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ENGAGING DIVERSE YOUTH IN EXPERIENTIAL STEM LEARNING: A UNIVERSITY AND HIGH SCHOOL DISTRICT PARTNERSHIP

Research Article

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Abstract

This paper presents the results of a partnership between a New Jersey school district and four-year university seeking to enhance STEM programming for the district's diverse student population. The project utilized a STEM-focused experiential unit integrated into existing ninth grade school non-science classes (social studies and career readiness courses). A quasi-experimental double pre- and post-test design was used to gauge feeling towards and interest in STEM study among the diverse sample population over a two- year period. Data from Year One was used to refine and adjust the Year Two structure. Results offer credence to the use of focused STEM units with general population students to influence interest in science and STEM-related careers. The experiential component of the unit was most well-received with students supporting its integration into a non-science classroom.

Keywords: STEM, robotics, diverse, experiential learning

1. Introduction

According to a 2015 National Science Board report on the STEM workforce, it is important "that all Americans have access to a high-quality, well-rounded education that includes foundational concepts in STEM". Access, particularly for underserved and underrepresented populations, is a formidable challenge that needs to be addressed in order to increase math and science achievement (National Science Board, 2015). While productive engagement in scientific discourse is challenging for all students, those from disadvantaged backgrounds can have an even more difficult time due to lack of experiences available to students than those from more privileged backgrounds and schools (Holbrook, 2010). Furthermore, students of lower socioeconomic backgrounds may find difficulty with science literacy due to the lack of support at home (Brown, Reveles, & Kelly, 2005). Historically, this group of students is also up against barriers inherent in the school culture (Varelas, Kane, & Wylie, 2011; Barton & Yang, 2000).

Important to STEM exposure is a consideration for the kind of learning that students should experience. The national Next Generation Science Standards (National Research Council, 2013) identifies key classroom practices including the use of experiential learning in science (Kolb, 2015; Witt, 2015). Experiential learning, like a problem-based learning approach, allows students to learn science through authentic, real-life situations. These authentic situations are interdisciplinary in nature offering students a way to see the way scientists utilize knowledge from multiple areas of study in experimentation and study of the phenomenon (Balemen & Keskin, 2018; STEM Taskforce Report, 2014). Benefits of such an approach have been seen in research with learners showing more motivation, interest, and gains in math and/or science achievement (Stinson et al., 2009; Furner & Kumar, 2007). These benefits have gained momentum not only in the United States but across the globe with countries including Turkey aiming to develop STEM education within their educational system through novice teachers (Tekerek & Karakaya, 2018).

Experiential learning and STEM study can take many forms in a classroom setting. A topic of relevance that spans all grade levels and is recognized as an area of importance is that of ocean literacy (NOAA, 2013). The ocean is known to be largely unexplored, yet it also has a direct impact on humans, the Earth's climate and weather. Large organizations such as the National Oceanic and Atmospheric Administration (NOAA, 2013) and The Ocean Project (n.d.) seek to advance ocean literacy in schools with the hope of developing discovery and innovation among future generation explorers and researchers. The study of the ocean is described as interdisciplinary by nature with collaboration among multiple disciplines necessary to bring out and foster new ideas in ocean exploration (NOAA, 2013). With many technical advances over the past decade, new technologies and tools for exploration such as remotely-operated underwater vehicles, ROVs, have quickly become a powerful tool to facilitate this process.

This quasi-experimental study sought to investigate the use of an experiential STEM to build and diversify interest in STEM in the high school setting. Ocean exploration and literacy served as the focus for the project. Of particular importance was targeting a representative sample of the general school population in a non-science setting who might not elect to or have the opportunity to study advanced areas of science or participate in STEM instruction at the high school level.

2. Theoretical framework & empirical support

The theoretical framework of this work stems from the experiential learning model where students use authentic experiences to learn and develop an understanding of concepts. Theory and research have found that learners can build skills and thinking through their own experiences of a presented problem or situation (Kolb, 2015; Hmelo-Silver, 2004). Allowing some independence and exploration as part of the experience allows learners to develop their skills and in turn can lead to increased motivation and retention of content (English & King, 2015; Albanese & Mitchell, 1993; Norman & Schmidt, 1992).

Ocean literacy has become an increasingly important topic for study in K-12 settings (NOAA, 2013; Schoedinger, Cava & Jewel, 2006). Promoted specifically is building learners understanding of the human impact and how exploration can inform future discoveries and innovations that could impact our society and planet. Ocean exploration from both historical and educational contexts is naturally interdisciplinary connecting multiple fields and experts from a variety of STEM areas (NOAA, 2016). This provides a strong platform for experiential STEM learning with real-life application (New Jersey Lead Partner, 2011). Programs implemented in schools focusing on water and ocean literacy have shown promise positively impacting attitudes and interest in STEM-related study (Afterschool Alliance, 2016; Tseng, Chang, Lou & Chen, 2013).

The remotely operated underwater vehicle or ROV is an essential tool for ocean exploration and study (Lewis, 2013). ROVS allow for unmanned underwater exploration made possible through a tether or cable operated remotely by an engineer. With no driver, the ROV is capable of dives at great depths and duration. Models are equipped with photo and video capabilities, providing researchers with footage that can later be used for research and documentation (Regan, 2018). With advances in technology, ROVs have become more common and easily accessible to schools and universities to offer firsthand experiences with underwater exploration (Cook, 2017; Hurd, Hacking, Damarjian, Wright, & Truscott, 2015; Patterson, Elliot & Niebuhr, 2012). A popular example of a program designed to use the ROV as a learning tool is the Seaperch Program. Seaperch uses the hands-on experience of building a replica ROV to motivate and inspire young learners (Giver & Michetti, 2008). These ROVs, made with commonly found materials, allow for the building of a working small-scale replica

complete with a propulsion system and hand-held remote to operate it. Another program known for its integration with STEM study in K-12 through university settings is the Marine Advanced Technology Education, MATE, Center's ROV competition. This competition engages learners through an ROV design competition (Moore, Bohm, & Jensen, 2010). Teams ranging from beginner to advanced develop designs from the study of ROV structures, creating their own working replicas that are later tested on their ability to complete tasks like what real ROVs might do from pipe inspection in muddy waters to gathering specimens from simulated underwater habitats. ROV programs and ROV-focused marine science curricula like MATE and Seaperch are common among STEM-based practices providing ways to integrate robotics, engineering and study of underwater environments (Leak, 2017 Hurd, Hacking, Damarjian, Wright, & Truscott, 2015; Green, 2007).

3. Methodology

The project titled *Engaging Diverse Youth in Experiential STEM Learning Opportunities* (EYESTEM) was implemented over a two- year period to investigate potential STEM project structures and formats within the participating school district. The study sought to address the following specific research questions:

1. What is the impact of the EYESTEM unit on students' interest in their opinions and interest in STEM study? Within this question is consideration for the type of instructional approach to the unit that would work for a non-science high school setting.
2. What is the impact on students' attitudes and learning of the EYESTEM unit in a non-science high school class setting?

3.1 Research design

A quasi-experimental double pre-post-test design was used to gauge interest in STEM and impact of the EYESTEM unit. In each of the three schools in the district selected, a sample of classes was selected with a student demographic makeup representative of the school population. Each of these classes was then identified as one of two experimental groups and the control group for Year One. One experimental group participated in an experiential EYESTEM unit that included a webquest exploration (denoted as ExpWQ in Tables 1-5). The other experimental group participated in the unit but had an added experiential element of team building a small-scale ROV (denoted as ExpROV in Tables 1-5). The final group of students served as the control group receiving no change to their normal instruction. In Year Two, based on the success of the experiential element (ExpROV), the experimental group with web exploration was eliminated.

3.2 Participants

The school district, referred to as GEHR, located in southern New Jersey, selected for EYESTEM identified a need to increase STEM pathways among its students, especially its underserved student populations. GEHR, a large district spanning 324 square miles, is divided into three high schools including Absegami, Oakcrest and Cedar Creek serving a diverse group of over 3,000 students (New Jersey Department of Education, 2015). The population is mixed among the high schools with a high rate of economically disadvantaged students (41%, 46% & 57% respectively) and underrepresented ethnicity groups (Asian, Hispanic, & Black populations at 50%, 54%, & 35%). Performance data in biology for 2014-2015 indicates a wide range among performance levels with two of three schools' students performing below 50% proficient or advanced proficient (47%, 23%, & 64%).

Existing STEM study in the participating schools was isolated to magnet programs in the sciences with limited enrollment and within junior/senior college-prep track elective courses.

To capture the general population, the sample student population of this study was drawn from freshmen level courses all students must take. Year One pulled from select freshmen level social studies courses while Year Two pulled from a required career and educational technology (CET) courses offered by the schools. See Table 1 for details on study participants.

3.3 Instrument

A blend of quantitative and qualitative data was used to determine the impact of EYESTEM. Data was collected via a pre-post survey that included demographics and a series of Likert-style questions related to attitude and interest towards STEM drawn from an existing S-STEM survey (Friday Institute for Educational Innovation, 2012). Measures for each of the S-STEM subsections of the survey are determined through a preset 5-point or 4-point Likert scale containing prompts gathering details including: opinions about the study of science, opinions about the study of engineering and technology, and interest in future STEM career areas. Based on a large scale pilot of the instrument, the S-STEM was found to have strong consistency (Cronbach alpha range of .89-.92) particularly for high school level respondents (Wiebe et al, 2013).

All groups completed the survey at the start and end of the project. Additional questions were added to the post-test and completed by those in the experimental groups. These questions blended Likert-style and open-ended prompts asking students to describe their reaction to the experiential project and interest in future STEM initiatives. See Table 5 and Figure 2 for prompts and scales used.

Table 1. *Participants by year, group, gender, and ethnicity*

Year 1		Gender		Ethnicity				
		Female	Male	White	Black	Hispanic	Asian	Other
ExpROV	Count	45	42	45	7	13	6	16
	%	51.7%	48.3%	51.7%	8.0%	14.9%	6.9%	18.4%
ExpWQ	Count	51	32	42	15	5	5	16
	%	61.4%	38.6%	50.6%	18.1%	6.0%	6.0%	19.3%
Control	Count	52	41	49	2	12	8	22
	%	55.9%	44.1%	52.7%	2.2%	12.9%	8.6%	23.7%
Total	Count	148	115	136	24	30	19	54
	%	56.3%	43.7%	51.7%	9.1%	11.4%	7.2%	20.6%
Year 2		Gender		Ethnicity				
		Female	Male	White	Black	Hispanic	Asian	Other
ExpROV	Count	16	40	24	7	8	5	12
	%	28.6%	71.4%	42.9%	12.5%	14.3%	8.9%	21.4%
Control	Count	172	198	177	56	44	31	62
	%	46.5%	53.5%	47.8%	15.1%	11.9%	8.4%	16.7%
Total	Count	188	238	201	63	52	36	72
	%	44.1%	55.9%	47.2%	14.8%	12.2%	8.5%	17.3%

3.4 Treatment

Two faculty from a nearby university with expertise in STEM worked collaboratively with GEHR teachers and administration to develop and implement the EYESTEM experiential units for Year One and Year Two. With the Atlantic Ocean in proximity to all schools and a strong marine science center at the university, underwater exploration and technology were selected as the focus STEM topic.

The EYESTEM goal was to provide students with an opportunity to develop ocean literacy through the topic of underwater exploration, including robotics in the form of remotely operated vehicles, ROV. The unit content built upon existing work by the National Oceanic and Atmospheric Administration, (NOAA), including educational materials and their website (2016). The unit further aligned with Next Generation Science Standards (NGSS) that support the exploration of real-life problems rooted in science (2013). Specifically, the focus question and problem for exploration were how scientists use ROVs to explore the deep ocean. Objectives included being able to describe systems and capabilities of ROVS, make inferences about what can be learned from deep water habitats using ROV technology, and discuss the importance as well as the potential of ocean exploration from both a historic and modern perspective.

Year One and Year Two differed slightly in the treatment approach. In Year One, two experiential methods were used with experimental groups. The first involved a teacher-led discussion on ocean exploration with video highlights followed by a self-guided web quest using NOAA materials (2016). This was concluded with small group sharing of concepts and ideas. For the second method, a teacher-led discussion on ocean exploration took place followed by a hands-on build and testing of a small-scale replica ROV (see Figure 1). The replica, as shown, consisted of common items including: small plastic piping and connectors; film canisters (for buoyancy and ballast), two small rotating motors with propellers, connecting wires, small pre-made plastic mounts, and a basic remote with mounted battery as well as toggles to control direction and power of motors. Kits with all parts were provided to student teams who had to use them to build the ROV body and remote using schematics provided. This included the full construction of the ROV body, soldering of wires, and the building of the remote itself. The work concluded with testing of the ROV and small group collaboration on the uses of ROV technology and its application to ocean exploration. In Year Two, based on Year One results, only the latter method was used with the experimental group.

