted that economy is a dominant factor that affects learners negatively because learners and teachers may be engaged in fulfilling their physiological needs at social and economic level because children may have to be working outside schools to make their living, which causes them not to focus on their academic development. Another problem is that teachers tend to teach Turkish learners with grammar-translation method because in Turkey students have to be tested through multiple choice exams. Therefore, oral skills are often ignored. Even private schools and colleges hardly teach learners effectively because of the curriculum, syllabus and exam system besides socio-economic disadvantage.

Considering schools, learners and teachers in rural areas, the issue of learning English becomes worse because the agents of learning cannot access English education system effectively. Schools have physical problems, and learners have physiological problems (Deutch, 2003). Learners' motivation level seems to be at the lowest level because physiological needs are composed of health, food, shelter, water, sleep and homeostasis, which are hardly fulfilled by learners in rural areas. These learners cannot fulfill these needs effectively. Therefore, motivation for learning is reduced and lowered. Unless physiological needs are fully fulfilled, safety, belongingness, esteem, and self-actualization cannot be fulfilled. These needs are conceptualized in hierarchical relations. Socio-economic disadvantage produces safety problem as well as psychological weakness (Maslow, 1943; Maslow, 1954; Maslow, 1970; Maslow & Lewis, 1987).

When socio-economic safety is absent because of a possible economic crisis and absence of job opportunities, this safety needs shows itself in negative manners (Beckmann, 2019). In South Africa, also in rural areas learners encounter serious survival problems while learning another second language because basic needs are not easily met. South African countries such as Botswana and Namibia also suffer from similar problems because their survival needs are hardly met. When we include other sociopolitical problems in South Africa (Namibia and Botswana), things become more complicated. Arthur (1994) also mentions difficulties of learning English in Botswana because learners have few opportunities. Similarly, Piitz (1995) address and refer to the status of English language because of the problems mentioned in Maslowian hierarchy. O'Connor (2009) focuses on the challenges experienced in

South Africa because children suffer from severe emotional and social problems that hinder them from learning a second language. De Wet (2002), correspondingly, shares the socioeconomic disadvantages that learners encounter in South Africa. Since poverty and other economy-related problems including sociopolitical ones dominate the daily lives of learners as well as teachers, it may be unrealistic to reinforce the importance of second language learning in South Africa. Therefore, the education system of South Africa about second language teaching has been constructively criticized. Kadenge and Nkomo (2011) also express similar concerns regarding the status of English because the learners in Zimbabwe have other survival needs other than political ones. It seems that unless socioeconomic and Maslowian hierarchy is fulfilled by these learners, it is not possible to develop a realistic policy regarding English including South Africa.

Thus, when learners encounter physiological and safety problems at social and economic levels, they are unlikely to concentrate on learning English. Therefore, I believe that Turkish learners, to some extent even teachers, are faced with these problems, which lowers their motivation significantly. Personal, emotional, economic, social and health security problems pose a serious risk for learners in Turkey. Political and educational problems also affect their learning adversely. Turkish scholars have long discarded these problems because they have often focused on curriculum and syllabus in a narrow scope, which have prevented them from developing realistic perspectives towards learning English. Turkish scholars have often done their research at universities with pre-service teachers and undergraduates by forgetting their physiological and other basic needs (Azar, 2011). Therefore, a more realistic mapping should be developed to motivate learners to learn English.

Another problem that is often encountered in Turkey is that social belonging through English has not been sufficiently established. Loneliness, social anxiety, economic anxiety and clinical depression seem to dominate learners because even if they learn English, they cannot produce this foreign language in social situation. Therefore, social belonging seems to be a serious problem for Turkish learners. Especially learners in rural areas do not find learning English survival and important. They prioritize other needs that are vital for them. They lack opportunities to develop and practice their English outside classroom environment (Oxford & Shearin, 1994).

6. Limitations and Recommendations

This study has several limitations. First, the study has focused on only Maslow hierarchy needs. Second, only socio-economic disadvantage has

been emphasized. Another limitation is that other confounding variables have not been taken into consideration. In addition, only disadvantaged participants were involved in the study. Future research should focus on learners' basic and survival needs within the framework of Maslow hierarchy needs. Besides, Turkish scholars specializing in English education should also deal with these basic needs of learners so that curriculum and syllabus can be more concrete and realistic. Regional differences should also be considered instead of forming English curriculum centrally. Heterogeneity of schools and regions should be emphasized if we are to aim to teach English effectively and efficiently. Moreover, concrete action should be taken by policy makers, administrators, ELT departments and practitioners to help Turkish learners to learn English at the expected level.

7. Conclusion

This study aims to emphasize the importance of Maslow hierarchy needs because unless these basic needs are fulfilled, learners may not feel motivated to learn English as a foreign language. Safety, belongingness, esteem, and self-actualization are seen as serious problems in Turkey. This issue has been long forgotten in the context of Turkey by Turkish scholars who have focused more on curriculum, syllabus, methods, approaches and assessment. However, they have ignored the importance of physiological and basic needs that provide the real motivation for learners. Development of technology hardly guarantees learners' full achievement of English because learners' motivation is often found lower. Another serious problem is social belonging that is also not fulfilled in Turkey because learners scarcely have opportunities to use their English in small or large groups. Therefore, they cannot feel attached to a group that will accept their presence when they speak English. English language teaching departments, Turkish ministry of education and Turkish Council of Higher Education need to take Maslow hierarchy needs into consideration while preparing curriculum and syllabus. Unless socio-economic disadvantage is solved and terminated, it is hard to expect Turkish learners to develop high motivation for learning English. Therefore, studies on the relationship between Maslow hierarchy needs and learning English should be carried out so that a realistic goal can be achieved in Turkey. Turkish researchers in ELT departments can collaborate with developed economies to improve new models so that learners can advance a sense of belonging to these countries. Regional and cultural differences should be appreciated to motivate Turkish learners to learn English. Unless these differences are taken into consideration, a realistic model might be hard to develop. Maslow hierarchy needs can be a good starting point and model for policy makers, administrators, ELT departments and practitioners as well as learners.

Developing, undeveloped, colonial and postcolonial countries need to adjust their second language curriculum, especially English in this case, in accordance with the basic and survival needs of learners. Poverty, social inequality, ethnic problems, survival needs such as water, food and accommodation need to be solved if English teachers aim to teach these learners.

References

- Arthur, J. (1994). *English in Botswana primary classrooms: Functions and constraints*. Clevedon, England: Multilingual Matters.
- Azar, A. (2011). Quality or Quantity: A Statement for Teacher Training in Turkey. *Journal of Higher Education and Science*, 1(1), 36-38. <https://doi.org/10.5961/jhes.2011.004>
- Bayyurt, Y. & Akcan, S. (2015). *Current perspectives on pedagogy for English as a lingua franca*. Berlin: Walter de Gruyter GmbH & Co KG.
- Bayyurt, Y. & Altınmakas, D. (2012). *A World Englishes course at a foundation university in Turkey*. In A Matsuda (ed.). *Teaching English as an international language: Principles and practices*. Clevedon, England: Multilingual Matters.
- Beckmann, J. (2019). Thuma mina and education: Volunteerism, possibilities and Challenges, *South African Journal of Education*, 39(4), 1-9.
- Byrne, A. (2013). The British Council and cultural propaganda in the United States, 1938–1945. *Journal of Transatlantic Studies*, 11(3), 249-263.
- Cacciatore, J., Killian, M., & Harper, M. (2016). Adverse outcomes in bereaved mothers: The importance of household income and education. *SSM-population health*, 2, 117-122.
- Chiu, J., Economos, J., Markson, C., Raicovi, V., Howell, C., Morote, E. S., & Inserra, A. (2016). Which matters most? Perceptions of family income or parental education on academic achievement. *New York Journal of Student Affairs*, 16(2), 3.
- De Brouwer, P.J. (2011). *Maslowian portfolio theory*. Brussel: Vrije Universiteit Press.
- Deutch, Y. (2003). Needs analysis for academic legal English courses in Israel: a model of setting priorities. *Journal of English for Academic Purposes*, 2(2), 125-146.

- De Wet, C. (2002). Factors influencing the choice of English as language of learning and teaching (LoLT)—a South African perspective. *South African journal of education*, 22(2), 119-124.
- Doğançay-Aktuna S & Kiziltepe Z 2005. English in Turkey. *World Englishes*, 24(2), 253-265.
- Du Plessis, P. & Mestry, R. (2019). Teachers for rural schools—a challenge for South Africa. *South African Journal of Education*, 39(4), 1-9.
- Farrokhi, F. & Mahmoudi-Hamidabad, A. (2012). Rethinking convenience sampling: Defining quality criteria. *Theory and practice in language studies*, 2(4), 784.
- Fisher, A. (2009). A Story of engagement: the British Council 1934-2009. *British Council*, 17. Available at <http://www.media.leeds.ac.uk/papers/vp015805.html>. Accessed 23 January 2020.
- Kadenge, M. & Nkomo, D. (2011). The politics of the English language in Zimbabwe. *Language Matters*, 42(2), 248-263.
- Kırkgöz, Y. (2005). English language teaching in Turkey: Challenges for the 21st century. In G Braine (eds). *Teaching English to the world: History, curriculum, and practice*. London, England: Routledge.
- Koksal, D. & Şahin, C.A. (2012). Macro-level foreign language education policy of Turkey: A content analysis of national education councils. *ELT Research Journal*, 1(3), 149-158.
- Lai, E. T., Yu, R., & Woo, J. (2020). The Associations of Income, Education and Income Inequality and Subjective Well-Being among Elderly in Hong Kong—A Multilevel Analysis. *International Journal of Environmental Research and Public Health*, 17(4), 1271.
- Larekeng, S. H., Yassi, A. H., Najib, M., & Badaruddin, B. (2019). Exploring The Millennial Learners' Attributes and Needs in Educational Environment. *ELS Journal on Interdisciplinary Studies in Humanities*, 2(3), 389-397.
- Maslow, A.H. (1943). A Theory of Human Motivation. *Psychological Review*, 50(4), 370-396.
- Maslow, A.H. (1954). *Motivation and Personality*. New York: Harper and Row.
- Maslow, A.H. (1970). *Motivation and Personality*. New York: Harper & Row.

- Maslow, A. & Lewis, K.J. (1987). *Maslow's hierarchy of needs*. Illinois: Salenger Incorporated.
- McLeod, S. (2007). Maslow's hierarchy of needs, *Simply psychology*, 1, 1-8.
- O'Connor, J. & Geiger, M. (2009). Challenges facing primary school educators of English second (or other) language learners in the Western Cape. *South African Journal of Education*, 29(2), 253-270.
- Olaniyan, D.A. & Okemakinde, T. (2008). Human capital theory: Implications for educational development. *Pakistan Journal of Social Sciences*, 5(5), 479-483.
- Oxford, R. & Shearin, J. (1994). Language learning motivation: Expanding the theoretical Framework. *The modern language journal*, 78(1), 12-28.
- Piitz, M. (1995). *Attitudes and language: an empirical investigation into the status and use of English in Namibia. Discrimination Through Language in Africa?: Perspectives on the Namibian Experience*. Berlin: Mouten de Gruyter.
- Ranis, G. (2004). Human development and economic growth. *Yale University Economic Growth Center Discussion Paper*, 887. Available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=551662. Accessed 03 January 2020.
- Sen, A. (1985). Well-being, agency and freedom: The Dewey lectures 1984. *The journal of philosophy*, 82(4), 169-221.
- Stevens, P. & Weale, M. (2004). *Education and economic growth*. In G Johnes & J Johnes (eds). *International handbook on the economics of education*. Cheltenham: Edward Elgar Publishing.
- Tawodzera, M.C. & Themane, M. (2019). Schooling experiences of children left behind in Zimbabwe by emigrating parents: Implications for inclusive education. *South African Journal of Education*, 39(4),1-9.

CHAPTER VI

THE IMPACT OF THE COVID-19 PANDEMIC ON EDUCATION AND PSYCHOLOGICAL HEALTH

Dr. Inst. Tuncay ORAL* & Inst. Aykut GÜNLÜ**

* Pamukkale University, Kale Vocational High School, Denizli, Turkey
e-mail: toral@pau.edu.tr, Orcid ID: 0000-0001-5039-9812

** Pamukkale University, Tavas Vocational High School, Denizli, Turkey
e-mail: agunlu@pau.edu.tr, Orcid ID:0000-0002-6617-2871

Introduction

People's lifestyles have constantly changed and developed from the first humans to the present day. While the first people made their living by hunting and gathering, in the later periods, they switched to an agricultural lifestyle and began to domesticate animals. This has led to the coexistence of humans and animals. Over time, population growth, degradation of nature for a better life, accumulation of waste materials in nature and climate changes have led to increased diseases, decreased natural resources, and poor living conditions (Akın, 2018). Societies were found to be weak and helpless, especially in the face of occasional epidemics (Özden & Özmat, 2014). This has increased the importance of communities being prepared for major epidemics.

According to the World Health Organization, being healthy means that an individual is not diseased, and is able to fully perform the functions of their body spiritually and physically (WHO, 2018). To put it briefly, being healthy is “the complete well-being of the individual”. The concept of disease originates in French and Latin, and "dis-ease" is derived from the word "lack of comfort" (Boyd, 2000). Humanity has better realized the value of being healthy during periods of epidemic disease.

Societies have faced epidemics such as malaria, syphilis, plague and leprosy at different periods in history (Nikiforuk, 2007). The most important feature of these epidemic diseases is that they affect societies in multiple areas at the same time, such as economic, social, agriculture, education and tourism. This made it necessary for societies to fight epidemics in mobilization. In addition to medical interventions in the fight against diseases, it is observed that strategies to inform and raise awareness for the society are also used. The strategy of providing accurate information and raising awareness in the face of the epidemic is effective in protecting people's psychological and physical health. Thus, people can exhibit more accurate behaviors to protect themselves from the epidemic. Exhibiting the right behavior is known to be effective in reducing the rate of transmission of the epidemic (Eastwood, et al., 2009). It can therefore

be stated that protecting the psychological health of people is more important, especially during the epidemic period. Being psychologically healthy is also necessary for societies to emerge from the epidemic with strength. Therefore, in the last epidemic, the COVID-19 pandemic, psychological support services have started to be provided for healthy people who are not infected with the virus. The fight against the COVID-19 pandemic, which began in Wuhan, China, is still ongoing. Therefore, this section will first provide information about the last pandemic, COVID-19, and then discuss the impact of COVID-19 on individuals and societies. Subsequently, information will be shared on the impact of the epidemic on mental and physical health.

Basic Concepts

Epidemia is defined as an infectious disease being active in a single region, while *pandemia* is defined as an infectious disease affecting most people in more than one region or continent (Budak & Korkmaz, 2020). The pandemic announcement is made by WHO. The symptomatic feature is that the symptoms of the disease are seen in the individual who carries the virus. The asymptomatic feature is the absence of symptoms of the disease even though the individual is infected with the virus of the disease (TÜBA, 2020).

What is COVID-19?

Coronavirus is a family of viruses that have a large subgroup in nature (Uğraş-Dikmen, Kına, Özkan & İlhan, 2020). The new type of coronavirus is also the seventh member of this virus family, and the members of the virus family are HCoV-OC43, HCoV-229E, HCov-NL63, HCoV-HKU1, SARS-CoV, MERS-CoV and SARS-CoV-2 (2019-nCoV; COVID-19). (He, & Deng, 2019; Liu, Liang, & Fung, 2020; Yuan, Tao, Tan, & Hu, 2020). The Co and Vi in COVID-19 represent coronavirus, while the number 19 represents the year the virus first appeared (Evren & Us, 2020). In addition, because corona means crown in Latin and the extensions of the virus are likened to the crown, this virus family has been named by WHO with corona (Ministry of Health, 2020). COVID-19 is a respiratory disease. It first appeared in Wuhan, China and spread around the world in a very short time.

Features of COVID-19

COVID-19 is transmitted by inhalation of droplets of the virus that enter the air through sneezing and coughing. The virus can stay for 4 hours in copper, 24 hours in cardboard, 72 hours in plastic materials, and for hours suspended in the air (Çobanoğlu, 2020). It is also transmitted through contact with people who carry the disease or by bringing hands to the face, mouth, nose or eye after contact with the surfaces and objects touched by

people with the disease. The transmission risk of the virus is considered to be 1.5-2 meters on average (Budak & Korkmaz, 2020; Karcioğlu, 2020). The incubation period of the disease is 2-14 days (Lauer, 2020). The most obvious symptoms of COVID-19 are high fever, shortness of breath, dry cough, runny nose and tiredness (Budak & Korkmaz, 2020). A patient carrying COVID-19 can infect this virus of an average of 2.6 people. In the study conducted by Li et al (2020), the estimated contagion coefficient was determined to be 2.2. Therefore, the importance of complying with social distance rules to reduce the risk of the disease (market, shopping center, etc.) is among the precautionary strategies implemented by governments in many countries (Li, & Li, 2020).

Effects of COVID-19

Throughout history, it has been noted that some of the diseases have turned into epidemics, causing massive population casualties and a shift in cultures and social life by significantly impacting the environment and social life. Although the epidemics have weakened societies in the areas of economy, agriculture, industry, education and tourism, they have been effective in leading to radical changes in these areas. They also have an effect on people's habits, consumer behaviors, diets and forms of communication (Gençalp, 2020).

In order to reduce the negative effects of the epidemic, the priority must be to bring the epidemic under control. In order to achieve this, the states have implemented the necessary measures in line with the recommendations of the science committee in no time. The implementation of restrictions on quarantine and curfew caused people to be locked at home and production to stop in many areas (Ak, 2011). In addition, the fact that a large number of people are infected at the same time has rendered the health sector unworkable. This has shown that even developed countries are very fragile in terms of economy and health (Budak & Korkmaz, 2020). It is seen that the epidemic negatively affects the lives of individuals both physically and psychologically. In his book "The Psychology of the Pandemic", Taylor (2019), who tries to explain the epidemic by addressing it in terms of human psychology, has collected the effects of the epidemic on society as follows: the effort of people to stockpile food and cleaning products in panic, to preoccupy and exclude people in the country where the virus started, to unnecessarily engage the health sector with the worry of being infected, to resist social isolation and to easily believe misinformation and conspiracy theories. Therefore, it is necessary to try to protect not only the physical health of individuals but also the mental health in the fight against the epidemic. The COVID-19 epidemic has shown that it is necessary for countries to revise their health policies.

Impact on Education

One of the environments where epidemics spread most easily are schools where it is difficult to maintain social distance. It is therefore important to take the required education-related measures to reduce the epidemic's rate of transmission. Accordingly, after the first case was seen in Turkey, the Ministry of National Education and the Higher Education Council decided to close down schools for three weeks starting from March 16, 2020. Due to the continuing epidemic, schools remained closed and the spring semester was completed with distance education.

Distance education is actually not a new practice. Distance education has developed rapidly with the development of the internet and technology. Hence, since the last quarter of the 20th century and the beginning of the 21st century, education has increased every day and has taken its place in our lives (Kırmızıgül, 2020). During the period of COVID-19, the strategy of distance education has become a widely preferred practice in preventing the viral spread of the epidemic in many countries of the world (Yamamoto & Altun, 2020). The rapid transformation of education into distance education has made it difficult for students, educators and families to adapt to this process. Preparing lesson contents, presentations and sharing them with students emerged as an important problem for educators. In addition, giving practical lessons with distance education can reduce the effectiveness of the lessons. Some students live in villages. It was observed that these students could not follow the lessons because they did not have internet access. Some students have difficulty in participating in online trainings due to economic insufficiency. In addition, short attention span of the younger age group on the computer and the increase in learning deficit are factors that make distance education difficult. In addition, the inadequate distance education experience of both students and educators has increased the problem. This made it necessary to reconsider the quality of face-to-face education.

In time, the deficiencies in the infrastructure of distance education were eliminated, and both students and educators gained experience in distance education, thus ensuring a healthy closure of the period. It is stated that families participate more in education through distance education than face-to-face education (Kırmızıgül, 2020). Despite the disruptions and inadequacies in distance education, it can be stated that distance education has a positive contribution in the name of not interrupting the education process. In addition, distance education offers training opportunities regardless of place and time. Furthermore, distance education allows students to watch the lectures over and over again. For this reason, distance education is not thought to be a basic method of education but should be preferred as a supporting model of formal education.

Impact on Economy

The economy is another of the big areas adversely affected by COVID-19. The impact of the epidemic on the economy is not just directed at decreasing production and consumption. The countries' economy has been negatively affected due to increasing health costs of the communities, borrowing costs and financial support of those who have lost their jobs (Yavuz, 2020). Various measures have been taken by the government of the Republic of Turkey in order to reduce the risk of transmission of COVID-19. One of these measures is the circular on the temporary closure of workplaces issued by the Ministry of Internal Affairs on 19 March 2020. Together with this circular, 149,382 workplaces in Turkey have had to temporarily suspend their activities. With this application, production has decreased, consumption has decreased, especially in some sectors, and various difficulties have arisen regarding the logistics of the products produced. In order to mitigate these negative effects of COVID-19 on the economy, the Presidency has announced a package of support for small and large-scale enterprises (Presidency's Communications Directorate, 2020).

Due to COVID-19, the lack of access to the streets other than meeting the mandatory needs and the closure of shopping centers led people to online shopping. Stores and businesses have begun to concentrate on online sales strategy. Companies have made breakthroughs and innovations in this respect to make their infrastructure ideal for online shopping. As a result of all this, the online shopping rate increased significantly during COVID-19. COVID-19 can be said to have permanently changed producer and consumer behavior, making people more likely to shop online (Li, & Li, 2020). Although manufacturers try to take part in the market sector with an online shopping strategy, it is observed that the economy is deeply affected.

Impact on Communication

Another area negatively affected by the epidemic is undoubtedly communication. Communication is very important in social life. In times of epidemics, the need for communication is seen to increase even more. Communication is made face to face and closer especially in the collectivist cultures. However, trying to maintain physical distance during the COVID-19 period has been a difficult process in collectivist cultures.

During the epidemic period, the important issue is both communication between people and providing the necessary communication network to ensure that people have accurate information about the epidemic. It has been observed that the epidemic has spread faster in the past centuries as a result of lack of communication network and the prevention of the society from accessing accurate and useful information. In addition, as a result of

the lack of accurate information, the level of fear and panic experienced by people has seen to be increased. It has been experienced in epidemics of past years that distorting or hiding information about pandemic cases does not yield a positive outcome. (Kırık, Altıntaş-Var, Özkoçak, & Darıcı, 2020). By learning from the mistakes of the past years, it is tried to ensure that the society reaches the correct information on time during the current pandemic period. For this purpose, quantitative information about COVID-19 is disclosed by the Minister of Health himself every day.

With the reduction of face-to-face communication during the epidemic period, the behavior of using virtual communication facilities has gradually increased. This strategy was made possible by accurately informing the public about the epidemic. People try to avoid behaviors that involve physical contact, such as handshakes, hugs, and pay attention to social distance in communication. Communication is not just a social need. It is needed in all aspects of life. For example, it is inevitable to communicate with others while shopping in the market. Therefore, when communication is required in such areas, it is observed that the risk of transmission of the epidemic decreases with the use of protective equipment (mask, disinfectant, etc.) (Kaya, 2020).

The COVID-19 pandemic has also shown how effective communication technology, which has entered a new era, is when used correctly and properly (Kırık et al., 2020). In addition, the World Health Organization has prepared a guideline for Risk Communication and Community Engagement (8RCCE) preparation and first intervention against COVID-19 to ensure that mistakes made in pandemics in history are not repeated. This guide aims to both inform the community about the epidemic correctly and raise people's awareness of false and non-scientific medical practices. On the other hand, television programs that play a key role in communication are working with experts in the field to ensure that the community has access to efficient and accurate information (WHO, 2020).

Impact on Psychological Health

Epidemics have negative effects on the individual's psychological health. Negative effects can be seen in three main areas: emotions, thoughts and behaviors of individuals (Harvester, Çakmak, Demir, & Kurt, 2020). These three areas together have an impact on the individual's psychological health.

Emotional Impact: All epidemics from past to present are known to cause increased psychological problems such as panic attacks, anxiety, stress and depression in humans (Duan, & Zhu, 2020). The high risk of transmission and the rate of spread of the COVID-19 epidemic has led to an increase in fear, worry and anxiety among people in the society (Kaya,

2020). The unpredictability and uncertainty about the epidemic can increase the stress and anxiety when people are separated from their loved ones due to being in isolation. The fear of being stigmatized by other people is effective in increasing the fear and anxiety experienced by the individual (Sarı & Khorshid, 2008). This anxiety may increase even more, especially if there are someone who has a chronic disease in him/her or him/her family members. It is also stated that the risk of being infected at any time during the epidemic, food shortages, the fear of not being able to access health institutions increases the anxiety and stress experienced by individuals (Rubin & Wessely, 2020). The individual tends to go to health institutions more often due to experiencing anxiety and this might cause the health system to collapse (Biçer et al., 2020).

Behavioral Impact: Another effect of the epidemic is that it changes people's habits and behaviors. The daily routines of individuals staying at home on days of curfew restrictions have been disrupted. More internet use, more television viewing and long-term sedentary behavior has been observed (Chen, Mao, Nassis, Harmer, & Ainsworth, 2020). This can also increase people's dependence on the internet and social media. Sedentary life can lead to reduced flexibility of joints and weakening of the immune system (Lee, Jackson, & Richardson, 2017). This can lead to deterioration of the individual's physical health.

Cognitive Impact: It is very difficult for individuals to think clearly in situations of panic and anxiety. This can affect their emotions and behavior. Inadequate and incorrect information and distortion of accurate information prevent individuals from assessing pandemics in a healthy manner (Kaya, 2020). Therefore, informing the society by reliable sources during the epidemic period can enable people in the society to exhibit more conscious and controlled behavior against the epidemic (Karataş, 2020).

As a result, COVID-19, which affects the individual from a cognitive, sensory and behavioral point of view, can be said to be effective in transforming previously abnormal behaviors such as not shaking hands, not hugging and not communicating at a close range into behaviors that are now considered normal (Güngör, 2020). Therefore, it can be stated that in the new normal life period, it would be correct to evaluate the individual's emotions, thoughts and behaviors according to the new normal.

Strategies to Prevent the Spread of the COVID-19 Epidemic

Two key strategies play an active role in the fight against the epidemic. One of them is to stop the epidemic with vaccination, and the other is to increase prevention measures. Due to the lack of the COVID-19 vaccine in the period since the epidemic began in December 2019, prevention strategy has been implemented as the most effective method to prevent transmission of the epidemic (Alıcılar & Çöl, 2020). It can be said that the

prevention strategy is more important because the COVID-19 epidemic has asymptomatic properties. The protection strategy is also divided into three. Resource-oriented measures include identifying the source, isolating the patient, putting patients into quarantine and then treating them. Measures for the path of transmission include maintaining social distance, identifying asymptomatic individuals, paying attention to personal hygiene and avoiding contact as much as possible. The measures for healthy people include having minimum contact with other people, maintaining social distance and healthy diet (TÜBA, 2020).

The COVID-19 pandemic has brought up individual and social rights about health in the world. The right to health is the right of people to benefit from all kinds of health services. This right is governed by the Universal Declaration of Human Rights and the 56th amendment of the Constitution. The Ministry of Health took immediate action to fulfill this responsibility of the state towards the citizens and the strategy of being successful in the fight against the virus was determined with the slogan “the problem is global, our struggle is national” as the virus started to appear in Turkey. This strategy is also called as a suppression strategy (Çöl & Güneş, 2020). In this context, importance has been given to informing society properly. One of the most effective methods of reducing the risk of transmission is to emphasize hand hygiene. Hands should be washed with soapy water for at least 20 seconds as recommended by healthcare professionals. It should also be avoided to bring hands to the face, nose, mouth and eyes. In addition, objects should be touched at the minimum level in collective environments. Physical distance should be maintained at the highest level by paying attention to social isolation (Alıcılar & Çöl, 2020). Another of the most important information is the covering of the mouth with the inside of the elbow during coughing-sneezing (Public Health Association, 2020). Measures such as maintaining physical distance (1.5 meters) in society and using the mask correctly can reduce the risk of transmission of the virus (Niu, & Xu, 2020). Information about using the mask is also important. It is stated that if the correct behavior is not displayed while putting on and removing the mask, the mask may become an element that facilitates the transmission of the virus rather than being protective (Alıcılar & Çöl, 2020).

There are false beliefs and practices among the public to prevent the transmission of the virus, such as washing the nose with salt water and washing the mouth with vinegared water. There is no scientific evidence that these applications reduce the transmission of the virus (Sun, Lu, Xu, Sun & Pan, 2020). The Ministry of Health and scientific board members constantly warn people about this misinformation and prioritize informing the community correctly.

One of the measures taken by the state for the management of the pandemic is quarantine practices and curfew restrictions (Kumaş, 2011). Quarantine is not a new practice, it is a method applied in epidemics of past centuries (Eastwood et al., 2009; Kılıç, 2004). Especially for those coming from abroad, there is a 14-day quarantine obligation. In addition, partial curfew restrictions are used to reduce the risk of transmission of the disease. By establishing provincial pandemic boards, close monitoring of the pandemic has been provided by exercising divisions of labor in crisis management (Sancak & Çöl, 2020). Another measure taken to reduce the risk of transmission of the virus is the implementation of partial curfew restrictions. With the Presidential Decree of April 3, 2020, partial curfew restrictions have been imposed in 31 provinces over the weekend. Since those over the age of 65 and under the age of 20 are in the high risk group, these groups are also restricted from going out (Ministry of Interior, 2020a, 2020b). In addition, by the Ministry of Health, filection is applied for people with whom infected people are in contact. Fillation application ensures that people at risk of transmission of the virus are detected as soon as possible. Thus, the infection risk of the virus is controlled.

These methods aimed at preventing the epidemic, both by the state and by the community, appear to be very effective in lowering the risk of transmission of epidemics (Çirakoğlu, 2011). Nevertheless, ensuring that the community has access to accurate information reduces the level of anxiety and stress mentioned above and makes it easier for people to become more conscious.

Protection of Mental and Body Health during COVID-19

Natural disasters, wars and epidemics experienced in history affect societies deeply, but societies can get stronger from these negativities (Üzar-Özçetin & Hırdurmaz, 2017). This empowerment can be both psycho-social and spiritual (Tedeschi, & Calhoun, 2004). It is also known that epidemics cause fear and panic in society (Mak, Chu, Pan, Yiu, & Chan, 2009). Fear and panic can cause people to exhibit different behaviors. One of the most effective ways to reduce fear and panic during the epidemic is to ensure that the society has access to the correct information (Karataş, 2020).

During the pandemic period, it is observed that people pay more attention to self-controlled behavior. People have started to adopt a controlled lifestyle to reduce the risk of transmission of the virus (Arslan, & Ercan, 2020). In order to free themselves from the sedentary life at home, they turned to doing individual exercises (such as squats, yoga, push-ups, sit-ups) at home. These exercises are one of the exercises that can be done in a small area by maintaining social distance. In these ways, people seek to protect both their physical and psychological health.

During the period of the COVID-19 pandemic, there was a decrease in the rate of people using public transport (Karataş, 2020). It is also observed that people try to stay as far away from indoor places as possible, such as shopping centers. In the face of the epidemic, it is seen that some people use religious coping strategies, while others use secular coping strategies in dealing with the negative effects of the epidemic (Kirman, 2020). Both coping strategies are effective in maintaining mental and physical health.

Epidemics have shown humanity that keeping nature and the environment clean is an important factor for healthy living. It is also stated that it is effective in raising awareness of adequate use of human resources in the use of natural resources or in the use of other needs. The fact that people see nature renewing itself and the decrease in air and water pollution is also effective in the individual's hope for the future (Karataş, 2020).

As a result, it can be stated that it is important to implement measures to protect people's mental and physical health and to maintain their health status during the epidemic. However, it can be noted that people's display of controlled behavior in new normal life is effective in keeping the epidemic under control.

Result

The COVID-19 virus first appeared in China in December 2019. It spread to a large part of the world in as little as three months and on 10 March 2020, the WHO declared this epidemic as a pandemic. The pandemic continues to affect humanity as a major disaster facing the world. The epidemic affects most of the world's communities negatively in many areas such as health, education, tourism, industry, agriculture and social life.

It is seen that even the health systems of developed countries are insufficient in the face of the epidemic. There are two reasons for the insufficiency of the health system. One of them is the high number of patients who need medical devices (the number of intubated patients is high) at the same time. Another is the needlessly preoccupied health institutions with the people who experience anxiety and stress. This made it necessary to reconsider investments in the health sector.

Both people and countries have a significant accumulation of experience compared to the beginning of the epidemic. However, the fact that the vaccine has not yet been found suggests that the continuing risk of transmission of the disease remains serious. Therefore, it is constantly reminded by the Minister of Health and the members of the scientific board that it is necessary not to take the epidemic lightly and to pay maximum attention to the individual and social struggle in the first stages of the

epidemic. The three basic rules outlined by the Health Minister, “mask, distance and hand hygiene”, play a key role in fighting the epidemic.

Paying attention to personal hygiene and social distance rules in the new normal life is one of the most effective methods of keeping the epidemic under control. Therefore, in the new normal period, a controlled philosophy of life should be adopted by using masks and paying attention to the social distance. In order to keep the epidemic under control, it is also important that people act with self-control and fulfill their responsibility. COVID-19 pandemic is thought to redesign social life and change many things about social life.

References

- Afacan, E., & Avcı, N. (2020). A sociological overview of outstanding diseases through the coronavirüs example (Covid-19) [Koronavirüs (Covid-19) örneği üzerinden salgın hastalıklara sosyolojik bir bakış]. *Avrasya Sosyal ve Ekonomi Araştırmaları Dergisi*, 7(5), 1-14.
- Akın, H. (2018). A Catastrophe Foretold: An Assessment of the Great Pestilence of the Middle Ages and its Social Consequences [Felaket geliyor demişti: Ortaçağ’da yaşanan büyük veba salgını ve toplumsal yaşamdaki sonuçları üzerine bir değerlendirme]. *Kebikeç: İnsan Bilimleri için Kaynak Araştırmalı Dergisi*, 46, 247-296.
- Ak, M. (2011). A cholera epidemic in Antalya in the 19th century [19. Yüzyılda Antalya’da kolera salgını]. *Journal of International Social Research*, 4(17), 255-270.
- Alıcılar, H. E., & Çöl, M. (2020). Covid-19’dan korunmada etkili yaklaşımlar. O. Memikoğlu, and V. Genç (Eds.) in *COVID-19*, (pp. 80-84). Ankara: Ankara Üniversitesi Basımevi.
- Arslan, E., & Ercan, S. (2020). Significance of exercise during Covid-19 pandemic and social distancing. *Turkish Journal of Sports Medicine*, 55(2), 188-191.
- Biçer, İ, Çakmak, C., Demir, H., & Kurt, M. E. (2020). Coronavirus anxiety scale short form: Turkish Validity and reliability study. [Koronavirüs anksiyete ölçeği kısa formu: Türkçe geçerlik ve güvenilirlik çalışması. *Anatolian Journal of Clinical Medical Sciences*, 25(Özel sayı), 216-226.
- Boyd, K. M. (2000). Disease, illness, sickness, health, healing and wholeness: Exploring some elusive concepts: *Medical Humanities*, 26(1), 9-17.
- Budak, F. & Korkmaz, Ş. (2020). An overall evaluation for the Covid-19 pandemic process: The case of Turkey [Covid-19 pandemi sürecine

yönelik genel bir değerlendirme: Türkiye Örneği]. *Journal of Social Research and Management (SAYOD)*, 1, 62-79.

Chen, P., Mao, L., Nassis, G. P., Harmer, P., Ainsworth, B. E., & Li, F. (2020). Coronavirus disease (COVID-19): The need to maintain regular physical activity while taking precautions. *Journal of Sport and Health Science*. 9(2), 103-104. 10.1016/j.jshs.2020.02.001

Cumhurbaşkanlığı İletişim Başkanlığı, (2020). Tedbirlerle ve ekonomik destek paketleriyle vatandaşlarımızı bu krizin etkilerinden korumaya devam edeceğiz. Available at: <https://www.iletisim.gov.tr/turkce/haberler/detay/cumhurbaskani-erdogan-tedbirlerle-ve-ekonomik-destek-paketleriyle-vatandaslarimizi-bu-krizin-etkilerinden-korumaya-devam-edecegiz> July, 27, 2020.

Çırakoğlu, O. C. (2011). Investigation of perceptions associated with swine flu (H1N1) outbreak in the context of anxiety and avoidance level variables [Domuz gribi (H1N1) salgınıyla ilişkili algıların, kaygı ve kaçınma düzeyi değişkenleri bağlamında incelenmesi]. *Journal of Turkish Psychology*, 26(67), 49-64.

Çobanoğlu, N. (2020). Ethics of individual, professional, social, scientific and politic is questioned by covid-19 pandemi [Bireysel, profesyonel, toplumsal, bilimsel ve siyasal etiği yeniden sorgulatan Covid-19 pandemisi]. *Anatolian Journal of Clinical Medical Sciences*, 25(Özel Sayı), 36-43. 10.21673/adoloklin.709891

Çöl, M., & Güneş, G. (2020). Covid-19 salgınına genel bir bakış. O. Memikoğlu, and V. Genç (Eds.) in *COVID-19*, (pp. 1-8). Ankara: Ankara Üniversitesi Basımevi.

Duan, L., & Zhu, G. (2020). Psychological interventions for people affected by the Covid-19 epidemic. *The Lancet Psychiatry*, 7(4), 300-302.

Eastwood, K., Durrheim, D., Francis, J. L., d'Espaignet, E. T., Duncan, S., Islam, F., & Speare, R. (2009). Knowledge about pandemic influenza and compliance with containment measures among Australians. *Bulletin of the World Health organization*, 87, 588-594.

Evren, E., & Us, E. (2020). Covid-19 Etkeni. O. Memikoğlu, & V. Genç (Eds.) in *COVID-19*, (pp. 10-16). Ankara: Ankara Üniversitesi Basımevi.

Gençalp, D. K. (2020). Evaluation of dietary habits and physical activity status of first and emergency aid students in Covid-19 outbreak period [Covid-19 Salgını döneminde ilk ve acil yardım öğrencilerinin beslenme alışkanlıkları ve fiziksel aktivite durumlarının

- değerlendirilmesi]. *Paramedik ve Acil Sağlık Hizmetleri Dergisi*, 1(1), 1-15.
- Güngör, Ö. (2020). *Salgın dönemi sosyolojisi*. Ankara: AND Center.
- Halk Sağlığı Derneği. (2020). Kendinizi nasıl korursunuz? Available at: <https://korona.hasuder.org.tr/kendinizi-nasil-korursunuz/> July, 17, 2020.
- He, F., Deng, Y., & Weina, L. (2020). Coronavirus disease 2019: What we know? *Journal of Medical Virology*, 92, 719-725. <https://doi.org/10.1002/jmv.25766>
- İçişleri Bakanlığı, (2020a). 65 yaş ve üstü ile kronik rahatsızlığı olanlara sokağa çıkma yasağı genelgesi: <https://www.icisleri.gov.tr/65-yas-ve-ustu-ile-kronik-rahatsizligi-olanlara-sokaga-cikma-yasagi-genelgesi>
- İçişleri Bakanlığı, (2020b). 65 yaş ve üstü ile kronik rahatsızlığı olanlara sokağa çıkma yasağı ek genelgesi <https://www.icisleri.gov.tr/65-yas-ve-ustu-ile-kronik-rahatsizligi-olanlara-sokaga-cikma-yasagi-ek-genelgesi>
- Karataş, Z. (2020). Social impacts of Covid-19 pandemic, change and empowerment [Covid-19 pandemisinin toplumsal etkileri, değişim ve güçlenme]. *Turkish, Journal of Social Work Research*, 4(1), 3-15.
- Karcıoğlu, Ö. (2020). Covid-19: Its epidemiology and course in the World [Covid-19: Epidemiyolojik bilgilerimiz ve hastalığın Dünyadaki gidişi]. *Journal of ADEM*, 1(1), 55-71.
- Kaya, B. (2020). Effects of pandemic on mental health [Pandeminin ruh sağlığına etkileri]. *Journal of Clinic Psychiatry*, 23, 123-124. 10.5505/kpd.2020.64325
- Kılıç, O. (2004). *Eskiçağdan Yakınçağa genel hatlarıyla dünyada ve Osmanlı Devleti'nde salgın hastalıklar*. Available at: <http://www.orhankilic.com.tr/yayinlar/kitaplar.html> <http://hdl.handle.net/11508/8881>
- Kırık, A. M., Altıntaş Var, S. S., Özkoçak, V., & Darıcı, S. (2020). Communication and perception management in pandemia periods: The case of new coronavirus disease (Covid-19) [Pandemi dönemlerinde iletişim ve algı yönetimi: Yeni koronavirüs hastalığı (Covid-19) örneği]. *The Journal of Academic Social Sciences (ASOS JOURNAL)*, 8(104), 36-57. <http://dx.doi.org/10.29228/ASOS.43249>
- Kırmızıgül, H. G. (2020). The covid-19 pandemic and resulting education process [Covid-19 salgını ve beraberinde getirdiği eğitim süreci]. *Avrasya Sosyal ve Ekonomi Araştırmaları Dergisi (ASEAD)*, 7(5), 283-289.

- Kirman, F. (2020). Psychology of pandemia in social media: Perception, effect, and coping. *World Journal of Human Sciences*, 2020(2), 1-34.
- Kumaş, N. (2011). Chole epidemics in Bursa and the quarantine precautions (1890-1895). *Uludağ University Faculty of Arts and Sciences Journal of Social Sciences*, 12(21), 1-29.
- Lauer, S. A., Grantz, K. H., Bi, Q., ... & Nicholas, G. R. (2020). The incubation period of coronavirus disease 2019 (COVID-19) from publicly reported confirmed cases: Estimation and application. *Annals of Internal Medicine*, 172(9), 577-582.
- Lee, P. G., Jackson, E. A., & Richardson, C. R. (2017). Exercise prescriptions in older adults. *American Family Pyhsician*, 95(7), 425-432.
- Li, Q., Guan, X., Wu, P., Wang, X., Zhou, L., Tong, Y., ... & Xing, X. (2020). Early transmission Dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. *New England Journal of Medicine*. 382, 1199-1207. <https://doi.org/10.1056/NEJMoa2001316>.
- Li, K. J., & Li, X. (2020). Covid-19 Pandemic: Socian distancing, public policy, and market response, 1-29. (Electronic copy). Available at: SSRN: <https://ssrn.com/abstract=3593813> or <http://dx.doi.org/10.2139/ssrn.3593813>
- Liu, D. X., Liang, J. Q., & Fung, T. S. (2020). Human coronavirus-229E, -OC43, -NL63, and -HKU1. *Reference Module in Life Sciences*, B978-0-12-809633-8.21501-X. <https://doi.org/10.1016/B978-0-12-809633-8.21501-X>
- Mak, I. W., Chu, C. M., Pan, P. C., Yiu, M. G., & Chan, V. L. (2009). Long-term psychiatric morbidities among SARS survivors. *General Hospital Psychiatry*, 31(4), 318-326. 10.1016/j.genhosppsy.2009.03.001
- Nikiforuk, A. (2007). *Fourth Horseman: A short history of eğidemics plagues & famine [Mahşerin dördüncü atlısı-Salgın ve bulaşıcı hastalıklar tarihi]*. S. Erkanlı (Çev.). İstanbul: İletişim Yayınları.
- Niu, Y., & Xu, F. (2020). Deciphering the power of isolation in controlling Covid-19 outbreaks. *The Lancet Global Health*, 8(4), 452-453.
- Özden, K., & Özmat, M. (2014). Epidemic and the City: Social, Political and Economic Results of Plague of 1347 in Europe [Salgın ve kent: 1347 Veba salgınının Avrupa'da sosyal, politik ve ekonomik sonuçları]. *Kent Araştırmaları Dergisi*, 5(12), 60-87.
- Rubin, G., J., & Wessely, S. (2020). The psychological effects of quarantining a city. *Bmj*.368 *Published online:* 10.1136/bmj.m313

- Sağlık Bakanlığı, (2020). Covid-19 (SARS-CoV-2 Infection) General information, epidemiology, and diagnosis [Covid-19 (SARS-CoV-2 Enfeksiyonu) Genel bilgiler, epidemiyoloji, ve tanı]. Erişim tarihi: 25.07.2020 https://covid19bilgi.saglik.gov.tr/depo/rehberler/covid-19-rehberi/COVID-19_REHBERI_GENEL_BILGILER_EPIDEMIOLOJI_VE_TANI.pdf
- Sancak, M., & Çöl, M. (2020). Türkiye’de Covid-19 pandemisinin kronolojik olarak incelenmesi. O. Memikoğlu, & V. Genç (Eds.) in *COVID-19*, (pp. 202-217). Ankara: Ankara Üniversitesi Basımevi.
- Sarı, D., & Khorshid, L. (2008). The psychological consequences of source isolation to communicable diseases (Bulaşıcı hastalıklarda kaynak izolasyonun psikolojik sonuçları]. *Journal of Ege University Nursing Faculty*, 24(3), 83-91.
- Sun, P., Lu, X., Xu, C., Sun, W., & Pan, B. (2020). Understanding of Covid-19 based on current evidence. *Journal of Medical Virology*, 92(6), 548-551. <https://doi.org/10.1002/jmv.25722>
- Taylor, S. (2019). *The psychology of pandemics: Preparing fort he next global outbreak of infectious disease*. Newcastle upon Tyne: Cambridge Scholars Publishing.
- Tedeschi, R. G., & Calhoun, L. G. (2004). Posttraumatic growth: Conceptual foundations and emprical evidence. *Psychological Inquiry*, 15(1), 1-18.
- Türkiye Bilimler Akademisi – TÜBA, (2020). *Covid-19 Pandemic Evaluation Report* [COVID-19 Pandemi Değerlendirme Raporu]. Türkiye Bilimler Akademisi Yayınları, TÜBA Raporları, Rapor No: 34, Ankara. Available at: <http://www.tuba.gov.tr/files/yayinlar/raporlar/Covid-19%20Raporu-revize.pdf> Erişim Tarihi:10.07.2020
- Uğraş-Dikmen, A., Kına, H. M., Özkan, S., & İlhan M., N. (2020). Epidemiology of Covid-19: What we learn from pandemic? [Covid-19 Epidemiyolojisi: Pandemi den ne öğrendik?]. *Journal of Biotechnology and Strategic Health Research*, 1(Özel Sayı), 29-36.
- Üzar-Özçetin, Y. S., & Hiçdurmaz, D. (2017). Posttraumatic growth and resilience in cancer experience [Kanser deneyiminde travma sonrası büyüme ve psikolojik sağlamlık]. *Current Approaches in Psychiatry*, 9(4), 388-397. 10.18863/pgy.290285
- World Health Organization, (2020). Risk Communication and Community Engagement (RCCE) Action Plan Guidance COVID-19 Preparedness and Response. <https://www.who.int/publications/i/item/risk->

communication-and-community-engagement-(rcce)-action-plan-guidance July, 25, 2020.

World Health Organization, (2018). Who we are? Available at: <https://www.who.int/about/who-we-are> July, 25, 2020.

Yamamoto, G. T., & Altun, D. (2020). The coronavirüs and the rising of online education [Koronavirüs ve çevrimiçi (online) eğitimin önlenemeyen yükselişi]. *Journal of University Research*, 3(1), 25-34.

Yavuz, K. (2020). Effets of covid-19 pandemic on future of social policy [Covid-19 salgınının sosyal politikanın geleceği üzerine etkileri]. *The Journal of Social Science*, 7(45), 181-193.

Yuan, M., Yin, W., Tao, Z., Tan, W., & Hu, Y. (2020). Association of radiologic findings with mortality of patients infected with 2019 novel coronavirüs in Wuhan, China. *PLOS ONE* 15(3): e0230548. <https://doi.org/10.1371/journal.pone.0230548>

CHAPTER VII

FUNDAMENTALS OF ONLINE EDUCATION in UNDERGRADUATE MOLECULAR BIOLOGY AND GENETICS PROGRAMS

Dr. H. Omer TONTUS

Istanbul Technical University, Faculty of Science & Letters
Department of Molecular Biology & Genetic, Istanbul, Turkey
e-mail: otontus@itu.edu.tr, Orcid ID: 0000-0002-3435-9244

1. Introduction:

Due to the COVID19 outbreak, higher education is in a period of turbulence in all disciplines. It is now imperative for teachers to adapt to new educational tools, which are mainly distance education techniques. Some teachers likely participated in distance education activities during their student life. Many teachers have already discovered that remote learning has some difficulties, one of the most important is being how to teach hands-on laboratory courses outside of an actual laboratory. There are many studies showing that laboratory learning can be done through distance education by meeting the learning outcomes and objectives, since the early 2000s (1, 2, 3).

Disciplines such as molecular biology and genetics (MOBIG), chemistry, biology and medicine provide lectures and practical skills training in different specialized laboratories.

The most important consideration for MOBIG students is the diversity in the educational process that goes from mastering basic cell concepts to challenging molecular biology and/or genetic problems. Promoting learning environments with a strong emphasis on differentiated teaching methods and distance learning plays a very important role in this context. In fact, these environments guarantee the learner to be given the time necessary to learn autonomously within a personally customized time frame.

The current and expected future expansions in online learning present distinctive challenges to science educators. During online education, Importance needs to be given not only to the teaching of theoretical science content, but also of practical scientific processes. Traditionally such processes are taught in a hands-on lab medium setting. Lab experiments enable students to develop an understanding of the nature of science, develop analytical and critical thinking skills, and increase interest in science. For the new models of tertiary education, given the centrality of the laboratory to science education, efforts are needed to determine best practices for integrating laboratories with online instruction

(2). Practical training is an important part of the students learning objectives in undergraduate MOBIG programs. However, the restriction of access to "wet" labs due to the pandemic and the requirements to provide standard molecular biology experiments have made virtual ("dry") laboratories (VRL) an indispensable alternative for student practical training (4). Due to the intense need for more experiments in lab techniques, many schools launched projects for expanding newly developed online training materials to address lab training needs (5).

This article in first, briefly explains the distance education concepts for MOBIG. The next section introduces the problems and solutions of distance learning for the reader. The results section provides feedback and insights from various researcher view. Finally, some conclusions and recommendations for further improvement are presented.

2. Background:

A multicenter survey of US higher education's immediate priorities and responses to the COVID19 outbreak evaluated the concerns faced by academic institutions implementing distance education in the 2020-2021 academic year. As part of the survey conducted by Bay View Analytics in partnership with six leading academic institutions, more than 800 higher education faculties and administrators were surveyed to measure the concerns and needs of the participants (6).

It is acknowledged by all parties that the sudden transition from face-to-face training events to online distance education has caused a major change in behavior and practices in the world of academia. In almost all of the institutions surveyed (97%), it was found that faculty members who had no previous online teaching experience were asked to bring courses online. The majority of the faculty members (56%) reported that they had to use teaching methods that they had never used before. Some participants felt that online environments were not compatible with the fields of study they were teaching.

The responses generally reflected the concerns of educational institutions and academic staff. Among the responses were concerning such as how I can teach "die-casting", "dancing" or "blood sampling/taking techniques" on a webcam. Institutions and instructors are working to tackle these challenges, but have expressed distress that the quality of education is declining. Academics and administrating teams also express concerns about the impersonal nature of virtual education. A respondent stating that education is not just providing content to students, "drew attention to the difficulty of establishing the relationship and trust built with face-to-face teaching online.

The limiting of face-to-face education is compounded with a lack of access to the tools required in an online learning environment such as low-income community learners not having an appropriate computer, some learners have no regular access to a computer, and some learners have insufficient bandwidth to participate in online classes. Faculty and administrators are concerned about the diminished quality in the educational experience as a result of the rapid shift from face-to-face to online learning which can lead students to the next stage of their educational journey are ill-prepared. The coming academic years will force schools to find ways to somehow cope with the effects of the COVID-19 pandemic in the context of education. As a matter of fact, academics who were concerned about this and participated in an online survey (6) stated that they needed compiled resources showing examples of successful practice in order to construct a good example of distance education experience that works for institutions, teachers, educators, and students.

The development of information and communication technologies has affected students' learning styles as well as where they learn. Technological innovations have enabled the creation of online learning tools as well as virtual environments for teaching. Online education technologies are an electronic, location-independent, free from time-limitation platform that is accessible 7/24. Users benefit from the flexibility of online learning as resources are available and accessible, anywhere and anytime. The platforms offer a variety of resources: from glossary to a limitless library, and from thousands of exercises to deep discussion forum with instant reviews and corrections. Over the past decade, there has been a steady increase in the number of students choosing to take courses remotely (7). While this may offer an acceptable learning experience for courses in many areas, online courses are a challenge specific to the laboratory component of the curriculums.

For many teachers, the COVID-19 pandemic has opened an important "teaching era" that can be defined as a process of the future-oriented reshaping of program development and planning activities. All higher education parties from manager to student need to evolve, to meet "the new normal" emerging in their environment. Educators and institutions need concrete plans on how to develop and implement "contemporary and future faced learning methodologies" in order to succeed and develop during and after the pandemic (6).

It is customary that the first semester of the school year begins in Mid-September and ends in January in Turkey. But for 2020 the start of the first semester was decided to be postponed by a few weeks, and tertiary schools were instructed courses to be given distantly at least for the first few months. At the beginning of the second semester which is in early

February, it is predicted that the outbreak would be under control and the part of face-to-face sessions would begin. However, due to the situation of the current outbreak and possible future pandemic together with the option of digitalization, it is predicted that in many universities across the world all of the courses should be given online for the whole term.

At the second semester of 2019, the decision to shift to online teaching was made swiftly, and in the beginning, most educators did not have adequate time and expertise for online courses, which were completely dissimilar to traditional face-to-face classroom-based teaching (8). During online education, the interactions of learners with teachers or each other are limited. In addition, they were unable to directly perform practical skill procedures and laboratory experiments. Looking at the basic biology courses offered online by the CDC, it will be seen that online training materials are readily available on topics such as "Basic Microscopy", "Basic Molecular Biology Laboratory Practice", "Basic Culture Media", "Biochemicals and Gram-Positive Organism", "Routine Microscopy Procedures". These titles will encourage other institutions to easily prepare content according to their own programs (9).

Before the pandemic, online courses in most of the universities were not very common. Lectures in the MOBIG program were usually taught by lecturers in classrooms. Similarly, laboratory practices were taught and supervised by faculty members.

This study summarizes information that will help schools and academics find suitable techniques for online or distance lab training, but likely face-to-face courses will return to campus.

With the distance learning decision for the first semester of 2020, many faculty members who did not have the necessary practice in distance learning had to seriously examine three forms of online course modes (8):

1- Synchronous (real-time) online lectures; one-way didactic conversation. Educators and learners access video conferencing software simultaneously during the pre-announced class hours and educators give lectures on the topics.

2- Interactive synchronous online lectures; Students can ask questions or join the discussion during the lectures by verbally or live text.

3- Asynchronous (video-on-demand) online lectures; Course videos prepared by faculty members publish on the institution's learning management system (LMS) website. Students take courses by watching video clips on-demand anywhere at any time.

Even before the full-scale online courses, videos have been shown to be efficient in teaching (10, 11). However, although there are many

publications about online education, an adequate comparative analysis is not yet possible between who graduated in full-scale traditional face-to-face courses and who graduated in full-scale online courses.

Most university students have kind of computers or smart devices available and have access to online networks, and thus, the necessary physical conditions for online courses are satisfied for most students in many countries. On the other hand, hundreds of videos must be produced in order to be able to online broadcast all the lectures of a program such as the undergraduate MOBIG program. This situation makes it necessary for schools to have a very costly online publication infrastructure.

At present, some higher education institutions do not have sufficient resources and staff to professionally produce such large amounts of course videos. For this reason, many educators have had to create video clips for their course contents in their own offices with own resources which results in the production of video clips that are not as good as those produced by professionals (8).

Nowadays, many high school students join online courses with high-quality videos when they are preparing to enter university. Therefore, the students expect at least similar quality of online lectures at universities. Online courses which produced university enrolment exam are commercially prepared with experts and are mostly of high quality. However, many online course videos of tertiary schools were produced without adequate preparation period, and probably some students will not be satisfied with the quality of videos technically not the contents (8).

It is more challenging to transform current lab courses into online formats, and relatively there are little articles on this issue. Some experts recommend the home-based lab course by using easily obtainable lab kits or materials (12) while others suggest the VRL for simulating the lab sessions (13).

While hands-on experiments with ready kits might be a better option from a purely pedagogic viewpoint, some of the kits are not available in certain some countries or are very expensive for students' budget. In addition, there are safety, health and waste management concerns with this option. Although there are suggestions that VRL sessions are a good and convenient alternative, adapting it to MOBIG laboratories in a short time is not easy.

3. Laboratory courses during distance education:

Program-specific learning objectives are a very useful tool for defining the field of a program and can be a very important instrument when planning experiments and measurements. With simple alteration, these

learning objectives can work as a guide when shifting to an online teaching format, particularly in a hands-on lab (14).

While VRL courses might be a good alternative. For example, there are approximately 10 MOBIG lab sessions in Istanbul Technical University, MOBIG department in a semester. It is difficult to prepare for students such a number of lab courses in a short period of time. VRL courses can be produced by faculty members for each lab session. The produced videos and the experimental data can be shared by the learners so that they could learn online how to perform the experiments and how to process the experimental data (8). Table.1 shows some of the laboratory courses present in most MOBIG programs and the online training techniques available for these courses.

Lab course name	Course content in short	Proposed online model
General Chemistry Lab-I	Safety rules, basic chemical concepts, applications in chemistry laboratory (e.g. Preparation of KCl, VSEPR Theory, Synthesis of Soap, Determination of Acetic Acid in Vinegar, Thermochemistry: Determination of the Heat of Reaction)	2D/3D online course
General Biology Lab-II	Introduction to laboratory techniques; solution preparation, solution dilutions, pH measurement; investigation of structure and functions of the enzymes; spectrophotometric measurements	2D/3D online course
Cell Biology Lab	Basics of light microscopy and observation of different types of cells, isolation of organelles, investigation of factor affecting cell membrane structure, DNA isolation, cell division cycle phases.	2D online course + VRL
Microbiology Lab	Safety rules; guidelines for the preparation of laboratory reports; sterilization and preparation of culture media; quantitative determination of bacterial numbers; staining bacteria; identification of bacteria through biochemical testing.	2D/3D online course
Molecular Genetics Lab	Following genetic material extraction from cells, application of recombinant DNA technology steps for molecular cloning.	2D/3D online course + VRL
Biochemistry II	Methods for purifying and characterizing industrially important enzymes. production of the recombinant enzyme. purification of enzyme by chromatography, characterization by gel electrophoresis and enzyme kinetic experiments.	2D online course + VRL
Molecular Biology Lab	Investigating intracellular effects of recombinant DNA technology-based gene manipulations; gene expression assessment on RNA and protein levels, cell viability assays, proteomic analyses.	2D/3D online course + hands-on wet-lab

Table.1. Some laboratory courses present in MOBIG and proposed online training techniques.

Believing that it is still better for students to do some experiments in the laboratory, several real laboratory sessions can be planned in which students can participate face-to-face by dividing into groups to ensure physical distancing. However, some of the students can have a concern about attending the hands-on lab sessions due to pandemic, due to this it is best for only willing students to attend these extra sessions. Although an explicit measurement not available for the current year, it is likely that students taking online lab courses miss some experiments that can be acquired only by actual participation (8).

The technological approach of online computer-based laboratory teaching can be grouped in two different ways. The first group includes experiments involving the use of a distant laboratory environment. These refer to the use of a computer interface to control a laboratory instrument located in a different place from the student's location, and this is the category most frequently used (15). For instance, a learner can control a robotic unit to take a physical measure or calculation, distantly. This technique also allows learners to gather real-time data from tools without being physically present. The second group includes experiments that simulate the whole process, including data collection. Called the VRL medium, this approach greatly reduces operating costs as there are no physical lab spaces, substance, or instruments to maintain. There are many different approaches to the VRL, extending from simple simulations (16, 17) to fully immersive mediums (18) and multiple mediums in between (19, 20, 21).

Regardless of which medium is selected as an alternative, learning outcomes must be similar to the learners in the traditional hands-on laboratory across following the three domains of learning (7):

- Cognitive domain; It is knowledge acquisition from an experiment (22), and usually measured by asking content-based quizzes in a lab setting or exam questions in a classroom environment.
- Psychomotor domain; It is about skills acquired from the experience (23), and usually measured in the lab environment with the use of practical exams that assess particular skills that students are expected to have learned.
- Affective domain; It is the learner's interests, attitudes, values, and appreciation of a given an experiment or the learning environment (24), and usually measured by self-report, rating scales, semantic differential scales, and checklists etc.

4. Differences between traditional and alternative environments:

Many studies have been executed to evaluate the pros and cons of integrating virtual experimentations in varied programs (20, 25, 26). These are usually in two groups. The first group covers comparative studies to

investigate differences between virtual "dry" lab and traditional hands-on "wet" lab experiments using sample and control groups. The second group covers studies that define the VRL's potential pros and cons without the use of a control group (7). Hawkins and Phelps administered a comparative study with 84 students who completed a virtual electrochemistry lab and 85 students who completed the experimentally identical traditional hands-on lab. No statistical difference between the two groups on the cognitive domain and psychomotor domains was detected (21). In Pyatt and Sims' comparative study on differences in the affective domain learners were assessed using a newly prepared affective instrument (the Virtual and Physical Experimentation Questionnaire), for measurement of attitudes toward various aspects of the two different mediums. 184 learners completed both a VRL trial and a traditional hands-on lab trial. The study results showed a better score on laboratory equipment usability for the VRL environment, while there was no difference in laboratory usefulness between the two environments. Additionally, cognitive domain differences were measured and no significant difference was detected between groups in the first trial. But there was a significant difference in the second trial in favor of the VRL (27). Grove and colleagues evaluated differences in three learning domains in a school using LearnSmart Labs developed by McGraw-Hill Education (28). In total, 195 learners finished the hybrid curriculum which included a VRL experiment and a traditional hands-on lab experiment. Statistically, there weren't statistically significant differences between groups, on the cognitive domain or psychomotor domain.

Winkelmann et al exercised the virtual Second Life (SL) platform to assess variation in three learning domains for two specific trials (18). In their study, 55 learners (experimental group) studied "a gas law experimental study" and "an experiment on titration" both on the SL platform, while 67 learners studied both experiments as a control group in a traditional lab environment. Both groups showed on the cognitive domain gains in the posttest compared with the pretest; however, the SL group achieved remarkably more gains in all two experimental studies. In the psychomotor domain, learners in both groups performed similarly well. In the affective domain, the students stated that when working with SL tools, the time to complete the experiments was shortened; students stated that they learned more in the classical hands-on studies and had higher perceived levels in the SL experiment compared to former hands-on experiments. In descriptive studies, the pros and cons of the SL platform were evaluated by Woodfield et al. They prepared a set of virtual experiments, one part of the inorganic lab course (26), and the other part of the organic lab course (20). In the inorganic laboratory groups, the students stated that they easily completed the experiments in the virtual environment, which are difficult to complete in the traditionally applied

laboratory environment. Most of the learners qualitatively reported that VRL studies helped them learn the contents. Similarly, in their organic lab studies, learners stated that they had a positive experience with the VRL were more likely to get a better lecture rating. Woodfield et al aimed more on emotional differences. According to the findings of the study, students in both groups stated that they preferred the VRL in terms of experimenting compatibility. In general, comparative and descriptive studies on virtually designed labs in the chemistry curriculum show that there is either no difference (21, 25) or a small possible advantage (18, 20, 26, 27) in the cognitive domain when learners finish the VRL.

5. Assessments during distance education:

In most MOBIG courses, students usually take exams consisting of several different techniques, as it is necessary to understand the concepts and improve knowledge in MOBIG in order to answer questions, solve problems and analyze subjects. As long as the education continues online, students should be given online tests, assignments and essays and they upload their solutions to the LMS within the specified time frames.

As the number and standard of assessments in distance education are similar to those in face-to-face courses, the efficacy of assessment would not be different. In many universities, most lectures in MOBIG usually have at least two examinations per semester, e.g. mid-semester and final exams. Until guidelines for online exams are released, some instructors are at least right to expect exams to be taken in classrooms instead of online, due to the concern for academic dishonesty. For this reason, executing online exams can be postponed until guidelines prepared.

Fairness in the assessment of the exam and equality in exam conditions are very important for all universities, all academicians and all students. Therefore, it must be understood that all parties are concerned about online exams. It should be ensured that the conditions that may vary from student to students, such as the speed of internet access and the capacity of the computer used, are brought to an acceptable level, within the framework of fairness and equality.

During the distance exams, online tools or exam security software and self-esteem or honour codes don't prevent cheating. A culture of academic integrity and consistent notifications to students about when and what types of assistance are allowed for exams and assignments can be helpful to block the cheating. In the rush to move education online, schools might not have had time to worry about cheating. But beyond preventive action, schools may need to rethink what makes an assessment to be effective. For example, it may be necessary to comment on the value of multiple-choice question-based tests and testing techniques for practice skills. Some instructors did online exams and noted that although students were asked

to work independently, some students shared their solutions. On the other hand, some schools that monitored the exams with video conferencing software reported that they had no evidence of cheating in the exams (8). While the omniscient google is open on the next computer and computer literacy is high in younger generations, the security of online tests can be achieved with Bloom's Taxonomy Level 4 (analysing) and Level 5 (evaluating) questions. Measures such as students taking the exams only at the specified time and giving a shorter time than usual for each question may reduce the possibility of cheating (8). A different answering time can be defined for each question, thus allowing optimum sufficient time for questions requiring intensive numerical calculations, for example. Considering that preventing students from cheating in an online exam is extremely difficult, allowing to use textbooks and printed materials may be encountered to ensure equal conditions for all students during the exam. By the help of the exam software, both the order of questions and options can be shuffled automatically during the online exam, and each student can be asked to solve the problems in a different order.

6. Different aspects of digital courses:

First of all, according to the many studies and to the experiences of many schools from the second semester of 2019, the validity of distance teaching/learning activities is not different from face-to-face lessons (8, 30).

Some researchers state that students are more easily distracted if opportunities for interaction with instructors and peers are limited. Therefore, a more interactive online environment will provide more learner participation (31). Students participation can be increased by many different ways: digital peer-led team learning, learner-directed online discussions, sharing social media videos (32, 33, 34) etc.

The number of learners in a standard MOBIG program in most universities approximately somewhere around 50, while the number of students in most lab sessions is around 25, in many universities. In the case of asynchronous video-on-demand based learning, it is possible to avoid the negative impact of crowded classes. Despite some disadvantages in online lectures (as lesser engagement and interaction), there are several advantages in online lectures (such as independency from time and space). It is expected that online courses are now the new education system and will replace face-to-face lessons in all possible educational activities.

In synchronous online courses, some students participate interactively during the lesson, while others cannot concentrate on the content. Since without eye contact, it is difficult to understand whether learners are paying enough attention to the lesson, even if they are connected. Attention monitoring applications can be used to predict students' attention

levels during synchronized lessons, but such applications may require student permission. Video meeting software used in synchronous real-time teaching can be convenient to make online courses more interactive. Some restrictions may apply for viewing plans of asynchronous lectures using the LMS. For instance, students may be obliged to watch broadcasted videos before the next lesson starts or before the next week. This planning is essential to help students take courses that complement each other courses on time. In a study, the researcher noted that the students preferred asynchronous lectures to synchronous (3.40 and 2.86 average satisfaction scores respectively over 5), probably due to the flexibility of asynchronous courses (8).

Many schools and educators are trying to find solutions to engage students more in their learning activities. The biggest obstacle to the online video lecture-based teaching approach is that many schools and educators are not trained in video creation. The new situation that emerged with the pandemic suddenly forced them to record lectures as video clips. As faculty members become familiar with the cameras and microphones, it is expected that online teaching can be implemented in an easier and more professional way.

7. Conclusion:

In fact, with the COVID-19 outbreak, it has surfaced that educational institutions and academics are already preparing for transforming education to distance learning/teaching. As a matter of fact, articles on online education have been increasingly seen in the literature since 2000. Online courses have become applicable by the development of technologies in various fields such as faster internet connection, relatively high-performance computers, availability of tablet PCs, video conferencing software. Many schools have experienced difficulties in teaching MOBIG online in the past semester, but now many students receive regular and uninterrupted education or training online. Although the teaching style is different from past years, it appears that the effectiveness of online teaching is almost comparable to traditional courses for aspiring students. However, it is thought that students missed some things in case of an online laboratory course (8). Guidelines were distributed by most of the universities and authorities at the beginning of the new semester of the 2020-2021 academic year promising that more effective online education will take place so that educators plan the lessons and exams in advance and evaluate the effectiveness of online courses more quantitatively. With the extraordinary educational experience gained in the last semester, the instructors are now better adapted to online teaching and there will be a smoother online education process in the future.

This chapter describes the development and implementation of online education in the MOBIG program. Online education has been the foremost teaching and learning method all over the world with a very rapid transformation without preparation due to the pandemic. It is a technology-based active learners-centred reformative teaching method allowing learners to digitally evaluate their knowledge of fundamental and advanced MOBIG concepts. A large number of asynchronous and synchronous lectures, prepared lab experiments with various levels of difficulty, links to supplementary sources of data, automated feedback, and the combined rating software are essential characteristics of online education. Although it is originated as a distance teaching and self-motivated learning method, it also works well with classroom-based activities.

MOBIG programs often use participation in active hands-on research laboratories as a form of undergraduate curricula. However, access to the lab is severely restricted by the pandemic. As a way of addressing this need, schools obliged to transform the hands-on lab courses model to newly developed online training materials to pass experience from academics to learners. This chapter provides clues in detail the main ideas, processes, and assessment plans of online learning.

Current situations have made the move to online education an obligation for many higher education institutions, it has become clear that these teaching methods will become more common in the near future. Online and/or virtual training that is planned to be used should be structured as interactive education-oriented rather than didactic. Therefore, ensuring the high standards and particularity of tertiary level molecular biology courses will require an attentive shift from effective learning objectives to online education. This is not only logical but also crucial and compulsory if schools are to adapt to the post-COVID19 new world and beyond.

References:

1. J. A. Herzog (2020) Teaching Lab-Based Courses Online & Remote: From “Are You Kidding Me?” to “This Is Effective!” <https://asm.org/Articles/2020/May/Teaching-Lab-Based-Courses-Online-Remote-From-Are>
2. M. V. Mawn, P. Carrico , K. Charuk , K. S. Stote & B. Lawrence (2011); Hands-on and online: scientific explorations through distance learning, *Open Learning: The Journal of Open, Distance and e-Learning*, 26:2, 135-146, DOI: 10.1080/02680513.2011.567464
3. Casanova, R. S.; Civelli, J. L.; Kimbrough, D. R.; Heath, B. P.; Reeves, J. H. (2006); *Distance Learning: A Viable Alternative to*

- the Conventional Lecture-Lab Format in General Chemistry. *J. Chem. Educ.* 2006, 83 (3), 501, DOI: 10.1021/ed083p501
4. G Iazzetti, G Santini, M Rau, E Bucci, R A Calogero, VIRTLAB: a virtual molecular biology laboratory., *Bioinformatics*, Volume 14, Issue 9, 1998, Pages 815-816, <https://doi.org/10.1093/bioinformatics/14.9.815>
 5. Boulay R. Designing and Developing Online Materials for Molecular Biology: Building Online Programs for Science. *Int J Des Educ.* 2013;6(3):53-61. doi:10.18848/2325-128x/cgp/v06i03/38420
 6. Ralph N. Perspectives: COVID-19, and the future of higher education, <http://www.onlinelearningsurvey.com/covid.html>
 7. C. Hensen and J. Barbera (2019); Assessing Affective Differences between a Virtual General Chemistry Experiment and a Similar Hands-On Experiment, *Journal of Chemical Education* 2019 96 (10), 2097-2108, DOI: 10.1021/acs.jchemed.9b00561
 8. Lee M.W. (2020); Online Teaching of Chemistry during the Period of COVID-19: Experience at a National University in Korea. *Journal of Chemical Education* 2020 DOI: 10.1021/acs.jchemed.0c00881
 9. CDC (2020); Microbiology Series <https://www.cdc.gov/labtraining/training-courses/basic-microbiology/index.html>
 10. Rose, J.; Pennington, R.; Behmke, D.; Kerven, D.; Lutz, R.; Paredes, J. E. B. Maximizing Student Engagement Outside the Classroom with Organic Synthesis Videos. *J. Chem. Educ.* 2019, 96, 2632– 2637, DOI: 10.1021/acs.jchemed.9b00234
 11. Ramachandran, R.; Sparck, E. M.; Levis-Fitzgerald, M. Investigating the Effectiveness of Using Application-Based Science Education Videos in a General Chemistry Lecture Course. *J. Chem. Educ.* 2019, 96, 479– 485, DOI: 10.1021/acs.jchemed.8b00777
 12. Phipps, L. R. Creating and Teaching a Web-Based, University-Level Introductory Chemistry Course That Incorporates Laboratory Exercises and Active Learning Pedagogies. *J. Chem. Educ.* 2013, 90, 568– 573, DOI: 10.1021/ed200614r
 13. Winkelmann, K.; Keeney-Kennicutt, W.; Fowler, D.; Macik, M. Development, Implementation, and Assessment of General Chemistry Lab Experiments Performed in the Virtual World of Second Life. *J. Chem. Educ.* 2017, 94, 849– 858, DOI: 10.1021/acs.jchemed.6b00733
 14. Ballester M, VanHoozen B, Sikora AK. (2020); Stay calm and focus on the learning outcomes: Tools for taking biophysical chemistry online. *Biochem Mol Biol Educ.* 2020;1–2. <https://doi.org/10.1002/bmb.214212>

15. Ma, J.; Nickerson, J. V. Hands-on, simulated, and remote laboratories: A comparative literature review. *ACM Computing Surveys (CSUR)* 2006, 38 (3), 7
16. Perkins, K.; Adams, W.; Dubson, M.; Finkelstein, N.; Reid, S.; Wieman, C.; LeMaster, R. PhET: Interactive simulations for teaching and learning physics. *Phys. Teach.* 2006, 44 (1), 18–23.
17. Clark, T. M.; Chamberlain, J. M. Use of a PhET interactive simulation in general chemistry laboratory: Models of the hydrogen atom. *J. Chem. Educ.* 2014, 91 (8), 1198–1202.
18. Winkelmann, K.; Keeney-Kennicutt, W.; Fowler, D.; Macik, M. Development, Implementation, and Assessment of General Chemistry Lab Experiments Performed in the Virtual World of Second Life. *J. Chem. Educ.* 2017, 94 (7), 849–858.
19. Reece, A. J.; Butler, M. B. Virtually the Same: A Comparison of STEM Students Content Knowledge, Course Performance, and Motivation to Learn in Virtual and Face-to-Face Introductory Biology Laboratories. *Journal of College Science Teaching* 2017, 46 (3), 83–89.
20. Woodfield, B. F.; Andrus, M. B.; Andersen, T.; Miller, J.; Simmons, B.; Stanger, R.; Waddoups, G. L.; Moore, M. S.; Swan, R.; Allen, R.; Bodily, G. The virtual ChemLab project: A realistic and sophisticated simulation of organic synthesis and organic qualitative analysis. *J. Chem. Educ.* 2005, 82 (11), 1728–1735.
21. Hawkins, I.; Phelps, A. J. Virtual laboratory vs. traditional laboratory: Which is more effective for teaching electrochemistry? *Chem. Educ. Res. Pract.* 2013, 14 (4), 516–523.
22. Bloom, B. S.; Engelhart, M. D.; Furst, E. J.; Hill, W. H.; Krathwohl, D. R. *Taxonomy of Educational Objectives, Handbook I: The Cognitive Domain*; David McKay: New York, 1956.
23. Simpson, E. *Educational Objectives in the Psychomotor Domain*. In *Behavioral Objectives in Curriculum Development: Selected Readings and Bibliography*; Educational Technology Publications: Englewood Cliffs, NJ, 1971.
24. Krathwohl, D. R.; Bloom, B. S.; Masia, B. B. *Taxonomy of Educational Objectives, Handbook II: Affective Domain*; David McKay Company. Inc., New York, 1964; Vol. 1.
25. Winkelmann, K.; Scott, M.; Wong, D. A study of high school students' performance of a chemistry experiment within the virtual world of second life. *J. Chem. Educ.* 2014, 91 (9), 1432–1438.
26. Woodfield, B. F.; Catlin, H. R.; Waddoups, G. L.; Moore, M. S.; Swan, R.; Allen, R.; Bodily, G. The virtual ChemLab project: a realistic and sophisticated simulation of inorganic qualitative analysis. *J. Chem. Educ.* 2004, 81 (11), 1672–1678.