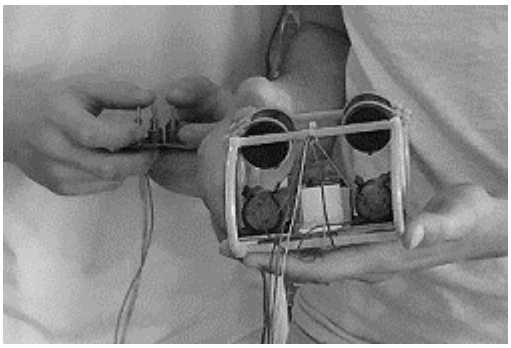

Figure 1. Close-up of small-scale replica ROV completed by experimental group participants

3.5 Procedure

Implementation of the project was done within the schools' existing curriculum and class structures. Duration was set for two-hour sessions for three consecutive days. (This was shortened to two days for Year Two due to scheduling issues.) Teachers asked to implement the EYESTEM unit were pre-trained by University faculty on underwater exploration and robotics. A full day training was conducted including in depth discussion of unit content and instruction on the ROV building kit (School of Engineering, n.d.; Madlab, n.d.). In addition, University faculty and at least one university undergraduate science major volunteer was present to support the teacher's instruction. (This was done purposely since teachers were in non-science classrooms.)

Participants in the project were organized through existing class structures. All classes (Social Studies for Year One and CET for Year Two) were part of the project with a designated

number of classes serving as the experimental group(s). All other students were part of the control group. See Table 1 for participant breakdown. During training, teachers collaborated with university faculty to prepare an implementation schedule including designation of classes.

The EYESTEM unit began with the pre-survey taken by all participants prior to instruction. The next day implementation began for all designated experimental groups. (Keep in mind that Year One and Year Two differed slightly in terms of treatment for experimental groups.) At the end of implementation, all participants took the post-survey.

4. Findings and discussion

S-STEM survey data collected were gathered and analyzed in categories based on the organization of the S-STEM survey. The first of these categories represented feelings towards the study of science. Table 2 reports data from this category. Analyses consisted of a one-way between-groups analysis of variance (ANOVA). In cases where the test for homogeneity of variances was violated the non-parametric Kruskal-Wallis Test was utilized. An initial review of mean responses between groups for Year One revealed those experiencing the ROV build more strongly agreeing with all but one statement, "I can handle most subjects well, but I can't do a good job with science". Additionally, five statements revealed statistically significant differences between groups at the $p<.05$ level (see Table 2). However, in Year Two the results are reversed with the control group means reflecting stronger agreement for all statements. In two cases for the same year a statistically significant difference was found at the $p<.05$ level between groups including "I know I can do well in science" (Exp: $\mu=3.73$, $SD=1.01$; Control: $\mu=3.23$, $SD=1.17$, $p=.05$) and "I am sure I can do advanced work in science" (Exp: $\mu=3.04$, $SD=1.17$; Control: $\mu=3.29$, $SD=1.19$, $p=.02$).

Table 2. *Participant responses and statistical analyses on the study of science by year and group*

Year 1							Year 2				
Statement	Group	n	Mean	SD	Mean Rank	Asymp. Sig.	n	Mean	SD	F	Sig.
I am sure of myself when I do science.	ExpRov	87	3.66	.76	146.49	.01*	56	3.48	.97	3.58	.06
	ExpWQ	82	3.18	1.08	113.73						
	Control	91	3.43	.968	130.32		367	3.65	.99		
I would consider a career in science.	ExpRov	87	3.34	1.12	149.90	.02*	56	3.02	1.09	0.01	.91
	ExpWQ	83	2.87	1.25	122.47						
	Control	93	2.86	1.45	123.76		367	3.04	1.26		
I know I can do well in science.	ExpRov	87	3.95	.79	148.49	.02*	55	3.73	1.01	3.76	.05*
	ExpWQ	83	3.46	1.17	119.55						
	Control	93	3.52	1.30	127.69		366	3.88	.93		
I expect to use science when I get out of school.	ExpRov	86	3.51	1.16	3.12	.05*	54	3.19	1.05	0.25	.62
	ExpWQ	80	3.14	1.15							
	Control	90	3.11	1.22			355	3.21	1.22		
Knowing science will help me earn a living.	ExpRov	87	3.46	1.07	1.96	.14	54	3.33	.87	0.32	.57
	ExpWQ	83	3.20	1.18							
	Control	93	3.12	1.32			363	3.41	1.09		
I will need science for my future work	ExpRov	87	3.36	1.14	2.50	.08	55	3.07	1.02	0.20	.66
	ExpWQ	83	3.04	1.26							
	Control	93	2.97	1.29			356	3.23	1.17		
	ExpRov	86	3.30	1.14	1.17	.31	53	2.94	.95	2.03	.16

Science will be important to me in my life's work.	ExpWQ	81	3.17	1.12							
	Control	90	3.03	1.23			356	3.21	1.14		
I can handle most subjects well, but I can't do a good job with science.	ExpRov	87	2.54	1.17	.20	.82	56	2.34	1.01	0.75	.39
	ExpWQ	81	2.65	1.24							
	Control	90	2.57	1.26			370	2.42	1.13		
I am sure I could do advanced work in science.	ExpRov	87	3.47	1.12	3.90	.02*	55	3.04	1.17	5.24	.02*
	ExpWQ	83	2.98	1.31							
	Control	91	3.05	1.32			368	3.29	1.19		
Likert Scale from 1 (Strong Disagree) to 5 (Strongly Agree); * $p<.05$											

The second series of survey statements focused on the study of engineering and technology. Analyses were completed in a similar style to the previous section discussed (see Table 3). An initial review of mean responses reflects those building the ROV in more agreement than other groups for Year One. This pattern continues in Year Two with all statements yielding stronger means for the experimental versus the control group. Though variation is seen within means calculated, the ANOVA completed only revealed statistical significance for the Year One groups for three of the nine statements given and none for Year Two groups.

Table 3. *Participant responses and statistical analyses on the study of engineering and technology by year and group*

		Year 1					Year 2				
Statement		n	Mean	SD	F	Sig.	n	Mean	SD	F	Sig.
I like to imagine creating new products.	ExpRov	87	3.75	.81	4.70	.01*	56	3.52	1.08	0.00	.96
	ExpWQ	82	3.24	1.16							
	Control	93	3.49	1.19			369	3.43	1.07		
If I learn engineering, then I can improve things that people use every day.	ExpRov	87	3.74	.86	4.29	.02*	56	3.64	.98	0.02	.89
	ExpWQ	81	3.35	1.03							
	Control	90	3.69	.93			370	3.58	.98		
I am good at building and fixing things.	ExpRov	86	3.59	.96	3.90	.02*	55	3.64	.97	0.06	.81
	ExpWQ	79	3.14	1.12							
	Control	91	3.44	1.09			367	3.40	1.03		
I am interested in what makes machines work.	ExpRov	87	3.37	1.09	1.73	.18	56	3.36	1.09	0.01	.93
	ExpWQ	80	3.04	1.16							
	Control	91	3.24	1.21			364	3.17	1.20		
Designing products or structures will be important for my future work.	ExpRov	87	3.11	1.10	1.26	.29	56	3.09	.98	0.54	.46
	ExpWQ	82	2.87	1.17							
	Control	90	2.90	1.07			364	2.87	1.09		
I am curious about how electronics work.	ExpRov	86	3.64	.94	1.83	.16	56	3.48	.95	0.24	.63
	ExpWQ	82	3.33	1.13							
	Control	91	3.54	1.12			365	3.35	1.14		
I would like to use creativity and	ExpRov	87	3.67	.96	2.47	.09	55	3.55	1.07	0.20	.66
	ExpWQ	82	3.34	1.15							

innovation in my future work.	Control	90	3.63	1.02			368	3.46	1.12		
Knowing how to use math and science together will allow me to invent useful things.	ExpRov	87	3.66	.99	1.89	.15	56	3.57	.93	0.07	.79
	ExpWQ	81	3.36	1.13							
	Control	91	3.62	1.093			368	3.53	1.08		
I believe I can be successful in a career in engineering.	ExpRov	87	3.66	.986	.72	.49	56	3.25	1.08	0.22	.64
	ExpWQ	81	3.36	1.13							
	Control	91	3.62	1.09			368	3.10	1.17		

Beyond feelings regarding the study of sciences, the survey also included a section for students to identify the level of interest in STEM careers. Descriptions of each career were given with a 1-4 scale Likert style response provided as noted in Table 4. Means and standard deviations by group were compared for post-test responses. Mean responses were stronger for the Year One experimental group with the ROV build for most careers (all but Environmental Work). Year Two results differed with the control group reporting more interest in all careers except engineering and computer science where the experimental mean was slightly higher (ExpRov μ=2.55, SD=1.02, Control μ=2.47, SD=1.09; ExpRov μ=2.35, SD=1.04, Control μ=2.29, SD=1.03).

Table 4. *Participant responses and statistical analyses on career interest in STEM areas by group and year*

		Year 1			Year 2		
Career Type		n	Mean	SD	n	Mean	SD
Physics	ExpRov	87	2.20	.90	56	1.96	.81
	ExpWQ	81	2.20	.84	---	---	---
	Control	91	2.27	.94	370	2.23	.95
Environmental work	ExpRov	87	2.17	.88	56	2.04	.85
	ExpWQ	81	2.23	.87	---	---	---
	Control	90	2.23	.94	369	2.15	.89
Biology & Zoology	ExpRov	87	2.59	.92	56	2.27	.94
	ExpWQ	82	2.44	1.04	---	---	---
	Control	91	2.36	1.07	368	2.35	.98
Veterinary work	ExpRov	86	2.52	.94	55	2.22	.96
	ExpWQ	81	2.43	.94	---	---	---
	Control	91	2.43	1.01	366	2.40	1.00
Mathematics	ExpRov	86	2.38	1.01	56	2.04	.95
	ExpWQ	82	2.04	.87	---	---	---
	Control	91	2.34	1.08	369	2.23	1.00
Medicine	ExpRov	87	2.68	.95	56	2.36	.96
	ExpWQ	81	2.54	.96	---	---	---
	Control	90	2.59	1.00	367	2.67	1.07
Earth Science	ExpRov	85	2.31	.86	56	2.04	.85
	ExpWQ	80	2.21	.82	---	---	---
	Control	88	2.06	.95	364	2.16	.90
Computer Science	ExpRov	86	2.29	.95	55	2.35	1.04
	ExpWQ	82	2.27	1.00	---	---	---

	Control	88	2.17	1.05	368	2.29	1.03
Engineer*	ExpRov	---	---	---	55	2.55	1.02
	ExpWQ	---	---	---	---	---	---
	Control	---	---	---	368	2.47	1.09
4-point scale from 1 (Not at all interested) to 4 (Very interested) *Career added for Year 2 survey							

In addition to the S-STEM sections described above, a series of questions were tailored to capture the impact of the EYESTEM unit. Table 5 provides survey prompts with data and analyses completed. Analyses vary from Year One to Year Two based on the groups utilized. For Year One a paired-sample t-test was used to determine how experimental structures compared. Data from Year One was used to narrow the structure for Year Two to one experimental group. As a result, a one-sample t-test was completed using a test value to measure variation in participant responses. For both years, statistical significance was found in several areas. Year One mean responses illustrate those participants completing an ROV build liking the STEM activity more (ExpROV μ =1.74, SD=.89 vs ExpWQ μ =3.22, SD=.86) but webquest-only participants liking it more in the context of the Social Studies course (ExpWQ μ =2.03, SD=.89 vs ExpROV M=3.68, SD=1.18). All mean responses for Year One indicated interest in the implementation of additional STEM program structures. For Year Two, mean responses indicate students liking the STEM activity (μ =2.15, SD=.97) but not as strongly as in the CET course (μ =2.26, SD=.95). In terms of interest for future STEM projects, Year Two participant mean responses indicated the highest interest for a week-long format (μ =2.49, SD=1.10). Beyond quantitative data, a series of open-ended statements were included in the Year Two survey as shown in Figure 2. Words describing the experience (question 20) were mainly positive (39 out of 55 responses received) including responses such as “fun”, “cool”, and “amazing”. When asked what was liked about the project (question 21), respondents felt strongly regarding the experiential structure and collaborative component of the work. Areas not liked included shortness of the project and inability to choose classmates to work with (question 22).

Table 5. *Participant survey responses and statistical analyses for experimental groups to EYESTEM unit by question and year*

Shortened Survey Statement			Liked STEM Activity	Liked STEM in SS* class	Interest in other potential STEM program structures			
					Week Long	Full Year	Summer Program	After school
Year 1	ExpRov	Mean	1.74	3.22	3.22	2.64	2.08	2.31
		n	84	87	87	87	86	87
		SD	.89	.86	.86	1.12	1.01	1.14
	ExpWQ	Mean	3.68	2.03	2.05	1.76	1.73	1.71
		n	79	80	80	83	78	83
		SD	1.18	.89	.91	1.03	.92	1.02
	T-test results	*t*	-11.90	8.86	8.54	5.35	2.32	3.60
		df	161	165	165	168	162	168
		Sig.	.00**	.00**	.00**	.00**	.00**	.00**
Year 2			Liked STEM Activity	Liked STEM in CET* class	Week Long	Full Year	Summer Program	After school
	ExpRov	Mean	2.15	2.26	2.49	2.15	1.76	1.85
		n	55	55	55	55	54	54

		SD	.97	.95	1.10	1.11	.97	1.11
	T-test results	*t*	-6.53	-5.84	3.30	.97	-1.82	-.98
		df	54	54	54	54	53	53
		Sig.	.00**	.00**	.00**	.33	.07	.33
			Test value=3		Test value=2			
			Scale- 1 (Loved it) to 5 (Didn't like it at all)		Scale- 1 (Not interested) to 4 (Very interested)			
* SS stands for Social Studies; CET stands for Career and Educational Technology **p<.005								

Topic	***Sample responses***
One word to describe experience (Question 20)	39 positive statements such as • Fun • Amazing • Enjoyable • Outstanding • Inspiring • Great 7 neutral or not applicable statements such as • Alright • Building 9 negative or blank statements such as • Non-existent • Complicated
One thing enjoyed from experience (Question 21)	• Ability to work on own • Using tools • Assembling & testing of ROV • "i liked how we got to build the sub and test it out and find out what was going wrong if there was anything." • "Making the robot was the best part. Testing it and making sure it worked felt like I had accomplished something." • "I enjoyed following the directions to physically put together a product that can be useful for a problem that people are trying to solve."
One thing not enjoyed from experience (Question 22)	• Not able to choose who they worked with on teams • Not being able to keep the ROV • Not always active since it was done in teams • **Over half of the respondents said "nothing" or none*

Figure 2. Sample qualitative participant responses from Year Two of Post-Survey

5. Conclusion

Implementation of the EYESTEM Project over the two-year period provided varied results offering insight into the impact of the project as well as the potential for future study. The first year illustrated that exposure to the STEM unit could positively influence students' thoughts about the study of science especially in engineering and technology that is consistent with research that links self-efficacy in STEM with interest in post-secondary study in STEM fields (Wang, 2013). (This may have been a result of the unit being focused in underwater robotics though it cannot be said for certain.) The format of the STEM unit mattered with responses favoring the ROV build in Year One and guiding the structure for Year Two study. This provides additional support to project-based on experiential learning experiences in STEM (Balemen & Keskin, 2018; Afterschool Alliance, 2016; Hmelo-Silver, 2004; Albanese & Mitchell, 1993) Results differed with the integration of the unit in various settings (SS versus CET courses) so it was not possible to determine where the unit was best integrated. However, there is consistent support for additional STEM programming with the Year Two responses favoring a week-long structure. Qualitative results illustrate a generally positive tone to the experience that further supports additional STEM programming consistent with research by Wang (2013). It is important though to note that Year Two results did not seem to have as significant of an influence on the study of science or careers in STEM areas though influences were still seen in related fields of study to the EYESTEM unit. These findings are in alignment with other studies that increased interest and attitudes regarding STEM study through similar short-term STEM units (English & King, 2015; Nugent et al., 2010).

Lessons learned from this study are valuable in addressing the need for high-quality science education that benefits all students (U.S. Department of Education, 2016; National Science Board, 2015; PCAST, 2010; National Research Council, 2007), not just those students that elect advanced study in science. The initial impact from this short-term study illustrates the positive influence relevant, standards-aligned short-term STEM work can have on student interest, attitudes, and possible career paths. More sustained, long-term study is needed on varied STEM structures use in the high school curriculum and how it can influence various groups of students, particularly underrepresented populations, including their future interest in STEM study and careers.

References

Afterschool Alliance (2016). *The impact of afterschool STEM: Examples from the field*. Washington, DC: Author. Retrieved from: http://afterschoolalliance.org/documents/AfterschoolSTEMImpacts2016.pdf

Albanese, M. & Mitchell, S. (1993). Problem-based learning: A review of literature on its outcomes and implementation issues. *Academic Medicine*, 68, 52-81.

Balemen, N. & Keskin, M. (2018). The effectiveness of project-based learning on science education: A meta-analysis search. *International Online Journal of Education and Teaching*, 5(4), 849-65.

Barton, A, & Yang, K. (2000). The culture of power and science education: Learning from Miguel. *Journal of Research in Science Teaching*, 37, 871–889.

Brown, B., Reveles, J., & Kelly, G. (2005). Scientific literacy and discursive identity: a theoretical framework for understanding science learning. *Science Education*, 89, 779-802.

Cook, B. (2017). Oceanographic ROV inspiring students to become future marine scientists [Blog post]. *Deeptrecker*. Retrieved from: https://www.deeptrekker.com/marine-biologist-oceanographic-rov/

English, L. & King, D. (2015). STEM learning through engineering design: fourth grade students' investigations in aerospace. *International Journal of STEM Education*, *2*(14), 1-18.

Friday Institute for Educational Innovation (2012). *Middle/high school student attitudes toward STEM survey*. Raleigh, NC: Author.

Furner, J. & Kumar, D. (2007). The mathematics and science integration argument: a stand for teacher education. *Eurasia Journal of Mathematics, Science, and Technology*, *3*(3), 185-189.

Giver, S. & Michetti, S. (2008). The Sea Perch Challenge: Generating interest in marine science, engineering ocean engineering and naval architecture through hands-on activities. *2008 Annual American Society for Engineering Education Conference and Exposition*, Philadelphia, PA. Retrieved from: https://peer.asee.org/3496

Green, A. (2007). Aquatic robotics: Teens plunge into technology. *High Season 2007*. Retrieved from: https://ncseagrant.ncsu.edu/coastwatch/previous-issues/2007-2/high-season-2007/sea-science-aquatic-robotics-teens-plunge-into-technology/

Hmelo-Silver, C. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review*, *16*, 235-266.

Holbrook, J. (2010). Education through science education for all. *Science Education International, 21* (2), 80-91.

Hurd, R., Hacking, K., Damarjian, J. Wright, G. & Truscott, T. (2015). Underwater robots surface in Utah. *Technology and Engineering Teacher*, *74*(5), 8-16.

Kolb, D. (2015). *Experiential learning: Experience as the sources of learning and development*. Upper Saddle River, NJ: Pearson Education, Inc.

Leak, S. (2017). Underwater robotics: A model for interdisciplinary engaged learning at Elon. *Project Proposal*, Elon University. Retrieved from:

https://www.elon.edu/u/academics/catl/wp-content/uploads/sites/126/2017/07/hargrove-leakcatlscholarproposal-1.pdf

Lewis, T. (2013). Incredible technology: How to explore the deep sea. *Live Science*. Retrieved from: https://www.livescience.com/38174-how-to-explore-the-deep-sea.html

Madlab (n.d.). Remotely-operated vehicle. Retrieved from: http://www.madlab.org/kits/rov.html

Moore, S., Bohm, H., & Jensen, V. (2010). *Underwater robotics: Science, design & fabrication*. Monterey, CA: Marine Advanced Technology Education (MATE) Center.

National Oceanic and Atmospheric Administration. (2016). *Ocean explorer*. Retrieved from: http://oceanexplorer.noaa.gov/explorations/explorations.html

National Oceanic and Atmospheric Administration (2013). *Ocean literacy: The essential principals and fundamental concepts of ocean sciences for all ages (Version 2)*. Retrieved from: http://www.coexploration.org/oceanliteracy/documents/OceanLitChart.pdf

National Oceanic and Atmospheric Administration. (2012). *The NOAA ship Okeanos Explore educational materials collection for grades 5-12, volume 2: How do we explore? (Vol.2)*. Retrieved from: http://www.usna.edu/STEM/_files/documents/TES_Fall2015_Issue_USNA_NOAA.pdf

National Research Council (2013). *Next Generation Science Standards: For states, by states*. Lead States. (2013). Washington, DC: The National Academies Press. Retrieved from: https://doi.org/10.17226/18290\

National Research Council. (2007). *Taking science to school: Learning and teaching science in grades K-8*. Washington DC: National Academies Press.

National Science Board (2015). *Revisiting the STEM workforce: A companion to science and engineering indicators*. Retrieved from: http://www.nsf.gov/pubs/2015/nsb201510/nsb201510.pdf

New Jersey Department of Education. (2015). *NJ School Performance Report 2014-2015: Greater Egg Harbor Regional*. School Performance, State of New Jersey. Retrieved from: http://www.nj.gov/education/pr/1415/

Norman, G. & Schmidt, H. (1992). The psychological basis of problem-based learning: A review of the evidence. *Academic Medicine, 67*, 557-565.

Nugent, G., Barker, B., Grandgenett, N., and Adamchuk, V. (2010). Impact of robotics and geospatial technology interventions on youth STEM learning and attitudes. *Teacher Education Faculty Publications*, 33. Retrieved from: http://digitalcommons.unomaha.edu/tedfacpub/33

Patterson, M., Elliot, J. & Niebuhr, D. (2012). A STEM experiment in informal science education: ROVs and AUVs survey shipwrecks from the American Revolution. *2012 Oceans Conference*, Hampton Roads, VA.

President's Council of Advisors on Science and Technology (PCAST) (2010). Report to the President: *Prepare and inspire: K-12 science, technology, engineering, and math (STEM) education for America's future*. President's Council of Advisors on Science and

Technology. Retrieved from: http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-stem-ed-final.pdf

Regan, S. (2018). What are underwater ROVS and what are they used for? *Deeptrecker*. Retreived from: https://www.deeptrekker.com/underwater-rovs/?locale=en

Schoedinger, F., Cava, F. & Jewell, B. (2006). The need for ocean literacy in the classroom: Part I. *NSTA Webnews Digest*. Retrieved from: http://www.nsta.org/publications/news/story.aspx?id=52453

School of Engineering (n.d.). *The RGU ROV kit: Introduction*. Scotland, UK: The Robert Gordon University. Retrieved from: https://www.scribd.com/document/234925665/00-ROV-Instructions-Additional-Revised

STEM Taskforce Report (2014). *Innovate: a blueprint for science, technology, engineering and mathematics in California public education*. Dublin California: Californians Dedicated to Education Foundation.

Stinson, K., Sheats, S. Meyer, H., & Stallworth, J. (2009). Mathematics and science integration: Models and characterizations. *School Science and Mathematics*, *109*(3), 153-161.

Tekerek, B. & Karakaya, F. (2018). STEM education awareness of pre-service science teachers. *International Online Journal of Education and Teaching*, *5*(2), 348-359.

Tseng, K., Chang, C., Lou, S. & Chen, W. (2013). Attitudes towards science, technology, engineering, and mathematics (STEM) in a project-based learning (PjBL) environment. *International Journal of Technology and Design Education*, *23*(1), 87-102.

The Ocean Project (n.d.). In *The Ocean Project*. Retrieved from: www.theoceanproject.org

Wang, X. (2013). Why students choose STEM majors: Motivation, high school learning, and postsecondary context for support. *American Educational Research Journal*, *50*(5), 1081-1121.

U.S. Department of Education, Office of Innovation and Improvement (2016). *STEM 2026: A vision for innovation in STEM Education*. Washington, D.C.: Author.

Wiebe, E., Faber, M., Corn, J., Collins, T., Unfried, A. & Townsend, L. (2013). A large-scale survey of K-12 students about STEM: Implications for engineering curriculum development and outreach efforts. 2013 *American Society for Engineering Education Annual Conference*, Atlanta, Georgia.

Witte, B. (2015). What to know about the Next Generation Science Standards. *Time*. Retrieved from: http://time.com/3992995/next-generation-science-standards/

Varelas, M., Kane, J., & Wylie, C. (2011). Young African American children's representations of self, science, and school: Making sense of difference. *Science Education, 95*(5), 824-851.