27. Pyatt, K.; Sims, R. Virtual and physical experimentation in inquiry-based science labs: Attitudes, performance and access. *J. Sci. Educ. Technol.* 2012, 21 (1), 133–147.
28. Enneking, K. M.; Breitenstein, G. R.; Coleman, A. F.; Reeves, J. H.; Wang, Y.; Grove, N. P. The Evaluation of a Hybrid, General Chemistry Laboratory Curriculum: Impact on Students' Cognitive, Affective, and Psychomotor Learning. *J. Chem. Educ.* 2019, 96 (6), 1058–1067.
29. Dyer, J. M.; Pettyjohn, H. C.; Saladin, S. (2020); Academic Dishonesty and Testing: How Student Beliefs and Test Settings Impact Decisions to Cheat. *Journal of the National College Testing Association* 2020, 4(1), 1–30
30. Paul, J.; Jefferson, F. A Comparative Analysis of Student Performance in an Online vs. Face-to-Face Environmental Science Course from 2009 to 2016. *Frontiers in Computer Science* 2019, 1, 7, DOI: 10.3389/fcomp.2019.00007
31. Dixon, M. D. Creating Effective Student Engagement in Online Courses: What Do Students Find Engaging? *Journal of the Scholarship of Teaching and Learning* 2010, 10, 1–13
32. Smith, J.; Wilson, S. B.; Banks, J.; Zhu, L.; Varma-Nelson, P. Replicating Peer-Led Team Learning in Cyberspace: Research, Opportunities, and Challenges. *J. Res. Sci. Teach.* 2014, 51, 714–740, DOI: 10.1002/tea.21163
33. Stockman, B. J. Student-Led Engagement of Journal Article Authors in the Classroom Using Web-Based Videoconferencing. *J. Chem. Educ.* 2015, 92, 120–123, DOI: 10.1021/ed500566j
34. Lichter, J. Using YouTube as a Platform for Teaching and Learning Solubility Rules. *J. Chem. Educ.* 2012, 89, 1133–1137, DOI: 10.1021/ed200531j

CHAPTER VIII

A SCALE ADAPTATION AND APPLICATION STUDY FOR SECONDARY SCHOOL STUDENTS' 21st CENTURY SKILLS¹

Münevver Mehtap KARAKAŞ* & Prof. Dr. Şengül S. ANAGÜN**

Science Teacher, Burdur, Turkey

e-mail: m.mehtap.c@gmail.com, Orcid ID: 0000-0001-7612-8295

Prof. Dr., Eskisehir, Turkey

e-mail: ssanagun@ogu.edu.tr, Orcid ID: 0000-0002-8011-0730

Introduction

Human capital with creative knowledge and skills is needed depending on the conditions of the changing age. This tendency forces individuals to gain valuable knowledge and skills and to develop socio-cultural tools such as language and information and communication technology (ICT) (Kang et al., 2010). While individuals with “intellectual” knowledge are defined as strong in an industrial society, today, the training of individuals who design new products and processes using information to solve complex life problems comes to the fore. From this point of view, individuals living in an information society should have important skills such as problem solving, creative and critical thinking skills. In addition to cognitive skills, social skills are also needed in the 21st century. The learners of the new age, born after 1980, have increased the society to the most advanced digital technology age with daily life. The teaching and learning environment for the learners of the new age is especially influenced by superior computer and internet technologies. In line with the basic competencies of the learners of the new age; it is necessary to equip future students with 21st century skills to adapt to the changing age and to prepare appropriate education (Kang et al., 2010).

Turkey has launched a number of reforms to equip students with the 21st century skills. Therefore, the constructivist approach adopted in the curriculum aims to equip students with different skills. These skills are listed as; using Turkish well, problem solving, scientific research, creative thinking, entrepreneurship, communication, using information and technologies and critical thinking skills (MEB, 2006). Furthermore, it is aimed to gain some 21st century skills such as creativity, entrepreneurship, communication skills, teamwork and self-responsibility to reach the scientific knowledge with the life skills and scientific knowledge that emerges from the science curriculum (MEB, 2013).

¹ *This study is a part of first authors master thesis

As the 21st century skills include the skills and competencies necessary for lifelong learning, it is important for secondary school students to acquire these skills. Therefore, educators have a responsibility to determine students' characteristics and to develop their 21st century skills (Shin & Lee, 2008). Students' gaining 21st century skills is especially important in the secondary school period when cognitive, affective and socio-cultural skills are shaped (Slavin, 2000). However, there are no studies conducted to measure the 21st century skills. With this study, the 21st century skills of the secondary school eighth grade students for the Science course will be measured.

21st century skills

National and international research institutions are making great efforts to identify the skills and competencies that have been emphasized in the 21st century, which emerged in parallel with the rapid development of information and communication and the rapid growth of the global economy. These broad cognitive and affective abilities that support success are called 21st century skills today and they are classified in various sub-categories. In this chapter, the 21st century skills will be examined within the framework of the studies carried out by international research institutions.

The Partnership for 21st Century Skills (P 21) has revealed a comprehensive framework for different conceptualization of key skills for university and workforce, grouped into 3 main and 17 sub-themes. *Learning and regeneration skills* include creativity, innovation, critical thinking, problem solving, communication, collaboration sub-fields, while *Information, media and technology skills* include information literacy, media literacy and technology literacy subfields, and *Life and career skills* are expressed in the subfields of flexibility, adaptability, assertiveness, self-management, social and intercultural skills, productivity, responsibility and leadership (Partnership for 21st Century Skills, 2009).

The National Research Council (NRC) hosted several workshops and seminars that began in 2005. Apart from this, based on the need to group knowledge and skills in university and career preparation, the skills mentioned are grouped as follows: *Cognitive skills*; critical thinking, non-routine problem solving and systematic thinking, *Interpersonal skills*; complex communication, social skills, teamwork, cultural sensitivity and dealing with diversity, *Inner-essential skills*; self-management, time management, personal development, self-regulation, compliance and executive functioning (Committee on the Assessment of 21st Century Skills, 2011).

The Assessment and Teaching of 21st Century Skills (ATC 21), the framework that it offers for the different arrangement of 21st century skills

is classified into four subgroups: *Ways of thinking*; creativity and innovation, critical thinking, problem solving and decision making, meta-cognition or learning to learn, *Ways of working*; communication and collaboration or teamwork, tools for work; information literacy and information and communication technologies (ICT) literacy, *Life in the world*; citizenship, life and career skills, personal and social responsibility (Binkley et al., 2010).

Lai and Viering (2012) stated that there are overlapping areas between P21, NRC, ATC21 frameworks. For example, the NRC cognitive skills category seem roughly equivalent of the P21 learning and innovation and the ways of thinking category of ATC 21. Similarly, it can be seen that NRC's personal skills category, P21 life and career skills category, and ATC 21's "life in the world" category are analogues. Finally, the P21's category of information, media and technology skills can be compared directly with the ATC 21's "tools for study" category. Therefore, the 21st century skills are discussed in five groups as critical thinking, creativity, cooperation, motivation, metacognitive skills. The structures shown in Table 1 respond to a very strong and established research base in education and psychology (Lai & Viering, 2012, p.6).

Table 1. *21st Century Skills Infrastructure Map*

Research-based structure (Lai and Viering (2012))	P21 Infrastructure terminology	NRC Infrastructure terminology	ATC 21 Infrastructure terminology
Critical thinking	Learning and innovation-, critical thinking	Cognitive - critical thinking	Ways of thinking - critical thinking, problem solving and decision making
Collaboration	Learning and innovation-communication and collaboration	Interpersonal - complex communication, social skills, teamwork	Ways of working - communication and collaboration
Creativity	Learning and innovation - creativity and innovation	Cognitive - non-routine problem solving	Ways of thinking - creativity and innovation

Motivation	Life and career skills initiative, flexibility	Internal - self-development, adaptability	Living in the World- adaptability, flexibility, selfdirection
Metacognition	Life and career skills - self-direction, productivity	Internal - self management, self regulation	Ways of thinking Metacognition or learning to learn

When 21st century skill classifications are analysed, it is seen that all categories are designed for university, career preparation and workforce. However, our research focuses on measuring 21st century skills of secondary school students. Therefore, the grouping study created by Kang et al. (2010) for high school, secondary school and primary school students shed light on our research. In line with previous studies, key competencies are classified within three areas as; cognitive, affective and socio-cultural space (Livingston & Bober, 2005; OECD, 2003; White, 1997). Table 2 shows the definitions of the major domain and subdomains.

Table 2. Dimensions of 21st Century Skills

Domain	Subdomain	Definitions of Subdomains
Cognitive	Information Management Skill	Tool usage, use of resources, questioning skills
	Information Structuring Ability	Information processing, reasoning skills, critical thinking
	Information Usage Ability	Analytical skills, judgment and evaluation, producing solutions
	Problem Solving Ability	Metacognition, creative thinking skills
Affective	Self-identity	Self-perception, self-esteem, self-respect
	Self-value	Awareness, reliability, honesty
	Self Management	Self- efficacy, goal setting, obligation (responsibility)
Socio-cultural	Self-responsibility	Assertiveness, resistance (persistence), responsibility
	Social Membership	Social value system, sense of community, global citizenship
	Social Sensitivity	Intercultural understanding, tolerance to differences
	Socialization Ability	Language fluency, intercultural communication skills, communication skills
	Social Performance (fulfilment)	Leadership, teamwork and fulfilment of social services

In this research, it is aimed to adapt a measurement tool that can be used in determining the 21st century skills of the secondary school eighth grade students and to examine the 21st century skill levels of the secondary school eight grade students. For this purpose, answers to the following questions were sought:

1. In the process of the adaptation of the 21st Century Skills Scale to Turkish culture;
 - Is the linguistic equivalence of the Turkish form with the original form ensured?
 - Does the three-factor measurement model comply with the data?
 - What is the reliability coefficient of the scale?
2. What are the “21st century skill” levels of the secondary school eighth grade students towards the Science course?
 - What are the “21st century Cognitive skill” levels of the secondary school eighth grade students towards the Science course?
 - What are the "21st century Affective skill" levels of the secondary school eighth grade students towards the Science course?
 - What are the “21st century Socio-cultural skill” levels of the secondary school eighth grade students towards the Science course?

Method

The research involves two basic studies. In the first part, the "21st Century Skills" scale was adapted to Turkish culture, in the second one, the 21st century skills levels of secondary school students were determined. In the first phase, a quantitative method used in the stages of scale adaptation was followed. The second phase is structured as a mixed method that includes more than one research method and uses quantitative and qualitative methods together (Cresswell, 2009). Quantitative data was collected first, and then qualitative data was collected to explain the quantitative data and make it more understandable. Therefore, “explanatory mixed method research” was used.

Study 1: Scale Adaptation

The 21st Century Skills Scale developed by Kang, Kim, Kim and You (2012) was adapted to Turkish. There are 33 items in the original scale. These items consist of 3 main dimensions (cognitive, affective and socio-cultural) and 12 sub-dimensions. The classification of the scale according to its dimensions is given in Table 3. The scale is a 5-point Likert type scale and it is evaluated as; "1" I Strongly Disagree, "2" I Disagree, "3" I am Neutral, "4" I Agree and "5" I Strongly Agree.

Table 3. *Sub-domains and Items of Scale Questions*

Domain	Subdomain	Scale items of the sub-domain
Cognitive	Information Management Skill	1, 2, 3, 4
	Information Structuring Ability	5, 6, 7, 8
	Information Usage Ability	9, 10
	Problem Solving Ability	11, 12, 13
	Self-identity	14, 15
Affective	Self-value	16, 17, 18
	Self Management	19, 20

	Self Responsibility	21, 22, 23
	Social Membership	24, 25
Socio-cultural	Social Sensitivity	26, 27, 28
	Socialization Ability	29, 30
	Social Performance (fulfilment)	31, 32, 33

In this process, firstly, permission was demanded from Kang. Then, the process of translation from English to Turkish was done. Then, the scale was translated into English again by field experts, and the compatibility between the translations was examined. After necessary corrections, the scale was finalized. In the following stage, “Confirmatory factor analysis” was conducted to ensure structural validity. This analysis is generally used in scale development and validity analysis or it aims to verify a predetermined scale (Bayram, 2010). In this context, the analysis was carried out on 300 students studying in the 8th grade of four secondary schools. Compiled data were analyzed with DFA with the help of LISREL package programme. In the final stage, the Cronbach alpha coefficients of the sub-dimensions were calculated for the reliability of the scale.

Study 2: Examining the 21st Century skill levels of secondary school 8th grade students

The participants are 1067 secondary school students studying in the 8th grade and selected by the convenient sampling method. 499 of the participants are female students and 568 are male students. During the application, students were given 1 lesson-duration which is 40 minutes, to answer the 21st century skill scale.

After the application of the scale, qualitative data were collected through semi-structured interviews. The following steps were followed in the form prepared for the interviews:

- The draft interview form was created based on the analysis of the quantitative data. Later, the interview form was examined by three faculty members expert in the field and necessary corrections were made.
- To get students' opinions and conduct an in-depth examination, six randomly selected students from each classroom and the teachers were asked about their opinions regarding the form.
- As a result of the preliminary interviews, the interview form was finalized. There are 12 questions in the interview form. The first question consists of questions regarding students' personal information (such as school, classroom info). Question 2 is about ways to access information, 3rd, 4th and 6th questions are related to reactions to problems. The 5th question is about the relation of the course with life. Questions 7 and 8 talk about student responsibilities. The 9th, 10th, 11th and 12th questions are related to friendship relations.

- Semi-structured interviews were held one-on-one with 15 students students, with the consent of their parents. Interviews were held in a place suitable for the interview at the school.
- During the interviews, notes were taken manually, but a voice recorder was used to eliminate possible shortcomings and misunderstandings, by taking permission from the interviewees.
- The interviews took about 20-25 minutes. Then, the audio recordings were transcribed by the researcher. Later, the data were evaluated by descriptive analysis.

Sample

- The participants were selected with the appropriate sampling method for the first study of the research. This method refers to a process that starts from the most accessible participant and continues until the required size or reaches all possible participants in the current time frame (Cohen, Manion, & Morrison, 2007).
- In this context, the study included four different study groups. Linguistic equivalence studies were performed on the first group while structural validity and internal consistency analysis were performed on the second group. The third group, on the other hand, constituted the working group for determining the 21st century skill levels of secondary school 8th grade students.
- Four linguists and six students participated in the linguistic equivalence study. Face to face interviews were held with the students.

Analysis and Interpretation of Data

As a quantitative data collection tool in the research; "21st Century Skill Scale" was used. Quantitative data obtained for the solution of research problems were analyzed in line with the research questions. Relevant statistical analyses were made in the analysis of the data. Within-group comparisons were made to answer the research problems. In data analysis, the sample was tested with descriptive statistics method to determine whether it shows normal distribution in terms of the tested variables. In data analysis, besides descriptive statistics, procedural statistical methods were also used. They are Single Sample Kolmogorov-Smirnov test, Non-Parametric Mann Whitney-U test and Kruskal-Wallis test techniques. The .05 significance level was taken as a criterion in the interpretation of the findings.

Interpretation of qualitative data

The analysis of the data was carried out using descriptive analysis method. In the analysis of the qualitative data, the sub-dimensions of the scale were accepted as themes. In the presentation of the data; research questions and questions used in the interview were taken into account.

Direct quotations are usually made to reflect the opinions of the individuals interviewed (Yildirim & Simsek, 2005). In this way, it was possible to compare the 21st century skills of students with both scale results and interview results. The findings reached through the analysis of qualitative data are presented under the headings related to the themes and interview questions.

Findings

In the presentation of the findings, firstly, findings related to the adaptation of the scale are given, and then quantitative and qualitative findings related to the 21st century skill levels of the students are given.

Language validity

In the scale adaptation studies, translations from the target language to the source language constitute the most important part of the adaptation study. For this reason, the translation of the scale from English to Turkish was made by two lecturers with field knowledge and English linguistic proficiency. Then, these two translation texts, along with the original text of the scale, were examined by experts working as faculty members in Eskişehir Osmangazi University Faculty of Education, Department of Elementary Education and Department of Educational Sciences (n=7) and faculty members were asked to determine the most appropriate items from the expressions in the translations. With the adjustments made after this process, the scale has taken its new form with Turkish items. Later, the Turkish text was given to two referees who were experts in the field of English and translated it into English. Next, it was decided that the original text and the Turkish text were relevant.

As a result of the translation process, the scale was read out by six 8th grade students selected from the eighth grade to read the scale and language comprehension was tried to be determined according to their levels. During the application, the students were asked about the items they had difficulty in understanding. These items were marked and then necessary arrangements were made in line with the feedback received and the scale was finalized.

Construct validity

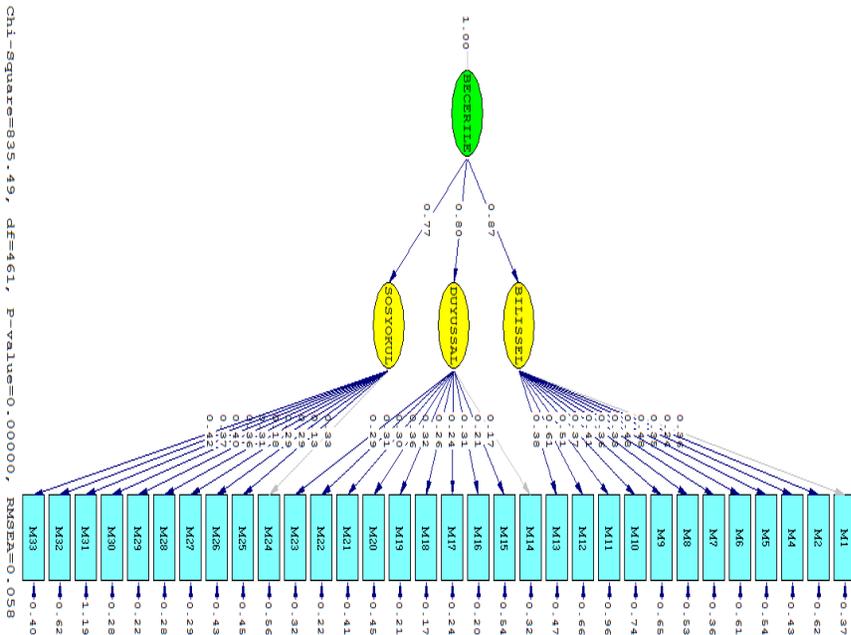
Confirmatory Factor Analysis was conducted to examine whether the 21st century Skills Scale shows the factor structure of the original form also in Turkish culture. To prepare the data for analysis, firstly, the extreme values in the data set were examined and z scores were calculated for each item. Values with z points less than -3 and greater than +3 were accepted as extreme values and after these data were removed from the data set, the analyses were made on the data of 245 people remaining in the data set.

Although the model established in the first stage showed compatibility with the data, it was observed that the item 3 in the Cognitive sub-dimension did not show a significant load under this dimension ($t_{492} = 1.40$, $p > .05$). Therefore, item 3 was removed from the scale and confirmatory factor analysis was repeated with the remaining items. Accordingly, the goodness of fit statistics obtained according to the results of the confirmatory factor analysis are given in Table 4.

Table 4. 21st Century Skills Confirmatory Factor Analysis Fit Indexes.

Fit Index	Value	comment
χ^2	817.23	($p < .05$)
sd	461	
χ^2 / sd	1.77	Perfect Fit (Tabachnick and Fidell, 2007)
RMSEA	.058	Good fit (Tabachnick and Fidell, 2007)
SRM	.070	Good fit (Hu and Bentler, 1995)
CFU	.090	Good fit (Hu and Bentler, 1995)
AGFI	.70	Not compatible

Figure 1 shows the path diagram of the confirmatory factor analysis result.



As a result of the confirmatory factor analysis, it can be seen that 32 items were gathered in 3 sub-dimensions. At the same time, these three sub-dimensions are gathered under one dimension. When the fit indexes are analyzed, it is seen that only the AGFI index is not compatible but other fit indexes provide model - data fit. In this case, as a result of confirmatory

factor analysis, it can be said that the factor structure and the data showed fitness.

Findings Regarding the 21st Century Skill Levels of Secondary School Students

The 21st century skill levels of secondary school eighth grade students towards the Science course were tried to be determined by evaluating their answers to the questions in the 21st century skills measurement scale. The scale applied measures the 21st century skills in three different dimensions (cognitive, affective, and socio-cultural). Thus, the scale was analyzed in 3 different categories and statistical analyzes were carried out in three separate categories.

Cognitive skill levels of secondary school students

Information about the 21st century cognitive skill levels of secondary school eighth grade students for the Science Course is presented in table 5.

Table 5. Arithmetic Mean, Standard Deviation, Minimum and Maximum Values regarding the Students' 21st Century Cognitive Skill Levels

Dimension	I	I s. disagree		I do not agree		I am Neutral		I agree		I s. agree		\bar{X}	ss			
		F	%	f	%	f	%	f	%	f	%					
Information Management Skill	1	15	1.4	27	2.5	1	86	17	4	02	7	337	31	4:0 4	0.84	
	2	18	1.7	61	5.7	1	65	15	3	66	.3	4	67	42.8	4:1 0	0.97
	3	13	1.2	37	3.5	1	96	18	4	43	41	3	78	35.4	4:0 6	0.88
<i>Total</i>												4:0 6	0.89			
Information Structuring Ability	4	31	2.9	70	6.6	2	69	25	3	59	33	338	31	3.8 4	1:03	
	5	37	3.5	93	7.8	2	58	24	4	08	2	271	25	3.7 3	1:04	
	6	9	0.8	38	3.6	1	51	2	3	14	93	36	475	44	4:2 0	0.87
<i>Total</i>												4:0 6	0.98			
Information Usage Ability	8	35	3.3	82	7.7	2	58	24	3	91	36	301	28	3.7 8	1:04	
	9	48	4.5	91	8.5	3	35	31	3	79	35	214	20	3:5 8	1:04	
	<i>Total</i>												3:6 8	1:04		
<i>Total</i>												3:3 7	1:11			
	10	57	5.3	170	15.9	3	50	32	2	8	27	199	18	3:3 7	1:11	

Problem Solving Ability	11 th	63	5.9	11 8	11 .1	3 56	33 .4	3 41	32 .0	189	7. 17	3:4 4	1:08
	12	12	1.1	47	4. 4	1 96	18 .4	4 49	42 .1	363	34 .0	4:0 3	0.89
<i>Total</i>												3.6 1	1:02
TOTAL												3.8	0.98

According to Table 5, students' Cognitive Skill Level averages (\bar{x} = 3.85) are high. When analyzed in terms of sub-dimensions, the Information management skill averages (\bar{x} = 4.06) and Information structuring ability averages of students (\bar{x} = 3.95) are above the average. The average of Information usage ability (\bar{x} = 3.68) and the problem solving ability average (\bar{x} = 3.61) are at the intermediate level. When the "Information Management Skill" is analyzed based on sub-dimension, it is seen that students mostly benefit from other information sources (\bar{x} = 4.10). Based on the sub-dimension of "Information Structuring Ability", it can be seen that students try to understand their questions while studying the most (\bar{x} = 4.20). Based on "Information Usage Ability" sub-dimension, students use the information they learn in the lesson in their daily lives (\bar{x} = 3.78) the most. When analysed at the sub-dimension of the "Problem Solving Ability", it is seen that students try to deal with the problem calmly the most (\bar{x} = 4.03).

Qualitative Findings

Ways to access information

In order to reach the information, students said that they conducted their searches not only from the internet but also from different sources. However, they also stated that the diversity of information and the fastest and most reliable way is the internet. Furthermore, students had the opportunity to deepen their knowledge by conducting research from various sources. Students stated that they also increased their competence in diversifying knowledge during their searches. An example of student views on this topic is given below:

I usually access information on the internet; I think the internet is the fastest and most reliable way to access information. If I have enough time, I also search from reference books and magazines (S8).

Information structuring

Regarding the process of information structuring, which is a sub-theme of the cognitive information theme, students said that they created and interpreted the information according to the results of the research they conducted themselves or from various sources. They also stated that they interact with different people:

First of all, as far as I can, I try to find information, understand it, structure it in my mind, look at the notes I took during the lesson from my notebook when I cannot understand. If I cannot find the information I am looking for, I look at books. If I get a high grade from the exam, I say it is okay (S2).

Information usage

When the views of students about the use of information are examined; students said that they used their knowledge of Science lessons in their daily lives and that they shared this information with the people around them and that they were beneficial to others in that way. Students' reflections of the information they have learned is an indication that they have gained higher-order thinking skills. A student expressed his/her view on this as follows:

S1: For example, when my mother cooks at home, I tell her to put the salt later. If she puts the salt in advance, the food will cook late. Our teacher gave us this information during an experiment.

Problem solving

There are two categories of the problem solving sub-theme; metacognitive and creative thinking, which are among the most important 21st century skills. All students emphasized that they try to solve the problems they face and that learning is more permanent with this method. This shows that students follow a metacognitive way. They stated that if the problem could not be solved despite all efforts, they would receive help from the people around. It was also found that many students bring unusual creative solutions to the problem. This is an indication that students are free from ordinary thinking patterns and have a creative perspective. In addition, students' use of these two important skills proves that they have high-level thinking skills.

I try to deal with my problem first myself. In this way, I would think that I have found more permanent and creative solutions to my problem. If I can't solve it by myself, I get help from my friends. Finally, I ask my teacher for help or use the internet (S1).

Affective skill levels

Information regarding the 21st century affective skill levels of the secondary school eighth grade students for the Science course is presented in table 6.

Table 6. Arithmetic Mean, Standard Deviation, Minimum and Maximum Values regarding the Students' 21st Century Affective Skill Levels

Sub Conte nt	Scale Item	I s. disagree		I do not agree		I am neutral		I agree		I s. agree		\bar{X}	ss
		f	%	f	%	f	%	f	%	f	%		
Self- identity	13	12	1.	15	1.4	70	6.	26	25.	70	65.	4:5	0.77
			1				6	7	0	3	9	3	
	14	18	1.	32	3.0	14	13	30	28.	56	53.	4:2	0.92
			7			8	.9	2	3	7	1	8	
<i>Total</i>												4:4	0.84
												0	
Self- value	15	7	0.	12	1.1	53	5.	30	28.	68	64.	4:5	0.70
			7				0	6	7	9	6	5	
	16	13	1.	22	2.1	88	8.	31	29.	62	58.	4:4	0.82
			2				2	8	8	6	7	2	
17	6	0.	16	1.5	46	4.	33	30.	66	62.	4:5	0.70	
			6				3	0	9	8	6	3	
<i>Total</i>												4:5	0.74
												0	
Self Manage ment	18	6	0.	18	1.7	81	7.	32	30.	63	59.	4:4	0.75
			6				6	5	5	7	7	7	
	19	32	3.	51	8.4	18	17	38	36.	41	39.	4:0	1:01
			0			2	.1	5	1	7	1	3	
<i>Total</i>												4:2	0.88
												5	
Self Responsi bility	20	15	1.	34	3.2	14	14	41	38.	45	43.	4:1	0.88
			4			9	.0	0	4	9	0	8	
	21	9	0.	24	2.2	91	8.	33	31.	61	57.	4:4	0.80
			8				5	3	2	0	2	1	
22	11t	1.	34	3.2	11	5.	31	29.	59	55.	4:3	0.86	
	h	0				2	10	5	5	5	8	5	
<i>Total</i>												4:3	0.84
												1	
TOTAL												4.3	0.8

According to Table 6, the students' Affective Skill averages ($\bar{x} = 4.37$) are very high. When analysed in terms of sub-dimensions, students' Self-identity averages ($\bar{x} = 4.40$) and Self-value averages ($\bar{x} = 4.53$) are above the average. Students' Self-management averages ($\bar{x} = 4.25$) and Self-responsibility averages ($\bar{x} = 4.31$) are also very high. When analyzed based on "Self-identity" sub-dimension, it was revealed that students knew their own characteristics the most ($\bar{x} = 4.53$). In the "Self-value" sub-dimension, it is seen that students fulfil their promise ($\bar{x} = 4.53$) the most. In the "Self Management" sub-dimension, it is seen that students pay attention to the things they do the most ($\bar{x} = 4.47$). In the "Self Responsibility" sub-dimension, students try to do their best in group learning environments the most ($\bar{x} = 4.41$).

Affective features depending on the qualitative data set of students are classified as; responsibility, coping with failure and moral values. Moral values are divided into categories of honesty, trust and respect.

Responsibility

Students stated that they fulfil the responsibility, which is a critical factor for success, in the best way. However, students perceived the questions about responsibilities only as “homework responsibilities” and giving appropriate answers accordingly. Another contribution of their homework is that they offer students the chance to plan what they want to learn. This shows that students' self-responsibility also improves. The students had the opportunity to choose the information they believed necessary for them from different sources other than books through searches. The views expressed by the students support this interpretation:

I first fulfil my responsibilities regarding the assignments I take in the lessons, and I prepare it beautifully. While preparing it, I search about that thing and collect information. Of course, I do not mind getting help from others. I try to fulfil that responsibility in the most perfect way and hand it in on time (S13).

Coping with Failure

Students stated that they exhibit very different behaviours against the ability to cope with failure, which is one of the sub-themes of the affective attitude theme. Some students said that they turned it into an opportunity and made self-evaluation and self-criticism. In this way, they stated that they both had the opportunity to follow a different path from before and correct their mistakes and they went to the way to learn from their mistakes. For instance, one student said:

First of all, I question myself; I search for the reasons why I failed. I criticize myself and try not to make the same mistakes in the following exams (S6).

A group of students, on the other hand, stated that they get desperate and sad by the failure and cannot be motivated to study like before.

Well, first of all, I cry, asking why I couldn't do it even though I studied. I feel offended; either I forget when I study or what I do is wrong and I am wrong. In fact, I sometimes criticize myself because my studying style is wrong, but I am generally not motivated, and unable to study like before (S15).

Failure prevents students from adapting to their lives and affects their life skills negatively. One student explained how the failure he/she experienced in a Science lesson affected his/her life with the following example:

If you want, let me start the topic by telling a memory of myself. Science exams are as difficult as some things in life. I was very happy until the third exam because my Science exams were very

good the year before; the first term was 4, the second term was 5, and this year my last two exams were 77 and 80 were. I had studied hard for that exam, but as it was immediately after the Turkish exam, all my knowledge was mixed up. Two days later, when the exam result was announced, I learned that I got 40 and I was so shocked that I never spoke on the school bus until I arrived home from school. There were guests for dinner at home. They said that they had never seen me so sad before, in fact, I was too sad to eat anything. As you can see the effect of failure on me is extremely huge. (S9).

Moral values

When the answers of the students to the criteria they consider important in making friends are examined, the moral values that they attach importance to have emerged. Among these moral values, they focused on honesty, trust and respect the most; they expressed that they care about tolerance, understanding and success. Many students said that friendship relationships should be built on trust and that they would end their friendships in an environment where there was no trust. An examples of student views suitable for this situation is as follows:

I will be friends with people who are trustable, honest, and able to lead me to good ways. Also, when he/she promises for something, he/she must fulfil it. I always need to trust him/her. He/She must share everything with me and mustn't tell me even a tiny lie (S1).

On the other hand, some students emphasized that it is important to have the same viewpoint and common aspects with their friends. This view is an indicator that students have a single point of view and are not closed to different viewpoints. An example of this view is given below:

The most important thing I value in making friends is to think about things in the same way. I can call it as looking at life through the same window. If my friend has a different opinion from me, it is not possible for me to get on with him/her most of the time (S15).

Socio-cultural skill levels

Information regarding on the 21st century Socio-cultural Skills levels of the eighth grade students of secondary school for the Science Course is presented in Table 7.

Table 7. *Arithmetic Mean, Standard Deviation, Minimum and Maximum Values regarding the Students' 21st Century Socio-cultural Skill Levels*

Sub Content	Scale Item	I s disagree		I do not agree		I am neutral		I agree		I s agree		\bar{X}	ss
		f	%	f	%	f	%	f	%	F	%		

Social Membership	23	2	1.	45	4.2	15	2.1	37	35.	476	44.6	4:1	0.94
		0	9			2	4	4	1			6	
	24	3	3.	32	3.0	11	10.	245	23.	64	60.4	4:3	0.9
		2	0			4	7		0	4		4	9
<i>Total</i>												4:2	0.9
												5	6
Social Sensitivity	25	1	1.	32	3.0	13	12.	387	36.	494	46.3	4:2	0.8
		7	6			7	8		3			2	9
	26	1	1.	19	1.8	90	8.4	367	34.	576	54.0	4:3	0.8
		5	4						4			7	2
	27	1	0.	21	2.0	85	8.0	194	18.	757	70.9	4:5	0.7
		0	9						2			6	9
<i>Total</i>												4:3	0.8
												8	3
Socialization Ability	28	1	1.	17	1.6	80	7.5	354	33.	602	56.4	4:4	0.8
		4	3						2			1	0
	29	1	0.	12	1.1	10	9.9	383	35.	556	52.1	4:3	0.7
		0	9			6			9			7	8
<i>Total</i>												4:3	0.7
												9	9
Social Performance	30	8	7.	14	13.	28	26.	342	32.	219	20.5	3:4	1:1
		2	7	0	1	4	6		1			4	7
	31	5	5.	58	5.4	36	33.	407	38.	182	17.1	3:5	1:0
		8	4			2	9		1			5	1
	32	2	2.	39	3.7	23	1.2	420	39.	345	32.3	3:9	0.9
		7	5			6	2		4			5	5
<i>Total</i>												3.6	1:0
												4	4
TOTAL												4.1	0.9

According to Table 7, students' Socio-cultural Skill averages are high (\bar{x} = 4.10). When analyzed in terms of sub-dimensions, the Social membership averages (\bar{x} = 4.25), Social sensitivity averages (\bar{x} = 4.38) and Socialization ability averages (\bar{x} = 4.39) of the students are above the average and very high. Their averages of social performance (\bar{x} = 3.64) are at medium level. When "Social Membership" is analyzed on the basis of sub-dimension, it is revealed that there are individuals (\bar{x} = 4.38) that students can share their feelings outside the school the most. When "Social Sensitivity" is analyzed based on sub-dimension, it is seen that students do not regard colour and race as a problem when making friends the most (\bar{x} = 4.56). When analyzed in terms of "Socializing Ability" sub-dimension, it is determined that students study in cooperation and peace the most (\bar{x} = 4.41). When it is analyzed in terms of "Social Performance" sub-dimension, it is seen that students contribute more than usual in group environments (\bar{x} = 3.95) the most.

Unlike the previous ones, the theme of socio-cultural behaviours associated with the newly created socio-cultural dimension as a result of new experiences, consists of sub-themes of teamwork, communication skills, leadership and social responsibility.

Team work

Group learning environments and experimental groups were researched to reveal the students' roles in teamwork. They said that permanent learning took place by taking the responsibility of the learning of the students actively working in group learning environments and experimental groups. The students stated that collaboration during team work had a positive effect on their permanent learning, and that their communication skills improved thanks to their cooperation networks. They stated that they wanted to apply this practice not only in the Science Course but in all courses. Students also stated that their thinking skills improved in group learning environments. This statement of students shows that high-level thinking skills are put into practice through teamwork.

Working as a team helps me understand the lessons better. Through mutual communication, everyone shares the information they know with others. In this way, there can be both a variety of information and it enables us to have information about the parts that are not understood (S6).

Students said that they had different perspectives and learned to look at a problem from different perspective with teamwork. They also stated that they understood the lesson better and permanently in group teaching rather than in individual learning. Another benefit of group learning is that students, who stated that they sat at their seats in the classroom in their past practices, preferred learning by doing rather than learning from the course book, and stated that more permanent and efficient learning was realized. An example taken from student opinions on this subject is given below:

I think group learning is more useful than individual learning, because everybody says his/her opinion, so we have the opportunity to look at the topic from different perspectives. In addition, our mutual communication skills are improving (S8).

Communication skill

The Communication skill, which is in the Skill dimension of the 2013 Science Programme, is one of the most important skills that students should have in the 21st century. When students' views on this issue are examined, it is seen that some students have gained this skill. Generally, the students who define themselves as leaders do not have any problems in social communication. However, while some students show abstaining behaviour only during the lesson due to lack of self-confidence, some students say that they have problems with their friendship relationships outside the school. Students stated that they did not discriminate especially against individuals of different races and colours, in their friendship

relations. This is an indication that this skill is gained by most students. Students' views appropriate for these comments are given below:

I get on well with my friends. I have no friends who I quarrelled or had a problem with; we get along well with each other. I am said to be very successful in mutual communication. I'm a little more timid about friendships outside the school; I can't go and meet someone right away. I communicate with everyone regardless of their colour and race (S13).

Some students remarked that they constantly had problems in their communication with their friends and teachers. They said that they were very worried that they had problems especially during the lesson or in new friendships. It is a pity that the communication skill, which is one of the most important 21st century skills, has not been achieved by some students. An examples of this case is as follows:

I am generally reserved. I have a problem of communicating, especially when someone new comes to the class. I cannot be said to be successful in interpersonal communication (S4).

Leadership

Leadership, which has a very important place for socio-cultural behaviour, has a very important place for students in the 21st century. When student views are examined, it can be seen that many students have this skill. Leadership has a positive effect on the increase of students' self-confidence. When the views of the students who undertake the leadership role are examined, it can be said that they are generally students with developed self-confidence. The opinions of students suitable for this situation are given below:

Leadership is very important to me, especially in group environments. When I am the leader, I both manage the group and have a voice. In this way, I feel more secure (S7).

In the ideal leadership understanding of the 21st century, leadership is shared by all students, not the classroom environment where a single student is the leader. Some students said that in the groups they formed in the classroom, there was no single leader and that everyone in the group shared the leadership. This is the most ideal leadership behaviour for this century. One student opinion that fit this interpretation is as follows:

In our classroom, our teacher shares leadership equally to everyone. Everyone has the right to speak in our group works. When we were at primary school, the same people would always be the group leader. I would feel very sorry then. However, now we are all group leaders. I am very happy about this situation (S12).

A student who has a lack of self-confidence explained that he/she was very reluctant to be a leader, so she always wanted another friend to be the leader, saying:

Meanwhile, I am a bit shy about being a group leader and I would like another friend to be the group leader. I don't trust myself that much. I think my confidence has not developed enough (S9).

In the 21st century ideal leadership approach, leadership should be distributed equally among all students, not just to one student. However, as supported by the opinions received from the students, some teachers are inadequate in this regard. Giving leadership to a single student is the greatest injustice to be made for other students. For these reasons, distributing the leadership to all students should be the basic rule in this age of science.

Social responsibility

By looking into the student opinions, it can be said whether they have social responsibilities towards other people or not. Students say that they try to fulfil all responsibilities especially in group environments. The student opinions that fit this interpretation are listed below:

If I have been assigned a task, I try to do it thoroughly; I perform my duty in my group without defect (S1).

Conclusion

In the process of adapting the 21st Century Skills Scale to Turkish culture, it is determined that the Turkish form of the scale and its original form provided language and structure validity and ensured sufficient conditions in terms of reliability. In the quantitative dimension of the second stage of the research, the 21st century skills were measured in three different dimensions as *Cognitive, Affective and Socio-cultural skills*. In its qualitative dimension, they were examined in three dimensions: *Cognitive information, Affective attitudes and Socio-cultural behaviour*.

It is determined that the information management, information structuring, information usage and problem solving skill averages in the cognitive skill sub-dimension of the scale are high in the eighth grade students. It is concluded that students use the other information sources the most while managing the information. Findings from the qualitative data also support this view. It is revealed that students perform their research by using different sources in order to reach information. It is concluded that they examine different perspectives to ensure that they have the right information and to reach more information diversity, and thus they diversify and deepen their knowledge. It is understood from the research results that students have the ability to structure information. Students construct knowledge by trying to understand their questions while studying

and by communicating with other people. Findings obtained from qualitative data are also in the same direction. It is concluded that students construct and interpret information according to the research results by conducting searches or structure it by interacting with different people. It is concluded that students use the information they learned in the lesson in their daily lives the most. The findings obtained from qualitative data also support this finding. It is revealed that students use their knowledge of Science lessons in their daily lives, share this information with people around them, and thus they are beneficial to others. It is concluded that transferring information to life contributes to the permanent structuring of information as well. In addition, the reflection of the learned information is an indicator of the students' gaining higher-order thinking skills. Their averages of problem solving ability, which is one of the cognitive skill sub-dimensions, are high. It is concluded that the students try to deal with problems calmly the most. Qualitative data also support this view. It is concluded that all students try to solve the problems they face by themselves and that learning with this method is more permanent and metacognitive. It is concluded that students find creative solutions to their problems the least. Findings from qualitative data do not correspond to this view. In qualitative data, it is concluded that most students bring unusual creative solutions to the problem.

Another result of the research is that students' affective skill levels are *very high*. The averages of self-identity, self-value, self management and self responsibility included in the affective skill sub-dimension were found to be very high. It is concluded that students are aware of their own characteristics and have dreams and goals that they can pass them on to others. Self-value averages, which are among the affective skill sub-dimensions, were calculated very high. The most important value is the fulfilment of the promise and honesty. This view is supported by the findings obtained from qualitative data. It has been revealed that students focus on honesty, trust, respect the most and they care about tolerance, understanding and success. It is concluded that students have the ability to manage themselves, pay attention to the work they do, and try to find the causes of their failure. When the qualitative findings were analyzed, the methods of coping with the failure of the students were revealed. It has been determined that students display very varied behaviours against failure. It has been concluded that some students turn it into an opportunity to make self-evaluation and self-criticism, while some students experience hopelessness and low motivation in the face of failure. It is determined by the results of the research that students also have a high level of self-responsibility. It has been revealed that students try to do their best in group learning environments and fulfil their responsibilities regarding homework. Findings from qualitative data are also in the same direction. It has been found that students realize permanent learning and plan what they

want to learn by taking responsibilities of both their homework and their learning, and that their self-responsibility also improves by this means.

Research results show that students' socio-cultural skill levels are *high*. Social membership, social sensitivity and socialization ability averages, which are sub-dimensions of socio-cultural skills, were found to be very high. When analysed on the basis of sub-dimension, it was concluded that there are individuals who can share their emotions out of school the most, and after that, it is important to meet new people. In the results, it was found that students did not make discrimination in terms of making friends, colour and race the most. Communication skill theme findings obtained from qualitative data also showed similar results. Students stated that they do not discriminate against individuals of especially different races and colours in friendship relations the most. While the quantitative findings also revealed that students had a good relationship with their friends with original personality and new students, qualitative findings revealed differently that they had problems and were very worried about new friendship. The mean of students' socialization ability is above the average and very high. When analysed in terms of the socialization ability sub-dimension, it is determined that students worked in collaboration and peace the most and that they had friendship skills. Qualitative findings also support this view. Students stated that collaboration during team work had a positive effect on their permanent learning, and that their communication skills also improved thanks to their cooperation networks. According to the results of the research, the average social performance of the students in the socio-cultural skills sub-dimension is at the medium level. When analyzed in terms of social performance sub-dimension, it is seen that students contribute more than usual in group environments the most. Qualitative data also supports this frame of mind. They stated that students, who take active roles in group learning environments and experimental groups, take responsibility for their learning and carry out permanent learning. In the social responsibility sub-theme of the qualitative data theme, students likewise say that they try to fulfil all responsibilities especially in group environments. Students did not prefer the task of taking the leadership much in the other part of the social performance sub-dimension. Similar to the quantitative findings, in qualitative data, it was observed that some students prefer leadership and some students abstain from it.

Discussion and Suggestions

The original form of the scale, which was adapted to Turkish, was developed with the participation of 496 Korean primary school students. The results of the research revealed that the scale includes appropriate structures that can measure 21st century skills of students and is a valid and reliable tool. In this context, it is concluded that the scale can be used

as a reliable and valid measurement tool similar to the original scale to measure the 21st century skill levels of the secondary school students in Turkey. In the study conducted by Gunuc, Odabasi and Kuzu (2013), 21st century student characteristics are defined as personal skills, research and knowledge acquisition, creativity, innovation and career skills and technology skills. Osman, Soh and Arsad (2010) developed a 21st century skill scale to be used in teaching in their studies, and identified these skills as digital literacy age, creative thinking, effective communication, high efficiency and spiritual values. It can be said that the 21st century skills determined by these two studies are in line with the 21st century skills examined in our study. In the research, the 21st century skills scale was used to determine the 21st century skills of students. Similarly, Osman, Soh and Arsad (2010), Kang et al. (2010) and Sukor, Osman and Abdullah (2010) observed the 21st century skill level of students in their studies with quantitative tools. In terms of data collection tools, it can be said that the research uses tools parallel to the tools used in other studies in the literature. In the second stage of the research, the scale was tested. The results obtained from the scale revealed that the eighth grade students' 21st century skill levels were high. Similarly, Calisici and Ozcakil-Sumen (2017) used the scale adapted to Turkish by us in their research. The results obtained on the scale applied to secondary school students at different grade levels are in line with the results of this research. This situation can be interpreted as ensuring the cultural compatibility of the scale.

In the research, the levels of students having 21st century skills towards the Science course were found to be high. In a similar study conducted by Gulen (2013), it is determined that students have active learning, problem solving, learning to learn, collaboration and communication skills at a good level, which are considered to be 21st century learning skills. In the studies of Soh, Arsad and Osman (2010), the 21st century skills of students against Physics course were examined and it was concluded that the 21st century skills had an important positive and strong relationship on students' attitudes towards Physics. Research findings are similar to the studies conducted. It is thought that the reason for the high level of 21st century skills of the students was the constructivist approach having been applied since 2005 and the changes made along with the renewed 2013 science programme. With the constructivist approach, skills such as problem solving, creative thinking, entrepreneurship and critical thinking, and life skills such as creativity, entrepreneurship, communication skills and teamwork started to be emphasized in the renewed Science course programme. It can be said that the reason for the high level of 21st century skill levels of students is the radical changes made in programmes.

In the research, it was concluded that students “try to deal with their problems calmly”. Yazgan and Bintas (2005), in their study to measure the

level of elementary school students' ability to use problem solving strategies, have reached the conclusion that students can use some problem solving strategies informally even though they have not received any training in this regard. It can be said that these two research findings show parallelism.

In the research, it was found that students' "collaboration during teamwork had a positive effect on their permanent learning, and that their communication skills improved thanks to their collaboration networks". This finding of the study coincides with the finding of Edmondson (2005)'s research that "Science knowledge of students deepen through their collaborative discussions".

In the research, it was found that students "take the responsibility of their learning and problems, make permanent learning, plan what they want to learn, and thus develop their own responsibilities as well". It can be said that this finding is in line with the aim of MEB/MoNE (2013) programme "Taking responsibility for daily life problems and using life skills to solve these problems".

In the study, it was found that students "use their knowledge of science lessons in their daily lives, share information with people around them, and thus they are beneficial to others". It can be concluded that transferring information to life contributes to the permanent information structuring. Yigit, Devecioglu, and Ayvaci (2002), in their research aimed to determine the 8th grade secondary school students' levels of associating the knowledge they learned in Science classes with daily life, concluded that students could not interpret science concepts in their minds at an adequate and scientific level and could not convey the information they learned in this way. Similarly, it was determined that the majority of students could not achieve this association at a desired level in the studies conducted to determine different education levels related to different topics of science (Ayas and Ozmen, 1998; Pınarbasi et al., 1998; Ayas, Karamustafaoglu and Sevim, 2001; Enginar et al., 2002; Anagun et al., 2010; Tasdemir & Demirbas, 2010). These studies are not in line with the research findings. It can be said that the studies carried out before the constructivist approach programme adopted in 2005 and the new Science programmes that started to be implemented in 2013 did not coincide with the findings of the research because the developments in science and technology were reflected in the educational environments.

In the study, no statistically significant difference was found in the levels of students' adoption of problem solving skills in terms of gender. In this regard, Balci (2007) concluded that gender does not make a significant difference on problem-solving skills of primary school fifth grade students. Similarly, in the study of Ilhan (2014), problem-solving skills did not

differentiate according to the gender of students. It can be said that the results of the research are in line with the findings of the studies.

When a general evaluation of the findings of this research based on the studies in the literature is made, it can be said that the findings obtained in the research are similar to the findings of other studies in the literature. This research is thought to be useful in determining the levels of students having 21st century skills, including the skills and competencies required for lifelong learning. Thus, it will be a guide for how effective the current education system is for students to acquire these skills and ensure their continuity. The research was conducted with the secondary school eighth grade students. These kinds of studies planned to be done in the future can also be applied to students studying in high school and undergraduate education and the results can be compared.

References

- Anagün, Ş. S., Ağır, O., Kaynaş, E. (2010). İlköğretim Öğrencilerinin Fen ve Teknoloji Dersinde Öğrendiklerini Günlük Yaşamlarında Kullanım Düzeyleri. 9. Ulusal Sınıf Öğretmenliği Eğitimi Sempozyumu. Elazığ: Fırat Üniversitesi Eğitim Fakültesi.
- Ayas A., Karamustafaoğlu Ö., Sevim S. ve Karamustafaoğlu S. (2001). Fen Bilgisi Öğrencilerinin Bilgilerini Günlük Yaşamla İlişkilendirebilme Seviyeleri. Yeni Bin Yılım Başında Fen Bilimleri Eğitimi Sempozyumu. Maltepe Üniversitesi, İstanbul.
- Bayram, N. (2010). *Yapısal Eşitlik Modellemesine Giriş*, Amos Uygulamaları, Ezgi Kitabevi, Bursa.
- Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., ve Rumble, M. (2010). Defining 21st century skills. Assessment and teaching of 21st century skills draft white paper. The University of Melbourne.
- Cohen, L., Manion, Lve Morrison, K. (2007). *Research Methods in Education. Sixth Edition..* London and New York: Routledge. ISBN 9780415368780.
- Creswell, J. W. (2009). *Research Design. Qualitative, Quantitative, and Mixed Methods Approaches (3rd. ed.)*. Los Angeles: Sage Publications.
- Edmondson, E. W. (2005). İşbirlikli Konuşmalar: Dördüncü sınıf öğrencilerinin fen tartışmalarının derinleştirilmesi. Yayınlanmamış doktora tezi, Clemson Üniversitesi.
- Enginar, İ., Saka, A. ve Sesli, E. (2002). Lise 2 Öğrencilerinin Biyoloji Derslerinde Kazandıkları Bilgileri Güncel Olaylarla İlişkilendirebilme Düzeyleri. V.Ulusal Fen Bilimleri ve Matematik Eğitim Kongresine Sunulmuş Bildiri.

- Kang, M., Heo, H., Jo, I., Shin, J. ve Seo, J. (2010). Developing an Educational Performance Indicator for New Millennium Students. *Journal of Research on Technology in Education*, 43(2): 157-170.
- Kang, M., Kim, B., Kim, B., You, H. (2012). Developing an Instrument to Measure 21st Century Skills for Elementary Students. *The Korean Journal of Educational Methodology Studies*, 25(2).
- Knnewell, S. ve Morgan, A. (2006). Factors influencing learning through play in ICT. *Computers & Education*, 46(3), (s. 265-279).
- Koenig, J.A. (2011). *Assessing 21st Century Skills: Summary of a Workshop*. <https://www.learntechlib.org/p/159080/>. adresinden 24.04.2014 tarihinde indirilmiştir.
- Lai, E.R. ve Viering, M. (2012), *Assessing 21st Century Skills: Integrating Research Findings*, National Council on Measurement in Education Vancouver, B.C.
- Livingstone, S. ve Bober, M. (2005). *UK children go online: Final report of key Project findings*. London: LSE Research Online. <http://eprints.lse.ac.uk> adresinden 14 Temmuz 2014 tarihinde indirilmiştir.
- MEB. (2006). *İlköğretim Fen ve Teknoloji Dersi (6., 7. ve 8. Sınıflar) Öğretim Programı*. Ankara: Talim ve Terbiye Kurulu Başkanlığı.
- MEB. (2013). *İlköğretim Kurumları (İlkokullar Ve Ortaokullar) Fen Bilimleri Dersi (3,4,5,6,7 ve 8. Sınıflar) Öğretim Programı*. Ankara: Talim ve Terbiye Kurulu Başkanlığı.
- Partnership for 21st Century Skills. (2009). P21 framework definitions. Retrieved from http://www.p21.org/storage/documents/P21_Framework_Definitions.pdf.
- Organization for Economic Cooperation and Development (OECD). (2003). *The definition and selection of key competencies*. <http://www.oecd.org/dataoecd/47/61/350703677.pdf> adresinden indirilmiştir.
- Özçakır-Sümen, Ö. ve Çalışıcı, H. (2017). Examining the 21 century skills of secondary school students: A mixed method study, *Journal of Education & Social Policy*, 4(4), 92-100, ISSN 2375-0782 (Print) 2375-0790 (Online)
- Pınarbaşı, T., Doymuş, K., Canpolat, N. ve Bayrakçeken, S. (1998). Üniversite Kimya Bölümleri Öğrencilerinin Bilgilerini Günlük Hayatla İlişkilendirebilme Düzeyleri. III. Ulusal Fen Bilimleri Eğitimi Sempozyumu. Trabzon: KTÜ.

- Shin, H.I. ve Lee, S. H. (2008). *Analysis of New Millennium Learner's behavior*. Seoul: Keris.
- Slavin, R. E. (2000). *Educational psychology: Theory and practice (6th ed.)*. Boston: Ally and Bacon.
- White, J. N. (1997). *Schools for the 21st century*. Harpenden, UK: Lennard Publishing.
- Yıldırım, A. ve Şimşek, H. (2005). *Sosyal bilimlerde nitel araştırma yöntemleri*. Beşinci Baskı, Ankara: Seçkin Yayıncılık.
- Yiğit, N., Devcioğlu, Y. ve Ayvacı, H. Ş. (2002). İlköğretim Fen Bilgisi Öğrencilerinin Fen Kavramlarını Günlük yaşamdaki Olgu ve Olaylarla İlişkilendirme Düzeyleri. V. Ulusal Fen Bilimleri ve Matematik Eğitimi Kongresine Sunulmuş Bildiri.

CHAPTER IX

EXAMINING SECONDARY SCHOOL STUDENTS' SENSE OF RESPONSIBILITY IN TERMS OF GENDER AND GRADE LEVEL

Assis. Prof. Dr. Seda OKUMUŞ

Ataturk University, Erzurum, Turkey

e-mail: seda.okumus@atauni.edu.tr, Orcid ID: 0000-0001-6271-8278

1. Introduction

Many nations across the world have entered the race of raising qualified individuals to keep up with changing world conditions and schools, the most important institutions in training people, are attempting to fulfill this duty. Today, the 21st-century skills expected of qualified people encompass foundational literacies (literacy, numeracy, scientific literacy, ICT literacy, financial literacy and cultural and civil literacy), competencies (critical thinking and problem solving, creativity, communication and collaboration) and character features (curiosity, initiative, persistence or grit, adaptability, leadership and social and cultural awareness) (World Economic Forum (WEF), 2016). While the foundational literacies and competence skills needed in the 21st century relate primarily to the mental skills of the person, character features include social skills. In this context, the task of schools is not only to provide society with knowledgeable and successful individuals but also good citizens who are sensitive to the value judgments of society, can adapt to society and are responsible (Tully, 2009). Kohlberg (1981) states that the primary function of the school is to pass the value judgments of society on to the next generations. Reflecting this framework, increased importance has been attached to values education in schools in recent years (Gündüz & Bağcı, 2019). One of the most important values targeted for students within the scope of values education is responsibility (Kaivola & Paaso, 2007) because this value forms the basis for acquiring others (Altunok Çal & Yeşil, 2019) to the extent that, in 2002, the American Psychological Association stated that providing students with a sense of responsibility is the most important element of a 21st-century education (Fishman, 2014).

Existing studies conducted on responsibility have found the concept to be complex (Helker & Wosnitza, 2016); it has been found to be important in gaining other values (Altunok Çal & Yeşil, 2019), and students, teachers, and family appear to be important in developing a sense of responsibility (Matteucci & Helker, 2018). The value of responsibility is generally covered within the framework of social studies education (e.g. Herdem, 2016). In addition, values education has been studied at preschool and primary school levels (e.g. Sapsağlam, 2017). In science education,

there are insufficient studies in the literature regarding both the acquisition of values and the value of responsibility (e.g. Lee & Brown, 2018). This research is a preliminary study on the value of responsibility in the field of science education and aims to determine the sense of responsibility in secondary school students.

Sense of responsibility is not an innate feature (Babadoğan, 2003): it begins to be acquired at a young age - usually around 6 years - and affects the personality of the individual (Aydoğan & Gündoğdu, 2015). Individual differences are important in learning (Kuzgun & Deryakulu, 2006), not only in cognitive learning but also in the acquisition of affective values. Adolescence is also an important stage for developing a sense of responsibility (Spencer, Dupree, & Swanson, 1996). In this context, the period of adolescence, which includes the transition phase from childhood to youth, can be seen as an important process in which the life of the individual begins to take shape in order to gain a sense of responsibility (Hayta Önal, 2005). The beginning of adolescence coincides with the start of secondary school education, and it is important to take steps to raise students as individuals who know their responsibilities during this period. This study aims to determine the sense of responsibility in students, in whom the education-training process aims primarily to instill this sense of responsibility. In this context, this research examines the changes in the sense of responsibility of students at secondary school, according to a number of variables, as they experience adolescence, which is an important period in shaping the students' lives, forming their character and starting to gain values.

2. Literature review

2.1. Values education

The concept of value is the abstract measure for determining the importance of something or the worth of something (Ersoy & Şahin, 2012). According to Rokeach (1973), values are the affective thoughts of individuals about objects, ideas, behaviors etc. that direct behavior but do not necessarily require it (Kesici, 2018). Placing a value on an object or behavior arises from subjective preferences which vary from person to person (Koster & de Regt, 2020). Slater (2002) defines values education as:

spiritual, moral, social and cultural education; personal and social education; multicultural/anti-racist education; post-program themes, especially citizenship, environment and health; spiritual care; school ethics; additional activities to the program; broad community connections; common worship/meeting; as an inclusive term for making a classification of common program experiences such as school life as a learning community (p.3).

Values education starts in the family (Güleç & Yalçın, 2020) and continues throughout the education and training process. In order to raise individuals, who make a positive contribution to society, the values gained in the family should be developed in the education process (Herdem, 2016; Kohlberg, 1981). In this regard, the aim should be to develop important values such as responsibility, diligence, benevolence, honesty, love, and respect through values education in schools, in order that students may become good citizens, aware of their responsibilities and useful, hardworking and productive members of their communities. Values education is, thus, essential for future generations and the long-term goals of a society and societies that want to invest in the future should, accordingly, accord it the necessary importance. However, individual differences in learning may also affect the acquisition of values: each individual learns differently (Jonassen & Grabowski, 2012) and, in this context, it is important to consider individual differences in values education.

In the 1920s, the first studies on values education were conducted under the name of character education in the USA. After the 1990s, individual adjustment values started to gain importance in values education (Herdem, 2016). In terms of samples, it is seen that there are studies on students at pre-school (Penderi & Rekalidou, 2016), primary school (Romi, Lewis, & Katz, 2009), secondary school (10-13 age) (Helker & Wosnitza, 2016), high school (14-17 age) (Matteucci & Helker, 2018) and university (Fishman, 2014). In addition, studies have been conducted with prospective teachers and teachers (Helker & Wosnitza, 2016). In examining the literature on values education in terms of lessons, it becomes clear that the majority of studies are conducted in social studies lessons (Herdem, 2016). The studies carried out about values within science education generally attempted to obtain the opinions of teachers and prospective teachers about values education or specific values (Saracaloğlu, Evin Gencer, & Altın, 2016). There is limited literature on the views of secondary school students about values in science education and developing those values (e.g. Herdem, 2016), possibly as a result of the perception of the relationship between science and values. Science as a value-free enterprise has been widely accepted since Max Weber defended it in the nineteenth century (Koster & de Regt, 2020). The positivist philosophers believed that science was based only on logic and sensory experiences and the notion that there is no room for subjective perspectives and emotions in science prevailed. Scientific research was considered to be unaffected by value judgments (Corrigan & Smith, 2015) and, therefore, in science, values remained in the background. In recent years, values have been accepted as important in science, particularly after Kuhn's (1977) study of values. In this context, some important questions about values have been raised in science: "What values play a role in science? What is

the role of these values in science? How do these values affect science?" Attempts have been made to answer these questions (Koster & de Regt, 2020) and values in science are generally addressed from three angles: values in science, values in education and values in science education (Hildebrand, 2007). Since science cannot be disconnected from society, attempts should be made to gain values in the education process. Values in science education constitute the intersection of values in science and in education (Chowdhury, 2016) and it is, therefore, aimed to develop values in students in the science education process (Koster & de Regt, 2020). Dewey states that students decide on a scientific issue, not just by questioning, but based on their own value judgments (Lee & Brown, 2018). In this respect, the greater the role of scientific inquiry in science education, the more important the education of values.

Values education is becoming increasingly important in the education system and content for it is now being added to education programs. Values education was added implicitly to the curriculum of all courses in Turkey, including science, as schools are responsible not only for teaching but also for a broader education and this process continues throughout a student's educational life. The most important values targeted in the curriculum in Turkey are known as "root values" (Ministry of Education Turkey, 2018) and, in the science education curriculum in Turkey, it is determined that the most important root target is responsibility (Gündüz & Bağcı, 2019).

2.2. Responsibility

The concept of responsibility is defined as a person fulfilling their obligations to themselves and other people, performing their duties and accounting for their actions (Schessler, 2011). Responsibility is an important value that values education aims to impart. In order for countries to realize their potential in terms of sustainable development, each individual in that society has to fulfill their duty. For this reason, schools have always aimed to raise responsible individuals in every society (Öztürk & Güven, 2020). A sense of responsibility is essential for individuals to get to know themselves and to determine their place in society. The individuals who know themselves is aware of their duties and responsibilities, tries to fulfill their responsibilities, carries responsibility for the society they live in, and takes responsibility for the results of their actions (Helker & Wosnitza, 2016; Öztürk & Güven, 2020). Responsibility faces people in every field of their lives. In this regard, it can be said that the individuals who know their responsibilities, fulfill their duties on time, and who take responsibility for their actions, are essential for the development of nations and it is, therefore, important to educate all our students as individuals who are aware of their responsibilities.

In previous studies on the value of responsibility, several points are emphasized. Firstly, the responsible person in schools is generally a teacher, and the teacher is responsible for students' successes or failures (Helker & Wosnitza, 2014). Secondly, some studies identified a family influence on the student's sense of responsibility (Helker & Wosnitza, 2016), with both positive and negative effects noted (Helker & Wosnitza, 2016; Peterson et al., 2011). Thirdly, the responsibility of the student, the teacher and the family have a positive effect on the success of the school and create a positive learning environment (Bacon, 1993; Fishman, 2014; Peterson et al., 2011).

Education begins in the family and continues throughout school life. Schools, which undertake the task of raising individuals qualified to play a part in society, also play an important role in raising students as individuals who know their responsibilities. Thus, it can be said that the students' sense of responsibility determines their motivation to learn and to attend school or lessons.

2.3. Students' sense of responsibility

A student's responsibility is two-fold (Romi et al., 2009): one aspect emphasizes the student's values, morals, and character (Fenstermacher, 2001); the other is focused on being a good citizen (Gearon, 2003). Both aspects are necessary to give students a sense of responsibility (Romi et al., 2009) and training students as responsible citizens enables them to gain this sense. A sense of responsibility requires students to be motivated in school and lessons, to take control by taking responsibility for their success or failure. Therefore, a highly developed sense of responsibility has a positive effect on academic achievement. Students' sense of responsibility also affects and shapes the perspectives of their teachers and their families (Allan, 2006; Helker & Wosnitza, 2016). Problematic behaviors are more common in students with a poor sense of responsibility; their motivation towards lessons and school is lower, and their job awareness is less developed (Aydoğan & Gündoğdu, 2015). Barr and Tagg (1995) found that students who take responsibility for their own learning have a decisive role in setting and organizing their goals and implementing their actions. It is important for the student to develop a sense of responsibility in order to be successful in school life (Helker & Wosnitza, 2014; 2016). Helker and Wosnitza (2016) identified three dimensions of responsibility in their study of secondary-school students and their families: student success, learning responsibility and supportive social network. Accordingly, students' personal responsibilities affect their school success and their communication with families and teachers. Allan (2006) identified six dimensions of the responsibility for learning: "orientation towards school and learning", "active participation in learning activities", "autonomy and

control of learning”, “initiative”, “management of learning resources” and “cooperation and control of classroom behavior”.

Various scales related to student responsibility have been developed and applied in the literature (Allan, 2006; Kaya & Doğan, 2014; Özen, 2013). Kaya and Doğan (2014) developed the Sense of Responsibility Scale (SRS) to determine sense of responsibility in high-school students (14-17 age) and found it to be a valid and reliable measurement tool. Allan (2006) examined the understanding of responsibility in primary-school students between the ages of 5 and 11, the attitudes and behaviors of students in fulfilling their learning responsibilities, and how their understanding, attitude and behavior was affected by gender and age. He determined that students' attitudes towards learning responsibilities are positive; students are not sufficiently developed in terms of learning responsibilities; young students have a greater sense of responsibility, and that in the “behavior control and collaboration” category only female students have a greater sense of responsibility.

Determining the responsibilities of the students towards learning in the education process is a prerequisite for directing the teaching process (Yakar & Saracaloğlu, 2017). In the literature, no existing studies measured the effects of gender and age on secondary school students' sense of responsibility. This study plans to aid future studies by determining whether the gender factor has an effect on students' sense of responsibility. In addition, considering the grade level variable, it aims to determine whether there is a difference in the development of students' sense of responsibility according to age.

2.4. The present study

The purpose of this study is to determine the effects of gender and grade level variables on the sense of responsibility of secondary school students. The research questions are as follows:

1. Does the gender variable have an effect on secondary school students' sense of responsibility?
2. Does the grade level variable have an effect on secondary school students' sense of responsibility?

3. Method

3.1. Participants

The purpose of this study is to determine how the sense of responsibility of secondary-school students differs according to gender and grade level variables. Since the existing situation is determined, the most suitable method for this research is the survey, which describes an existing situation and reveals certain characteristics in a given group. The data collection

process usually involves a large sample and data can be collected with the help of scales, questionnaires or interviews (McMillan & Schumacher, 2010).

The sample in this study comprises 398 students (10–13 years old) studying in a public secondary school in Erzurum (Turkey) during the second period of the 2018–2019 academic year. The simple random sampling method was used, in which the probability of each unit being selected for sampling is equal (McMillan & Schumacher, 2010). It was preferred in this study because it is a stronger sampling method than others for universal representation. Of the total 398 students, 96 were in the 5th grade, 99 in the 6th grade, 105 in the 7th grade and 98 in the 8th grade; 50.5% of the total sample are girls and 49.5% are boys. The city of Erzurum is located in Eastern Anatolia, one of the least developed regions of Turkey. However, it is one of the largest cities in this region and the school where the research is conducted is a successful medium level (in terms of academic achievement) school. The collection of data took place in March 2019, predating the mandatory requirement introduced in 2020 to adopt the documentation of the ethics committee. Nevertheless, in this study, all ethical rules were followed, and the identities of the participants were kept confidential. Students voluntarily participated in this study; they were fully informed and their consent was obtained before the study. The sample of the study is presented in Table 1.

Table 1 Participants in study

Gender	Grade				All participants
	Grade 5	Grade 6	Grade 7	Grade 8	
Girls	49 (51.0%)	54 (54.5%)	49 (46.7%)	49 (50%)	201 (50.5%)
Boys	47 (49.0%)	45 (45.5%)	56 (53.3%)	49 (50%)	197 (49.5%)
Total	96 (100%)	99 (100%)	105 (100%)	98 (100%)	398 (100%)

3.2. Measures

3.2.1. Sense of responsibility scale. The Sense of Responsibility Scale (SRS) developed by Kaya and Doğan (2014) was used to collect data in the study. The SRS is a four-point Likert-type scale, in which items are scored as 1 = never, 2 = sometimes, 3 = frequently and 4 = always. It comprises four sub-factors: Attendance on course (AC), Attendance at school (AS), Homework awareness (HA) and Awareness of success (AOS). Within the sub-factors, 13 items are included: three items in AC (1–3), four in AS (4–7), three in HA (8–10) and three in AOS (11–13). There are no inverse items in the SRS. The highest score that can be obtained from the SRS is 52. The reliability coefficient of the scale was

determined by Kaya and Doğan (2014) as $\alpha = .85$. In the sub-factors, reliability was determined as $\alpha = .82$ for AC, $\alpha = .86$ for AS, $\alpha = .87$ for HA and $\alpha = .79$ for AOS. Since Kaya and Doğan (2014) prepared the SRS for high-school students, confirmatory factor analysis was performed for the construct validity of the SRS in this research and its reliability was re-examined. The SRS was initially applied to two secondary school students; the sections that were not understood were revised and the comprehensibility was increased for secondary school students. The reliability of the SRS was then re-examined, applying SRS 86 to secondary school students and its reliability coefficient was determined as $\alpha = .86$. Accordingly, the scale can be said to be reliable (George & Mallery, 2003). Of the sub-factors, AC, AS and AOS have good reliability (DK, $\alpha = .66$; OK, $\alpha = .60$; BF, $\alpha = .68$), and HA has low reliability ($\alpha = .47$) (Özdamar, 2002). In the confirmatory factor analysis, $\chi^2/df \leq 3$; GFI ≥ 0.90 ; CFI ≥ 0.97 ; RMSEA ≤ 0.05 must be achieved in order for the model fit to be accepted as good (Meydan & Şeşen, 2015). As a result of the confirmatory factor analysis of SRS, improvements were made and it was determined that the model fit was good ($\chi^2(56) = 1.139$, $p = 0.222$, GFI = 0.901, CFI = 0.978, RMSEA = 0.040).

3.3. Procedure

Firstly, a pilot application of SRS was carried out and the reliability coefficient determined ($\alpha = .86$). A confirmatory factor analysis was then performed. The sample was then randomly selected, and it was informed that the school was a middle level secondary school in terms of academic achievement by school administration. Subsequently, the participants' approval was received and the students completed the SRS questionnaire. The general instructions stated that there were no right or wrong answers on the scale and the students were not asked for their name, only their grade and gender. It was re-emphasized that their identity would not be divulged and they were asked to answer the questions honestly. It was hoped that this would encourage students to give more accurate answers. The data were collected face to face. The survey was conducted by a science teacher and the researcher during the regularly scheduled class period. Initially, 403 students participated in the study, but five students did not mark their gender and these data were not, therefore, included. Data from 398 students were analyzed.

3.4. Data analyses

Firstly, descriptive statistics of the sub-factors were derived from the analysis of the data. Descriptive statistics of the SRS are given in Table 2.

Table 2 Descriptive statistics of the SRS.

Sub-factors	M	SD	Sample item
Attendance on course (AC)	8.35	2.008	I speak in lessons.
Attendance at school (AS)	10.30	2.238	I know the school rules.
Homework awareness (HA)	7.14	2.219	If I cannot complete my homework, I will get help from my friends.
Awareness of success (AOS)	10.35	1.804	I can be successful in classes if I want to.

Before proceeding to the significance analysis of the data, the suitability of applying a normal distribution to the data obtained from the SRS was tested. The Kolmogorov-Smirnov test was applied to the data to determine normality, since the sample exceeded 30 people in all groups (Can, 2017). According to the normality test conducted to evaluate the significance of gender on the data obtained from SRS, normal distribution could not be applied to the data ($p = .00$; $p < .05$). For this reason, the Mann Whitney U test was applied to the data, and to the sub-factors, to determine the significant difference in terms of gender. Accordingly, it was determined that a normal distribution could not be applied to the data obtained in all sub-factors ($p = .00$, $p < .05$). The effect size η^2 was then calculated. Green and Salkind (2005, p.157) define η^2 values as follows: 0.01 as small, 0.06 as medium and 0.14 as a wide effect size. In addition, the students' sense of responsibility by gender at the grade level was compared. For this, the Kolmogorov-Smirnov test was used to check for the normality of the data obtained at each grade level. Normal distribution could be applied to the data obtained from girls ($p = .200$; $p > .05$) and boys ($p = .08$; $p > .05$) at 5th grade and girls and boys ($p = .200$, $p > .05$) at 7th and 8th grade but not to girls ($p = .00$, $p < .05$) and boys ($p = .03$; $p < .05$) at the 6th grade. Accordingly, an independent sample t-test was applied to the data in order to evaluate the data obtained from the 5th, 7th and 8th grades in terms of gender, and the Mann Whitney U Test for the data obtained from the 6th grade.

According to the normality test results for the grade level variable, normal distribution could not be applied to data obtained from all classes ($p = .03$; $p < .05$ for 5th grade, $p = .00$; $p < .05$ for 6th grade, $p = .04$; $p < .05$ for 7th and 8th grade). For this reason, the Kruskal Wallis Test and the Mann

Whitney U Test were applied to the data for significance analysis. In addition, the effect of grade levels on the sub-factors of the SRS was examined. For this, the normality of the data obtained from each sub-factor was first checked with the Kolmogorov Smirnov Test. Normal distribution cannot be applied to the data obtained from all grade levels for all sub-dimensions of the SRS: for AC, AS and AOS in all grade levels, $p=.00$; $p<.05$ while, for HA, $p=.02$; $p<.05$ in 5th grade; $p=.01$; $p<.05$ in 6th grade; $p=.00$; $p<.05$ in 7th and 8th grades. For this reason, the Kruskal Wallis Test and Mann Whitney U Test were performed on the data. The data obtained from the study were analyzed using SPSS 20. and SPSS Amos 20. programs.

4. Results

4.1. Effect of gender on a sense of responsibility

The results of the Mann-Whitney U test conducted on SRS data comparing the sense of responsibility of all students participating in the study in terms of the gender variable are given in Table 3.

Table 3 Mann Whitney U test results of SRS data by gender.

Groups	n	Mean rank	Sum of ranks	U	p
Girls	201	196.52	39501.50	19200.500	.601
Boys	97	202.54	39899.50		

According to Table 3, there is no significant difference between girls and boys in terms of sense of responsibility ($p>.05$).

The results of the Mann Whitney U test performed on the data for comparing students' sense of responsibility in the sub-factors of SRS by gender are given in Table 4.

Table 4 Mann Whitney U test results of SRS data by gender (sub-factors).

Sub-factors	Groups	n	Mean rank	Sum of ranks	U	p
AC	Girls	201	209.06	42020.50	17877.50	.09
	Boys	197	189.75	37380.50		
AS	Girls	201	195.15	39226.00	18925.00	.44
	Boys	197	203.93	40175.00		
HA	Girls	201	184.25	37035.00	16734.00	.01
	Boys	197	215.06	42366.00		
AOS	Girls	201	205.05	41214.50	18683.50	.32
	Boys	197	193.84	38186.50		

According to Table 4, only in HA is there a significant difference in SRS sub-factors, and this is in favor of boys ($p<.05$). The effect size for the HA sub-factor was determined as $\eta^2 = 0.02$, indicating a small effect.

Students' sense of responsibility in terms of gender was compared by grade. For this, an independent sample t-test was performed to evaluate the data obtained from the 5th, 7th and 8th grades by gender, and a Mann Whitney U Test was performed for the 6th-grade data. Independent sample t-test results of the SRS are presented in Table 5 and Mann Whitney U Test results are presented in Table 6.

Table 5 Independent sample t- test results of SRS data by gender (grades 5, 7, and 8).

Grade	Groups	n	X	SD	t	p
Grade 5	Girls	49	36.80	5.248	-.774	.44
	Boys	47	37.62	5.144		
Grade 7	Girls	49	36.96	4.873	.620	.54
	Boys	56	36.39	4.483		
Grade 8	Girls	49	35.82	3.887	.620	.55
	Boys	49	35.20	5.969		

According to Table 5, the data obtained from the 5th, 7th and 8th grades showed no statistically significant difference between girls and boys ($p > .05$).

Table 6 Mann Whitney U test results of SRS data by gender variable (grade 6).

Grade	Groups	n	Mean rank	Sum of ranks	U	p
Grade 6	Girls	54	48.08	2596.50	1111.50	.47
	Boys	45	52.30	2353.50		

According to Table 6, data obtained from the 6th grade showed no statistically significant difference between girls and boys ($p > .05$). It can be said, from Table 5 and Table 6, that the sense of responsibility does not differ between girls and boys at any grade.

4.2. Effect of grade level on a sense of responsibility

The Kruskal Wallis Test performed on SRS data to determine the effect of grade level on a sense of responsibility is presented in Table 7.

Table 7 Kruskal Wallis Test results of SRS by grade level.

Grade	n	Mean rank	df	X ²	p
Grade 5	96	224.54	3	11.726	.00
Grade 6	99	178.77			
Grade 7	105	213.11			
Grade 8	98	181.33			

According to Table 6, there was a significant difference in the sense of responsibility ($p < .05$) between classes. The effect size was determined as $\eta^2 = 0.03$ which can be interpreted as a small effect size. The Mann

Whitney U Test was performed on the data to determine which classes have a significant difference and the results are given in Table 8.

Table 8 Mann Whitney U test results of SRS by grade level.

Grade	n	Mean rank	Sum of ranks	U	p
Grade 5	96	109.35	10498.00	3662.00	.01
Grade 6	99	86.99	8612.00		
Grade 5	96	104.33	10015.50	4720.50	.44
Grade 7	105	97.96	10285.50		
Grade 5	96	107.85	10354.00	3710.00	.01
Grade 8	98	87.36	8561.00		
Grade 6	99	93.34	9241.00	4291.00	.03
Grade 7	105	111.13	11669.00		
Grade 6	99	98.44	9745.50	4795.50	.89
Grade 8	98	99.57	9757.50		
Grade 7	105	110.02	11552.00	4303.00	.04
Grade 8	98	93.41	9154.00		

According to Table 8, there was a significant difference in favor of the 5th grade between 5th and 6th grades, in favor of the 5th grade between the 5th and 8th grades, in favor of the 7th grade between the 6th and 7th grades and in favor of the 7th grade between the 7th and 8th grades ($p < .05$). The highest average is in the 5th grade and the lowest average in the 6th grade. The effect size was determined as $\eta^2 = 0.03$ between the 5th and 6th grades and between the 5th and 8th grades. It was determined as $\eta^2 = 0.02$ between the 6th and 7th grades and between the 7th and 8th grades. The effect size can, therefore, be said to be small.