Dost, Ş. (2019). Examining the example generation abilities of high school students within the context of mathematics course. *International Online Journal of Education and Teaching (IOJET)*, *6*(2). 260-279.
http://iojet.org/index.php/IOJET/article/view/581

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EXAMINING THE EXAMPLE GENERATION ABILITIES OF HIGH SCHOOL STUDENTS WITHIN THE CONTEXT OF MATHEMATICS COURSE

Case Study

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Abstract

Examples are an indispensable part of mathematical thinking through analogy, learning and the teaching process. In this study, the strategies that high school students used in example generation activities in mathematics course; operational and conceptual knowledge levels were determined and their effect on example generation ability was examined. The working group of the study was designed as a case study that followed a qualitative research method; the study consisted of 22 students attending high school in the 2016-2017 academic year. As a data collection tool, example generation questions were administered to the students. To analyze students' example generation processes in depth, semi-structured interviews were conducted and data obtained from the interviews were analyzed using a content analysis method. The results showed that the students used trial and error strategy more than transformation strategy while generating examples but no finding of analysis strategy was obtained. Factors affecting the students' example generation skills negatively included the lack of a mathematical equivalent of the concept images related to the topics covered by the questions and their not having a high enough level of concept knowledge. Results also indicated that conceptual knowledge had a positive effect on the ability to generate examples.

Keywords: example generation, conceptual knowledge, procedural knowledge

1. Introduction

The purpose of a secondary education mathematics program is to raise students to be good problem solvers who have developed mathematical thinking skills. This program emphasizes mathematical concepts, relations between them, basic mathematical operations, and their mathematical meanings (TTKB, 2017). However, students sometimes do not understand the mathematical thinking behind operations, rules, and formulas (Hiebert & Lefever, 1986). For this reason, in order to understand the mathematical concepts and relations between these concepts, the activities that involve questions to use and learn conceptual knowledge need to be implemented in the classroom environment. However, it can be said that such activities do not take place much in the secondary school mathematics program. Although mathematics teachers often want to use these activities, they do not apply these activities to class because of concerns about the completion of the mathematics program topics on time according to the annual course schedule. With this study, it is aimed to contribute to activities that are not encountered very much in secondary school mathematics lessons and to teachers who want to use these activities in lessons.

Examples have an important role in learning mathematical concepts, techniques and reasoning, and in the development of mathematical competence (Bills, Dreyfus, Mason,

Tsamir, Watson & Zaslavsky, 2006). Examples vary according to the situations they are used in. Examples with strong visual characteristics and specific features are called prototype examples (Hershkowitz, 1990). For example, the number $\sqrt{2}$, used for irrational numbers, emerges as a prototype. Beyond prototypes, in order to go beyond the boundaries as the definition allows and to be aware of the boundaries in this process, it is also important to use extraordinary examples (Bills et al., 2006). Examples that can be used by teacher or student in different situations related to the topic and that help to eliminate and clarify some of the mathematical ambiguities are defined as "reference" examples. An example of this is the use of R^2 to understand how the situations in the real analysis are formed (Michener, 1978). Examples needing a counter hypothesis or claim, in the context of a concept, procedure or proof, are called counter examples (Bills et al., 2006). The function f (x) = | x | is a counter example for the proposition "a continuous function is differentiable."

Example generation is a problem-solving activity in which individuals can develop different strategies (Zaslavsky & Peled, 1996). This activity emerges as some kind of open-ended problem in which the subject examines whether the wanted example exists, and shows why if it does not (Antonini, 2006). In this process, students make sense of the concepts by generating examples as learning strategies (Dahlberg & Housman, 1997). In order to learn a concept, it is necessary to construct rich examples related to that concept (Tall & Vinner, 1981). In the creation of conceptual learning, example generation activities have a very strong potential, in the pedagogical sense (Watson & Mason, 2005). In the study of Wagner, Orme, Turner and Yopp (2017) a teaching experiment involving example generation tasks was conducted for 8 weeks with 42 university students who had not previously taken a first-semester calculus course. In these activities, students were asked to explain their ideas about mathematical concepts novel for them and to generate examples. As a result of the study, it was seen that the students were able to explain the mathematical concepts that became more and more complex provided that the students sufficiently engaged in the tasks and their example generation abilities have improved in this way.

The way how example generation is used, the situations in which it is successful, the factors affecting the example generation process, and the way how the students develop strategies when generating examples are among the topics investigated in this context. Antonini (2006) identified the strategies that mathematicians use during example generation activities, based on the definition of example generation, and collected them under three headings:

- *Trial and Error: The example is sought among some recalled objects; for each example, the individual observes in most cases, whether the requested properties exist or not.*
- *Transformation: A number of transformations are made on the example that the individual has written to provide one or more requested properties, until all other requested properties are met.*
- *Analysis: It is assumed that the object constructed by individual provides some features which added to restrict and simplify the search ground. Other features occur with processes that remind a known concept or method to generate the requested example.*

Antonini (2006) states that expert mathematicians sometimes use all the example generation strategies together and they switch in between these strategies. Also, the transition from trial and error to analysis requires higher level thinking skills. Iannone, Inglis, Mejia-Ramos, Siemons and Weber (2009) stated that novice mathematicians (university students)

used trial and error quite often, while analysis was very rarely used in this process, and students were quite inadequate in switching between the strategies.

Most of the students think that mathematics learning is to operate on some symbols, and that mathematics is learned by memorization (Soylu & Aydın, 2006). Procedural knowledge is in the foreground with these students, who have the ability to apply the rules without understanding their reasons (Skemp, 1971). Procedural knowledge is considered as both the symbolic language of mathematics and the knowledge of the rules and procedures used to solve problems (Hiebert & Lefever, 1986). The type of information in which the algorithms take place and process steps used in problem solving can also be treated as procedural knowledge (Star, 2007). However, a student with conceptual learning is a problem solver that generates mathematical knowledge using creativity and intuition (Bell & Baki, 1997). In the literature, conceptual understanding can be used instead of conceptual knowledge (Anderson, 2000; Rittle- Johnson & Schneider, 2015). Conceptual knowledge is the ability to understand which operation is to be done and why. When newly learned information is associated in accordance with the old knowledge, learning about the concept in question occurs (Skemp, 1971).

At national evaluation activity for educational development (Post, 1981), students were asked, "Which one of the numbers 1,2, 19 or 21 will be close to the result when 7/8 is added to 12/13?" Only 23% of children aged 13 years in the country gave the right answer to this question. More than half (55%) thought the answer was 19 or 21. Such answers show that the concept is misunderstood. A correct and conceptually based approach will "7/8 and 12/13 about 1, so their sum is about 2" form. Instead of using this idea based on conceptual knowledge, most of the students have tried a procedure (possibly from memory) to find a solution. This can be given as an example for conceptual and procedural knowledge. However, conceptual and procedural knowledge can be included in each other and it may not be the case that they are completely separated (Carpenter, 1986). Both types of knowledge are very important for mathematics education and their contributions to the individual's mental development are rather high (Post & Cramer, 1989).

In this process, students' understanding and ways of thinking are displayed by asking students to generate examples related to problems and objects (Hazzan & Zazkis, 1999; Van den Heuvel-Panhuizen, 1995; Watson & Mason, 2005; Zaslavsky, 1997), it is inevitable to encounter concept images. The concept image contains what arouses in the mind related to that concept. Therefore, when example generation efficiency is used as an evaluation tool by teachers, it can be determined whether there are any misconceptions about any mathematical concepts. Thus, factors that affect students' example generation skills may arise. On the other hand students' concept images and therefore their conceptual and procedural knowledge generally emerge as a result of their experience with examples and non-examples of a concept (Vinner & Dreyfus, 1989). When defining a concept, students who try to generate an example place more examples on the image for a mathematical concept and they use these examples better than students using other learning strategies (Dahlberg & Housman, 1997). For this reason, more example generation activities should be designed by the teachers in order to prevent the factors that negatively affect the example generation skills of the students.

Example generation activities, which are used by teachers as evaluation and teaching strategies, and by students for development of reasoning, conceptual learning, and mathematical competence, are thought to be an important subject to be analyzed in mathematics teaching. In the literature, the participants of the studies about the examples are generally teachers (Ng & Dindyal, 2015; Zaslavsky & Peled, 1996; Zodik & Zaslavsky,

2008) and university students (Antonini, 2006; Sağlam & Dost, 2015; Dahlberg & Housman, 1997; Edwards & Alcock, 2010; Iannone et al., 2009). There is a need for studies specifically regarding high school students' ability to generate examples within the context of a mathematics course (Zaslavsky & Ron, 1998). This study is thought to contribute to fill in this gap in the literature.

The aim of this research is to evaluate the example generation skills of high school students in the context of the strategies they use, concept image, and conceptual and procedural knowledge, so that the factors affecting the example generation process can be determined.

2. Method

This research is designed as a case study, which is a qualitative research method. In the case study, the information contained in a limited system is described and examined in depth, so the reader understands the product better (Merriam, 2013). In this study, the effects of concept images, conceptual and procedural knowledge, and the strategies used by high school students in the process of example generation were investigated.

2.1. Participants

Participants of the research were students attending an Anatolian High School in Nevşehir in the 2016-2017 academic year. First, questionnaires on example generation were administered to 129 students randomly selected from all grade levels of the high school. The questionnaire responses, belonging to the students, were then examined by each researcher independently. Based on the data obtained, semi-structured interviews were conducted with 22 students, who were expected to provide rich and in-depth data to the research, according to the purposeful sampling strategy. In the selection of these 22 students, volunteer participation was used as the basis and the following criteria were taken into consideration:

(i) Attempting to solve most of the questions used in the research

(ii) Academic achievement in mathematics courses

(iii) Ability to express their opinions in the direction of their teachers' suggestions and to defend their solutions.

Table 1: *Number of Students Participating in the Interview According to Grade Level*

Grade	9^{th} Grade	9
	10^{th} Grade	3
	11^{th} Grade	5
	12^{th} Grade	5

2.2. Data collection process

The data collected in the study were obtained from two sources. These consisted of written documents containing the answers of students to example generation questions, and semi-structured interview records and their analysis.

In the preparation stage of the example generation questions, first the topics in the curriculum of the secondary school mathematics course were determined and questions were created according to the topics. In addition, it was decided to prepare questions that were not much included in mathematics courses and textbooks in order to investigate the effect of the students' conceptual knowledge level on the example generation ability. In this phase, the first writer who is high school teacher has been consulted about the suitability of the questions created in the mathematics curriculum, the relevance of the topics in the recent past, and the stated quality (not included in the textbooks too much). In addition, in order to contribute to the reliability and validity of the questions, the views of an academician working in the field of mathematics education were taken. Then a pilot study was done. As a result, it was identified that some of the questions on the form would not reveal the example generation skills of the students, and these questions were not used. For example, the question "give examples of two functions that cannot be composed" was omitted.

In the last stage, the final version of the example generation questions was established by taking expert opinions again.

1.2.1 Questions used in research

In this section, there are questions used in the research. It was emphasized that the questions used in the research are aimed at revealing the level of conceptual knowledge of the students. In addition by introducing some restrictions on the questions students were expected to think differently from the prototypes and customary examples they encounter in classroom and course books.

Research questions included questions about functions and equations that were common to all students at each grade level (9th, 10th, 11th, and 12th grade), and a question about the subject limit and continuity in 12th grade curriculum for 12th grade students. The questions used in the research are listed below.

1) Give a function example defined from Z to N, with a set of Z integers and a set of N natural numbers.

2) Give an example by drawing a graph for an expression that does not specify a function.

3) "Child-mother" mapping specifies a function with domain “children” and codomain “their mothers.” Give another function example from everyday life.

4) Give a function example in which "m is the function of n" when m and n are variables.

5) Give an example of a first-degree equation, in one variable, in which the solution set is a null set.

6) Give a function example whose limit exists at $x_0 \in R$ but discontinuous at this point.

Questionnaires on example generation have been made in one course hour (40 minutes) for each level under the supervision of the mathematics teacher and the researchers. Appointments were scheduled with the students where semi-structured interviews were conducted in a suitable environment at school outside the class hours. Each interview, which was conducted individually, took 20-25 minutes on average and a voice recording was taken with the permission of the students. During the interviews, which started four days after the practice, students are asked to explain the solutions they have made and to think aloud.

2.3. Analysis of data

Content analysis was used to analyze the data collected. The main purpose of content analysis is to create concepts that can explain collected data, to make meaningful relations between the concepts and to provide relevant explanations (Yıldırım & Şimşek, 2011). In the first phase of the analysis, the students' written responses to the questions were examined in order to obtain information about the nature of the generated examples. This provided information about diversity of the examples and the strategies students used while generating examples.

Later, interviews with students were transferred to written text and read carefully by each author. In the analysis of these data, open coding was used for content analysis (Strauss & Corbin, 1990). The data obtained were examined based on the strategies they used and the use of procedural and conceptual knowledge while generating examples.