In addition, the effect of grade levels on students' sense of responsibility in the sub-factors of SRS was examined. For this, the Kruskal Wallis Test was performed on the data obtained from the sub-factors of the SRS and the results are given in Table 9.

Table 9 Kruskal Wallis test results of SRS by grade level (sub-factors).

Sub-factors	Grade	n	Mean rank	df	X ²	p
AC	Grade 5	96	232.52	3	11.978	.01
	Grade 6	99	188.51			
	Grade 7	105	198.12			
	Grade 8	98	179.73			
AS	Grade 5	96	220.50	3	29.420	.00
	Grade 6	99	171.33			
	Grade 7	105	237.78			
	Grade 8	98	166.37			
HA	Grade 5	96	202.96	3	3.840	.28
	Grade 6	99	196.60			
	Grade 7	105	184.44			
	Grade 8	98	215.17			
AOS	Grade 5	96	200.65	3	.177	.98
	Grade 6	99	202.05			
	Grade 7	105	195.81			
	Grade 8	98	199.74			

Table 9 shows a statistically significant difference between grades in the sub-factors AC and AS ($p < .05$). The effect size was determined as $\eta^2 = 0.36$ for AC and $\eta^2 = 2.18$ for AS. It can, thus, be interpreted that the effect size is high for both sub-factors. There was no statistically significant difference in the sub-factors HA and AOS based on grade level ($p > .05$). In order to determine which groups have a significant difference in the AC and AS sub-factors, the Mann Whitney U Test was performed and the results are given in Table 10.

Table 10 Mann Whitney U test results of SRS by grade level (for AC and AS sub-factors).

Sub-factors	Grade	n	Mean rank	Sum of ranks	U	p
AC	Grade 5	96	109.05	10469.00	3691.00	.01
	Grade 6	99	87.28	8641.00		
	Grade 5	96	110.23	10582.00	4154.00	.03
	Grade 7	105	92.56	9719.00		
	Grade 5	96	110.24	10583.00	3481.00	.00
	Grade 8	98	85.02	8332.00		
	Grade 6	99	99.89	9889.50	4939.50	.54
	Grade 7	105	104.96	11020.50		
	Grade 6	99	101.33	10032.00	4620.00	.56
	Grade 8	98	96.64	9471.00		

	Grade 7	105	106.60	11193.50	4661.50	.24
	Grade 8	98	97.07	9512.50		
<i>Continued</i>						
AS	Grade 5	96	109.91	10551.00	3609.00	.00
	Grade 6	99	86.45	8559.00		
	Grade 5	96	96.83	9295.50	4639.50	.33
	Grade 7	105	104.81	11005.50		
	Grade 5	96	110.77	10633.50	3430.50	.00
	Grade 8	98	84.51	8281.50		
	Grade 6	99	84.89	8404.00	3454.00	.00
	Grade 7	105	119.10	12506.00		
	Grade 6	99	99.99	9899.00	4753.00	.81
	Grade 8	98	98.00	9604.00		
	Grade 7	105	119.86	12585.50	3269.50	.00
	Grade 8	98	82.86	8120.50		

As shown in Table 10, there was a significant difference between the 5th grade and other grades, in favor of the 5th grade, for the sub-factor AC ($p < .05$). For the sub-factor AS, there was a statistically significant difference between the 5th and 6th grades in favor of the 5th grade; between the 5th and 8th grades in favor of the 5th grade; between the 6th and 7th grades in favor of the 7th grade; and between the 7th and 8th grades in favor of the 7th grade ($p < .05$). Effect sizes for the sub-factor AC were: $\eta^2 = 0.04$ between grades 5 and 6; $\eta^2 = 0.02$ between grades 5 and 7; and $\eta^2 = 0.05$ between grades 5 and 8. These values can be interpreted as having a small impact. Effect sizes for the sub-factor AS were: $\eta^2 = 0.04$ between grades 5 and 6; $\eta^2 = 0.06$ between grades 5 and 8; $\eta^2 = 0.09$ between grades 6 and 7; and $\eta^2 = 0.10$ between grades 7 and 8. Accordingly, effect sizes can be interpreted as small between the 5th and 6th grades, medium between the 5th and 8th grades and high between the 6th and 7th grades and the 7th and 8th grades.

5. Discussion

5.1. Gender

The first sub-problem of the study is whether gender has an effect on secondary school students' sense of responsibility. In this context, the sense of responsibility of the students in terms of all the SRS data was compared between the girls and boys who participated in the study. According to this, there was no significant difference ($p > .05$) and it can, therefore, be said that gender is not an important variable in the sense of responsibility of secondary school students. Instead, age appears to have a greater effect on sense of responsibility. Similar results were obtained in previous studies investigating the effect of gender on sense of responsibility in different

samples (Hakkari, 2020; Lau, Kitsantas, Miller, & Drogin Rodgers, 2018). However, some studies have reported that a sense of responsibility is more developed in females (Allan, 2006; Kesici, 2018; Özbulat, 2020; Taylı, 2013). There is generally a consensus that girls show more responsibility in school (King, 2016). It may be that expecting girls to take on more responsibility in the family has an effect in this situation (Taylı, 2013). However, the literature has found that boys are more active in participating in lessons, asking questions and responding to questions asked by the teacher (Jones & Dindia, 2004).

When the data obtained from all students in the SRS sub-factors were analyzed by gender, a significant difference was found in favor of boys in the sub-factor HA ($p < .05$), from which it can be concluded that boys take greater responsibility for their homework than girls. The fact that boys are more active in participating and being heard in lessons (Jones & Dindia, 2004) may have influenced this finding. Some studies reveal that boys are more reluctant than girls to help their friends in the learning process and to ask for help (HA sub-factor) (Marchand & Skinner, 2007) and, in this respect, the results of this study are not compatible with the literature. Peers can be influential in students' perceptions of affective characteristics, such as values and attitudes. Students' desire to be part of a community may cause them to want to be accepted by their friends. For example, King (2016) states that boys are affected by the negative approaches of their friends (peers) in their attitudes, achievements and motivations towards school, a finding supported by the fact that boys' peer groups have more negative attitudes towards school than girls' peer groups (Van Houtte, 2004).

When the sense of responsibility of girls and boys in each grade were compared in terms of gender, there was no significant difference ($p > .05$). It can, therefore, be concluded that gender is not an important factor in the sense of responsibility of younger or older students. In line with these results, Hakkari (2020) found no significant difference between male and female students from vocational schools in terms of grade level or gender, in their study comparing their responsibilities. Romi et al. (2009), found that girls had higher scores in terms of individual responsibility than boys, but identified no significant difference between girls and boys in terms of encouraging others to be responsible. In fact, gender may be a factor in individual differences. Watkins (2000) states that individual differences affect the education and training process and these effects are complex (Matteucci & Helker, 2018). It is not possible to identify all aspects because the affective features vary from person to person and have a very complex structure; students' sense of responsibility is affected by too many factors.

Today, all students should be equipped with 21st-century skills, to become individuals who benefit and are productive in society. It is, therefore, important that all students experience a values education process without discrimination between girls and boys. In this context, increased importance needs to be given to values education, especially in the field of science, including science and technology, and to implementing the values education emphasized in science education programs. By trying to gain and develop responsibility in science education, students will contribute to their own learning responsibilities in the process of learning science.

5.2. Grade level

The second sub-problem of the study is whether grade level has an effect on the sense of responsibility of secondary school students. For this, comparisons by grade were made for the whole scale, and then for the data in the sub-factors, showing that the students whose sense of responsibility was most-developed were the 5th-grade students. The fact that these students have not yet entered adolescence may be relevant here (Özbulat, 2020). In addition, students in the 7th grade had a greater sense of responsibility than those in the 6th and 8th grades. In this case, the fact that in Turkey, adolescence generally starts in the range 6 years of age may be a factor. In this period, emotional changes in students as well as their physical growth may have affected their values' development: starting to question life, they also start to question their value judgments (Haran, 2003), which may have caused a decline in the development of a sense of responsibility. The fact that the sense of responsibility in the 7th grade is higher than in the 6th grade may be due to students becoming accustomed to the maturity brought by adolescence. It is thought that the entrance examination for high schools (LGS) in Turkey reduces the sense of responsibility in 8th-grade students; it is recognized in the literature as constituting intense pressure (Diken, 2020). In this context, students may have to assume their responsibilities to avoid feeling as the exam stress. According to the results of this research, as the grade level increases, the responsibility for learning generally decreases, with the exception of the 7th grade. The reason for this may be the onset of adolescence, as mentioned above, or the increased influence of popular culture or peer groups (Özbulat, 2020; Sezer & Çoban, 2016). Studies examining the change in sense of responsibility according to grade level have, variously, shown that the sense of responsibility decreases (Allan, 2006; Özbulat, 2020) or increases (Lau et al., 2018) as the grade level increases, and Kesici (2018) found no significant difference in terms of grade level in his research into responsibility in high school students.

In terms of sub-factors of SRS, a significant difference between grades was seen in sub-factors AC and AS ($p < .05$) in favor of the 5th grade overall and in the sub-factor AC and in favor of the 5th and 7th grades in the sub-

factor AS ($p < .05$). In terms of the sub-factor AC, it can be said that the 5th-grade students participate to a greater extent in lessons, asking when they do not understand and making up work for the lessons they cannot attend. The developmental stage of the students affects their school life (Rodopman Arman, 2018). Grade 5 students are still in a stage of concrete transactions and have not reached the age of puberty; that they have not yet started to feel the confusion of mind and values brought by adolescence. Thus, there is not yet any decrease in students' sense of responsibility. In the AS sub-factor, students in the 5th grade have higher scores; they pay more attention to the school rules, attend information meetings at school and listen attentively. This may be due to the fact that there is less academic pressure in all lessons of the 5th grade than the other classes, less progress is made (in education programs in Turkey) and the students experience less exam stress. Students in the 7th grade have a greater sense of responsibility than those in the 6th and 8th grades in the sub-factor AS, are more mature than the 6th-grade students and experience less test stress than the 8th-grade students.

The responsibility value requires a person to take responsibility for the learning process and to act more consciously in all the works they do and, therefore, has an important place in values education. Moreover, it is a prerequisite for gaining other values which increases its importance still further. Starting from the pre-school period, practices are embedded to enable students to gain responsibility value at all educational levels. The importance of science should not be ignored at this point. Science is a comprehensive course that seeks to understand both the human and the universe. The rapid advancement of science and technology has revealed that societies which are pioneers in science are also successful in other fields and that science education is very important for raising successful individuals. However, being successful in science is not enough to make a person beneficial to society; it is also necessary to be a good person with strong ethical and moral values. In this context, the fact that values education – especially the value of responsibility – is more deeply embedded in the science curriculum will make students conscious and self-aware citizens and valuable employees. Thus, students will be trained as individuals who respect social value judgments, take responsibility, comply with ethical and moral rules, and are hard-working, productive, equipped with 21st-century skills, and able to adapt to changing conditions.

5.3. Conclusion

The gender variable did not have a significant effect on secondary school students' sense of responsibility in this study. Moreover, it was observed that the sense of responsibility in 5th and 7th-grade students was higher than in other students. It is thought that it would be effective for schools to undertake the task of raising individuals who are beneficial to

society by focusing more on practices aimed at developing students' sense of responsibility.

References

- Allan, G. M. (2006). *Responsibility for learning: students' understandings and their self-reported learning attitudes and behaviours* (Unpublished master thesis). Queensland University of Technology, Queensland, Australia.
- Altunok al, I., & Yeşil, R. (2019). Sorumluluk eğitimi uygulamaları ölçęinin geçerlik ve güvenirlilik incelemesi. *YYU Journal of Education Faculty*, 16(1), 1442-1462. <http://dx.doi.org/10.23891/efdyyu.2019.167>
- Aydoęan, R., & Gündoędu, K. (2015). İlkokul öğrencilerine yönelik hazırlanan bir sorumluluk programının yansımaları bir eylem araştırması. *Journal of Theory and Practice in Education*, 11(3), 1061-1088.
- Babadoęan, C. (2003). Sorumlu davranış geliştirme stratejileri bağlamında öğrenen sınıf. *Milli Eğitim Dergisi*, 157, 121-136.
- Bacon, C. S. (1993). Student responsibility for learning. *Adolescence*, 28(109), 199-212.
- Barr, R. B., & Tagg, J. (1995). From teaching to learning—A new paradigm for undergraduate education. *Change: The Magazine of Higher Learning*, 27(6), 12-26.
- Can, A. (2017). *SPSS ile bilimsel araştırma sürecinde nicel veri analizi*. (5. baskı). Ankara: Pegem Akademi Yayıncılık.
- Chowdhury, M. (2016). Emphasizing morals, values, ethics, and character education in science education and science teaching. *The Malaysian Online Journal of Educational Science*, 4(2), 1-16.
- Corrigan, D., & Smith, K. (2015). *The role of values in teaching and learning science*. In J. Deppeler, T. Loreman, R. Smith, & L. Florian (Eds.), *Inclusive pedagogy across the curriculum* (pp. 99–117). Emerald Publishing.
- Diken, E. H. (2020). The opinions of science teachers on the weaknesses and strengths of LGS and TEOG systems (The case of Kars province). *Journal of Curriculum and Teaching*, 9(2), 20-32. Doi:10.5430/jct.v9n2p20
- Ersoy, F., & Şahin, T. (2012). Sosyal bilgiler ders kitaplarının değerler eğitimi yaklaşımları açısından incelenmesi. *Educational Sciences: Theory & Practice - 12(2)* [Supplementary Special Issue], 1547-1558.

- Fenstermacher, G. D. (2001). On the concept of manner and its visibility in teaching practice. *Journal of Curriculum Studies*, 33, 639–53
- Fishman, E.J. (2014). With great control comes great responsibility: The relationship between perceived academic control, student responsibility, and self-regulation. *British Journal of Educational Psychology*, 84, 685–702. Doi:10.1111/bjep.12057
- Gearon, L. (Ed). (2003). *Learning to teach citizenship in the secondary school*. London: Routledge-Falmer.
- George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference. 11.0 update* (4th edition). Boston: Allyn & Bacon.
- Green, S. B., & Salkind, N. J. (2005). *Using SPSS for Windows and Macintosh: analyzing and understanding data* (4th edition). New Jersey: Pearson.
- Güleç, S., & Yalçın, A. (2020). The value of responsibility in the point of view of the 5th grade students. *International Journal of Educational Methodology*, 6(1), 123-133.
- Gündüz, M., & Bağcı, M. (2019). Fen bilimleri öğretmenlerinin kök değerler hakkındaki farkındalıkları ve değerleri öğretme yöntemleri. *Journal of International Social Sciences Education*, 5(2), 184-197.
- Hakkari, F. (2020). Meslek yüksekokulu öğrencilerinin öğrenme sorumluluğu düzeyinin çeşitli değişkenlere göre belirlenmesi. *Kastamonu Education Journal*, 28(2), 650-661. Doi:10.24106/kefdergi.693444
- Haran, S. (2003). Ergenlerde gelişimsel kriz üzerine bir klinik örnek. *Kriz Dergisi*, 12(1), 47-53.
- Hayta Önal, Ş. (2005). *Bir sorumluluk eğitim programının lise dokuzuncu sınıf öğrencilerinin sorumluluk düzeylerine etkisi* (Unpublished master thesis). Uludağ University, Bursa, Turkey.
- Helker, K., & Wosnitza, M. (2014). Responsibility in the school context – development and validation of a heuristic framework. *Frontline Learning Research*, 5, 115-139. Doi: <http://dx.doi.org/10.14786/flr.v2i3.99>
- Helker, K., & Wosnitza, M. (2016). The interplay of students' and parents' responsibility judgements in the school context and their associations with student motivation and achievement. *International Journal of Educational Research*, 76, 34–49. <http://dx.doi.org/10.1016/j.ijer.2016.01.001>.
- Herdem, K. (2016). *Yedinci sınıf fen bilimleri dersi konularıyla bütünleştirilmiş değerler eğitimi etkinliklerinin öğrencilerin değer*

- gelişimine etkisi* (Unpublished master thesis). Adıyaman University, Adıyaman, Turkey.
- Hildebrand, G. (2007). *Diversity, values and the science curriculum. Which curriculum? What values?* In D. Corrigan, J. Dillon & R. Gunstone R. (Eds), *The reemergence of values in science education*. Rotterdam: Sense Publishers.
- Jonassen, D. H., & Grabowski, B. L. (2012). *Handbook of individual differences, learning, and instruction*. New York: Routledge.
- Jones, S. M., & Dindia, K. (2004). A meta-analytic perspective on sex equity in the classroom. *Review of Educational Research*, 74, 443–471.
- Kaivola, T., & Paaso, M. M. (2007). *Education for global responsibility Finnish perspectives*. Helsinki: Publications of the Ministry of Education.
- Kaya, M., & Doğan, U. (2014). Öğrenci sorumluluk: ölçek geliştirme, güvenilirlik ve geçerlik çalışması. *Journal of European Education*, 4(1), 11-18.
- Kesici, A. (2018). Lise öğrencilerinin sorumluluk düzeylerinin çeşitli değişkenlere göre incelenmesi. *GUJGEF*, 38(3), 965-985.
- King, R.B. (2016). Gender differences in motivation, engagement and achievement are related to students' perceptions of peer—but not of parent or teacher—attitudes toward school. *Learning and Individual Differences*, 52, 60–71. <http://dx.doi.org/10.1016/j.lindif.2016.10.006>
- Kohlberg, L. (1981). The philosophy of moral development moral stages and the idea of justice. Retrieved from <https://philpapers.org/archive/KOHTPO-6.pdf>
- Koster, E., & de Regt, H.W. (2020). Science and values in undergraduate education. *Science & Education*, 29, 123–143. <https://doi.org/10.1007/s11191-019-00093-7>
- Kuhn, T. S. (1977). *Objectivity, value judgment, and theory choice*. In the essential tension. selected studies in scientific tradition and change (pp. 320–339). Chicago: University of Chicago Press.
- Kuzgun, Y., & Deryakulu, D. (2006). *Eğitimde bireysel farklılıklar*. (güncelleştirilmiş 2. baskı). Ankara: Nobel Yayın Dağıtım.
- Lau, C., Kitsantas, A., Miller, A.D., & Drogin Rodgers, E. B. (2018). Perceived responsibility for learning, self-efficacy, and sources of self-efficacy in mathematics: a study of international baccalaureate primary years programme students. *Soc Psychol Educ*, 21, 603–620. <https://doi.org/10.1007/s11218-018-9431-4>

- Lee, E.A., & Brown, M.J. (2018). Connecting inquiry and values in science education: an approach based on John Dewey's philosophy. *Science & Education*, 27, 63–79.
- Marchand, G., & Skinner, E. (2007). Motivational dynamics of children's academic helpseeking and concealment. *Journal of Educational Psychology*, 99, 65–82.
- Matteucci, M. C., & Helker, K. (2018). Who is responsible for educational outcomes? Responsibility ascriptions for educational outcomes in a sample of Italian teachers, parents, and students. *Learning and Individual Differences*, 61, 239–249. <https://doi.org/10.1016/j.lindif.2017.12.009>
- McMillan, J. H., & Schumacher, S. (2010). *Research in education: evidence-based inquiry* (7th edition). New Jersey: Pearson.
- Meydan, C.H., & Şeşen, H. (2015). *Yapısal eşitlik modellemesi Amos uygulamaları* (2. baskı). Ankara: Detay Yayıncılık.
- Ministry of Education of Turkey (MEB) (2018). Fen bilimleri dersi öğretim programı: (ilkokul ve ortaokul 3, 4, 5, 6, 7 ve 8. sınıflar)” <http://mufredat.meb.gov.tr/ProgramDetay.aspx?PID=143> Last access date 04.01.2020.
- Özdamar, K. (2002). *Paket programlarla istatistiksel veri analizi-1*. (4. baskı). Eskişehir: Kaan Kitabevi.
- Özen, Y. (2013). Sorumluluk duygusu ölçeğinin geliştirilmesi; geçerlik ve güvenilirliği. *Journal of European Education*, 3(2), 17- 23.
- Öztürk, A., & Güven, S. (2020). Analysing studies conducted on responsibility education in Turkey: A meta-synthesis study. *Elementary Education Online*, 19(2), 865-888. doi:10.17051/ilkonline.2020.695280
- Penderi, E., & Rekalidou, G. (2016). Young children's views concerning distribution of clean-up duties in the classroom: Responsibility and self-interest. *European Early Childhood Education Research Journal*, 24(5), 734-747. Doi:10.1080/1350293X.2016.1213566
- Peterson, E. R., Rubie-Davies, C. M., Elley-Brown, M. J., Widdowson, D. A., Dixon, R. S., & Irving, E. S. (2011). Who is to blame? Students, teachers and parents' views on who is responsible for student achievement. *Research in Education*, 86(1), 1–12.
- Rodopman Arman, A. (2018). Okul yaşamında ergen ve sorunları (school based problems in adolescence). *Türkiye Klinikleri Çocuk Psikiyatrisi-Özel Konular*, 4(2), 153-158.
- Rokeach, M. (1973). *The nature of human values*. New York: Free Press.

- Romi, S., Lewis, R., & Katz, Y. J. (2009). Student responsibility and classroom discipline in Australia, China, and Israel. *A Journal of Comparative and International Education*, 39(4), 439-453. Doi:10.1080/03057920802315916
- Sapsağlam, Ö. (2017). Examining the value perceptions of preschool children according to their drawings and verbal expressions: sample of responsibility value. *Education and Science*, 42(189), 287-303. Doi: 10.15390/EB.2017.7002
- Saracaloğlu, A.S., Evin Gencil, İ., & Altın, M. (2016). Öğretmen adaylarının sahip olduğu sosyal değerler ile kritik düşünme düzeylerinin incelenmesi. *Eğitimde gelecek arayışları: dünden bugüne Türkiye'de beceri, ahlak ve değerler eğitimi uluslararası sempozyumu bildiriler kitabı*, s.,441- 465, Ankara: Atatürk Araştırma Merkezi Yayınları.
- Schessler, E. J. (2011). *Adolescent perceptions on the meaning and development of personal responsibility: a phenomenological study* (Unpublished doctoral dissertation). Azusa Pacific University, California, USA.
- Sezer, A., & Çoban, O. (2016). Ortaokul öğrencilerinin sorumluluk değeri algıları. *Uşak Üniversitesi Eğitim Araştırmaları Dergisi*, 2(1), 22-39.
- Slater, F. (2002). *Citizenship education through secondary geography: values and values education in the geography curriculum in relation to concepts of citizenship*. In *Active Citizenship, Sustainable Development and Cultural Diversity*. University of London Institute of Education.
- Spencer, M. B., Dupree, D., & Swanson, D. P. (1996). Parental monitoring and adolescents' sense of responsibility for their own learning: An examination of sex differences. *Journal of Negro Education*, 30-43.
- Taylı, A. (2013). Sorumluluğun bazı değişkenler açısından değerlendirilmesi. *Muğla Sıtkı Koçman Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 30, 68-84.
- Tully, S. (2009). Helping students find a sense of purpose. *Chronicle of Higher Education*, 55 (27), 1.
- Van Houtte, M. (2004). Why boys achieve less at school than girls: The difference between boys' and girls' academic culture. *Educational Studies*, 30, 159-173.
- Watkins, D. (2000). Learning and teaching: A cross-cultural perspective. *School Leadership & Management*, 20(2), 161-173.

- World Economic Forum (WEF), (2016). What are the 21st-century skills every student needs? <https://www.weforum.org/agenda/2016/03/21st-century-skills-future-jobs-students/> last accesses date 22.06.2020.
- Yakar, A., & Saracalođlu, A. S. (2017). Öğrenmeye yönelik sorumluluk ölççeđi. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi*, 42, 27-49.

CHAPTER X

EXAMINING THE MAIN AND INTERACTION EFFECTS OF DIFFERENT FACTORS ON STUDENTS' PERFORMANCE ON LANGUAGE TEST

Asst. Prof. Dr. Burhanettin OZDEMIR

Prince Sultan University, Riyadh, KSA,
e-mail: bozdemir@psu.edu.sa, Orcid ID: 0000-0001-7716-2700

1. Introduction

Educational assessment ranges from classroom assessment to large-scale testing based on the different purposes of assessments such as selection and placement, screening, and measuring proficiency (Brennan, 2006; Kuramoto & Koizumi, 2018). However, the main concern of psychometrics and stakeholders in educational measurement is to justify the quality of assessment tools developed for classroom assessment or large scale assessment, since the output of these tests might have a huge impact on test-takers academic life. Likewise, for a language assessment, psychometric properties of language test at any level must ensure that interpretation of the test results and decisions made upon test-takers are valid. In other words, these requirements ensure that the language test measures what it intends to measure (Kunnan, 2003).

In the last four decades, the concept of language proficiency has shifted from a general unitary ability to multi-componential ability (e.g., Canale, 1983; Oller, 1983; Bachman, 1990; Bachman & Palmer, 1996) that consists of interrelated domains such as grammatical, textual and pragmatic knowledge (Bachman, 1990; Bachman & Palmer, 1996; Purpura, 1998; Chapelle, 1998, 2006; Phakiti, 2003, 2008). However, there is no universal consensus on factorial structure and components of language test or a theoretical assessment model that can be favored by test developers or stakeholders in language assessment (Bachman, 2007). Therefore, the validity of a language test indicates that interpretations based on scores obtained from the test is meaningful and represents students' performance, rather than representing the latent ability of test-takers or theoretical language model.

Although educational measurement and language testing have not consensus on the procedure of score-based inferences and linking test scores, some studies provide evidence and rationale to justify the use of the favored assessment procedures (see, Bachman & Palmer, 2010). For instance, argument-based validity (e.g., Kane, 1992, 2001; Kane, Crooks, & Cohen, 1999; Mislevy, Steinberg, & Almond, 2003; Bachman, 2005), recently developed independent formulations in language testing (e.g., Bachman & Palmer, 1996; Kunnan, 2003; Lynch, 2001) and critical

language testing (e.g, Shohamy, 1999, 2001) are among the recently proposed language assessment procedures that aim to shed light on score-based inferences and linking test scores.

As the number of language learners increases, so does the demands for diverse language assessment methods that are valid and relevant to the measured construct. The language learners might be classified into two groups; those (1) who are not a native speaker of the language and need to learn it to pursue their education and become part of society and those (2) who need to learn different languages to function well in a multilingual working environment as a result of globalization. Likewise, corporations and businesses demand from educational institutions to produce potential workers with sufficient language abilities that force them to be accountable for this process. Moreover, test developers are expected to be accountable to different stakeholders including those who are affected by the usage of language assessment, those who are affected by inferences drawn from the results, and those language programs and institutions that make use of the test.

The language skills of individuals have gained a significant role in maintaining international relations with other countries due to globalization. Thus, English has become the second language that needs to be acquired for most of the University students to meet the need and catch up on the trend in today's globalized world (Modiano, 2001; Kung, 2015). As a result, many different large scale tests have been developed to determine students' language proficiencies and to test if students have required language skills to pursue education and meet the need of the working environment.

There have been many studies conducted to investigate the effects of various factors on students' language learning achievement and test performance concerning socio-linguistic factors, and educational factors (El-omari, 2016), student-related factors (Andreou et al., 2005; Genc & Aydin, 2011; Hungi and Thuku, 2010), as well as teacher-related factors (Kung, 2015). This study aims to contribute to how students' related factors affect the students' performance on the English placement test. Ultimately, this study focuses on how ignoring the interaction effects between these factors obscure the accuracy of the inferences and interpretations of the results, respectively.

1.2 The purpose of the study

The purpose of this study is to examine the relationship between the English Proficiency Test (EPT) and the subdomains of the EPT, and to examine the effects of gender, proficiency level based on the EPT scores and students' major factors on students' performance. Besides, the direct and indirect effects of these factors on the EPT were examined and

compared. For this purpose, along with the correlation analyses, one-way ANOVA analyses were conducted to examine the mean difference in students` EPT scores across the categories of the aforementioned factors. Therefore, research questions are provided in the following section.

1.3 Research questions

1. What is the magnitude and significance level of the relationship between the EPT and the subdomain scores?
2. Do the mean EPT scores significantly differ across the categories of gender, proficiency levels, and major variables?
3. How do interactions between the factors (gender, proficiency levels, and major) affect the students` EPT performance?

2. Method

2.1 Data

The study group consisted of 2913 university students studying in a private University that took the English Placement Test administered by the National Center for Assessment. Additionally, the students in this study group have four different majors (engineering, science, health-1, and health-2) with three different proficiency levels based on the EPT scores that are “beginner”, “intermediate” and “advanced”, respectively. The cut-scores for each proficiency level defined by the National Center for Assessment are provided in Table 1.

Table 1 Cut-score and frequency distribution of proficiency levels based on the EPT scores

	Range	Frequency	Percent (%)
Beginner	0-45	678	23.3
Intermediate	46-79	1538	52.8
Advanced	80-UP	697	23.9

As can be observed from Table 1, the majority of the students were classified as moderate (52.8%) based on cut scores defined by NCA. Moreover, the percentages of the students classified as beginner and advance were similar.

Table 2 provides frequency distributions across categories of the factors, that are gender, proficiency levels, and major, respectively.

Table 2 Frequency distribution table of the study group across the factors.

Variables		f	%
Gender	Male	1368	47%
	Female	1545	53%
Proficiency Level	Beginner	678	23.3%
	Intermediate	1538	52.8%
	Advanced	697	23.9%
Major	Engineering	513	17.6%
	Science	1344	46.1%
	Health-1	776	26.6%
	Health-2	280	9.6%

The study group consisted of 1368 (47%) males and 1545 (53%) females. For the proficiency levels, 23.3 % of students were classified as beginner, 52.8% as intermediate, and 23.9% as advanced, respectively. When it comes to the distribution of population across the majors, 46.1% of a study group comprised of Science and it was followed by Health-1 (26.6%), Engineering (17.6%), and Health-2 (9.6%), respectively.

2.2 Statistical Analysis

The analyses were conducted at two stages. In the first stage of the study, Pearson's correlation analyses were conducted to examine the relationship between the EPT and the subdomains' scores that are reading comprehension, compositional analysis, and structure, respectively. In the second stage of the study, the factorial Analysis of Variance (ANOVA) method was conducted to compare the main and interaction effects of gender, proficiency level, and major type on the EPT scores.

2.3 The English Placement Test (EPT)

The English Placement Test is used to measure the language skills of high school graduates that aim to pursue their education and enroll in colleges and universities in Saudi Arabia. It is developed and administered by the National Center for Assessment (NCA) in Saudi Arabia (Education & Training Evaluation Commission [ETEC], 2020). There are mainly three domains of EPT that are reading comprehension, structure, and compositional analysis, respectively. The test contains 85 multiple-choice questions. Among these questions, 22 questions belong to the reading comprehension, 43 questions to the structure, and 20 questions to the compositional analysis, respectively.

3. Results

In this section, the findings of the study were classified based on the research questions so that one can easily understand and match research questions with related findings.

3.1 What is the magnitude and significance level of the relationship between the EPT and the subdomain scores?

The EPT constitutes of three domains that are reading comprehension, compositional analysis, and structure, respectively. The EPT subdomains' scores are supposed to be highly correlated since the test aims at measuring students' general language abilities. The relationship between the EPT and subdomain scores were examined with correlation analysis. Table 3 provides correlation coefficients between each pair of the EPT and subdomain scores, respectively.

Table 3 Correlation statistics between the EPT and subdomain scores

	EPT	Reading comprehension	Compositional analysis
EPT	-		
Reading comprehension	.694**	-	
Compositional analysis	.95**	.693**	-
Structure	.754**	.736**	.728

*** Correlation is significant at the 0.01 level (2-tailed)*

According to results in Table 3, all the bivariate correlations were statistically significant at significance level equal to 0.01. Moreover, the correlation between EPT and subdomains of the EPT ranged from .694 to .950, which indicates that the relationship between the EPT and subdomain scores were moderate to high. On the other hand, the relationship between subdomain scores ranged between .693 and .736 indicating the existence of a relatively moderate relationship between the subdomain scores.

3.2 Do the mean EPT scores significantly differ across the categories of gender, proficiency levels, and major variables?

The factorial ANOVA analyses were conducted to compare the main and interaction effects of proficiency levels, gender, and major types on the EPT scores. Table 4 provides factorial ANOVA results of the main and interaction effects of factors on the EPT scores.

Table 4 ANOVA results for the EPT test scores

Source	Type-III Sum of Squares	df	Mean Square	F	Sig.	Effect size
Corrected Model	807168.301a	23	35094.274	483.214	.000	.794
Intercept	1322474.510	1	1322474.510	18209.173	.000	.863
Gender	302.026	1	302.026	4.159	.042	.001
Major	222.605	3	74.202	1.022	.382	.001
Proficiency level	329911.522	2	164955.761	2271.279	.000	.611
Gender * Major	700.497	3	233.499	3.215	.022	.003
Gender * Proficiency level	556.768	2	278.384	3.833	.022	.003
Major * Proficiency level	692.421	6	115.404	1.589	.146	.003
Gender * Major * Proficiency level	980.165	6	163.361	2.249	.036	.005
Error	209818.909	2889	72.627			

The factorial ANOVA results indicate that the main effect for gender was significant ($F(1, 2889) = 4.159, p = .042 < .05, \eta^2 = .001$). Likewise, the main effect for proficiency level yielded an F ratio of $F(2, 2889) = 2271.279, p = 0.00$ indicating a significant difference between proficiency levels. Furthermore, the proficiency level variable had the largest effect size compared to the other independent variables. Unlike *gender* and *proficiency levels*, the main effect of the major variable was not statistically significant ($F(3, 2889) = 1.022, p = .382 > .05$), indicating that the EPT scores were equivalent across the categories of the major variable. Moreover, the interaction effect of gender and major; gender and proficiency levels; gender, proficiency levels, and major types on the EPT were statistically significant. The results in this table, however, do not provide any information about where these significant differences occurred. Therefore, the Bonferroni post-hoc test was conducted to investigate and find out where these significant mean differences occurred.

3.3 How do interactions between the factors (gender, proficiency levels, and major) affect the students' EPT performance?

Table 5 presents Bonferroni's Post-Hoc test results which provide the mean difference comparisons between categories of gender and proficiency levels with respect to the EPT scores. Bonferroni's Post-Hoc

test is suggested when the independent variables have more than two categories.

Table 5 ANOVA Comparisons of the EPT scores across gender and proficiency levels

Variable	Group	n	Mean	SD	Bonferroni's Post-hoc test (p values)	
					Male	Female
Gender	Male	1368	59.032	.431		
	Female	1545	60.843	.777	.001	
Proficiency Level	Group				Beginner	Intermed.
	Beginner	678	33.762	.333	-	
	Intermediate	1538	60.931	.294	< .001	-
	Advanced	697	85.119	1.256	< .001	< .001

The post-hoc comparison using the Bonferroni test indicates that the mean score for male students was significantly different from the female students' mean score. Additionally, female students had higher EPT scores than male students regardless of their major. On the other hand, the mean score of proficiency levels increased from beginner level to advanced level, and the mean difference between each pair of levels was statistically significant which indicates the validity of predefined cut-scores of proficiency levels based on the EPT scores.

Three different graphs were drawn to investigate the interaction between these three aforementioned factors. The first graph presents the EPT scores across the categories of proficiency levels and major variables that facilitate to investigate the interaction between these two factors.

Figure 1 reveals that the mean score of each proficiency level remained almost the same across the majors indicating the non-significant interaction effect between these two factors. These results also indicate that the average EPT scores of students remained the same across proficiency levels regardless of their majors.

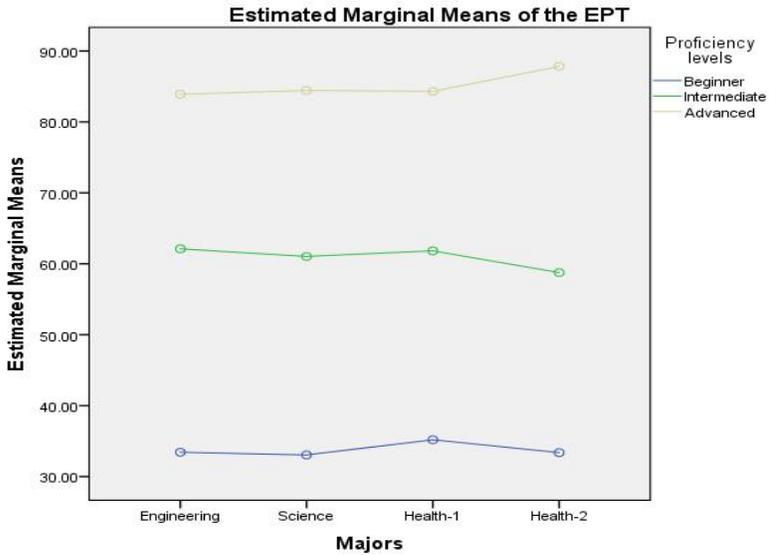


Figure 1 The EPT scores as a function of proficiency levels and major.

Figure 2 depicts the mean EPT scores across the categories of gender and major variables.

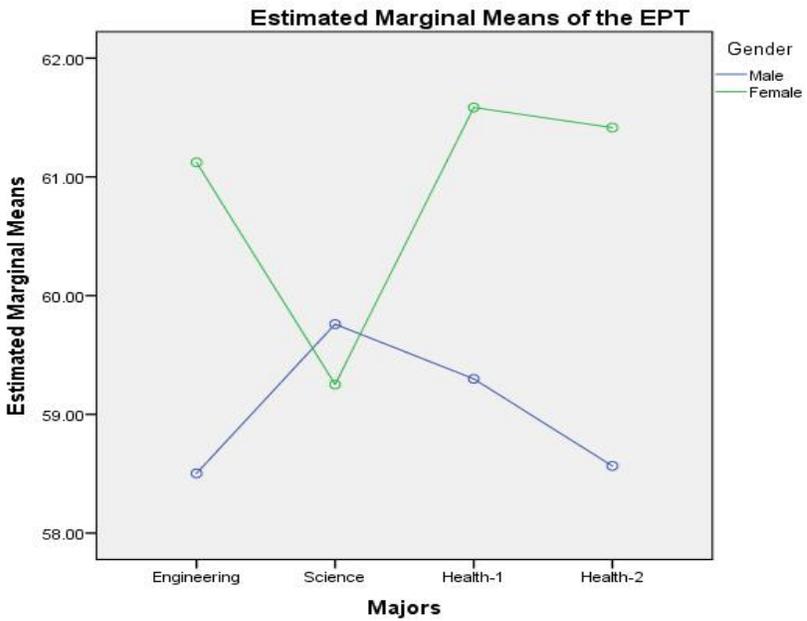
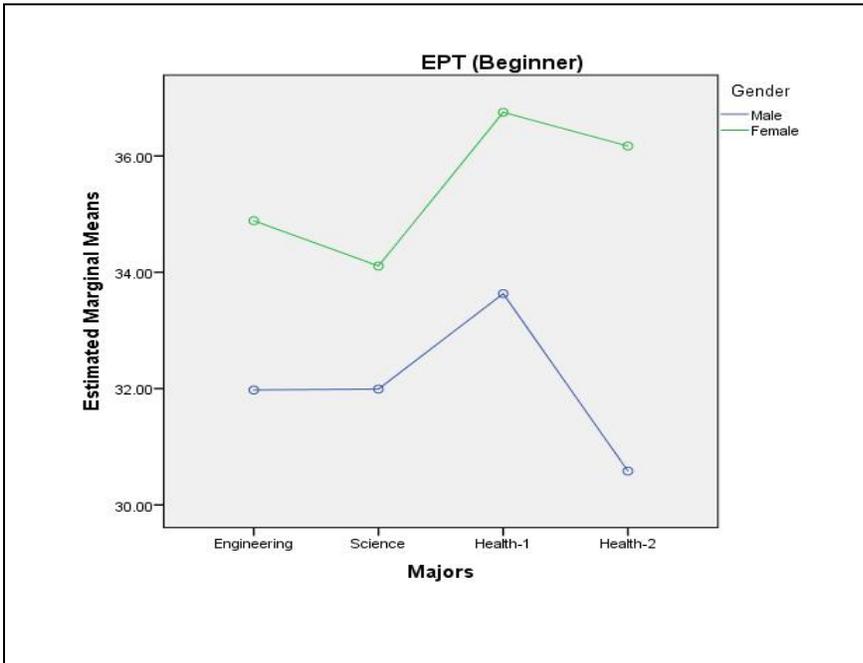


Figure 2 The EPT scores as a function of gender and majors.

Inspecting Figure 2 clearly shows the fact that the effect of gender was

much larger for health-2 than it was for other majors. Additionally, female students had a consistently higher score than male students across the categories of major except for science in which male students outperformed female students. This effect was relatively smaller for science major compared to the other majors.

Figure 3 depicts the EPT scores as a function of gender, proficiency levels, and majors which enable us to investigate the effect of the interaction between these three factors on the EPT scores.



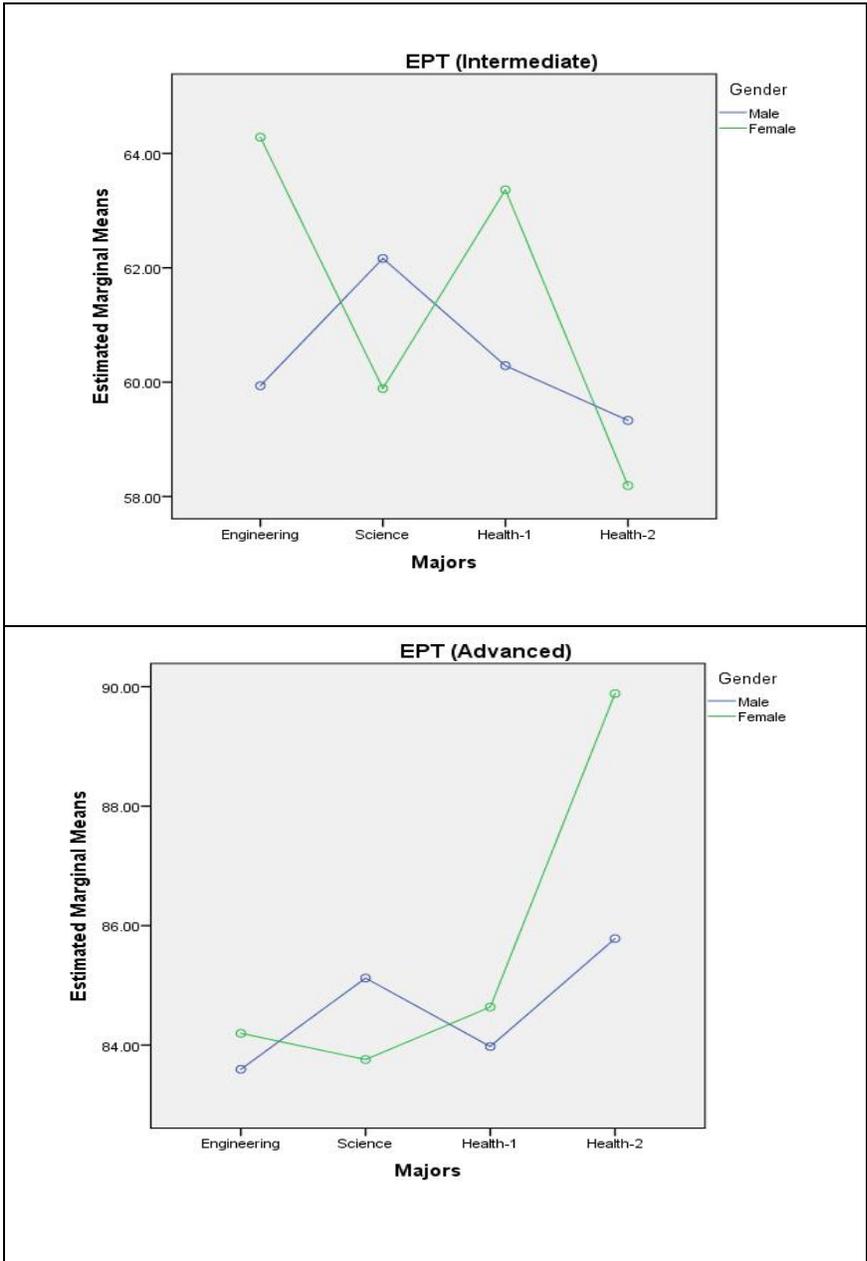


Figure 3 The EPT scores as a function of gender, majors, and proficiency levels

The inspection of Figure 3 reveals that female students had a higher score than male students across the majors at the beginner proficiency level. Moreover, the interaction effect of gender and major on the EPT score was relatively smaller, while this effect was somewhat larger for the

health-1 group. However, unlike the beginner level, the effect of the gender on the EPT scores differed across the majors for both the intermediate and advanced proficiency levels. Moreover, the effect of gender was much larger for the health-2 group than it was for other majors at beginner and advanced proficiency levels, while this effect was much larger for engineering at the intermediate level.

4. Conclusion and Discussion

The main goal of language assessment is to minimize or eliminate the potential factors that might influence the test takers' performance negatively and that contribute to the measurement error which decreases the reliability and the validity of a language test (Kormos, Brunfaut & Michel, 2020).

This study aims at examining the effect of student-related factors, such as gender, proficiency level, and major, on the students' EPT performance. Moreover, along with the main effect of each factor, the effects of interaction between these factors on the students' performance have been investigated. Before examining the effects of these factors, the relationship between the EPT and subdomain scores were examined.

The results associated with the first stage of the study, in which the relationship between the EPT scores and subdomain scores were examined, reveals that all bivariate correlations between the EPT scores and the subdomain scores were statistically significant at the significance level of 0.01. The correlation between the EPT and subdomain scores were ranging from .693 to .95 indicating that the relationships between the EPT and its subdomains were moderate to high. The EPT had the highest correlation with the compositional analysis ($r=.81$) and it was followed by the correlation between the EPT and structure domain; and reading comprehension, respectively. Therefore, it is assumed that the students' performance in the compositional analysis domain reflects the students' general language ability levels better than other domains.

The main effects of gender and proficiency levels on the EPT were found to be statistically significant, while the main effect of major was not significant. On the other hand, the mean score of proficiency levels increased from beginner level to advanced level, and the mean difference between each pair of levels was statistically significant which indicates the validity of predefined cut-scores of proficiency levels based on the EPT scores.

On the other hand, all the main and interaction effects of gender, proficiency levels, and majors on the EPT scores were found to be statistically significant except for the interaction effect of major and proficiency levels. Additionally, the effect of gender was much larger for

the Health-2 major than it was for the other majors regardless of proficiency level. However, when the interaction between the major and gender was examined for each proficiency level, it was found that the discrepancy between gender groups was larger for beginner and advanced proficiency level, while this discrepancy was larger for engineering students for students with intermediate proficiency level. Moreover, the female students outperformed male students for each major for beginner proficiency level. For the other proficiency levels, however, female students outperformed male students except for science majors where male students showed better performance which indicates an obvious gender and major interaction effect at each proficiency level. Therefore, one should avoid interpreting the gender effect without taking other factors such as students' majors and proficiency levels into account, which might lead to an inaccurate and misleading interpretation of gender effect.

When it comes to the effect size of the main and interaction effects of the factors, the proficiency level variable had the largest effect size compared to other independent variables, and it was followed by the interaction effect of gender, major, and proficiency levels. However, the effect sizes of other significant main and interaction effects were somewhat small. Therefore, it is recommended to take the amount of the effect size into consideration, when interpreting the significant effects, since the effect size statistics indicate the contribution of each variance component to the constructed model.

Minimizing the effects of unintended factors facilitate to obtain more accurate and reliable estimations of measured skills of test-takers. Moreover, stakeholders in the language testing process utilize assessment tools, such as language placement tests (EPTs), to make a decision about the language policy, to make required changes in the curriculum and syllabus design, and to use them for placement purposes (Wolf & Butler, 2017, Kormos, Brunfaut & Michel, 2020). Therefore, it is of great importance to examine the influence of student and test-related factors on the students' performance in the context of language testing.

As a result, it is suggested to use more sophisticated models to unveil the relationship between psychological factors. It is believed that the findings of this study will contribute to the existing knowledge as well as provide references for further studies.

Acknowledgments

I would like to convey my sincere thanks to Prof. Dr. Abdulrahman Hadi Alshamrani, the Director of Language Department, for his support and contribution, and thanks to National Center for Assessment (QIYAS) for providing data and guidelines for this study. The results of this project were partially presented in the Online 8th International Scientific Research Congress, August 22-23, 2020.

References

- Andreou, G., Vlachos, F., & Andreou, E. 2005. Affecting Factors in Second Language Learning. *Journal of Psychological Research*, 34(5), 429 – 438
- Bachman, L. F. (1990). *Fundamental considerations in language testing*. Oxford, England: Oxford University Press.
- Bachman, L. F. (2005). Building and Supporting a Case for Test Use. *Language Assessment Quarterly: An International Journal*, 2(1), 1-34, DOI: 10.1207/s15434311laq0201_1
- Bachman, L. F. (2007). What is the construct? The dialectic of abilities and context in defining constructs in language assessment. In J. Fox, M. Wesche, & D. Bayless (Eds.), *What are we measuring? Language testing reconsidered* (pp. 41–72). Ottawa, Canada: University of Ottawa Press.
- Bachman, L. F., & Palmer, A. S. (1996). *Language testing in practice: Designing and developing useful language tests*. Oxford, England: Oxford University Press.
- Bachman, L. F., & Palmer, A. S. (2010). *Language assessment in practice: Developing language assessments and justifying their use in the real world*. Oxford, England: Oxford University Press.
- Brennan, R. L. (Ed.). (2006). *Educational measurement* (4th ed.). Westport, CT: American Council on Education and Praeger.
- Canale, M. (1983). On some dimensions of language proficiency. In J. W. Oller (Ed.), *Issues in language testing research*. Rowley, MA: Newbury House.
- Chapelle, C. A. (1998). Construct definition and validity inquiry in SLA research. In L. F. Bachman & A. D. Cohen (Eds.), *Interfaces between second language acquisition and language testing research* (pp. 32–70). New York, NY: Cambridge University Press.
- Chapelle, C. A. (2006). L2 vocabulary acquisition theory: The role of inference, dependability and generalizability in assessment. In M. Chalhoub-Deville, C. A. Chapelle, & P. A. Duff (Eds.), *Inference and*

generalizability in applied linguistics: Multiple perspectives (pp. 47–64). Dordrecht, Netherlands: John Benjamins.

Education & Training Evaluation Commission. (2020). *Language Test*. Retrieved from <https://etec.gov.sa/en/productsandservices/Qiyas/lingual/Pages/default.aspx>

El-Omari, A. H. (2016), Factors Affecting Students' Achievement in English Language Learning. *Journal of Educational and Social Research*. 6(2), 9-18. DOI: 10.5901/jesr.2016.v6n2p9

Genc, G., & Aydin, S. 2011. Students' Motivation toward Computer-Based Language Learning. *International Journal of Educational Reform*, 20(2), 171-189.

Hungi, N., Thuku, F. W. 2010. Variations in Reading Achievement across 14 Southern African School Systems: Which Factors Matter? *International Review of Education*. 56(1), 63-101.

Kane, M. (1992). An argument-based approach to validity. *Psychological Bulletin*, 112, 527–535. DOI:10.1037/0033-2909.112.3.527

Kane, M. (2001). Current concerns in validity theory. *Journal of Educational Measurement*, 38, 319–342.

Kane, M., Crooks, T., & Cohen, A. (1999). Validating measures of performance. *Educational Measurement: Issues and Practice*, 18(2), 5–17.

Kormos, J., Brunfaut, T., & Michel, M. (2020) Motivational Factors in Computer-administered Integrated Skills Tasks: A Study of Young Learners. *Language Assessment Quarterly*, 17(1), 43-59, DOI:10.1080/15434303.2019.1664551

Kung, S. S. (2015). Factors Affecting English Test Scores: A Case Study in Taiwan. *Education Journal*. 4(1), pp. 33-36. DOI:10.11648/j.edu.20150401.17

Kunnan, A. J. (2003). Test fairness. In M. Milanovic & C. Weir (Eds.), *Select Papers from the European Year of Languages Conference*, Barcelona. Cambridge, England: Cambridge University Press

Kuramoto, N. & Koizumi, R. (2018). Current issues in large-scale educational assessment in Japan: focus on national assessment of academic ability and university entrance examinations. *Assessment in Education: Principles, Policy & Practice*, 25(4), 415-433, DOI:10.1080/0969594X.2016.1225667

Lynch, B. K. (2001). Rethinking assessment from a critical perspective. *Language Testing*, 18, 351–372. DOI: 10.1191/026553201682430085

- Mislevy, R. J., Steinberg, L. S., & Almond, R. G. (2003). On the structure of educational assessments. *Measurement: Interdisciplinary Research and Perspectives*, 1, 3–62. DOI:10.1207/S15366359MEA0101_02
- Modiano, N. (2001). Linguistic imperialism, cultural integrity, and EIL. *ELT Journal*. 55(4), 339-346.
- Oller, J. W., Jr. (1983). A consensus for the eighties? In J. W. Oller (Ed.), *Issues in language testing research* (pp. 351–6.). Rowley, MA: Newbury House.
- Phakiti, A. (2003). A closer look at the relationship of cognitive and metacognitive strategy use to EFL reading achievement test performance. *Language Testing*, 20(1), 26–56. DOI:10.1191/0265532203lt243oa
- Phakiti, A. (2008). Construct validation of Bachman and Palmer’s (1996) strategic competence model over time in EFL reading tests. *Language Testing*, 25(2), 237–72. DOI:10.1177/0265532207086783
- Purpura, J. E. (1998). Investigating the effects of strategy use and second language test performance with high- and low-ability groups: A structural equation modelling approach. *Language Testing*, 15(3), 333–79. DOI:10.1177/026553229801500303
- Shohamy, E. (1999). Critical language testing, responsibilities of testers and rights of test takers. Paper presented at the AERA Convention, Montreal.
- Shohamy, E. (2001). *The power of tests: A critical perspective on the uses of language tests*. London, England: Pearson.
- Wolf, M. K., & Butler, Y. G. (2017). An overview of English language proficiency assessments for young learners. In M. K. Wolf & Y. G. Butler (Eds.), *English language proficiency assessments for young learners* (pp. 3–22). New York, NY: Routledge. [Crossref]

CHAPTER XI

COGNITIVE DIAGNOSTIC MODELS

Dr. Elif Kübra DEMİR

Ege University, Izmir, Turkey

e-mail: elif.kubra.demir@ege.edu.tr, Orcid ID: 0000-0002-3219-1644

Cognitive Diagnostic Models (CDMs) are approaches that are popular again in the 2000s and are becoming increasingly widespread and based on latent class analysis. Latent class analysis is a statistical method that determines subgroups using multivariate categorical data and using interrelated situations. CDM was developed in order to calculate the structure of a certain knowledge or the development of a skill in the student, taking into account the strengths and weaknesses of the student at the cognitive level (Leighton & Gierl, 2007). According to these models, the answers given by the students to the items in the test are a vector of the latent classes they belong to. For this reason, the models aim to determine the latent classes of the students based on the answers given to the items. There are different models developed for this purpose. In this chapter, information will be given about the basic attributes and structures of cognitive diagnostic models.

The purpose of CDM is to classify students according to latent categories. In these models, latent variables, a vector that determines expertise, define the set of attributes underlying the student-oriented diagnosis. Here, the concept of "attribute" can be defined as a qualification, task, subtask, cognitive process or skill (Tatsuoka, 1995). In a test developed with CDM, instead of a total score or total sub-scale scores, a measurement is made in which each individual who takes the exam has specific skills in the scope and which are deficiencies. In this sense, tests developed with CDM serve not only for the evaluation process but also for determining the educational needs of each student (Cheng & Chan, 2007). In the implicit property theory, Item Response Theory (IRT) models have become increasingly popular recently. IRT models are very successful tools in predicting the implicit traits of an individual based on the answers given by individuals to items. While estimating item and ability parameters on a continuous scale, IRT models calculate "a", discrimination, "b", difficulty and "c" guessing parameters. However, IRT models do not give an idea about how the item difficulty occurs. In fact, education basically aims at analyzing the structure of the learning area, the psychological structure of the student, and the psychology under the ability to solve the task examined in the item, beyond what the IRT models offer us (Almond, Steinberg, Mislevy, 1993).

In IRT, the student's ability is modeled with the general ability parameter and denoted by θ . θ and observed scores allow us to predict a particular student's performance and rank within the group. CDM can reveal the mental process of the student and the structure of the knowledge underlying the performance. Instead of giving a score at the end of the exam, the teacher can organize student performance with CDM by showing the skills they have. In this case, the teacher can focus on these points by making a skill profile of the student and identifying the missing points. Better learning strategies can be arranged by revealing the strengths and weaknesses of the educational process. Cognitive Diagnostic Models are more suitable for situations where the test focuses on more than one interrelated structure and these structures are measured by student performance. Each item in the test measures these structures or cognitive components. CDM does not focus on students' latent ability levels, but determines student performance on each cognitive element. The possibilities obtained can be transformed to profile the skills the student has mastered.

There is an interaction between the test item and the information on the basis of the CDM. Therefore, summarizing the approaches that emphasize substance-information interaction will make it easier to define the structure of CDM. CDM is more suitable for tests where more than one attribute is measured. In the test development process with CDM, each item in the test is representative of the characteristics and cognitive structures desired to be measured. Each item in the test is arranged to measure one or more of these attributes.

CDMs can be classified by considering the following two characteristics: (1) the scale type of the latent variables (latent class models vs. latent trait models), and (2) the compensatory or non-compensatory structure of the latent attribute variables. A latent class model classifies examinees into categories on a set of skills by providing attribute mastery patterns or mastery probabilities. Latent trait model estimates examinee's ability on a continuous scale for each attribute. Because of this, CDMs can be viewed as an extension of unidimensional IRT models. But this models are non-compensatory models while traditional IRT models are compensatory latent variable models (Rupp & Templin, 2008). The list of the CDMs for the two categories is presented in Table 1.

Table 1. List of the CDMs

Latent class models	Latent trait models
Rule space (K. K. Tatsuoka, 1983)	LLTM (Fischer, 1973)
DINA (Haertel, 1989)	MLTM (Embretson, 1984)
HYBRID model (Yamamoto, 1989)	MIRT-C (McKinley & Reckase, 1982)
Unified model (DiBello, Stout, & Roussos, 1993)	GLTM (Embretson, 1984)
NIDA (Junker & Sijtsma, 2001)	LPCM (Fischer & Ponocny, 1994)
Fusion (Hartz, 2002)	
AHM (Leighton, Gierl, & Hunka, 2004)	2PL-Constrained model (Embretson, 1999)
DINO (Templin & Henson, 2006)	MLTM-D (Embretson & Yang, 2008)
LCDM (Henson, Templin, & Willse, 2009)	

The pioneers of CDMs are the Linear Logistics Test Model (LLTM) (Fischer, 1973) and the Rule Space method of Tatsuoka (1983). In this chapter, the pioneer CDM models and the most used models DINA, NIDA and DINO are mentioned.

Linear logistic test model

Although the linear logistics test model (LLTM) is thought to be the source of multi-dimensional IRT models, it is also an important step in the development of CDM. LLTM defines the difficulty parameter of the model by dividing the item difficulty parameter into difficulty-based cognitive abilities with a logical model. LLTM is similar to multidimensional item response models, where each skill represents multiple dimensions. However, the difficulty parameter is not item specific for each skill, in this model each attribute has difficulty level related to the whole test (DiBello, Roussos & Stout, 2007). It is seen that CDM, whose basic function is based on IRT, approaches IRT with a non-parametric and multi-dimensional content. The multidimensional treatment of traditional unidimensional IRT and the changes on the Item Response Function (IRF) will be explained. LLTM has a Q-matrix that contains a "cognitive process" list for each item, and with this attribute, it bridges CDM with unidimensional models such as the Rasch model (Fischer, 1983). The mathematical expression of LLTM is as follows;

$$b_i = \sum_{k=1}^K q_{ik} + \eta_k + c$$

When the mathematical formula of the model is examined, the q_{ik} parameter is an indicator of the situation in which k ability is a factor in the solution of item i . The η_k parameter is the difficulty property of the k capability, and the c parameter is an arbitrary constant that can be determined at the origin of the scale. In LLTM, the q_{ik} variable is always binary and indicates whether the skill is affected by item difficulty (DiBello et al., 2007). As seen in the model, there is only one possible strategy for the item to be answered correctly. Although the model allows any number of abilities for an item, it is not possible to model a performance for disaggregated abilities. Using a single implicit property, the model successfully reduces the levels of all abilities to a one-dimensional parameter, giving a value for the combination of capabilities. This θ can be accepted as the weighted average of all the student's ability levels (Başokçu, 2011).

Rule space method

K. K. Tatsuoka is a pioneer in the development of the rule space method (RSM; Tatsuoka, 1971; Tatsuoka, 1983; Tatsuoka, 1985; Tatsuoka, 1990; Tatsuoka, 1995). She introduced the Q-matrix theory and the rule space model to diagnose the knowledge level of examinees. Q-matrix is used to match the items with the attributes to be measured in the test development process with CDM. The term Q-matrix was used for the first time by Tatsuoka (1990) and shows the distribution of items and properties of items. In the Q-matrix, columns represent attributes (i.e., tasks, subtasks, and skills, etc.) and rows represent items. The Q-matrix guiding in CDM applications is formed by coding 1-0. This coding was defined as "weighting" and stated that a k attribute is coded as 1 when it is in an item i , and 0 when it is not found (Fisher, 1973). Since the basic cognitive tasks required to answer the test items are specified in a Q matrix, the Q matrix can be viewed as the cognitive plan or properties of the test (Gierl & Leighton, 2007).

In Table 2, a sample Q-matrix belonging to a test consisting of 3 attributes and 4 items was created. While creating the Q-matrix, the necessary attributes are coded as "1" and the unnecessary properties as "0" in order to answer an item correctly. When the Q-matrix in Table 1 is examined, it is understood that in order to answer the 1st item correctly, it is necessary to have the α_2 attribute, to answer the 2nd item correctly, α_1 and α_2 attributes, and to answer the 3rd item correctly, all three attributes are required.

Table 2. Q- Matrix

Item	Attributes		
	α_1	α_2	α_3
1	0	1	0
2	1	1	0
3	0	1	1
4	1	1	1

2^k latent classes are determined for k properties defined in the Q-matrix. Since there are 3 attributes in the Q-matrix given in Table 1, $2^3 = 8$ latent classes are determined. These latent classes are determined as (000), (100), (010), (001), (110), (101), (011), (111). Latent classes are groups that express what attributes a student has and which they do not. (100), it is understood that the student who is included in the latent class has only the first attribute defined as α_1 among the three measured attributes. Items in the Q matrix are mostly scored by field experts or cognitive psychologists. Henson (2004) states that the quality of the Q matrix directly determines the prediction of students' skill profiles.

The rule space is a two-dimensional Cartesian coordinate system that maps states of information, and the observed response models, ability parameters (θ), and atypical measures (ζ) are calculated and mapped to a classification field. The first dimension corresponds to the skill or competence variable (ζ). This dimension indicates the variation in response patterns that can be attributed to differences in examinee competence levels. The level of proficiency can be assessed by talent estimation methods. The second dimension corresponds to the variable ζ (Tatsuoka, 1984, 1985), which measures the unusualness of item-response patterns.

As one of the personal adjustment index, the ζ index has been developed to detect abnormal response patterns caused by unusual behaviors such as cheating or guessing (Tatsuoka, 1984). The ζ index was used for cognitive error diagnosis in the context of the rule space model (Tatsuoka, 1985). The purpose of defining the ζ index is to find a continuous variable or a function θ that is orthogonal to the first axis, and then a Cartesian product space (θ, ζ) where an observed item response model will be classified in one of the predetermined information states (Tatsuoka, 2009).

CDMs, which are expressed with the term cognitive diagnostic models, are given the following names in the literature; cognitive psychometric models (Rupp, 2007), cognitive diagnosis models (Nichols, Chipman, & Brennan, 1995), restricted latent class models (Haertel, 1989), multiple classification models or structured item response models (Rupp & Mislevy, 2007). Each of these different definitions express some

connotations of specific features of the models. While some definitions are determined according to the theoretical background of the models, some express the specific purpose of the models. In others, the statistical properties of the models were taken into account.

The cognitive psychometric model emphasizes the theoretical basis of the models. With the term cognitive psychological model, it is stated that the response process is theoretically a part of cognitive psychology (Rupp & Mislevy, 2007). The Restricted latent class model states that models divide the respondents into latent classes, and there is also a limitation on the number of latent classes estimated (Haertel, 1989). The multiple classification model emphasizes the creation of a multivariate profile of the respondents according to their characteristics, and they are classified according to their status of each attribute or the degree to which they have that attribute. (Rupp & Templin, 2010). The structured item response model emphasizes that models are a section within implicit property models and indicates that these models have an explanatory structure and additional parameters that include heterogeneity compared to non-structural models (Rupp & Mislevy, 2007). The aim of the models to create a diagnostic profile for individuals was effective in the spread of different names given to the models under the name of cognitive diagnosis model.

Unified model

RSM is a leading method among latent class cognitive models, but has a limitation in finding resources in response behavior from those predicted by Q. As a practical method for modeling and measuring the cognitive aspects of examinees, the unified model also includes four basic sources of such response variations. The first is the Strategy Selection. According to Tatsuoka's Q matrix (Tatsuoka, 1983) it is assumed that there is only one strategy for correctly responding to each item. However, the examinee may or may not use the strategy based on the Q-matrix. Therefore, the unified model considers this possibility and includes in the model as j_d , which is the possibility to choose the strategy based on Q instead of all other strategies to solve an item. The second source, Completeness, is based on the idea that an item j may require skills or attributes that are excluded from the Q matrix, and the Q matrix is said to be "incomplete" for the item. The third source is Positivity, the person who possesses an attribute may not be able to successfully apply it to a particular substance that requires it, or someone who does not have that attribute may apply it correctly. When such Q-unpredictable behaviors are common in the population, the trait can be said to be low positive for that item. As the fourth source, slips show random mistakes made by test takers. This term differs from Tatsuoka's usage in that any Q-unpredicted response is seen as a shift in RSM (DiBello, Stout, & Roussos, 1993)

The item response function of the unified model is given below

$$P(X_{ij} = 1 | \alpha_j, \eta_j) = di \pi_i^* \prod_{k=1}^K r_{ik}^{*(1-\alpha_{jk}).q_{ik}} P_{c_i}(\eta_j) + (1 - d)P_{b_i}(\eta_j)$$

where $P(X_{ij} = 1 | \alpha_j, \eta_j)$ is the probability of answering item i correctly given that examinee j has a skill mastery vector of α_j , and a supplemental ability parameter of η_j . q_{ik} indicates whether or not skill k is required by item i on the Q -matrix.

Fusion model (Reparameterized unified model)

The unified model (DiBello et al., 1993) has a critical limitation, that is, not all of the parameters in the model are identifiable and statistically estimable. To overcome this limitation Hartz (2002) reduced the number of parameters from $2k + 3$ to $k+2$ (k = number of skills required to solve an item). The reduced model is referred to as the Reparameterized Unified Model (RUM), is also called the fusion model.

The Fusion model is mathematically equivalent to the original unified model, the strategy selection parameter in the original unified model was omitted in the RUM. If strategy selection parameter in the unified model is set to 1, the unified model can be converted into RUM as follows (Roussos et al., 2007):

$$P(X_{ij} = 1 | \alpha_j, \eta_j) = \pi_i^* \prod_{k=1}^K r_{ik}^{*(1-\alpha_{jk}).q_{ik}} P_{c_i}(\eta_j)$$

The r_{ik}^* parameter distinguishes which item is more effectively discriminating between examinees with or without skill k . Similar to the positivity index in the unified model, if the r_{ik}^* parameters are closer to zero for most items, the test will be considered to be well designed for diagnosing mastery on skill k (Roussos et al., 2007).

DINA, NIDA, and DINO model

The Deterministic Inputs, Noisy “And” gate (DINA; Haertel, 1989) model and the Noisy Input, Deterministic “And” gate (NIDA; Junker & Sijtsma, 2001) models are conjunctive (non-compensatory) models for skills diagnosis. However, the *Deterministic Input; Noisy “Or” gate* (DINO; Templin & Henson, 2006) model is a disjunctive (compensatory) model. Conjunctive models are suitable for skill diagnostics where the

solution of a task is divided into a series of combined interactive steps rather than compensatory interaction. Compensatory models are increasingly applied to various settings, such as medical and psychological disorder diagnosis, where the presence of other symptoms can compensate for the absence of certain symptoms (Haertel, 1989; Rousoss et al., 2007).

DINA model

The item response function for a single task of the DINA model is

$$P \left[X_{ij} = 1 \mid \eta_{ij}, s_j, g_j \right] = (1 - s_j) \eta_{ij} g_j^{1 - \eta_{ij}}$$

The corresponding item j of the matrix Q can be represented as

$$\eta_{ij} = \prod_{k=1}^K \alpha_{ik}^{q_{jk}}$$

When the above equation is examined, whether $\alpha_{ik} = 0$ or 1 depends on whether the i student has the k attribute or not. Although j shows the total number of items, it allows to determine whether the student i has the desired qualifications and the X_{ij} observed score.

The latent response (η_{ij}) is a function of student ability (α_{ik}) and item requirements (q_{jk}) (de la Torre, 2008). The DINA model produces two separate item parameters as s (slip) and g (guess) parameters for each item as a probability basis for the relationship between the latent attribute and the observed behavior. The s parameter indicates that the individual answers the item incorrectly despite having the necessary characteristics to answer the item j correctly. This situation is defined as false negative probability. The lower the value of the s parameter for the item, the more likely the individuals who have the necessary characteristics to answer the item correctly answer the item correctly. The parameter g , on the other hand, indicates that the individual answers the item correctly even though he / she does not have the necessary characteristics to answer item j correctly. This situation is defined as the false positive probability. The higher the value of the g parameter, the more likely the individuals who do not have the necessary qualifications to answer the item correctly answer the item correctly. Similarly, the lower the value of the g parameter, the more likely the item will be answered correctly only by individuals who have the necessary characteristics (Zhang, 2006). The slipping and guessing parameter are expressed as follows:

$$s_j = P \left[Y_{ij} = 0 \mid \eta_{ij} = 1 \right]$$

$$g_j = P \left[Y_{ij} = 1 \mid \eta_{ij} = 0 \right]$$

where Y_{ij} is a response for examinee j and item i . As student assessment methods improve, DINA model applications are also increasing. With the

DINA model, the deficiencies of the students are determined and learning activities are organized and it is aimed that the students have the attributes they cannot acquire. It is especially used in national or international language tests, computer-aided individualized tests and item bias.

NIDA model

NIDA model refers to the initials of the words "Noisy inputs, Deterministic" And "Gate". Although the NIDA model is a more complex cognitive diagnosis model, there are many similarities between the DINA model and the NIDA model. The two models are random cognitive models based on task performance under the assumptions of monotony and conditional independence. Unlike the DINA model, the NIDA model predicts offset and prediction parameters based on the attribute level instead of the item / task level. The mathematical expression of the NIDA model is as follows

$$P[Y_{ij} = 1 | \alpha, s, g] = \prod_{k=1}^K [(1 - s_k)^{\alpha_{ik}} g_j^{1-\alpha_{jk}}]^{Q_{jk}}$$

Unlike the DINA model, the NIDA model accepts that a student who does not have one of the properties of the item is more likely to answer the item correctly than the student who does not have any attributes (Junker & Sijtsma, 2001).

DINO model

The deterministic input, noisy-or-gate (DINO) model (Templin & Henson, 2006) is the compensatory version of the DINA model. While the DINO is a compensatory ("Or" gate) model, the DINA is a conjunctive ("And" gate) model.

In the And gate structure, only all inputs are 1 while the result is evaluated as 1. Or gate, coding any of the inputs as 1 is enough for the result to be 1. Accordingly, in the DINA model, the respondent should have all the necessary attributes for the item in order to have a high probability of answering an item correctly. In the DINO model, even if the respondent has only one of the attribute required by the item is sufficient for a high probability of answering the item correctly. Apart from this, the item and ability parameters of the two models are almost the same, but in the item response function, or gate is added to the DINO model (Templin & Henson, 2006).

The mathematical expression of the NIDA model is as follows

$$P(X_{ij} = 1 | \underline{\alpha}_j) = \pi_i^{[1 - \prod_{k=1}^K (1 - \alpha_{jk})^{q_{ik}}]} r_i^{\prod_{k=1}^K (1 - \alpha_{jk})^{q_{ik}}}$$

In the formula, $\pi_i = i$ the probability of a student who has at least one of the skills required for item i to answer the item correctly, while $r_{i=}$ is the probability of a student who does not have any skills required for item i to answer the item correctly (de la Torre & Douglas, 2004; Templin & Henson, 2006).

References

- Almond, R. G., Steinberg, L. S., & Mislevy, R. J. (2003). A framework for reusing assessment components. In H. Yanai, A. Okada, K. Shigemasu, Y. Kano, & J. J. Meulman. (Eds.), *New Development in Psychometrics*. Tokyo, Japan: Springer.
- Başokçu, T.O. (2011). *Bağıl ve Mutlak Değerlendirme ile DINA Modele Göre Yapılan Sınıflamaların Geçerliğinin Karşılaştırılması*. Unpublished doctoral dissertation, Ankara.
- Cheng Y. ve Chang H. (2007). The Modified Maximum Global Discrimination Index Method for Cognitive Diagnostic Computerized Adaptive Testing. *Presented at the CAT and Cognitive Structure Paper Session*.
- de la Torre, J. (2008). An empirically-based method of Q-matrix validation for the DINA model: Development and applications. *Journal of Educational Measurement*, 45, 343–362.
- de la Torre, J., Douglas, J.A.(2004). Higher-order latent trait models for cognitive diagnosis. *Psychometrika* 69, 333–353
- DiBello, L. V., Roussos, L. A., & Stout, W. F. (2007). Review of cognitive diagnostic assessment and a summary of psychometric models. In C. R. Rao & S. Sinharay (Eds.), *Handbook of statistics: Volume 26, psychometrics* (pp. 979-1030). Amsterdam: Elsevier.
- DiBello, L. V., Stout, W. F., & Roussos, L. A. (1993). *Unified cognitive/psychometric Diagnosis foundation*. Manuscript submitted for publication.
- Embretson, S. E. (1984). A general multicomponent latent trait model for response processes. *Psychometrika* 49, 175-186
- Embretson, S. E., & Yang, X. (2006a). Multicomponent latent trait models for complex tasks. *Journal of Applied Measurement*, 7 (3), 540-557.
- Embretson, S. E. (1999). Generating items during testing: Psychometric issues and models. *Psychometrika*, 64, 407-433.

- Fischer, G. H. (1973). The linear logistic test model as an instrument in educational research. *Acta Psychologica* 37, 359-374.
- Fischer, G.H. (1983). Logistic latent trait models with linear constraints. *Psychometrika* 48, s.3–26.
- Fischer, G. H., & Ponocny, I. (1994). An extension of the partial credit model with an application to the measurement of change. *Psychometrika* 59, 177-192.
- Gierl, M. J., & Leighton, J. P. (2007). Directions for future research in cognitive diagnostic assessment. In J. Leighton., & M. Gierl (Eds.), *Cognitive Diagnostic Assessment for Education*. New York, NY: Cambridge University Press.
- Haertel, E. H. (1989). Using restricted latent class models to map the skill structure of achievement items. *Journal of Educational Measurement*, 26, 301-323.
- Henson, R. (2004). *Test discrimination and test construction for cognitive diagnostic models*. Unpublished doctoral dissertation, University of Illinois.
- Henson, R. A., Templin, J. L., & Willse, J. T. (2009). Defining a family of cognitive diagnosis models using log-linear models with latent variables. *Psychometrika*, 74(2), 191-210.
- Junker, B.W., & Sijtsma, K. (2001). Cognitive assessment models with few assumptions, and connections with nonparametric item response theory. *Applied Psychological Measurement*, 25, 258–272.
- Leighton, J. P., & Gierl, M. J. (2007) *Cognitive diagnostic assessment for education: Theory and applications*. New York, NY US: Cambridge University Press
- Leighton, J. P., Gierl, M. J., & Hunka, S. M. (2004). The attribute hierarchy model for cognitive assessment: A variation on Tatsuoaka's rule-space approach. *Journal of Educational Measurement*, 41, 205-237
- McKinley, R. L., & Reckase, M. D. (1982). *The use of the general Rasch model with multidimensional item response data* (Research Rep. ONR 82-1). Iowa City IA: American College Testing.
- Nichols, P. D., Chipman, S. F., & Brennan, R. L. (1995). *Cognitively diagnostic assessment*. Hillsdale, New Jersey: Lawrence Erlbaum.