In order to determine the strategies students use while generating examples, the trial-and-error, transformation and analysis strategies, previously found in the literature, were benefitted and new findings that emerged during the study were taken into account. The coding scheme of example generation strategies is found in Table 3. Accordingly, a frequency table of example generation strategies used by students was created (Table 2).

Another category that is analyzed is the ability to generate examples according to how students use procedural and conceptual knowledge. During the analysis of procedural knowledge, it is usually asked to solve the problem and examined whether the result or the operation is correct (Rittle-Johnson & Schneider, 2015). However, the questions in this study were prepared mostly in a way that allows students to generate examples using conceptual knowledge. For this reason, conceptual knowledge has been analyzed more. In this process procedural knowledge that could come up with the conceptual knowledge was also analyzed in replies given by students.

Students are required to identify and explain the relevant concept in clinical interviews in order to determine their level of conceptual knowledge (Rittle-Johnson & Schneider, 2015). Accordingly, when one's conceptual knowledge is analyzed, the compatibility of this knowledge with the known and widely accepted concept definitions is examined. In addition, while the conceptual information is evaluated, examples given about the concept can be examined or the student can be referred to include different expressions (as an example of graphing a non-continuous function) (Yanık, 2014). In this context, after the application with the students, clinical interviews have been prepared in order to make a more detailed analysis.

The students were asked questions about the concepts found in the questionnaire, aiming to investigate the reasons and considerations of the responses; for example, "What did you think about this question?," "What do you understand when ….. is said?," " What does the function defined from Z to N mean?" In this context, they were asked to transfer their new ideas (if any) to practice forms belonging themselves. Thus, by evaluating the example generation process of students in the context of conceptual and procedural knowledge, the factors affecting example generation skills were investigated.

Analyzes of procedural and conceptual knowledge levels of students are planned for each application questionnaire as follows:

The analysis of the first six research questions will require the condition of function, so the following function definition has been used.

A subset of A x B cartesian set that provides “For each element in A, B only has one element such that A and B are two sets of elements so (a, b) ∈ f " this special condition, and a set of A to set B is called a function (Even, 1993).

In the first question of the research, it was expected that students would know what domain and codomain mean and how they should be used and to write a function rule by considering these sets. Domain of the function to be written must be integers, and codomain must be natural numbers. It will be said that there is a lack of concept knowledge of students who cannot give an appropriate example to this situation. Also, in this question, the operations that the students will take without considering domain and codomain of the function will be used when the answer to the question of whether the procedural knowledge is in the foreground.

In the second question, it is aimed to examine the graphic representation of conceptual information on the condition of being a function. In mathematics lessons this is usually explained by the vertical test. According to the vertical test, lines parallel to the y-axis are drawn and this graph does not specify a function if any of those lines pass through more than one point on the graph. However, it is not enough for this test to be known by students in terms of learning conceptual knowledge and it is expected to know why this test is needed. This test is usually learned and applied by the students as a procedural knowledge. Very few students can develop a conceptual knowledge by relating this to the definition of the function (Bayazit & Aksoy, 2013). It will be said that the conceptual knowledge of the students who can explain the vertical line test is sufficient.

In the third question, the students asked to give a function example related to daily life by considering the child-mother relation which many teachers use in mathematics lessons to explain the condition of function. The analyzes made here are more about whether the student can correctly determine domain, codomain and the rule of function that he or she has written.

In the fourth question of the research, it is requested to investigate whether the students can write the function rule with different variables other than the x independent and y dependent variables which are more commonly used in mathematics lessons. “m is the function of n” means n independent, m is dependent variable. In this case, it will be said that the conceptual knowledge level of the students who can determine the appropriate function rule is sufficient.

In the fifth question, it is aimed to reveal concept knowledge about solution set in first degree equations in one variable and in what case solution set can be empty set. In this question, the level of procedural knowledge can also be determined depending on the operations student has made in the solution of the equation. When analyzing the conceptual level of knowledge for this question, the following explanations will be taken into consideration:

In an equation of $ax + b = 0$, the x values are called the root of the equation. The set of roots is also called the solution set and it is indicated by “ÇK (initials of solution set)”. If $a = 0$ and $b \neq 0$, the equation becomes $0.x + b = 0$. In this case, equality will never be true even if any real number value is written in place of variable x. The solution set becomes a null set and is expressed as ÇK = Ø (Maviş, Gül, Solaklıoğlu, Tarku, Bulut & Gökşen, 2017).

At the last question, students were asked to investigate limit and continuity at one point. This can be explained by both an algebraic expression or a graph. The following definitions shall be used for the analysis of student responses to the question:

The real number of L1 (L2) is called the limit of the f function on the left (right) at point x=a if the values of f (x) approach to the reel number of L1 (L2) when x values approach to a

from left (right), with less (greater) values than a in the function f defined as f : R→ R or f : R - {a} → R , y= f(x). This is expressed as $\lim_{x\to a^-} f(x)= L_1$ ($\lim_{x\to a^+} f(x)= L_2$). The limit of the function at this point is $L_1 = L_2$ =R and represented as $\lim_{x\to a} f(x)$= L if the left and right limits of the function f(x) at point x = a are equal to each other.

If $\lim_{x\to a} f(x)$= f(a) ∈ R for function $y = f(x)$, then this function is called "continuous at point x = a." (Keskin, 2016).

According to these definitions, the students who are able to make graphical drawings appropriate to the conditions required in the question will also have the right concept knowledge.

In order to ensure the reliability of the work, the voice recordings were listened to several times by the researchers while they were being transmitted to text. The data were examined and coded by both researchers independently. The consistency between the encoders was calculated by Cohen's Kappa coefficient and was found to be 83.75%. In cases where there was a difference between encoders, the researchers worked together on codes to arrive at a consensus. In order to increase the reliability of the study, the method of data analysis has been explained in detail and direct quotations from the interview data have been included. Abbreviations such as S-1, S-2, S-3, etc have been used instead of the real names of the students when the quotations are given.

3. Findings

This section includes findings related to the use of conceptual and procedural knowledge and the strategies students used while generating examples.

3.1. Example generation strategies used by students

In this section, the frequency of students' use of each example generation strategy were determined (Table 2), and the strategies they used were given examples.

Table 2: *Frequency of Use of Example Generation Strategies by Participating Students*

Strategies	Frequency of Use	Ratio in All Strategies Used
Trial and Error	22	22/26 (85 %)
Transformation	4	4/26 (15 %)
Analysis	0	0/26 (0 %)

According to Table 2, all 22 students who participated in the interview used the trial and error strategy and 4 of them also used the transformation strategy. None of the students used the analysis strategy.

Table 3 shows the coding examples used when analyzing the data, according to example generation strategies and the subcategories related to them.

Table 3: *Coding scheme of example generation strategies*

Categories	Coding Examples
Trial and Error	• Because it is a limit value and not continuous for saying i approached at one point from left to right on function. If we approach from the right and left and both have the same result, there is a limit and it is continuous. Actually I have given a function example which is continuous but you want discontinuous. If we thought of something like this, the function isn't continuous where it is "broken". • m and n are variables. We will give a value to n and output of this value will be the elements in m. For example $f(x) = (m-n)x + n$ is the function of variables m and n. But i can write a function of x and y like this: $f(x) = x^2 + 5x + 1$. This one is a fuction according to x. So, if i write $n^3 + n + 5 = m$ it can be a function of m and n. • I tried the function $f(x) = 4x + 5$, again it is not OK. Let's try $f(x) = -3x - 5$.
Transformation	• I wrote this function $f(x) = x^2 + 5x - 4$. But then f(0)=-4. To avoid a negative, I made a change $f(x) = x^4 + x^2 + 5$. • When you think of integers, there are also negative ones. To avoid a negative, I wrote x^2 instead of x. • Well, i randomly gave this example. Hmm this one is providing the condition of being a function. But, if i change the condition of the function like this, it is not a function, because a child cannot have two mothers. • Well, I wrote a function like $f(m) = n$. I wonder if m is an output of n? No, it is not. Then, I changed the places of m and n. Now, it is OK $f(n) = m$.
Analysis	No relevant findings were found for the analysis strategy.

3.1.1. Trial and error strategy

As found in previous studies (Antonini, 2006; Sağlam & Dost, 2015; Edwards & Alcock, 2010; Iannone et al., 2009), trial and error was the most used strategy by the participants (Table 2). Some participants used this strategy in the following way:

In the first question, S-22 generated random examples without regard to constraints such as the definition of function and number sets.

Researcher: How did you generate the function in this question?

S- 22: I wrote a function to natural numbers form integers. $f(x) = -3x + 5$ […] x's must be natural numbers. It is […] $f(3) = -4$. -4 is not a natural number. It is an integer rather than a natural number. If it is positive, I think it will be OK. Let's say $f(x) = 4x + 5$. However, it is $f(-3) = -7$. Again it is negative.

In the last question of the research, student S-17 could not generate an appropriate example of the constraints on the question because he had lack of concept knowledge about limit and continuity. He used trial and error strategy and has concept image that the function is not continuous in the place where it is "broken".

Researcher: Can you explain your thoughts on this question?

S- 17: I approached at one point from left to right on function because it is a limit value and not continuous for saying. If we approach from the right and left and both have the same result, there is a limit and it is continuous. Actually I have given a function example which is continuous but you want discontinuous.

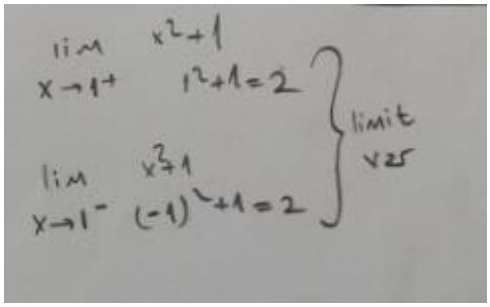


Figure 1. Student 17's answer to question 6

Researcher: Can you express it on the graphic?

S- 17: If we thought of something like this, the function isn't continuous where it is "broken".

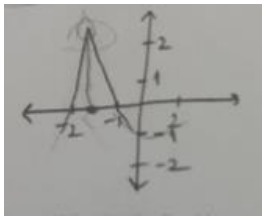


Figure 2. Student 17's the other answer to question 6

In the fourth question of the application, the students were asked to give a function example with different variables, rather than the common notations used in the functions.

Among the participants, the student S-12 could not generate a suitable example in the fourth question while doing random trials. However he later gave an example appropriate for the restrictions by using the function $f(x) = x^2 + 5x + 1$, depending on the variable x, which is the reference representation of the functions.

Researcher: Can we talk about the example you gave here? What comes to your mind when you hear m is n's function?

S- 12: m and n are variables. We will give n a value and it will be an element of m. […] For example, the function $f(x) = (m - n)x + n$ is the function of the variables m and n.

Researcher: How is the function expressed according to x and y variables?

S- 12: For example, the expression $f(x) = x^2 + 5x + 1$ is a function. A function according to x. […] Then, if I write $n^3 + n + 5 = m$, it is a function according to n.

3.1.2. Transformation strategy

In this strategy, the example that satisfies one or more of the requested properties is modified through some transformations until it turns into an example with all the requested characteristics. In this study, it was a less used strategy than trial and error (Table 2). Below are the answers that some participants gave by using the transformation strategy.

In the first question, student S-4 tried to write a function as a prototype, or the first example that came to his mind. But then he thought that the outputs were negative for some elements in the domain and did not provide the requested properties. By transforming the rule of function, the student wanted to give a function example defined from integers to natural numbers.

Researcher: Do your examples provide the desired characteristics from the question?

S-4: First, I got the function $f(x) = 2x$. When you say integers, there are also negative ones. […] I thought x^2 to eliminate the negative ones. Everything was positive now.

Figure 3. Student 4's answer to question 1

In the fourth question, Student S-17 could not distinguish between dependent/independent variables. But he tried to generate an appropriate example by changing the places of dependent and independent variables during the interview.

Researcher: Can you explain how you solved this question?

S- 17: Well.. First, I wrote $f(m) = n$ here. I wrote a function. That is, instead of x value, the value of $f(m)$ function is equal to n ….[thinking]… Then, will m be the output of n? No, it is not OK. If I write $f(n) = m$, it is OK.

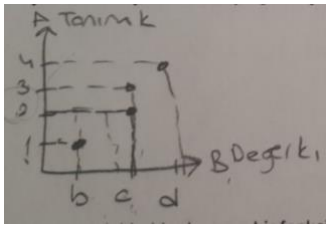
Researcher: Can you write an appropriate algebraic rule for this?

S- 17: $(n) = n^2 + 2n = m$.