- Roussos, L. A., DiBello, L. V., Stout, W., Hartz, S. M., Henson, R. A., & Templin, J. L. (2007). The fusion model skills diagnosis system. In J. Leighton., & M. Gierl (Eds.), *Cognitive Diagnostic Assessment for Education*. New York, NY: Cambridge University Press.
- Rupp, A. A. (2007). The answer is in the question: A guide for describing and investigating the conceptual foundations and statistical properties of cognitive psychometric models. *International Journal of Testing*, p95-125.
- Rupp, A.A., & Mislevy, R. J. (2007). Cognitive Foundations of Structured Item Response Models. In J. Leighton., & M. Gierl (Eds.), *Cognitive Diagnostic Assessment for Education*. New York, NY: Cambridge University Press.
- Rupp, A. A., & Templin, J. T. (2008). Unique Characteristics of Diagnostic Classification Models: A Comprehensive Review of the Current State-of-the-Art. *Measurement: Interdisciplinary Research & Perspective*, 6(4), 219-262
- Rupp, A. A., & Templin, J. (2010). *Diagnostic Measurement: Theory, Methods, and Applications*. New York: The Guilford Press A Division of Guilford Publication 82/83.
- Tatsuoka, K. K. (1983). Rule space: An approach for dealing with misconceptions based on item response theory. *Journal of Educational Measurement*, 20, 345-354.
- Tatsuoka, K. K. (1984). Caution indices based on item response theory. *Psychometrika*, 49, 94-110.
- Tatsuoka, K. K. (1985). A probabilistic model for diagnosing misconceptions in the pattern classification approach. *Journal of Educational Statistics*, 12(1) 55-73.
- Tatsuoka, K. K. (1990). Toward an integration of item-response theory and cognitive error diagnosis. In N. Fredrickson, R. L. Glaser, A. M. Lesgold, & M. G. Shafto (Eds). *Diagnostic monitoring of skills and knowledge acquisition* (pp. 453-488). Hillsdale, NJ: Erlbaum
- Tatsuoka, K. K. (1995). Architecture of knowledge structures and cognitive diagnosis: A statistical pattern recognition and classification approach. In P. D. Nichols, S. F. Chipman, & R. L. Brennan (Eds.), *Cognitively diagnostic assessment* (pp. 327-359). Hillsdale, NJ: Erlbaum.
- Tatsuoka, M. M. (1971). *Multivariate analysis*. New York: John Wiley.

- Templin, J. L., & Henson, R. A. (2006). Measurement of psychological disorders using cognitive diagnosis models. *Psychological Methods*, *11*(3), 287-305.
- Yamamoto, K. (1989). *HYBRID model of IRT and latent class models* (ETS Research Report RR-89-41). Princeton, NJ: Educational Testing Service (ERIC Document Reproduction Service No. ED 310161)
- Zhang, W. (2006). *Detecting Differential Item Functioning Using the DINA Model*. Unpublished doctoral dissertation. The University of North Carolina at Greensboro.

CHAPTER XII

POSITIVE EDUCATION AND SELF-DETERMINATION THEORY: A REVIEW OF IMPLEMENTATIONS AND INFLUENCES

Mehmet Uğur KUTLUER* & Assoc. Prof. Aylin MENTİŞ KÖKSOY**

*Ege University, Izmir, Turkey

e-mail: mehmetugurkutluer@gmail.com, Orcid ID: 0000-0001-9441-1174

** Ege University, Izmir, Turkey

E-mail: aylinmentiskoksoy@gmail.com, Orcid ID: 0000-0003-4549-0579

1.Introduction

This study explores the Positive Education model, which values the happiness of students as well as their academic achievement and offers a new paradigm to education by aiming to increase their well-being levels, and the implementation methods and examples of Self-Determination Theory, which discusses well-being on the basis of autonomy and makes recommendations for classroom education practices, by providing a summary review from literature sources (Seligman, Ernst, Gillham, Reivich, & Linkins, 2009). When we examine the implementations done, we see that the content of the new paradigm offered by the PosEd education model includes not only well-being but also character strengths (White, 2016). In his article titled “Positive Education: Positive Psychology and Classroom Interventions” conducted with esteemed scientists in 2009, Martin Seligman expressed that disorders such as depression and anxiety experienced by students have been increasing. According to the current data of the World Health Organization, this is still a problem that remains valid (Mental Health, 2020). The inspiration of PosEd (Positive Education), Positive Psychology argues that people should focus on their positive and developable traits by changing their trajectory of pathological psychology, which focuses on people’s negativities (Kristjánsson, 2012). In fact, this point of view was reminiscent of a preventive medicine work that was trying to close the gateways to becoming sick. Adapting the ideas of Martin Seligman the founder of the Positive Psychology approach, PosEd also advocates supporting the positive aspects of the students (Hoare, Bott, & Robinson, 2017).

Today, PosEd is an educational approach that is accepted worldwide and is spreading day by day (Seligman & Adler, 2019: 52). Today, countries in different geographies and with different cultures interpret PosEd according to their educational needs. Wellness, mindfulness and character strengths added to the Tecmilenio University’s well-being ecology in addition to Martin Seligman’s PERMA well-being model can be shown as an example (Seligman & Adler, 2019). We in Turkey

geography, significant budget to be set aside and we think not cheap today, even if the implementation of posed models will attract more attention in the near future. In the case of Turkey, we believe that the PosEd model that we need to allocate significant budgets and that is not cheap to implement will attract more attention in the near future, if not today. If we contemplate the contributions of the PosEd's immersion to Turkish culture as in other countries to the country's education, we cannot ignore the necessity of a correct interpretation of PosEd specific to the culture.

Therefore, we believe that adding the autonomy and intrinsic motivation emphasis of the Self-Determination Theory in addition to the PERMA model will be beneficial (Noble & McGrath, 2015). In Turkish culture, where independence and freedom is highly emphasized, in contrast to this emphasis, the cases of embarrassment and oppression that undermine autonomy and kill intrinsic motivation in the relationships of the people nurtured by this culture and thus in the educational processes are frequently encountered. We believe that it will not be possible to build permanent positive values and witness the emergence of entrepreneurial individuals who will realize social breakthrough in an environment where life's responsibilities are not undertook and the potential brought by intrinsic motivation are not achieved due to embarrassing and oppressing others. In this study, a conceptual framework about PosEd and Self-Determination Theory will be presented, and implementation examples will be given with methods.

2.Positive Education

2.1. Positive Psychology

Elected as the president of the American Psychology Association (APA) in 1998, Martin Seligman argued that the trajectory of psychology science focusing on the pathological and negative aspects of people should move in a direction focusing on the positive aspects of people and striving to improve these aspects (Kristjánsson, 2012). Positive Psychology approach emerged as a result of the studies supporting these ideas. In this approach that is mindful of people's happiness, the term well-being referring to a framework that is clear and measureable was used instead of the term happiness that is ambiguous in itself. In the context of this theory, Martin Seligman used to see the realization of individuals' well-being dependent on three components, namely positive emotions, engagement and meaning. Over time, he updated this model and revealed the PERMA model consisting of five components (Oades, Robinson, Green, & Spence, G. B. 2011).

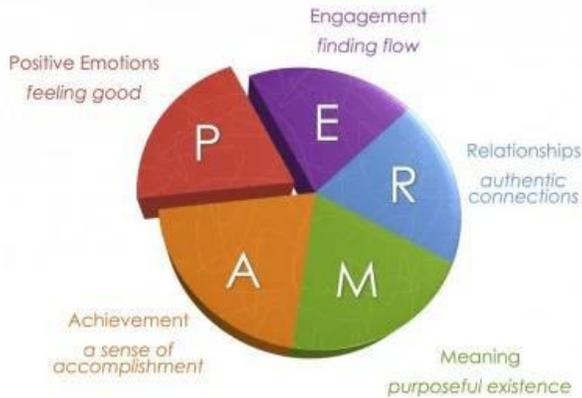


Figure 1 PERMA Model (PERMA Model, 2020)

2.1.1. Positive Emotions

Having positive emotions is the most basic and primary component of well-being. Positive emotions refer to having an optimistic outlook on life and feeling good. A person who has positive emotions has a positive attitude towards the past, present and future (Pekrun, Goetz, Titz, & Perry, (2002).

2.1.2. Engagement

Engagement refers to a state of flow that provides well-being. Flow, on the other hand, refers to experiencing a positive loss and integration within an activity as a result of intense focus on that activity. In fact, rather than getting lost in an activity, engagement refers to the experience of finding yourself in that activity and enjoying the activity fully (Waters, 2011).

2.1.3. Relationships

The relationships component states that interaction with other people is required for well-being to occur. This interaction describes a real relationship model where individuals who experience this relationship make active and nurturing sharings. The existence of real relationships with family or friends in this content supports well-being.

2.1.4. Meaning

Meaning refers to the necessity of something that meets the need of human beings' search of meaning in order to realize well-being. The meaning component states that people living a purposeful life contributes to people's well-being. It also states that the element that will ensure this purposeful life can be anything such as a sense of service to society, religious belief or the goal of achieving a task.

2.1.5. Achievement

Achievement refers to personal success through demonstrating competence according to social standards. Achievement is a sense of accomplishment that enables the person to feel he or she is a needed person in the society, and a sense of self-appreciation. This component argues that this accomplishment sense is necessary for well-being.

These five components in the PERMA model developed by Martin Seligman within the framework of Positive Psychology are stated by him as the conditions for ensuring well-being (Noble & McGrath, 2015).

Martin Seligman reached these conclusions as a result of a number of experimental studies on these components.

2.2. Positive Education

Bringing a new paradigm to education, PosEd (Positive Education) refers to Positive Psychology practices in the field of education. Fed by the conceptual framework of Positive Psychology, this educational approach gives importance to the happiness of students, in other words gives importance to well-being, which is a measurable and a clearer concept (White & Kern, 2018). In addition to the traditional approach in educational processes aiming at academic achievement, PosEd aims for objectives that students can develop their own well-being. With these life skills taught to students, it is aimed to ensure their lifelong well-being and increase their resilience levels in the face of a situation that strains their mental health and psychological status (Halliday, Kern, Garrett & Turnbull, 2020). Of course, we cannot consider the achievement of students' well-being independent from teachers' well-being or even school administrators' well-being. We see that such studies take place within the scope of PosEd. When we examine different PosEd implementations around the world, it is seen that these implementations focus not only on the psychological health of students, but also on the development of character strengths. Therefore, we can say that PosEd has three main goals: academic achievement, psychological well-being and character development (O'Brien, 2012).

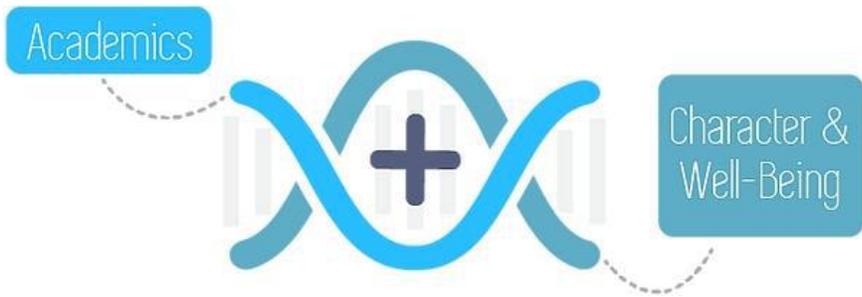


Figure 2 *The Double Helix* (*The Double Helix*, 2020)

We cannot say that PosEd is low cost because developing a curriculum appropriate for PosEd, providing the materials appropriate for this curriculum, developing educators training, continuous evaluations and event-based intervention all require serious human, time and money resources. In addition, being in constant communication with educators, officials and parents who are concerned that the time spent on well-being and character strengths will have a negative impact on the academic achievement of students (the study results revealed the opposite) and informing by sharing the assessments are actions that require serious time and effort for the success of the process.

3.Implementations Of Positive Education

Implementing the PosEd model requires a comprehensive and multi-participant study. A study conducted in 2019 explained how PosEd implementation was executed, and provided a checklist proposal regarding the implementation (Seligman & Adler, 2019: 52). This 12-item checklist is as follows:

- *Contextual and cultural immersion and understanding
- *Multi-stakeholder engagement
- *Needs and goals assessments
- *Quantitative baseline measurement
- *Curricular development and adaptation
- *Training of educators
- * Curriculum implementation
- *Ongoing training and embedding
- *Post-intervention measurement and ongoing impact evaluation
- *Evidence-based policy design and legal institutional embeddedness
- *Large-scale policy implementation

*Ongoing evidence-based evaluation, adaptation and evaluation

This checklist actually functions as a suggestion guide for all decision makers, describing how to transition to PosEd and which steps should be followed. These steps show that multi-stakeholder engagement is at the forefront, evidence-based progress is very important and these stages are full of intensive evaluation processes (Seligman & Adler, 2019: 52).

3.1. Geelong Grammar School

The implementation carried out in Geelong Grammar School is the first PosEd implementation. This does not mean that this was the first infrastructural work for PosEd because Martin Seligman, together with his colleagues, had previously carried out the work that was the basis of this implementation. For the works carried out in Geelong Grammar School, many national and international experts in the fields of resilience, educational and developmental psychology worked together, and this enabled the development of a strong philosophy. Strong communication was established with the school teachers, students, parents and decision-makers through the use of clear communication language and regular feedback, and they became a part of this transformation. The process was not interrupted, as the PosEd unit provided the committed funds without delay. Thus, Geelong Grammar School became the first institution to provide education entirely with the PosEd model (Seligman et al., 2009).

3.2. The University of Adelaide

In this institution, PosEd was implemented in the field of teacher education. In fact, if you are going to develop a new paradigm in the field of education and implement it as an educational model, it made sense to start with the most effective component of education, namely the teachers. A well-being framework was developed at the university under the leadership of Professor Faye McCallum. This framework was a well-being framework developed with evidence-based approaches based on the character virtues philosophy. Serious reforms were carried out with key institutions such as the Teachers Registration Board of South Australia. A large team of heads of schools, program directors, course coordinators, current and future teaching teams, learning designers and colleagues in learning enhancement and innovation, students with existing degrees and graduates from all degrees who were practicing teachers worked on the curriculum design. It is believed that the teacher candidates who will graduate from here will significantly affect the future of tens of thousands students in the coming years (Seligman & Adler, 2019: 52).

3.3. Tecmilenio University

This university located in Mexico provides education as a completely PosEd university with the Ecosystem of Happiness and Wellbeing they developed.



Figure 1 Well-Being's Ecosystem (Well-Being's Ecosystem, 2020)

Ecosystem of Happiness and Wellbeing includes wellness, mindfulness and character strengths in addition to the PERMA model developed by Martin Seligman. Tens of thousands of students studying at this university continue their education life in this ecosystem in its 29 campuses. Undergraduate students take happiness and well-being courses in their first semester each year. Positivity at this university, which is completely a PosEd university, is not limited to students, but also applies to alumni, employees, and institutions cooperating with the university (Well-Being's Ecosystem, 2020).

3.4. Bhutan

The country of Bhutan is the one country that made the most comprehensive PosEd move. This country measures the happiness level of its citizens with the Gross National Happiness measurement just like the economic measurements done in other countries. As in all PosEd implementations, they worked on a comprehensive multi-stakeholder engagement and adaptation of education policies to PosEd (Adler, 2016). A PosEd curriculum was developed, and with the works of the Ministry of National Education large-scale measurements were conducted. The

Ministry of Education developed a Life Skills Training curriculum containing ten life skills for secondary school students and ensured that these courses were offered alongside the academic courses. These ten life skills are as follows:

1. Mindfulness
2. Empathy
3. Self-awareness
4. Coping with emotions
5. Communication
6. Interpersonal relationships
7. Creative thinking
8. Critical thinking
9. Decision making
10. Problem solving

Extensive works were carried out for training for educations and curriculum implementation in the country, and post-intervention and impact evaluations of the implementations developed as a result of these works were conducted (Adler, 2016).

With large-scale scientific studies conducted in the country, whether PosEd implementations really contributed to well-being, and whether the increasing well-being level positively affected academic achievement were examined. As a result of these studies, the well-being levels of students increased, and these increased well-being levels also positively affected academic performance.

4. Positive Education-Based Programs

4.1. The United Kingdom

Universities UK (UUK) started a program on mental health in 2016 under the influence of PosEd. This program was carried out to determine the protection of mental health as a strategic priority in universities. In addition, the government allocated a high budget to a campaign called Time to Change aiming to contribute to mental health (Seligman & Adler, 2019: 52).

4.2. The U.S.A.

Gateway Community College in the United States has been carrying out a program with FiveCs components (Character-Connection-Care-Career-Contribution) with the aim of making well-being a priority in the entire

school system. This college aims to be the first well-being community college in the world (Seligman & Adler, 2019: 52).

4.3. China

The Positive Psychology Research Center (PPRC) at Tsinghua University has been developing PosEd curricula covering thousands of students, organizing trainings and conducting scientific measurements (Seligman & Adler, 2019: 52).

4.4. India

Three different studies were carried out by CorStone, a non-profit organization, in order to ensure well-being and mental health. In the Youth First project including students in public middle school, and the Girls First projects including students in Kasturba Gandhi Balika Vidyalaya, a positive change was aimed at the resilience, self-efficacy, social-emotional assets, psychological wellbeing and social wellbeing levels. In the project called Self-Help Group Resilience Project, the self-help group, a village-based financial intermediary formed by 10-20 local women in India, was made the tool of a well-being study that includes rural and low-literacy women (Seligman & Adler, 2019: 52).

4.5. United Arab Emirates

Outstanding schools in this country are awarded with the “Well Schools Mark”. The public and private schools that are members of The Well Schools Network are supported financially and as an advisory by this network in order for to comply with the PosEd principles. The schools that show high performance in terms of compliance with positive education receive the “Well Schools Mark” as an indicator of their distinction and excellence (Seligman & Adler, 2019: 52).

PosEd programs are also run in Canada, Colombia, Brazil, Chile, Peru, Japan, Nepal, Singapore, Thailand, Philippines, South Africa, New Zealand, France, Finland, Portugal, Slovenia, Switzerland and Spain. In addition, The International Positive Education Network (IPEN) has become a network with a large number of participants, including 28.000 educators from 165 countries (Seligman & Adler, 2019: 52).

5. Self-Determination Theory

Self-determination theory argues that individuals are born with an intrinsic motivation towards their own interests and potentials, and emphasizes the importance of nurturing this internal motivation. Developed by Edward Deci and Richard Ryan, theory states that the basic requirements for an individual’s well-being are autonomy, relatedness and competence. This theory developed mini theories within itself, whose number has increased over the years. These mini theories are Cognitive

Evaluation Theory, Organismic Integration Theory, Causality Orientations Theory, Basic Psychological Needs Theory, Goal Contents Theory and Relationships Motivation Theory (Self-Determination Theory, 2020).

5.1. Organismic Integration Theory

It discusses extrinsic motivation with a perspective on the basis of internal motivation. The important point is the internalization of extrinsic motivation by nurturing the autonomy, relatedness and competency requirements and the extrinsic motivation structures that emerge with this process. The structures that emerge with the internalization of extrinsic motivation are external regulation, introjected regulation, identified regulation and integrated regulation.

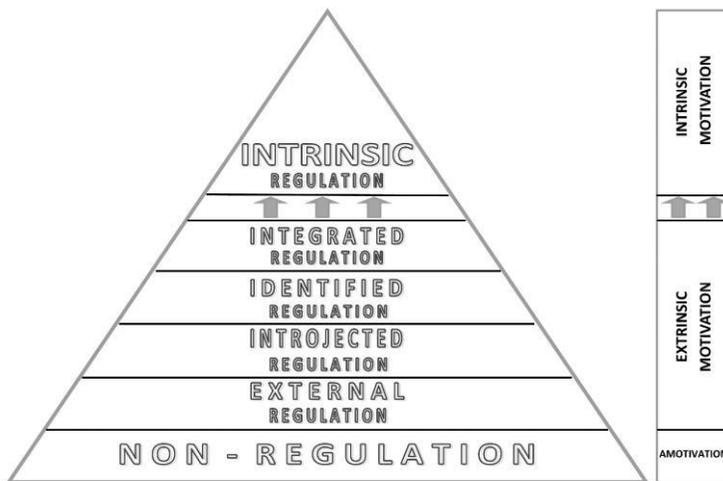


Figure 4 Originally Developed and Adapted from the Table Published by the Organismic Integration Chart (Deci & Ryan, 2002)

5.2. Basic Psychological Needs Theory

Self-determination theory considers the psychological well-being and psychological health of the individual as related to the satisfaction of the three aforementioned basic needs of autonomy, relatedness and competence. This mini theory argues that these three basic needs are interrelated and represent a unity. The lack of any of these needs will lead to negative situations (Ryan & Deci, 2000).

5.2.1 Autonomy

Autonomy refers to the realization of the processes of initiating, continuing and terminating the behaviors of the individual within his or her own will. This theory underlines that autonomy and independence do not have the same meanings. In the realization of autonomous behavior, the

will factor, the awareness of the values constituting the behavioral infrastructure and the adoption of these values are emphasized (Ryan & Deci, 2000).

5.2.2 Competence

Competence refers to being a useful individual who can fulfill an important function for the society. This functionality provides a space for the individual to be superior over his or her environment, and the individual develops a sense of competence. Providing the ability to influence and direct the environment, competence emphasizes not only functionality but also harmony with the environment (Deci & Ryan, 1985).

5.2.3 Relatedness

Relatedness refers to the presence of a connection with other people and the feeling that he or she is part of a whole. The satisfaction of this need is tried to be met through relationships based on trust, love and respect. It is stated that high quality and satisfying relationships support intrinsic motivation (Ryan & Deci, 2006).

5.3. Goal Contents Theory

Goal contents theory categorizes goals into intrinsic and extrinsic goals. It examines the effects of goals on well-being and motivation. It discusses intrinsic and extrinsic motivation as the determinant of intrinsic and extrinsic goals (Deci & Ryan, 2000).

5.3.1. Intrinsic Motivation

Manifesting itself existentially in the individual, intrinsic motivation is a type of motivation that is innate. Children's efforts to explore the environment that emerge from the moment they are born and their desire to play are considered within the scope of this motivation (Ryan & Deci, 2008).

5.3.2. Extrinsic Motivation

Extrinsic motivation is a type of motivation that occurs within the causality of and under pressure of avoiding reward and punishment. The individual performs the behavior not in line with his or her own will but in a compelling situation (Ryan & Deci, 2008).

6. Influences Of Self-Determination Theory In Education

Some scientific studies showed that students who have a self-determined motivation are more enthusiastic about doing schoolwork than students who lack self-determined motivation (Deci, Vallerand, Pelletier, & Ryan, 1991). What we mean with the effect of self-determination theory in education is supporting autonomy and intrinsic motivation and observing students' competence and relatedness needs. Encouraging

students to make choices and to reflect on their learning process, being warm, caring and respectful, providing an environment to develop students' competencies, providing feedback and presenting them problems that can be overcome is self-determined education (Niemic & Ryan, 2009).

The first longitudinal classroom-based self-determination theory experimental study conducted with 500 8th grade students determined that autonomy support contributed to students' academic achievement (Jang, Kim & Reeve, 2012). Two experimentally-based and longitudinally-designed studies conducted with five teachers and four students revealed that students and teachers' educational scores increased after teachers provided structure in an autonomy-supportive way (Cheon, Reeve, & Vansteenkiste, 2020). In another experiment conducted by giving autonomy support training to some of the teachers, it was observed that the teachers who received training were more autonomy-supportive and their classes were more enthusiastic towards the school (Reeve, Jang, Carrell, Jeon, & Barch, 2004). Furthermore, in another experiment, it was put forth that nine young people who took lessons from teachers trained with autonomy-supportive methods exhibited more positive educational experiences (Su & Reeve, 2011).

References

- Adler, A. (2016). *Teaching Well-Being increases Academic Performance: Evidence from Bhutan, Mexico and Peru* (Doctoral Dissertation). Publicly Accessible Penn Dissertations, (1572).
- Cheon, S. H., Reeve, J. & Vansteenkiste, M. (2020) When teachers learn how to provide classroom structure in an autonomy-supportive way: Benefits to teachers and their students. *Teaching and Teacher Education*, 90(2020), 103004.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press.
- Deci, E. L., & Ryan, R. M. (2002). *Handbook of self-determination research*. Rochester: University of Rochester Press.
- Deci, E. L., Vallerand, R. J., Pelletier, L. G., & Ryan, R. M. (1991). *Motivation and education: The self-determination perspective*, *Educational Psychologist*, 26(3&4), 325-346.
- Halliday, A. J., Kern, M. L., Garrett, D. K., & Turnbull, D. A. (2020). Understanding factors affecting positive education in practice: An Australian case study, *Contemporary School Psychology*, 2020 (24), 128-145.

- Hoare, E., Bott, D., & Robinson, J. (2017). Learn it, live it, teach it, embed it: Implementing a whole school approach to foster positive mental health and wellbeing through positive education, *International Journal of Well-Being*, 7 (3), 56-71.
- Jang, H., Kim, E. J., & Reeve, J. (2012). Longitudinal test of self-determination theory's motivation mediation model in a naturally occurring classroom context, *Journal of Educational Psychology*, 104(4), 1175–1188.
- Kristjansson, K. (2012). Positive psychology and positive education: Old wine in new bottles?, *Educational Psychologist*, 47(2), 86-105.
- Mental Health. (n.d.). Retrieved September 9, 2020 from <https://www.who.int/health-topics/mental-health>.
- Niemiec, C. P., & Ryan R. M. (2009). Autonomy, competence and relatedness in the classroom: Applying self-determination theory to educational practice, *Theory and Research in Education*, 7(2), 133-134.
- Noble, T., & McGrath, H. (2015). PROSPER: A new framework for positive education, *Psychology of Well-Being*, 5(2), 1-17.
- Oades, L. G., Robinson, P., Green, S., & Spence, G. B. (2011). Toward a positive university, *The Journal of Positive Psychology*, 6(6), 432-439.
- O'Brien, C. (2012). Sustainable happiness and well-being: Future directions for positive psychology, *Scientific Research*, 3(12A), 1196-1201.
- Pekrun, A., Goetz, T., Titz, W., & Perry R. P. (2002). *Positive emotions in education*. In E. Frydenberg (Ed.). *Beyond Coping: Meeting goals, visions and challenges* (p. 149-173). Oxford: Oxford University Press.
- PERMA Model. (n.d.) Retrieved September 9, 2020 from <https://positivepsychology.com/perma-model/>.
- Reeve, J., Jang, H., Carrell, D., Jeon, S., & Barch, J. (2004). Enhancing students' engagement by increasing teachers' autonomy support, *Motivation and Emotion*, 28(2), 147-169.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being, *American Psychologist*, 55(1), 68.
- Ryan, R. M., & Deci, E. L. (2006). Self-regulation and the problem of human autonomy: Does psychology need choice, self-determination, and will?, *Journal of Personality*, 74(6), 1557-1585.
- Ryan, R. M., & Deci, E. L. (2008). *Self-determination theory and the role of basic psychological needs in personality and the organization of*

- behavior*. In O. P. John, R. W. Robbins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (p. 654–678). New York: The Guilford Press.
- Seligman, Martin & Adler, Alejandro. (2019). *Positive Education* (Seligman, M. E. P., Adler, A. (2019). Positive Education. In J. F. Helliwell, R. Layard, & J. Sachs (Eds.), *Global Happiness and Wellbeing Policy Report: 2019*. (Pp. 52 - 71). Global Council for Wellbeing and Happiness.).
- Seligman, M. E. P., Ernst, R. M., Gillham, J., Reivich, K., & Linkins M. (2009). Positive education: Positive psychology and classroom interventions, *Oxford Review of Education*, 35 (3), s. 293-311.
- Su, Y., Reeve, J. (2011). A meta-analysis of the effectiveness of intervention programs designed to support autonomy, *Educational Psychology Review*, 23(1), 159-188.
- The Double Helix. (n.d.) Retrieved September 9, 2020 from <https://www.ipen-network.com/about-us>.
- Self-Determination Theory. (n.d.) Retrieved September 9, 2020 from <https://selfdeterminationtheory.org/the-theory/>.
- Waters, L. (2011). A review of school-based positive psychology interventions, *The Australian Educational and Developmental Psychologist*, 28(2), 75-90.
- Well-Being's Ecosystem. (n.d.) retrieved September 9, 2020 from http://www.wellbeinginhighereducation.com/uploads/3/8/0/4/3804146/icf_english_extmi.pdf.
- White, M. A. (2016). Why won't it stick? Positive psychology and positive education, *Psychology of Well-Being*, 6(2), 1-16.
- White, M., & Kern, M. L. (2018). Positive education: Learning and teaching for wellbeing and academic mastery, *International Journal of Well-Being*, 8(1), 1-17.

CHAPTER XIII

A SWOT ANALYSIS OF ENGLISH LANGUAGE TEACHER TRAINING CURRICULUM¹

Asst. Prof. Dr. Reyhan AĞÇAM* & Assoc. Prof. Dr. Pınar BABANOĞLU**

*K. Sütçü İmam University, Kahramanmaraş, Turkey
e-mail: reyhanagcam@gmail.com, Orcid ID: 0000-0002-5445-9031

**Mersin University, Mersin, Turkey
e-mail: pinarbab@hotmail.com, Orcid ID: 0000-0001-8166-974X

1. Introduction

Enhancing higher education quality in universities is a rising trend in the last decades. It is only possible with a contemporary and qualified education to train individuals equipped with knowledge, ability and art who can adapt themselves to the constantly growing and changing information and technology era that they live in. Teacher education programmes now embark the scope of the training of 21st century's teachers. The Turkish Referencing Report, designed based on Turkey's Qualifications Framework, became official after the approval of the Advisory Board of the European Qualifications Framework (EQF) on March 29-30, 2017. Accordingly, the general competencies for teaching profession were updated and put into practice. It is stated that the up-to-date qualifications are comprised of three interrelated competency domains: (i) professional knowledge, (ii) professional skills, and (iii) attitudes and values (Figure 1), and 11 competencies and 65 indicators that are related to these domains.

¹ Preliminary findings of this study were orally presented at the European Conference on Educational research (ECER) held in Hamburg on 3-7 September 2019.



Fig. 1 Interrelated Competency Domains in Turkey’s Teacher Qualification Framework (MoNE, 2017)

These qualifications are reported to address to the following areas: (i) pre-service teacher training, (ii) teacher employment, (iii) teacher induction process, (iv) self-evaluation, (v) performance evaluation, (vi) career development and rewarding, and (vii) continuing professional development (Figure 2). The qualifications in concern were announced on the official website of the Ministry of National Education (MoNE).



Fig. 2 Turkey’s Teacher Qualification Framework (MoNE, 2017)

It is acknowledged in the document that the competencies were renewed ‘to ensure that students are educated to be well equipped for the needs of the time, to help improve the status of the teaching profession, and to monitor the competencies closely and allow that their results are assessed effectively’ (MoNE, 2017, p. 7). In line with these developments, teacher training programmes which were re-designed with the contributions of various stakeholders were updated by the Turkish Council of Higher Education in March 2018, and put into practice by the faculties of education throughout the country in the subsequent academic year. English as a foreign language teacher training programme was no exception in that regard. The up-to-date programme primarily includes three groups of courses and the relevant course contents: (i) professional knowledge courses, (ii) field-specific training courses, and (iii) world knowledge courses. Each group consists of compulsory and optional courses throughout eight semesters. Table 1 presents compulsory courses in the revised programme.

Table 1 Compulsory courses in the revised ELT curriculum (Council of Higher Education, 2018)

1st Semester	2nd Semester
Introduction to Education	Educational Psychology
Educational Sociology	Educational Philosophy
Reading Skills I	Reading Skills II
Writing Skills I	Writing Skills II
Listening and Pronunciation I	Listening and Pronunciation II
Oral Communication Skills I	Oral Communication Skills II
Information Technologies	Linguistic Structure of English
Atatürk’s Principles and History of Turkish Revolution I	Atatürk’s Principles and History of Turkish Revolution II
Foreign Language I (German)	Foreign Language II (German)
Turkish Language I	Turkish Language II

3rd Semester	4th Semester
Instructional Technologies	History of Turkish Education
Instructional Approaches and Techniques	Research Methods in Education
Approaches to English Learning and Teaching	EFL Curricula
English Literature I	English Literature II
Linguistics I	Linguistics II
Critical Reading and Writing	Language Acquisition
5th Semester	6th Semester
Classroom Management	Assessment and Evaluation in Education I
Morals and Ethics in Education	Turkish Education and System and School Management
Teaching English to Young Learners I	Teaching English to Young Learners II
Teaching EFL Skills I	Teaching EFL Skills II
Language and Literature Teaching I	Language and Literature Teaching II
7th Semester	8th Semester
Teaching Practice I	Teaching Practice II
Special Education and Inclusion	Guidance in Schools
Community Service Practices	Testing in EFL Teaching
Developing EFL Course Contents	
Translation	

It is significant to note that the students enrolled in ELT programme are supposed to take six professional knowledge courses, six field-specific knowledge courses and four world knowledge courses among the elective courses listed by the Council of Higher Education as of their second year. It is also noteworthy that the integration of these courses into the curriculum may vary across universities in the country. The course list in concern is available at https://www.yok.gov.tr/Documents/Kurumsal/egitim_ogretim_dairesi/Yeni-Ogretmen-Yetistirme-Lisans_Programlari/Ingilizce_Ogretmenligi_Lisans_Programi.pdf.

To the best of the researchers' knowledge, no study has previously analysed the above-mentioned programme in terms of its strengths and weakness. Hence, in order to bridge the research gap, the current research was set out to report on strengths, weaknesses, opportunities and threats of the newly introduced English language teacher training programme, namely through SWOT analysis.

SWOT analysis in education

SWOT is an acronym for strengths, weaknesses, opportunities, and threats which is a technique for understanding a process or project's strengths and weaknesses, and for identifying both the opportunities and possible threats that it may face (Hill & Westbrook, 1997). Orr (2013) argues that 'a SWOT analysis is a simple tool to assist a faculty to initiate meaningful change in a program and to use the data for program improvement' (p. 381), and that 'strengths and weaknesses are revealed and adjustments to curriculum, internships, learning activities, education policies, etc., are justifiable if based on a SWOT analysis of a program' (p. 383).

The review of existing literature demonstrates that the SWOT model helps the principal stakeholders in higher education entities to identify expertise that pose as strengths or opportunities and the shortcomings within the internal and external environment that pose as weaknesses or threats. (Kuiper & Thomas, 2000; Lee, Lo, Leung & Ko, 2000). Although it has been used in a plenty of areas as health education, social work and revisions in business undergraduate curriculum and vocational education, it is not so commonly used in higher education (Thomas, Chie, Abraham, Raj, Beh, 2013, p. 5). Nevertheless, some past research on educational programmes using SWOT analysis has proved its employability. Balamuralikrishna and Dugger (1995) studied SWOT analysis for initiating new programmes in vocational schools. Gül (2008) investigated technical education via SWOT analysis through the perspectives of

lectures and students to determine the deficiencies of technical education faculties. In a descriptive- cross sectional research, Nekoueizadeh, Bahrani and Azizi (2016) evaluated teacher education programme in Iran using SWOT through students' views. Hande (2014) investigated strengths, weaknesses, opportunities and threats of blended learning based on students' perceptions. In a recent research, Aslan and Sağlam (2018) evaluated teaching practice course based on trainee teachers' opinions and concluded that the time allotted for teaching practice is not enough, that teaching practice schools are not in good conditions, that partners of teaching practice do not have required qualifications and that the student teachers are not well-informed prior to the teaching practice process. Conducting a study with a similar focus of the present research, Karakaş (2012) analysed the English language teacher education Programme in Turkey and concluded that the programme had more weaknesses than strengths. Hismanoğlu (2012) investigated the English language teacher training programme from the perspectives of pre-service teachers and revealed that it was found learner-centred, comprehensible and appealing to the interests and needs of the prospective teachers. The researcher also reported that it was not designed to develop their higher level thinking skills at the desired level and to enhance their involvement and interest in the lesson. Yavuz and Zehir-Topkaya (2013) studied the perceptions of teacher educators regarding the changes in the 2006 English language teacher education programme and informed that some of the changes were found appropriate while the teacher educators raised more serious concerns with the program regarding the sequence, content, structure, procedure and removal of courses.

2. Method

The research data were compiled from English language teacher training programme designed by the Council of Higher Education in Turkey and announced on the official website of the directorate of education affiliated to the council in 2018. A total of 50 compulsory courses (professional knowledge: 16; field-specific training: 26 & world knowledge: 8) and a pool of 53 optional courses (professional knowledge: 22; field-specific training: 13 & world knowledge: 18) were evaluated using SWOT analysis, a technique for understanding a process or project's strengths and weaknesses, and for identifying both the opportunities and possible threats that it may face (Hill & Westbrook, 1997). It mainly focused on simultaneous analysis of the course list and related course contents by the researchers. The expert opinion was obtained from a faculty member with an in-depth specialization in curriculum and instruction.

3. Results and discussion

The research findings indicated that the revised ELT curriculum has some strengths, weaknesses, opportunities and threats. The first strength is the extensive integration of the compulsory professional knowledge and world knowledge courses into the curriculum. The following were evaluated as the professional knowledge courses that are intended to develop pedagogical competence of prospective teachers and to raise research-oriented teachers equipped with digital literacy: *Introduction to Education, Educational Sociology, Educational Psychology, Educational Philosophy, Instructional Technologies, Teaching Principles and Methods, Research Methods in Education, Morals and Ethics in Education, Measurement and Evaluation in Education, Turkish Educational System and School Management, Special Education and Inclusion and Guidance in Schools*. Integration of the world knowledge courses such as *Turkish Language, Community Service Practices, Intelligence Technologies, Atatürk's Principles and History of Turkish Revolution and Foreign Language (other than English)* is also considered as a strength of the curriculum as they are designed to develop students' language skills, communication skills and digital skills.

Integration of the course of *Teaching EFL to Young Learners* (2 Semesters) was considered as the second strength of the curriculum particularly because most of the prospective students are likely to be teaching at primary schools in Turkey upon their graduation. On successful completion of this course, they are expected to have gained in-depth knowledge in young learners' characteristics (aged 5-12), their learning styles (i.e. audio-visual and affective) and learning strategies (i.e. meta-cognition, cognition and societal), language teaching activities, audio-visual teaching materials (i.e. pictures, realia, puppets and songs), and material adaptation and development.

Another strength of the revised ELT curriculum is the integration of courses on core language skills in 1st year (2 Semesters) such as *Reading Skills, Writing Skills, Listening and Pronunciation, and Communication Skills*. Through these courses, the students are expected to attain high-level competence in reading, writing, listening and communication in the target language they will be teaching after graduation. This finding is compatible with those reported in Yavuz and Zehir-Topkaya (2013) who advocated that language teachers equipped with content knowledge can competently use the knowledge as they master the target language. The fourth strength of the curriculum is the inclusion of field-specific courses with a focus on curriculum and instruction and field-specific teaching methods into it such as *EFL Curricula, Approaches to English Language Teaching and Learning, and Developing EFL Course Content. EFL*

Curricula is designed to provide the students with specialized knowledge in the historical development of EFL curricula, curricular approaches to ELT, learning and sub-learning areas, distribution of learning outcomes across semesters, instructional methods and techniques, approaches to assessment and evaluation and teacher qualifications. The course of *Approaches to English Language Teaching and Learning* covers objectives and fundamentals of ELT, history of ELT, core skills in ELT, in-class practices, current tendencies and issues in ELT, components of the effective ELT and evaluating ELT from social, cultural and economic perspectives. Likewise, *Developing EFL Course Content* is intended to provide them with in-depth knowledge in theories and principles of the design of EFL course content and materials, approaches to the use of EFL textbooks, fundamentals of EFL teaching materials (e.g. user friendliness, cultural content, language use and etc.), material adaptation in EFL teaching and evaluation of EFL course content. Lastly, inclusion of the course of *Translation* is considered another strength of the curriculum as it is designed to raise the students' consciousness in L1 and L2. All in all, the students are expected to gain competence in core language skills and to acquire fundamentals of ELT from different perspectives. This particular finding somehow overlaps with Yavuz and Zehir-Topkaya (2013) who previously reported that the extension of the 'Approaches and Methods in ELT' and introduction of some other field-specific training courses were evaluated as positive by the teacher educators.