In the second question of the application, while drawing a graphic that did not specify a function, the student S-2 gave an example based on the relation "mother-child" which is a reference and which is frequently used in her lessons. Although the first graphic that the

student drew randomly specified a function (graphic on the left), the student changed the range without changing the domain and codomain of the function and generated a suitable example.

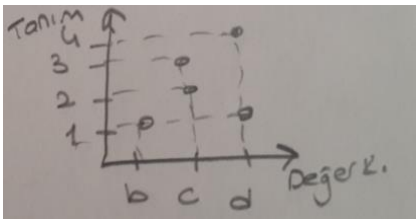
A (Domain)



B (Codomain)

Figure 4. Student 2's answer to question 2

A (Domain)



B (Codomain)

Figure 5. Student 2's the other answer to question 2

Researcher: Can you tell me the graphics you've drawn?

S-2: In this graphic [showing the graphic on the left], I considered domain (A) as children and codomain (B) as mothers. [thinking aloud] It must not be a function. Does every child have only one mother? Yes, it does. Well... It is a function.

Researcher: So, have you made a change on this chart?

S-2: Actually, I have not made much change. I have not changed domain and codomain. As you see here, [showing the graph on the right] I have changed the rule. This is not a function I have drawn because a child cannot have two mothers.

3.1.3. Analysis strategy

In this strategy, assuming the constructed object [exists], and possibly assuming that it satisfies other properties added in order to simplify or restrict the search ground, further properties are deduced, up to consequences that may evoke either a known object or a procedure to construct the requested one. It has been observed that students did not use the analysis strategy in the example generation activities included in this study. Analysis strategy has been seen very little in the example generation process at Iannone (2009) and Sağlam and Dost (2015) works with university students.

3.2. Use of procedural and conceptual knowledge in example generation process

In the process of generating examples for some mathematical concepts, it was seen that both the procedural and conceptual knowledge levels of the students are inadequate and for this reason they failed to generate examples. For example, student S-21 gave a function example for the first question and tried to determine whether he generated the example according to the desired conditions by performing some numerical operations on this function. However, as the student had a lack of knowledge about the function, the process of generating examples failed. It is also seen that there is a lack of procedural knowledge because the algebraic expression that the student wrote and the operations performed on it are incorrect.

Researcher: Can you tell me what did you think about this question?

S-21: For example, the function had an unknown. I assigned it. $f(x) = x^2 - 2 + 5 = 7$. We can also find the value x by doing some operations on the function. Hmm, is it okay with 1?

Researcher: Does your example provide these conditions? What is a function defined from Z to N?

S-21: Because the integers cover natural numbers. It's something like defined from big numbers to small numbers. [Thinking] Actually, the function I wrote is probably not very convenient. That is, it is not always 7. It may also be different numbers [... thinking] If I did not write 7, I would generate an appropriate example.

Concept images, which is a cognitive structure in which some features, methods and mental pictures of a concept take place (Tall & Vinner, 1981), have an important role in the example generation process. During the analysis of data for conceptual and procedural knowledge, it was seen that students also responded to the questions with the concept images in their mind. For example; the student S-20 tried to give a continuous function example by drawing a graph in the sixth question. For the concept of continuity, the student used a concept image as the graph's "flowing off." However, the student tries to find an answer to this question both algebraically and graphically it seems that he doesn't have the correct concept knowledge when the definitions for limit and continuity concepts are considered.

Researcher: Could you tell me your solution to this question?

S-20: In order to be continuous, the function must flow off. Is my function flowing off? [Thinking]

Researcher: So now is the function in the graph continuous?

S-20: The graph is flowing here [... showing a part on the graph]. But it is not continuous in -2 and 1. So this function is not continuous. Then what can I do? [Thinking].

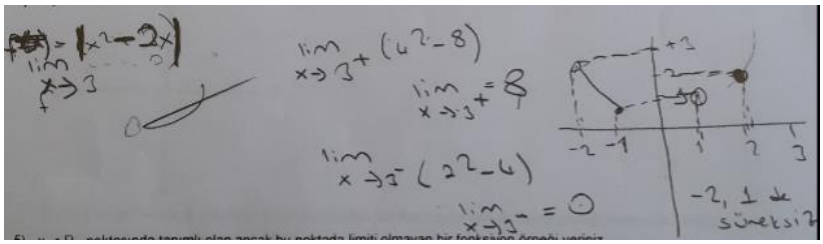
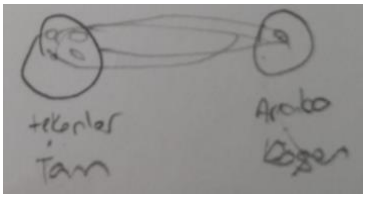


Figure 6. Student 20's answer to question 6

In the third question of the study, it was found that student S-11 had a concept image that is not mathematically compatible as "the elements of the codomain include the elements of the domain" for the definition of the function. Therefore, the student could not generate a suitable example for the constraints.

Researcher: Can you tell me what did you think about this question?

S-11: Since it comes from codomain to the domain, the car has all the wheels. I thought the elements of the codomain include all the other elements of the domain as function.



(Wheels Domain) (Car Codomain)

Figure 7. Student 11's answer to question 3

On the other hand, students who were able to use conceptual knowledge as well as procedural knowledge could give examples appropriate for the restrictions. For example, student S-1 has used the vertical line test for the condition of being a function in the second question. As the student explains what this test means, it can be said that she has the correct concept knowledge. So the student generated the desired example in this question.

Researcher: How did you solve this question?

S-1: I used vertical line test. Our teacher had given this example.

Researcher: What does the vertical line test mean?

S-1: It must have only one output in order to be a function. You see the vertical lines I draw here. They intercept the graph at more than one point. Actually, each child in the domain must have one mother. Here, it has more than one value. It is not a function.

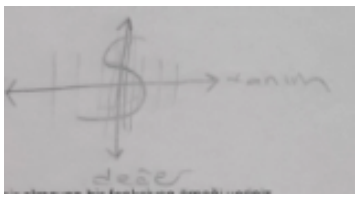


Figure 8. Student 1's answer to question 2

Similarly, student S-12 generated two appropriate examples, using the definitions of limit and continuity concepts, in the eighth question.

Researcher: Can you explain how did you solve the problem?

S - 12: The function must have a limit. That is, it must have a limit value at x_0 point. When we approach from right and left, it must have the same value but it must not be continuous there. [...] This function (showing the graph on the left) has a limit, but the function is discontinuous at the point x_o. Our teacher gave this example in the lesson.

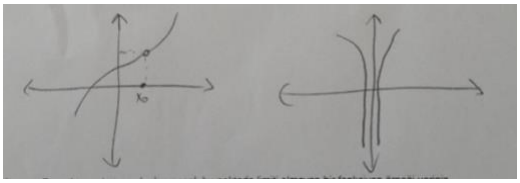


Figure 9. Student 12's answer to question 8

In the fifth question, the student S-15 generated an appropriate example of the first-degree equation in which the coefficient of the unknown on the left and right sides of the equation is equal but the remaining constants are not equal to each other (the answer to the question follows the general notion of equations with a solution set of empty sets). Thus, it can be said that the student had the right conceptual knowledge as well as procedural knowledge in this question.

Researcher: Could you explain your solution in this question?

S-15: I wrote an equation. For the solution set to be a null set, the right and left sides of the equation must not be equal to each other. Accordingly, the result of the equation I wrote is 0 = 1. So the solution set is a null set.

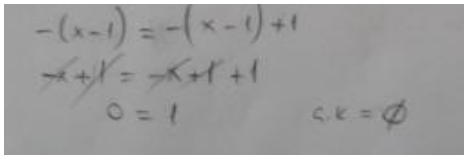


Figure 10. Student 15's answer to question 7

4. Conclusion and discussion

In this research, the strategies that high school students use in the process of generating examples in mathematics courses, and the effects of procedural and conceptual knowledge on example generation skills were investigated. According to the findings obtained from the study, the most used strategy in the process of example generation of high school students is trial and error and the least used strategy is the transformation strategy. As in the studies conducted by Edwards and Alcock (2010), Antonini (2006), Iannone et al. (2009) and Sağlam and Dost (2015), it was found that the most used strategy is trial and error.

When students used trial and error, they made random trials and could not determine whether their examples were appropriate or not because they did not have enough concept knowledge. However, during the interview, many students realized the mistakes they had made and made a second trial attempt. It was also found that encouraging students to use reference examples may be useful in generating appropriate examples. Arzarello, Ascari and Sabena (2011) also stated that the intervention of the teacher in the example generation activity has a critical importance. Students using the transformation strategy gave the prototypes as answers like in the trial and error strategy. However, when they found out that these examples were not appropriate to the required conditions in the question, they generated new examples by changing some features. In the study of Wagner et al. (2017), students made some changes on the examples they gave in order to provide the desired conditions in the example generation activity and used the transformation strategy. In addition, it was seen that example generation skills of students developed over time.

Example generation activities are an important pedagogical tool used to determine the level of competence of students in their understanding of related mathematical concepts. In this process, concept images of students (if any) can be determined. Everything in the mind of the student related to the concept represents concept images (Hershkowitz, 1990). The students answered some of the questions with concept images in their minds instead of concept definitions. Also, Tall and Vinner (1981) and Vinner (1991) achieved similar results in that students tend to use the concept image instead of using previous concept definitions in the process of generating a new concept. It was found that concept image was an incentive for the learner to comment on the question, but it was not enough by itself. We can say that

students use concepts incorrectly because generally example generation activities are not included and specific examples (prototypes) are used in lessons. It can be said that all these factors negatively affect the students' ability to generate examples. In the study of Tezer and Cumhur (2016), the common conceptual mistakes made by the students during the problem solving in mathematics courses were determined by primary school teachers. However, it has been concluded that the constructivist approach, that provide to be designed environments and situations where mathematics to be taught and students product their own knowledge, can prevent these conceptual errors seen in students. In this context, designing classroom activities that enable students to generate examples helps them to understand the new mathematical concepts they encounter (Wagner et al., 2017).

Other factors considered when examining example generation activities are procedural and conceptual knowledge. We tried to determine the students' ability to generate examples based on this. Students are a good mirror for learning through memorizing; they skillfully reflect what comes to them, but they do not generate anything (Cobb, 1986). The students who have a lack of conceptual and procedural knowledge failed to relate concepts, make inferences and manipulate the information. For this reason, they gave mathematically incorrect or incomplete answers during the example generation process, in which conceptual knowledge and learning were required. The individual who learns a concept should be able to identify the concept with his/her own expressions and give examples related to the concept (Gagne, 1977). In this study, students with conceptual knowledge were able to generate examples appropriate for the restrains involved in the questions. In Baki (2004) and Soylu and Aydın's (2006) studies, it was seen that participants did not use conceptual and procedural knowledge in a balanced manner and procedural learning was at the foreground. Therefore, it can be said that students were unable to apply the concepts or descriptions they learned in class.

5. Recommendations

The high school students' lack of sufficient conceptual knowledge, the fact that procedural knowledge is at the foreground, and their having mathematically inappropriate concept images are the main causes that negatively affect the example generation process.

Example generation activities can be used for both evaluation and skill development. Whether or not students' conceptual learning has taken place and concept images (if any), can be determined through the activities used for the purpose of evaluation. After this assessment made by the mathematics teachers, the activities aiming at developing conceptual learning and example generation skills can be planned. In this context, teachers can include the following activities in their lessons: "Make up an example with some constraints," which is used to encourage students to use a general method rather than giving a random answer through trial and error; "Make up another or more like or unlike this," which informs teachers about the thoughts of students about the concept of similarity and draws attention to the different elements of possible variations; and "Make up counter-examples and non-examples" (Watson & Mason, 2005), which is used when a counter hypothesis or claim is needed in the context of a concept, procedure, or proof, and to show the boundaries of a concept.

In mathematics lessons and textbooks, there are often prototypes. These can lead to a student's limited perception of a concept, by drawing attention to only certain characteristics of the concept, preventing them from coping with complex problem situations. For this reason, both counter examples to clarify the distinctions between the concepts and to show that the results cannot be generalized (Wagner et al., 2017) and reference examples that can be used in different situations related to any topic, can help to eliminate and explain some mathematical unknowns (Michener, 1978) and should be included in courses and textbooks.

In addition to this, students should be encouraged to perform different types of research and activities for mathematical concepts outside the class hours.

It was also found in this study that having only procedural knowledge is not sufficient in problem solving activities. In order to achieve lasting learning in mathematics education, it is necessary for teachers to plan for conceptual comprehension as well as procedural knowledge. In this context, by including problem situations that students have not encountered before in mathematics teaching, their thinking at the conceptual level can be improved.

Finally, mathematics teacher education programs should prepare teacher candidates for the use of instructional examples.