The first weakness of the revised curriculum is the inadequate class hours for teaching practice (14 out of 148 class hours, 9.5%) and its being limited to *Teaching Practice* courses in the final year of the programme. The course in concern is offered during two semesters for the purpose of allowing students to observe real classroom settings regarding the use of field-specific teaching methods and techniques, to practice micro-teaching with individual students and groups, to develop field-specific teaching materials, to design learning environments, to manage the classroom, and to assess, evaluate and reflect on their own teaching. This particular finding coincides with those recently reported by Aslan and Sağlam (2018).

The second weakness is the inadequate number of field-specific training courses throughout eight semesters (*Reading Skills, Writing Skills, Listening and Pronunciation, Oral Communication Skills, Linguistic Structure of English, Approaches to English Learning and Teaching, EFL Curricula, English Literature, Linguistics I, Critical Reading and Writing, Language Acquisition, Teaching English to Young Learners, Teaching EFL Skills, Language and Literature Teaching, Testing in EFL Teaching, Developing EFL Course Contents and Translation*). Even though these courses apparently correspond to 48% of

all programme courses, especially those offered in the first year are not specifically designed to teach the students how to teach English; hence, they are more inclined to fall into the category of skill courses that are, as noted earlier, intended to develop students' competence in the target language they will be teaching (i.e. *Reading Skills, Writing Skills, Listening and Pronunciation, Oral Communication Skills, and Linguistic Structure of English*).

Lack of courses on how to teach English to adult learners was evaluated as another weakness of the revised curriculum. In other words, the field-specific courses identified in the curriculum seem merely designed to train teachers who will be teaching EFL to young rather than adult learners. However, the graduates are also licensed to teach at secondary schools and institutions of higher education in Turkey. This might constitute a fundamental challenge for them as they tend to have inadequate knowledge in characteristics, learning needs, learning styles and learning strategies of adolescents/ adults as well as designing appropriate language teaching activities and materials in accordance with the programme outcomes.

In return for the afore-mentioned weaknesses, institutions of higher education that are in charge with the implementation of teacher training programmes are allowed to propose optional courses to be integrated into the revised curriculum. This was evaluated as an opportunity since supplementary courses that provide students more opportunity for teaching practice might be designed and included into the curriculum such as *Classroom Management Practices* (to supplement *Classroom Management*), *Educational Measurement and Evaluation Practices* (to supplement *Measurement and Evaluation in Education*) and *Teaching English to Adult Learners* (to supplement *TEFL to Young Learners*).

Lastly, a few threats were identified for the revised ELT curriculum. First of all, the above-cited opportunity might not be used to compensate for the weaknesses of the curriculum as the Council of Higher Education may not approve the optional course proposals of the institutions of higher education.

The second threat is related to the medium of instruction; to be more specific, English is restricted to the field-specific training courses as the medium of instruction. In other words, 52% of the courses are likely to be taught in students' L1 unless the programme language is identified as English (100%). This might be problematic for the prospective teachers' competence in the target language and their teaching this particular language.

The third threat of the curriculum is that courses with significant content are listed among the elective rather than compulsory courses [i.e.

Drama in Education, Project Design in Education, Critical and Analytical Thinking, Comparative Education, Microteaching, Learning Disability, Sustainable Development and Education, Life-long Learning (professional knowledge courses); *World Englishes and Culture, EFL Textbook Evaluation, Drama in Teaching EFL, Material Development in Teaching EFL, Vocabulary Teaching and Discourse Analysis* (field-specific knowledge courses)]. Due to this particular classification and limited number of elective courses identified per semester, the students cannot take most of these courses. More precisely, they can take only six courses of such kind during their undergraduate education.

Last but not least, it was revealed that the curriculum was designed disregarding the qualifications of the academic staff. Namely, the revised curriculum offers compulsory courses that require an in-depth field-specific knowledge such as *English Literature* (3rd and 4th Semesters), *Teaching Language and Literature* (5th and 6th semesters) and *Special Education and Inclusion* (7th Semester) regardless of the availability of lecturers with this particular knowledge. Like other teacher training programmes in Turkey, ELT programmes could be run with three faculty members with PhD degree in ELT. Hence, the revised curriculum requires them to teach the above-mentioned literature courses that remain out of their scope.

4. Conclusion

The research findings have indicated that the revised ELT curriculum has certain strengths such as extensive integration of the compulsory professional knowledge and world knowledge courses into the programme as well as containing *Teaching EFL to Young Learners* (2 Semesters), courses on core language skills in 1st year and field-specific courses with a focus on curriculum and instruction and field-specific teaching methods.

It has some weaknesses such as inadequate class hours for teaching practice and its being limited to *School Experience* course in the final year, inadequate number of field-specific training courses throughout eight semesters and lack of courses on how to teach English to adult learners. The threats could be listed as restriction of English to field-specific training courses as the medium of instruction, exclusion of courses with significant content from the compulsory course list and curriculum design disregarding the qualifications of the academic staff to teach some of the identified courses.

Although it seems to offer an opportunity allowing the institutions of higher education to propose optional courses to be integrated into it, this might turn into a threat unless the proposals are approved by the Council

of Higher Education. The following practical implications were developed in the light of the findings reported here.

- ✓ The ELT curriculum analysed in this research should be re-revised taking into consideration the qualifications of academic staff for the sake of more effective teaching of field-specific training courses.
- ✓ The number of class hours for teaching practice should be increased through additional courses that promote mentorship practices (Hubson, 2002).
- ✓ The number of field-specific training courses should be increased.
- ✓ Such courses as *Teaching English to Adult Learners* might be integrated into the curriculum to provide the pre-service EFL teachers with a good insight into the characteristics of adult language learners and the use of teaching approaches and techniques that meet their learning needs.
- ✓ Status of some essential courses should be re-considered; that is, they might be included as compulsory rather than elective courses (i.e. *Drama in Education, Project Design in Education, Critical and Analytic Thinking, Comparative Education, Microteaching, Learning Disability, Sustainable Development and Education, Life-long Learning, EFL Textbook Evaluation, Drama in Teaching EFL, Material Development in Teaching EFL, Vocabulary Teaching and Discourse Analysis*).
- ✓ English should not be restricted to field-specific training courses as the medium of instruction. Instead, its use should be extended to the teaching professional knowledge courses.

This study is limited to SWOT analysis of the revised ELT curriculum in Turkey. Further studies might explore ELT curricula implemented in other countries where English is learned as a foreign language. Besides, curricula for other foreign languages could be examined to reveal their strengths, weaknesses, opportunities and threats and compared with the findings reported here.

References

- Aslan, M., & Sağlam, M. (2018). Evaluation of teaching practice course according to opinions of student teachers. *H. U. Journal of Education*, 33(1), 144-162. doi: 10.16986/HUJE.2017030313
<http://www.efdergi.hacettepe.edu.tr/upload/files/2366-published.pdf>
- Balamuralikrishna, R. & Dugger, J. C. (1995). SWOT Analysis: A Management Tool for Initiating New Programs in Vocational Schools.

Journal of Vocational and Technical Education, 12,1.
<https://files.eric.ed.gov/fulltext/EJ514327.pdf>

Council of Higher Education (CoE). (2018). English Language Teaching Curriculum.

https://www.yok.gov.tr/Documents/Kurumsal/egitim_ogretim_dairesi/Yeni-Ogretmen-Yetistirme-Lisans-Programlari/Ingilizce_Ogretmenligi_Lisans_Programi.pdf

Eraslan, A. (2008). A faculty–school partnership programme: Prospective mathematics teachers’ reflections on school practice course. *H. U. Journal of Education*, 34, 95-105
<https://dergipark.org.tr/en/download/article-file/87544>

Gül, H. (2008). SWOT analysis of technical education and the evaluation of its effectiveness. *World Applied Sciences Journal*, 4(1), 45-50.

Hande, S. 2014. Strengths, weaknesses, opportunities and threats of blended learning: Students’ perceptions. *Annals of Medical and Health Sciences Research*, 4(3): 336. DOI: 10.4103/2141-9248.133455

Hismanoğlu, S. (2012). Prospective EFL teachers’ views on English language teacher training program. *Journal of Research in Education and Teaching*, 1(2), 330-341.

Hill, T. & Westbrook, R. (1997). SWOT analysis: it's time for a product recall. *Long Range Planning*, 30, 46-52.

Hobson, A. J. (2002). Student teachers' perceptions of school-based mentoring in initial teacher training (ITT). *Mentoring and tutoring*, 10(1), 5-20.

Karakaş, A. (2012). Evaluation of the English language teacher education program in Turkey. *ELT Weekly*, 4(15), 1-16.

Kuiper, S., & Thomas, M. W. (2000). A strategic consultancy model for establishing a center for business communication. *Business Communication Quarterly*, 63, 52–67.

Lee, S. F., Lo, K. K., Leung, R. F., & Ko, A. S. O. (2000). Strategy formulation frame- work for vocational education: Integrating SWOT analysis, balanced core card, QFD methodology and MBNQA education criteria. *Managerial Auditing Journal*, 15, 407–423.

Ministry of National Education (MoNE). (2017). General competencies for teaching profession.
http://oygm.meb.gov.tr/meb_iys_dosyalar/2018_06/29111119_TeachersGeneralCompetencies.pdf

- Nekoueizadeh, M., Bahrani, T. & Azizi, M. (2016). Considering the SWOT analysis of teacher evaluation by students. *British Journal of Education, Society & Behavioural Science*, 13(4), 1-11.
- Orr, B. (2013). Conducting a SWOT analysis for program improvement. *US-China Education Review A*, ISSN 2161-623X June 2013, Vol. 3, No. 6, 381-384. <https://pdfs.semanticscholar.org/f467/d767403f4f04ce05ffa050d7f94e865ebd3a.pdf>
- Thomas, S., Chie, Q. T., Abraham, M., Raj, S.J., Beh, L. (2013). A qualitative review of literature on peer review of teaching in higher education: An application of the SWOT framework. *Review of Educational Research*, September, 1-48. DOI: 10.3102/0034654313499617
- Yavuz, A., & Zehir-Topkaya, E. (2013). Teacher educators' evaluation of the English language teaching program: A Turkish case. *Novitas-ROYAL (Research on Youth and Language)*, 7(1), 64-83.

CHAPTER XIV

AN ASSESSMENT ON THEORY, RESEARCH AND APPLICATION RELATIONS IN EDUCATIONAL ADMINISTRATION

Dr. Reyhan ŞEKERCİ

Ministry of National Education in Turkey
e-mail:rnazaroglu@hotmail.com, Orcid ID: 0000-0002-9348-2621

1.Introduction

Education management entered the process of creating its own identity in the second half of the century we left behind and started to be considered as a separate field of study. Educational management was influenced by the theoretical developments observed in various fields and their reflections on the management field during this period of authentication. In a study that takes a closer look at the theoretical knowledge production and application process in the field of education management, in order to obtain theoretical information and to better understand the problems observed in practice, theoretical periods affecting the theory, theoretical knowledge, theory-practice relationship and education management have been briefly examined. Widespread problems encountered during the process were mentioned and some suggestions were opened for discussion (Beycioğlu & Dönmez, 2006). Another study starts with the association of concepts such as declaration, theory, model, metaphor, image, perspective and paradigm, summarizing the classical-traditional perspectives on the organization. Describes and discusses new perspectives such as "Critical Oriented Theories", and then depicts and discusses the positivist / normist paradigm and antipositivist / commentator paradigm under which viewpoints are organized, and finally, the organization of lenses provided by the lenses provided by the perspectives. How it envisages research is discussed (Balçı, 2003).

For nearly thirty years there have been some developments that cannot be described as "ordinary" in the field of science and scientific method in general and social sciences in particular; naturally these developments also affect educational sciences. In this process, as a dominant scientific analysis and explanation logic in ontological, epistemological and methodological dimensions, a number of paradigms and approaches are developed that can be described as opposed to or alternative to paradigms and approaches such as positivism, neopositivism, logical positivism, and functionalism; A war of paradigms is mentioned, especially between new paradigms and approaches that emphasize concepts such as subjectivity, relativism, contingency, locality, context, culture, values, language, and positivism. Social science debates depending on the developments in the

philosophy of science also affect the field of educational management. The theories and models developed in this field are built on the positivist paradigm and its functionalism, structuralism and system approaches, which are its extensions. Structural-functional models are generally used in both theory development and research and application; rather, quantitative research methods were preferred. As opposed to the generalizing, universal, objective, value-independent, deterministic, reductionist science understanding of positivism, issues such as non-generalizability, contingency, subjectivity, value-ladenness, relativism, and qualification come to the fore. In another study, the main implications of positivism as a dominant science paradigm and its interpretation as an alternative paradigm with its extensions, and the criticism of the phenomenology, ethnomethodology, critical theory and symbolic interactionist approaches that can be considered in this context, are discussed in terms of theory, research and application (Şişman, 1998). Educational management generally benefits from the basic principles and approaches of management theories. In the historical process, classical theory, human relations in management, and contemporary theories have closely influenced theoretical studies in the field of educational management. In recent years, especially the recent theoretical developments are tried to be examined (Çelik, 1997).

In a different study aimed educational administration and supervision in the field of master's and doctoral education to continuing students prepared by the Higher Education Board self-evaluation of the relationship with Turkey Higher Education Qualifications Framework in the context of its competence to examine with a descriptive approach. In this context, this study was designed as a qualitative research. 15 master's and 6 doctoral students who passed the course period in educational management and supervision graduate program participated in the study. The data were collected in the context of Turkey Higher Education Qualifications Framework researchers enhanced by semi-structured interview form was used. As a result of the research, it was observed that graduate students had problems in establishing a relationship between theory and practice, using research methods and techniques, conducting studies that will bring solutions to interdisciplinary and national problems, sharing their knowledge at national and international level, and foreign language issues. In addition, it has been determined that the participants have a great expectation from the faculty members in eliminating the deficiencies in almost all problem areas arising within the scope of the research. In the light of the results of the research graduate program information specified in the Framework of Higher Education Qualifications Turkey has made some suggestions in order to make more than enough to teach skills and competencies (Intuitive's, Scrapy & Kilinc, 2011).

Actually theory is the safest tool that takes us to reality. Successful management is reality-based. In this respect, the manager who wants to be successful in practice should not be afraid of theory, but should benefit from it. Successful manager is the manager who knows or unknowingly, behaves according to the theory. In addition, many managers establish their own unique theories. However, they have difficulty in generalizing and systematizing them. It is possible for them to overcome this difficulty by obtaining reliable information and values regarding the theory. On the other hand, it is necessary to be careful against misleading legends and fiction about organization and management without attempting to organize and manage theories. The purpose of this section is to help the education manager, who is among such contradictory ideas, to provide theory-practice matching by shedding light on the education manager (Bursalıoğlu, 2003).

1.1.Application Areas Specific to Educational Administration

Individuals should have the ability to use scientific knowledge to understand changes occurring naturally or as a result of human activities, to make decisions about these events, to identify problems related to these events, and to draw evidence-based conclusions. Also, he must understand the characteristic features of science as a form of human knowledge and inquiry; It is important that science and technology have the ability to be aware of the fact that they shape material, intellectual and cultural environments, analytical thinking skills, decision making and problem solving skills, mental flexibility that can develop appropriate reactions to changing situations, and a questioning mind structure that is open to learning new things. Sensitive to the problems in daily life with the perspective arising from scientific knowledge; should be competent to find solutions to problems, question life, and discover. It is about the skills people develop in answering questions, problem solving and decision making. These skills play an important role in the development of scientific understanding and the application of science and technology to new situations. Skills that can fill the practice gap in educational management can be grouped as follows:

Table 1. Basic Function and Competency Skills of Transferable Management to Education Management

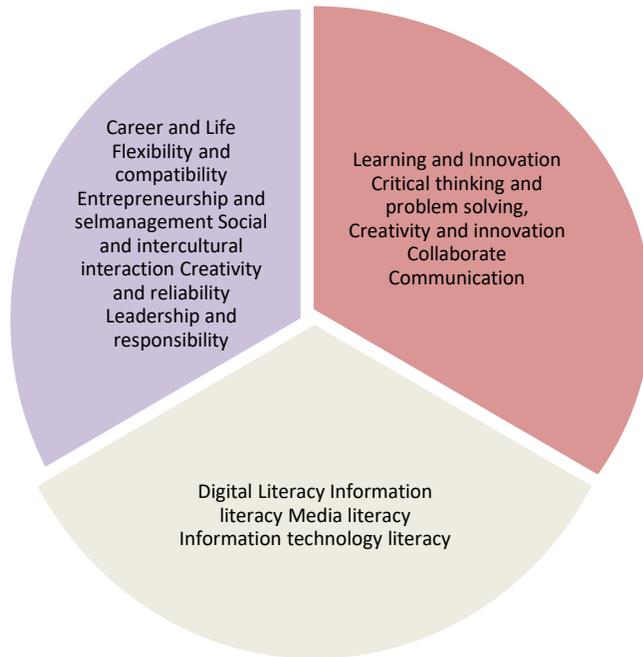
A. Basic Function Skills of Management	B. Administrative Competence Skills
<p>A1. to Decide</p> <p>A2. Planning</p> <p>A3. Organize</p> <ul style="list-style-type: none"> • Building the Building • Staffing • equipment <p>A4. Orientation</p> <ul style="list-style-type: none"> • Leadership • Motivation / Motivation <p>A5. to coordinate</p> <p>A6. Audit and Evaluation</p> <ul style="list-style-type: none"> • Setting Standards • Measurement of Studies • Comparing the Results with the Standards • Deciding on Corrections 	<p>B1. Technical Skills</p> <ul style="list-style-type: none"> • To be able to use computer programs related to the field • Ability to intervene in problems • Being familiar with technology <p>To be able to write and read technical prescriptions</p> <ul style="list-style-type: none"> • To be able to innovate in the field • Getting to know the technology parts • To be knowledgeable about tools, equipment and tools • Closely monitoring developments in the field • Dominate the field <p>B2. Human Skills</p> <ul style="list-style-type: none"> • Recognizing the emotions and feelings of others, • To be able to predict the results of the action style that it will perform • To be able to use them in a more useful way by reviewing their own values and understanding of work. <p>B3. Conceptual Skills</p> <ul style="list-style-type: none"> • Fast and accurate decision making

	<ul style="list-style-type: none"> • Thinking deeply and seeing after three moves • To be able to plan • To be able to produce concepts and terms • To make comparisons, • Identifying priorities <p>Three-dimensional visualization</p> <ul style="list-style-type: none"> • Reasoning, • Establishing cause-effect relationship
--	--

(Bursalioglu, Z. 2003)

Although there is a general trend about what activities are needed to fill the gap in practice in the 21st century, there are also different opinions. Ananiadou and Claro (2009), in a study conducted in OECD countries, investigated the basic learner skills gained in the curriculum of the member countries of the Economic Development and Cooperation Organization. The results of the study, those who learned of the training program in Turkey; research has revealed that it aims to provide skills such as problem solving, critical thinking, creative thinking, communication, decision making and using information and communication technologies. In another study carried out within the scope of OECD, Pedro (2006) gathered the characteristics of the learners of the new millennium under three main headings: the change in cultural and social values, alternative cognitive characteristics and expectations for teaching and learning. The skills that Wagner (2008) 21st century students should carry; While critical thinking and problem solving, accessing and analyzing information, effective oral and written communication, collaboration and entrepreneurship, taking leadership and initiative, curiosity and imagination and practical intelligence and adaptation; The 21st Century Learning Collaboration

Platform lists the skills required for the information age as follows:



(National Education Association, 2015)

The World Economic Forum (2016), on the other hand, handled the skills required for 2015 and 2020 comparatively. Skills for 2015; While solving complex problems, acting in harmony with others, people management, critical thinking, negotiation, quality control, compliance with the service sector, reasoning and decision making, effective listening and creativity; Skills for 2020; solving complex problems, critical thinking, creativity, human management, acting in harmony with others, emotional intelligence, reasoning and decision making, adaptation to the service sector, negotiation and cognitive flexibility (Kivunja, 2015).

2.Results and Discussion

In the 21st century, an unprecedented period of change is passed, bringing important results in terms of organization and management as a whole. Theories that were once thought to have solid foundations are no longer valid, and new theories appear quickly. Every day, new perspectives are emerging and management scientists try to understand the problems and take precautions. Stress management, change management, process management, social network management, learning organizations, cybernetics, good governance, new public management understanding, etc. are just a few of the new management approaches that have emerged. This

situation poses extraordinary difficulties for those who want to face new developments and overcome development in a positive way. It is necessary to be able to develop and follow our own views instead of getting under the surface of what is visible on the surface and understanding the deeper ones, developing possible solutions, taking precautions, and getting confused under the influence of the latest theories and trends.

An example of this is the first known workflow in educational administration in the USA. Using Csikszentmihalyi's flow theory and Dantley's purposeful leadership, a manager's practices have been examined for two guiding questions: (a) an integral purpose of closing existing gaps in success and (b) what are the elements of flow in successful education management? In the recorded interviews, it was subjected to template analysis developed from the principles of both theories. The results are the result of a manager's success in closing the success gap of the region, as well as the principles of purposeful leadership in the work experience, all nine flow elements (Beard, 2018).

Another example is the introduction of clinical simulations recently as a promising teaching strategy to overcome the theory-practice gap in teacher education. With this in mind, a general design framework was first presented in a study that did not aim to increase insight into the basic ideas underlying the design and construction of simulation-based learning environments, and then, the process of making and simulation in the context of parent-teacher communication (an online and face-to-face prototype). Two prototypes of learning-based learning environments have been described (De Coninck, Valcke, Ophalvens & Vanderlinde, 2019).

Similarly, in the implications for leadership preparation programs, it is emphasized that leaders develop a more complex view of the tight integration theory and the difficulties they face in practice. Leadership preparation programs to support future and current leaders should ensure that students understand their institutional context and the reasons why leaders can separate theory from action in various ways. Rather than seeing the theory / practice gap clearly, the study discusses a new way of thinking why school leaders and leadership candidates could be involved in theory and practice in different ways (Roegman & Woulfin, 2019).

As a result, In the 21st century, an unprecedented period of change is passed, bringing important results in terms of organization and management as a whole. Theories that were once thought to have solid foundations are no longer valid, and new theories appear quickly. Every day, new perspectives are emerging and management scientists try to understand the problems and take precautions. Therefore, in order to initiate development and change, it is necessary to see the future and plan the things to be done in the best way. To this end, first time should be

managed in the best way. In addition, contemporary management strategies, methods and techniques related to the subject area should be followed, learned in the best way and development should be continued by questioning the new ideas put forward. Because there is a need for a management practice where people are at the top of the application rather than theoretical knowledge.

References

- Ananiadou, K., & Claro, M. (2009). 21st Century Skills and Competences for New Millennium Learners in OECD Countries. OECD Education Working Papers, No. 41. *OECD Publishing* (NJ1).
- Balcı, A. (2003), New perspectives on educational organizations: Theory-research relationship II. *Educational Administration in Theory and Practice*, 33; 26-61.
- Beycioğlu, K., Dönmez, B. (2006), An evaluation of the production and application of theoretical knowledge in educational administration. *Educational Administration: Theory and Practice*, 12; 317-342.
- Beard, K. S. (2018), Standing in the gap: Theory and practice impacting educational opportunity and achievement gaps. *Urban Education*, 53; 668-696.
- Bursalioğlu, Z. (2003), *Theory and practice in educational administration*. Ankara: Pegem A Publications, 14.
- Çelik, V. (1997), Theoretical developments in educational administration. *Educational Administration: Theory and Practice*, 3; 31-44.
- De Coninck, K., Valcke, M., Ophalvens, I., Vanderlinde, R. (2019), *Bridging the theory-practice gap in teacher education: The design and construction of simulation-based learning environments*. In Kohärenz in der Lehrerbildung (pp. 263-280). Springer VS, Wiesbaden.
- World Economic Forum.(2016),Future of Jobs Survey.URL: <http://reports.weforum.org/future-of-jobs-2016/skillsstability>.
- Kivunja, C. (2015), Teaching students to learn and to work well with 21st century skills: Unpacking the career and life skills domain of the new learning paradigm. *International Journal of Higher Education*, 4; 1-11.
- National Education Association. (2015), Partnership for 21st century skills. *Retrieved from*.
- Pedró, F. (2008), New millennium learners: a project in progress. OECD Governing Board.

- Roegman, R., Woulfin, S. (2019), Got theory?: Reconceptualizing the nature of the theory-practice gap in K-12 educational leadership. *Journal of Educational Administration*.
- Sezgin, F., Kavgacı, H., Kılınc, A. Ç. (2011), Self-Evaluation of Educational Administration and Supervision of Graduate Students in Turkey. *Journal of Higher Education & Science / Journal of Higher Education and Science, 1*.
- Şişman, M. (1998), Theory and alternative paradigms and approaches in educational administration. *Educational Administration: Theory and Practice, 4*; 395-422.
- Wagner, P. (2008), *Consultation as a framework for practice*. Frameworks for practice in educational psychology: A textbook for trainees and practitioners.

CHAPTER XV

FORGOTTEN TURKISH TRADITIONS

Assoc. Prof. Dr. Hasan GÜNEŞ

Anadolu Üniversitesi, Eskisehir, Türkiye

e-mail: hasangunes32@hotmail.com, Orcid ID: 0000-0003-0877-4142

Introduction

Tradition, in TDK's Turkish dictionary; is defined as cultural remains, habits, knowledge, customs and behavior that are sanctioned and conveyed from generation to generation due to their former heritage in a society (TDK, 2019).

If you need to open the definition a little bit,

Tradition is behaviour;

- ancient,
- transmitted from generation to generation,
- bearing sanctioning in itself.

Turkish culture goes back thousands of years. Menstruation is the source of our ancestors. The experiences they have gained as a result of the important events they have been confronted with have led to the formation of the foundations of customs and traditions. Our society lives firmly on the customs and traditions that have been transferred from the past to the present and carry these traditions to the future through their children. In this respect, although some traditions in Turkish society seem to be forgotten, they continue in changing shape. For example, the charity stone has changed today into the form bread on the hanger, clothes on the hanger etc. Namely; Charity stones used to be located in front of mosques and tombs. The rich people who did not like the show would leave their charity to the cavity in the middle of the stones when no one could see it, and those who needed it would get the money they needed. In this way, people who suffered from livelihood and were not able to work would be saved from begging. This tradition of charity now has changed into bread on the hanger, soup on the hanger, clothes on the hanger, tickets on the hanger etc. People who are in good condition pay for 5 additional bread besides the bread they buy, saying and when they buy bread from the oven they say “5 breads are suspended”. The baker puts 5 breads on the hanger in front of the door. The needy buys as much bread as he needs without saying anything to anyone. This is the same for soup. The rich customer drinks the soup and says “2 suspended soup”. A person who doesn't have enough money to eat soup or food enters and drinks his soup and leaves without any charge.

This is a very important and humanistic system concerning the social community. There are numerous such examples. Only a few of these hundreds of examples have been chosen and given below.

Boat Fasting

One of the practices in Ramadan regarding children is “Boat Fasting”. In order to accustom children to fasting during the Ramadan month they are rewarded with gifts. It is allowed the younger ones to finish their fasting’s with the noon prayer instead of the evening prayer. They are also given gifts.

Buying The Fasting’s

Another facility that is special to the Ramadan is “buying fasting’s”. Children can’t stand the burden of the long fasting day as long as the adults do of course. Therefor in order to accustom them to the fasting one of the local merchants or members of the family says to the children “Sell your fasting to me”. So the children sell their fastings by receiving a gift from them. Sometimes they save their fastings and sell them later on. Because of the fact that fasting until the evening prayer is a too long and tough period for children tiring them enormously they are enabled to have lunch at noon time and then continue their fastings. But the most beautiful side of all these is that some people from the neighbourhood buy the fastings of the children.

Arife Flower

Feasts are very valuable in the Turkish society like they are in every society. There are some facilities regarding especially children on feasts. One of these facilities is called “The Arife Flower”. In the Turkish culture, the day before the feast new clothes are bought for the children. Children put on their new feast clothes the day before the feast that is called “Arefe” in the Islamic culture and walk around the streets in the neighbourhood. Therefor the children are called “Arife Flower”.

On the feast day children visit the houses of the relatives and neighbours and kiss the hands of the elder ones. The hosts give them little gifts like candies, balloons, tissues, money etc. Generally, children prefer money amongst the other gifts and love the people giving money much more.

Tooth Rent

There is an important structure of mystical thinking in our society. And that is the belief that when a person does a goodness he does it in fact for himself not the person in need. Therefor the hosts especially during the Ramadan, give some gifts to their guests saying: “You have been my guest, you got tired on the way to my home, your teeth got tired by eating the food I served you, for this reason, take this as a rent for your teeth.” This

gift is mainly money given within a towel, or money within a tissue for children. Not only Money but also other gifts were given. The logic beyond this shouldn't be questioned much. As a matter of fact in the way of thinking of these kinds of hosts there lies a logic as such: "These people have come to my house after a tiring way only for the sake of doing me a favour, they ate together with people unknown to them, and maybe ate the sort of food they haven't been used to, therefore I should reward them with gifts for the favour they have done.

Doors Are Left Open

In the Ramadan month the Muslims fast for 30 days. Nothing is eaten between the morning prayer and evening prayer. In order to not getting tired between the morning and the evening prayer Muslims have a meal just before the morning prayer and the eating period is finished as soon as the morning prayer is heard. This is called "Sahur". The fasting ends with the evening prayer. And the meal very after the evening prayer is called "İftar".

During the Ottomans doors were left open until the evening meal "İftar" came to an end, and this was done during whole Ramadan. So people travelling, people being in need would come to the doors they saw open and include themselves to the İftar table as a guest.

Zekats Were Hung On Trees

Zekat is one of the five rules of İslam. Zekat orders the believers to give one of the forty of his wealth to the poor. Muslims are responsible for delivering their zekats during the Ramadan. Muslims wishing to give their zekats start searching for people in need. During the Ottomans people used to search for people in need, but in case of not finding anyone they would put their zekats in a bag and hang it on a tree known by everybody. And poor people would cover their needs with this due money on the trees without feeling humiliated.

Turkish Coffee

Another Facility that solves another social problem is hidden "in the secret message of the Turkish coffee". The whole World knows the fame of the Turkish coffee. When a guest comes generally coffee is served. Next to the coffee there is usually a little glass of water. If the guest is hungry he first drinks a sip from the water, if he is full he drinks his coffee. In this way the host immediately understands if his guest is hungry or not and prepares the table for a meal. So with this tradition the guest would satisfy his hunger without being humiliated.

The Flowers in Front Of The Window

Another example bearing a hidden meaning and arranging the social structure is “flowers in front of the window”. If there is a yellow flower in front of the window viewing the Street, it means that there is a sick person and as a matter of fact that nobody should make any noise. If there is a red flower in front of the window this meant “there is a grown up girl in this home, so take care of your conversation, don’t speak dirty. In this way the sellers, merchants and pedestrians walking along the Street would pay utmost attention to the words they utter and pass the way without making any kind of noise.

The Knocker of the Door

During the Ottomans there used to be two knockers on the doors. One of them would produce a fine sound and the other a loud sound. So if the guest was a woman she would knock with the fine knocker and if man with the louder knocker. Thus people in the host’s house would get an information about the person standing in front of the door and receive their guests accordingly.

Guest of God

The notion “Guest of God” is very important in our culture. The guest is accepted as the guest of God. The foreign person approaching the house of the host says: “Do you accept a guest of God?” And the people living in the host’s house accept the foreign guest, satisfy his hunger, show him a place to sleep if necessary and then send him on his way after having made the necessary preparations.

The Detail in Going Downstairs and Upstairs of the Stairs

Another genuine tradition that arranges social life is “stairs”. In the old times by climbing up the stairs husbands would climb behind their wives. There are two reasons beyond this. The first one is catching the wife in case of falling, the second one is hindering the fact that the shape of the wife is seen apparently by others. It was just for the same reason that the man climbed down the stairs in front of his wife.

On The Way

There are rules that are written nowhere but have strong, ancient and traditional roots. One of them is by walking on the street the younger ones don’t walk in front of the elder ones. While entering the houses the elder ones come first. The young don’t take a seat until the elder ones are seated. The younger ones don’t start eating their meals until the elder ones do so etc., these kinds of applications protecting the social balance within the community still continue today.

Asking for A Bride

In the traditions of the Turkish society there are marital ceremonies. One of them is “Asking for a bride”. The parents and relatives of the groom go to the home of the prospective bride. In this way the family of the bride will have an opportunity to see and know the groom closer. While the family of the groom observes the way the bride behaves, observes the way she sits the way she moves, how she serves the food and drinks etc. And just the same the family of the bride observes how the groom has a seat, how he speaks, and they especially look at his trousers to understand if he performs “The Namaz Prayer” (performed five times a day by Muslims). If there is a hint on the knees of the trousers that would mean that the groom is performing “The Namaz Prayer”.

Drinking Şerbet

In the Ottoman time in order to announce the marital ceremony there was another nice tradition serving “şerbet” (a traditional sweet Ottoman drink served after the prayer in the mosque yard. While the şerbet is being served the imam of the mosque announces just as following: “Fatma the daughter of Mehmet and Ali the son of Ömer got engaged”. And thus it is announced to public that this couple made their first steps in the way of marriage.

Cafés

In the old times there used to be cafés in all districts of the town or city. Amongst these cafés there used to be cafés belonging to a special professional group. There used to be cafés where drivers went to, cafés where construction workers used to go, cafés where unemployed people used to go to find a job, and as well cafés where people from different classes and professions used to go. And when a citizen needed a worker from a special profession he would go to the due café and would make a deal with the worker whom the owner of the café had recommended and leave the café together. The recommendation of the owner of the café was of utmost importance. Thus the citizen would take the person he had never known to his home or grounds securely.

Doors Are Not Locked

In the old times the merchants and the public used to live together in unity and security. Especially during the Ottoman time, the merchants (shop owners) wouldn't lock the doors of their shops every time they went to the mosque for “The Namaz Prayer”. And just the same for the jewellers, they also used to go to the mosque without locking their jewellery shop, perform their prayer and turn back to their shops.

While Constructing a House

While homes are constructed it was taken care about not hindering their neighbours' reception of the sunlight. If the ground for the construction was not suitable for this purpose the person constructing a house would seek for the consent of the due neighbour. He would only start constructing with the consent. And in case of not receiving this consent he would cease constructing a house on that ground.

Shoes

In our present day the shoes of the guests are turned upside down by the hosts. That means the front of the shoes are headed towards outside. That means "You are welcome, we are overjoyed of your guestship, please us with another visit of yours. But this tradition was practised in the old times just vice versa. That is; when a guest came for a visit the host would put the shoes so that the front of the shoes would look to the inside of the house. In doing such they would mean "We are overjoyed of your visit, we are expecting you to honour us with another visit of yours."

The Way of Serving Water

When the guest asks for water the host puts the glass just in the middle of his palm and serves thus. In this way the guest takes the glass more easily and if the bottom of the glass is wet drinks his water without spilling water on his clothes.

Village Rooms

In the old times there used to be a village room in every village. In those times the person who travelled by passing through this village whether a stranger, a guest or a merchant, would be taken as a guest into this village room. The people of the village would send here food and would provide for the guest's feeling himself comfortable.

To Give Also a Few Examples of the Legislations the Ottomans Set About Animals and Some Applications

During the time of Fatih Sultan Mehmet it was made an obligation to build cavities as shelter for the birds and troughs providing for the birds' drinking water without being disturbed. The water containers built in the cemeteries so that birds could drink water is a feature special to our civilization. As a matter of fact there are some similar applications in the cemeteries of the Christian world today.

-During the migration of the birds catching and hunting any kind of birds had been prohibited strongly.

-In 1856 the fact had been assured by legislation that the beasts of burden should have a rest on Fridays and not be ridden on the due day.

And if it had been detected that some citizens had violated the legislation they had been punished heavily. Therefore the police wardens put on duty by the mayor controlled the public.

-The police wardens on duty used to control the stomachs of the animals very frequently. And if it had been detected that the animal had been left hungry the owner would have been punished.

Conclusion

The accumulation of culture is a result. It is the experience put together in years. The Ottoman Empire had a period of life long enough to accumulate plenty of cultural items. The examples we have given are the reflections of those. But as it is the fact in every country weakenings arised also in the Turkish Culture. Within the time people forgot their culture due to their hard working conditions.

But knowing that once upon a time such applications had been present within the social life of the community might make us human beings feel happy.

With the wish to seize the old spirit again.

References

- AND, Metin (2012), "16. Yüzyılda İstanbul Kent-Saray- Günlük Yaşam", Yapı Kredi Yayınları, İstanbul.
- ÇETİN, Ensar (2014), "Bir Sosyal Yardımlaşma Pratiği Olarak Askıda Kahve ve Sadaka Taşı", Akademik Bakış Dergisi, Sayı:41.
- ÇORUK, Ali Şükrü (2015), "İstanbul Yazıları" Kitabevi Yayınları, İstanbul.
- EKİCİ, Metin (2008), "Geleneksel Kültürü Güncellemek Üzerine Bir Değerlendirme", Milli Folklor Dergisi, Cilt:80, Sayfa: 33-38.
- GEORGEON, François (2018), "Osmanlı'dan Cumhuriyete İstanbul'da Ramazan", İş Bankası Kültür Yayınları, Ankara.
- KAYA, Doğan (2013), "Âşıklık Geleneğinin Geleceği İle İlgili Düşünceler ve Yapılması Gerekenler", Milli Folklor Dergisi, Sayı:52, Sayfa:87-93.
- NERVAL, Gerard (2012), "Doğu'ya Seyehat" Çev: Selahattin Hilav, Yapı Kredi Yayınları, İstanbul.
- OĞUZ, M. Öcal (2013), "Küreselleşme ve Uygulamalı Halk Bilimi", Akçağ Yayınları, Ankara.
- OZANSOY, Halit Fahri (2014), "Eski İstanbul Ramazanları (Bütün Adetleri, Eğlenceleri, Hatıraları, Fıkraları)" Dergâh Yayınları, İstanbul.

ŞAKİR, Ziya (2015), “Osmanlı Döneminde İstanbul Ramazanları” Akıl Fikir Yayınları, İstanbul.

USLUBAŞ, Tolga (2006), “Böyleydi Osmanlı'nın Ramazan'ı”, Yağmur Yayınları, İstanbul.