References

Anderson, J. R. (2000). *Cognitive psychology and its implications* (5th ed.). New York: Worth Publishers.

Antonini, S. (2006). Graduate students' processes in generating examples of mathematical objects. In J. Novotna, H. Moraova, M. Kratka, & N. Stehlıkova (Eds.), *Proceedings of the 30th conference of the international group for the psychology of mathematics education* (Vol. 2, pp. 57–64). Prague, Czech Republic: PME.

Arzarello, F., Ascari, M., & Sabena, C. (2011). A model for developing students' example space: The key role of the teacher. *ZDM Special Issue on "Examples in Mathematical Thinking and Learning from an Educational Perspective," 43*, 295–306.

Baki, A. (2004). Kavramsal ve işlemsel bilgi bağlamında lise öğrencilerinin cebir bilgilerinin karakterizasyonu [Characterizing the nature of high school students' algebra knowledge in terms of procedural and conceptual knowledge]. *Türk Eğitim Bilimleri Dergisi,* 2(1), 27–46.

Bayazit, İ., Aksoy, Y. (2013). Fonksiyon kavramı: Epistemolojisi, algı türleri ve zihinsel gelişimi [Epistemology and cognitive development of the function concept]. *Erciyes Üniversitesi Fen Bilimleri Enstitüsü Dergisi, 29*(1), 1-9.

Bell, A., & Baki, A. (1997). *Ortaöğretim matematik öğretimi* Cilt 1 [Secondary school mathematics teaching Volume 1]. YÖK, Ankara.

Bills, L., Dreyfus, T., Mason, J., Tsamir, P., Watson, A., & Zaslavsky, O. (2006). Exemplification in mathematics education. In J. Novotna, H. Moraova, M. Kratka, & N. Stehlikova (Eds.), *Proceedings of the 30th Conference of the International Group for the Psychology of Mathematics Education* (Vol. 1, pp. 126–154). Prague, Czech Republic: Charles University.

Carpenter, T. P. (1986). Conceptual knowledge as a foundation for procedural knowledge. In J. Hiebert (Ed.), *Conceptual and procedural knowledge: The case of mathematics* (pp. 113-132). Hillsdale, NJ, US: Lawrence Erlbaum Associates, Inc.

Cobb, P. (1986). Context, goals, beliefs, and learning mathematics. *For the Learning of Mathematics FLM, 6*, 2–9.

Dahlberg, R., Housman, D. (1997). Facilitating learning events through example generation. *Educational Studies in Mathematics, 33*, 283–299.

Edwards, A., & Alcock, L. J. (2010). How do undergraduate students navigate their example spaces? In *Proceedings of the 32nd Conference on Research in Undergraduate Mathematics Education*, Raleigh, NC, USA.

Even, R. (1993). Subject-matter knowledge and pedagogical content knowledge: prospective secondary teachers and the function concept. *Journal for Research in Mathematics Education, 24*(2), 94–116.

Gagne, R. M. (1977). *The conditions of learning*. New York: Holt, Rinehart, and Winston.

Hazzan, O., Zazkis, R. (1999). A perspective on "give and example" tasks as opportunities to construct links among mathematical concepts. *Focus on Learning Problems in Mathematics, 21*(4), 1–14.

Hershkowitz, R. (1990). Psychological aspects of learning geometry. In P. Nesher, & J. Kilpatrick (Eds.), *Mathematics and cognition* (pp. 70–95). Cambridge, UK: Cambridge University Press.

Hiebert, J., & Lefevre, P. (1986). Conceptual and procedural knowledge in mathematics: An introductory analysis. In J. Hiebert (Ed.), *Conceptual and procedural knowledge: The case of mathematics* (pp. 1–27). Hillsdale, NJ: Lawrence Erlbaum Associates.

Iannone, P., Inglis, M., Mejia-Ramos, J. P., Siemons, J., & Weber, K. (2009). How do undergraduate students generate examples of mathematical concepts? In M. Tzekaki, M. Kaldrimidou, & H. Sakonidis (Eds.), *Proceedings of the 33rd Conference of the International Group for the Psychology of Mathematics Education* (pp. 217–224), Thessaloniki, Greece.

Keskin, C. (2016). *Ortaöğretim matematik 12. sınıf ders kitabı* [Mathematics 12th Grade Book], Ankara: Dikey Yayıncılık.

Maviş, M., Gül, G., Solaklıoğlu, H., Tarku, H., Bulut, F., Gökşen, M., (2017). *Ortaöğretim matematik 9. sınıf ders kitabı* [Mathematics 9th Grade Book], Ankara: MEB Yayınları.

Merriam, S. B. (2013). *Nitel araştırma desen ve uygulama için bir rehber* (Çev. S. Turan) [Qualitative research a guide to design and implementation (Turan S., Trans)]. Ankara, Nobel Yayınları.

Michener, E. (1978). Understanding mathematics. *Cognitive Science, 2*, 361–383.

Ng, L. K., & Dindyal, J. (2015). Examples in the teaching of mathematics: Teachers' perceptions. In M. Marshman, V. Geiger, & A. Bennison (Eds.), *Proceedings of the 38th annual conference of the Mathematics Education Research Group of Australasia* (pp. 461–468). Sunshine Coast: MERGA.

Post, T. R. (1981). Fractions: Results and implications from National Assessment. *Arithmetic Teacher, 28*(9), 26-31.

Post, T., & Cramer, K. (1989, March). Knowledge, representation and quantitative thinking. In M. Reynolds (Ed.) *Knowledge Base for the Beginning Teacher - Special publication of the AACTE* (pp. 221-231). Oxford: Pergamon Press.

Rittle-Johnson, B., & Schneider, M. (2015). Developing conceptual and procedural knowledge in mathematics. In R. Cohen Kadosh & A. Dowker (Eds.), *Oxford handbook of numerical cognition* (pp. 1102-1118). Oxford, UK: Oxford University Press. doi: 10.1093/oxfordhb/9780199642342.013.014

Sağlam, Y., & Dost, Ş. (2015). A qualitative research on example generation capabilities of university students. *International Journal of Science and Mathematics Education*, *14*(5), 979-996.

Skemp, R. R. (1971). *The psychology of learning mathematics*. Middlesex, England: Penguin Books.

Soylu, Y., & Aydın, S. (2006). Matematik derslerinde kavramsal ve işlemsel öğrenmenin dengelenmesinin önemi üzerine bir çalışma [A study on importance of the conceptual and operational knowledge are balanced in mathematics lessons]. *Erzincan Eğitim Fakültesi Dergisi, 8*(2), 83–95.

Star, J. R. (2007). Foregrounging procedural knowledge. *Journal for Research in Mathematics Education, 38*(2), 132-135.

Strauss, A., & Corbin, J. (1990). *Basics of Qualitative Research: Grounded Theory Procedures and Techniques.* Newbury Park, C. A.: Sage.

Tall, D., Vinner, S. (1981). Concept image and Concept definition in mathematics with particular reference to limits and continuity. *Educational Studies in Mathematics, 12*(2), 151–169.

Tezer, M., Cumhur, M. (2016). Anthropological theory of didactics and the probability of the constructivist approach being a solution to the common mistakes made in mathematics lessons. *International Journal of Educational Sciences, 15(1*-2), 148-156, doi:10.1080/09751122.2016.11890524.

TTKB (2017). (Talim ve Terbiye Kurulu Başkanlığı) (Tarihsiz-a) [Presidency of Education and Training Assembly (Undated-a)]. *Tüm Öğretim Programları: Matematik Dersi (9-12.Sınıflar) Öğretim Programı* [All Teaching Programs: Mathematics Course (9^{th} -12^{th} Graders) Curriculum]. Retrieved from http://mufredat.meb.gov.tr/ProgramDetay.aspx?PID=179

Van den Heuvel-Panhuizen, M., Middleton, J., Streefland, L. (1995). Student-Generated problems: Easy and difficult problems on percentage. *For the Learning of Mathematics, 15*(3), 21–27.

Vinner, S., Dreyfus, T. (1989). Images and definitions for the concept of function. *Journal for Research in Mathematics Education, 20*(4), 356–366.

Vinner, S. (1991). The role of definitions in the teaching and learning of Mathematics. In D. Tall (Ed.), *Advanced Mathematical Thinking* (pp. 65–81). Dordrece Netherlands: Kluwer Academic Publishers.

Wagner, E.R., Orme, S.M, Turner, H.J., & Yopp, D. (2017) Encouraging example generation: A teaching experiment in first-semester calculus, *PRIMUS, 27*(2), 212-234, doi: 10.1080/10511970.2016.1194340.

Watson, A., & Mason, J. (2005). *Mathematics as a constructive activity: Learners generating examples*. Mahwah, NJ: Erlbaum.

Yanik, H. B. (2014). Middle-school student's concept images of geometric translations. *Journal of Mathematical Behavior, 36*(1), 33-50.

Yıldırım, A., & Şimşek, H. (2011). *Sosyal bilimlerde nitel Araştırma Yöntemleri 6. Baskı* [Qualitative research methods in the social sciences Volume 6]. Ankara: Seçkin Yayıncılık.

Zaslavsky, O. (1997). Conceptual obstacles in the learning of quadratic functions. *FOCUS on Learning Problems in Mathematics, 19*(1), 20–44.

Zaslavsky, O., Peled, I. (1996). Inhibiting factors in generating examples by mathematics teachers and student-teachers: The case of binary operation. *Journal for Research in Mathematics Education, 27*(1), 67–78.

Zaslavsky, O., & Ron, G. (1998). Students' understanding of the role of counter-examples. In A. Olivier & K. Newstead (Eds.), *Proceedings of the 22nd Conference of the International Group for the Psychology of Mathematics Education* (Vol. 4, pp. 225–232). Stellenbosch, South Africa: PME.

Zodik, I., Zaslavsky, O. (2008). Characteristics of teachers' choice of examples in and for the mathematics classroom. *Educational Studies in Mathematics*, 69, 165–182.

Karabıyık, C., (2019) The relationship between student engagement and tertiary level English language learners' achievement. *International Online Journal of Education and Teaching (IOJET), 6*(2). 281-293.
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THE RELATIONSHIP BETWEEN STUDENT ENGAGEMENT AND TERTIARY LEVEL ENGLISH LANGUAGE LEARNERS' ACHIEVEMENT

Research Article

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Abstract

The aim of this study was to investigate the interaction between student engagement and achievement. The study sample was composed of 296 at Ufuk University in Ankara, Turkey. The participants were enrolled in the intensive English language program of the foreign language Preparatory School of the institution. Data collection was carried out with the Mazer's (2012) Student Engagement Scale, which was adapted to Turkish by Uğur and Akın (2015). Students' English achievement was measured by their mid-term exam results. Statistical analysis revealed participants to be more engaged in silent in class behaviors followed by out of class behaviors, thinking about course content, and out-of-class behaviors. Moreover, it was found that participants had low engagement levels in oral in class behaviors. All types of engagement had a positive correlation with mid-term exam scores. Among all types of engagement behaviors, oral in class behaviors was the only predictor of students' exam scores.

Keywords: student engagement, achievement, foreign language learning

1. Introduction

The concept of academic achievement in higher education has been and is still a sophisticated and multifaceted area of research. In the past decades, theories and projections related to the factors affecting academic achievement have been proposed. The body of literature in this respect discloses that academic achievement is implicitly or explicitly depended upon manifold factors (Kuh, Kinzie, Buckley, Bridges, & Hayek, 2007; Perna & Thomas, 2008; Van Den Berg & Hofman, 2005). Common ground among these perspectives in the college impact literature is the notion that academic and social integration into the higher education learning environment is a must to achieve desirable learning outcomes (Jansen & Bruinsma, 2005; Keup, 2005/2006; Kuh et al., 2007; Pike & Kuh, 2005; Terenzini, Springer, Yaeger, Pascarella, & Nora, 1996). The core premise of this viewpoint underpins the integration theory posited by Tinto (1975), which proposes that success in higher education is highly dependent on students' academic and social engagement in their institutions. Other models that lay stress on engagement as an important element in learning are the involvement theory (Astin, 1984), student development model (Pace, 1990), and engagement model (Kuh, 2001; 2003). Even though the categorization of learning behaviors is different in these models, they all emphasize student engagement as the core of achievement. According Astin (1984) students' integration and academic development is highly influenced by the active role students take in the learning process; and he asserted that the mental and physical engagement of students in the learning experience leads to positive academic outcomes. In the same vein, Pace (1990) pointed out that quality of learning is improved via student endeavors towards learning and that its those efforts that are the most important determinant of academic outcomes. Similarly, in Kuh's (2001; 2003) model of engagement, it was emphasized that engaging in educationally purposeful activities led to desired academic outcomes. The importance of student engagement is also highlighted in the related line of literature. It was determined that engaged students reported higher levels of

motivation, interest (Mazer, 2012), satisfaction (Kuh, 2009) as well as greater affective and cognitive learning (Frymier & Houser, 2016; Mazer, 2012).

In light of the theoretical positions and studies promoting the importance of student engagement in achieving desired learning outcomes, student engagement in higher education was acknowledged as a notable multifaceted construct that may actualize owing to a variety of personal and contextual factors (Fredericks, Blumenfeld, & Paris, 2004) and research in this respect has been popular over the past three decades. Whereas some researchers investigated the link between engagement and achievement in higher education found a positive correlation between engagement and academic achievement (Astin 1977, 1993; Indiana University Center for Postsecondary Research, 2002; Pike, Schroeder & Berry 1997; Tross, Harper, Osher & Kneidinger 2000; Kuh, Cruce, Shoup, Kinzie, and Gonyea, 2008; Salanova, Breso, & Schaufeli, 2005; Handelsman, Briggs, Sullivan, & Towler, 2005) some studies did not (Manzano 2002a, 2002b, 2004; Martinez & Salanova, 2003). However, studies investigating the link between engagement and achievement in the foreign language teaching learning context are quite limited to date and researching the link between engagement and achievement in this context can provide valuable insights. For that reason, this paper centers upon the relationship between engagement and achievement in the learning English as a foreign language context by analyzing the student engagement make up, by examining the relationship between dimensions of student engagement and achievement, and by exploring the predictors of achievement with respect to dimensions of student engagement.

1.1. Literature Review

1.1.1. Student engagement

Formerly referred as the theory of college student involvement, the engagement theory developed by Astin (1993) posits active students to be those who dedicate a substantial amount of energy to their studies, that are active in their educational institutions, and those who communicate and interact with instructor and fellow students (Astin, 1984). Emphasizing the importance of active participation in the learning process, the theory literally posits successful students to be those who are more engaged (Astin, 1984). According to Astin (1984), engagement is the physical and psychological impetus allocated by students in their academic work. Other prevalent definitions of engagement characterize it as students' involvement (Ball & Perry, 2011) and psychological, cognitive, emotional and behavioral reactions (Gunuc & Kuzu, 2014) in educationally purposeful endeavors. Other student behaviors that were identified as forms of engagement were time allocated to tasks, quality of effort, student participation, and deliberation of learned material outside of the class (Hu & Kuh, 2002; Mazer, 2012). In general, those students who expend more affective, behavioral and cognitive effort in their academic endeavors are considered to be engaged students (Fredricks, Blumenfeld, & Paris, 2004; Kuh, 2009; Mazer, 2012).

As can be seen above, researchers have submitted several ways to qualify engagement, which highlights the complexity of the phenomenon. Among many conceptualizations of student engagement, it's that of Mazer (2012) that underpins this study. According to Mazer (2012), there are four types of student engagement that are termed silent in-class behaviors, oral in-class behaviors, thinking about course content, and out-of-class behaviors. In this conceptualization, silent in-class behaviors can be defined as presence in the class and paying attention to what the instructor and other students are communicating whereas oral in-class behaviors on the other hand can be construed as oral participation in the activities carried out in the class. On the other hand, the type of engagement labelled as thinking about course content is characterized as the out-of-class consideration of how course materials relate to

one's life and how one can make use of this knowledge in their daily lives as well as future careers. Lastly, out-of-class behaviors can be portrayed as talking about and studying class content.

1.1.2. Student engagement and learning outcomes

Engagement as a concept has been a popular research area; and research in this field have yielded favorable results with respect to the relationship between engagement and positive outcomes. Positive correlations were find between engagement and general abilities and thinking (Kuh, 2003; Pascarella et al., 1996; Pike, 1999, 2000; Shulman, 2002), competence in practical skills and the transferability of these skills (Kuh 1993, 1995); cognitive development (Astin, 1993; Pascarella, Seifert & Blaich, 2008); self-esteem (Bandura, Peluso, Ortman & Millard, 2000), and student persistence (Astin, 1993; Braxton, Milem & Sullivan 2000; Tinto, 2005).

Apart from such studies that have concentrated on manifold relationships, there are also studies that focalized on the relationship between student engagement and achievement at higher education institutions. For example, Carini, Kuh, and Klein, (2006), who used data from the National Survey of Student Engagement (NSSE) and Kuh et al. (2001) who included data from fourteen four year colleges and universities in the U.S. both concluded that engagement and grades were positively linked for many measures of student engagement. In a study aimed at exploring the link between engagement and the achievement of health care student in Spain, Casuso-Holgado, et al. (2013) ascertained engagement to be one of the main positive factors involved in academic achievement. Likewise, Gunuc (2014), in his study carried out at the education faculty of a state university in Eskişehir/Turkey, also asserted a significant positive relationship between student engagement and academic achievement. In a study carried out studying the predictors of success at a state university in Ankara/Turkey, Çapa-Aydın, Yerin-Güneri, Barutçu-Yıldırım, and Çağ (2015) concluded engagement to be a significant predictor of GPA. In the same vein, Akbari, Naderi, Simons, and Pilot (2016) found a significant high correlation between student engagement and English language learning in their study aimed at investigating the influence of using social networks on learning with a sample of Iranian PhD students.

Moreover, some there are also studies that have specifically concentrated on the relationship between student engagement and achievement using measures related to silent in-class behaviors, oral in-class behaviors, thinking about course content, and out-of-class behaviors.

Studies focusing on the association between silent in-class behaviors and achievement not surprisingly revealed significant positive links and effects. In a study realized in the US, Siciliano (1978), revealed a positive link between attendance and achievement in a research that was carried out with students of Romance languages. In another investigation undertaken in Taiwan, Kelsen and Liang (2012), revealed attendance to be one of the most significant indicators of achievement for students of English language. In a study that included Chilean students of an English pedagogy program; Fay, Aguirre, and Gash (2013), concluded a positive association between attendance and achievement in the target language and content. In studies carried out in the Turkish higher education context, Özkanal and Arıkan (2011), Bahar (2015), and Karabiyik (2016) also revealed significant positive associations between attendance and English achievement.

Another line of research on the other hand, concentrated on oral in-class behaviors. In a study realized with 13,121 eight grade students in the U.S. Voelkl (1995) concluded in-class participation to have a significant influence on achievement. Investigating the predictors of

achievement in Literature in English classes in Nigeria, Fakeye and Amao (2013) concluded that in-class participation was the only significant predictor of achievement for a sample of 500 second grade secondary school students. Similarly, Zheng and Warschauer (2015) on the other hand investigated the effect of student participation in an online discussion environment on student achievement with a sample of 48 fifth grade English language learners and reported that high participation and interaction lead to development in language and literacy in English. In another study carried out in Indonesia with 894 high school students, Syaveny and Johari (2017) revealed that in-class participation significantly correlated with English achievement.

On the other hand, in studies that focused on the relationship between thinking about course content and achievement, positive results were reported. In a study carried out by Lee and Loughran (2000) with 6 teacher trainees studying at an Australian university, it was concluded that reflection fostered learning. Similarly, Kealey, Holland, and Watson (2005) found critical thinking to be a significant predictor ag performance in a research conducted with 178 students in a principles of accounting class at a Midwestern university. In a study carried out in the Iranian EFL context involving 82 university students, Ghanizadeh and Mirzaee (2012) revealed higher order thinking to be a predictor of achievement. In another study undertaken in the Iranian context, Ghasemi and Dowlatabadi (2017) researched 190 undergraduate students majoring in English and concluded higher order thinking as being a predictor of language achievement.

Moreover, another interesting line of research focused on the relationship between out-of-class student behaviors and success. Green and Oxford (1995) found a high correlation between reading for pleasure and overall language proficiency in a study carried out with 374 undergraduate students in Puerto Rico. Furthermore, Krashen (2003) revealed a positive effect of extensive reading on L2 achievement in his study carried out in Turkey with international student attending British Council. Investigating English learning via out-of-class activities, Chausanachoti (2009) concluded that out-of-class language learning activities was beneficial for improving foreign language proficiency among 42 undergraduate English learners in Thailand. Moreover, researching the gains of extensive listening in English language learning with 16 undergraduate students in Mexico, Ucán, (2010), also concluded extensive listening to be beneficial to L2 improvement

1.2. Research questions

In light of the review of the related line of literature, there were certain reasons that motivated this study. To begin with, studies on the relationship between student engagement and achievement in the foreign language learning context are limited. Moreover, predictive nature of different types of student engagement on student's language achievement is also an under-researched field of investigation in the foreign language learning context. On the whole, engagement and its relationship to student achievement is a worthy area of investigation. Therefore, this study addressed the following research questions:

1. What engagement types are manifested by the participants?
2. What is the relationship between types of engagement and English achievement?
3. What is/are the predictor(s) of English achievement with respect to different engagement types?

2. Method

2.1. Setting and participants

The study included a sum of 296 undergraduate students who volunteered for the study selected via convenience sampling. 145 of the participants were female and 151 were male;

and they were aged between 18 and 24. The participants were enrolled in Ufuk University Preparatory Language School, which offers intensive English classes in listening, speaking, reading and writing over two semesters. Students are periodically assessed via monthly quizzes and a mid-term exam. The passing grade score for these assessments were 60 out of a 100. At the end of the academic year, students are administered a proficiency test to determine whether they are competent enough in English to pursue their undergraduate programs; and those who fail the proficiency test have to repeat the program.

2.2. Instruments

2.2.1. Student engagement scale

The instrument is a scale designed to assess in and out of class engagement behaviors of students by Mazer (2012). It was adapted to Turkish by Uğur and Akın (2015). The adapted version of the scale was used in this study. The scale is composed of 13 items scored on a 7 point Likert scale ranging from absolutely inappropriate (1) to absolutely appropriate (7) and has four sub-dimensions that are silent in class behaviors, oral in class behaviors, thinking about course content, and out of class behaviors. The reliability coefficients of the original scale were .86 for silent in class behaviors, .96 for oral in class behaviors, .92 for thinking about course content, and .82 for out of class behaviors, whereas the scale had a total reliability score of .90 (Mazer, 2012). The Cronbach's alpha values reported in the adaptation study were .81 for silent in class behaviors, .88 for oral in class behaviors, .84 for thinking about course content, and .81 for out of class behaviors; and .85 for the scale in total (Uğur & Akın, 2015). On the other hand, the scale reliability estimates for this study were .81 for silent in class behaviors, .83 for oral in class behaviors, .83 for thinking about course content, and .78 for out of class behaviors; whereas the Cronbach's alpha value for the scale in total was .87.

2.2.2. Demographic information form

The form consisted of two items asking students to write their gender and mid-term exam scores.

2.4. Data collection and analysis

Data for this quantitative study were collected via printed copies of the demographic information and the Turkish version of the Student Engagement Scale (Uğur & Akın, 2015). First, data was analyzed for possible missing data and outliers to make the data fit for analysis and then the normality, linearity and multicollinearity, homoscedasticity assumptions were examined to carry out the multivariate analyses (Tabachnick & Fidell, 2012)**.**

After that, data were analyzed using descriptive and inferential statistics via SPSS 20. Descriptive statistics were used to examine participants' achievement and engagement make-up, whereas the link between achievement and different dimensions of student engagement were examined by Pearson correlation coefficients. Lastly, a regression analysis was employed to explore whether any causal connection is evident between student engagement and achievement.

3. Findings

3.1. Participants' achievement

Analysis of the descriptive data showed that students' had admissible exam scores (M= 66.33, SD= 16.30). Female students (M= 66.98, SD= 16.44) achieved slightly higher exam scores compared to their male counterparts (65.70, SD= 19.19). Yet, the difference between female and male students was not significant ($t(294) = .68$, $p > .05$).

3.2. Participants' engagement make-up

In order to assess the engagement make-up of the participants, descriptive statistics were calculated. Results are summarized in Table 1 below.

Table 1. *Descriptive statistics for engagement types*

Items	Mean	SD
1. Silent in class behaviors	13.80	3.13
2. Oral in class behaviors	6.57	2.02
3. Thinking about course content	10.57	2.90
4. Out of class behaviors	12.55	3.72

As evident in Table 1, descriptive statistics ascertained that participants reported silent in class behaviors (M = 13.80, SD = 3.13) more than oral in class behaviors (M = 6.57, SD = 2.02), thinking about course content (M= 10.57, SD= 2.90), and out of class behaviors (M = 12.55, SD = 3.72).

3.3. Relationship between achievement and student engagement

Interaction between different dimensions of student engagement and achievement was established via a Pearson correlation coefficient test. Related results are presented in Table 2.

Table 2. *Relationship between engagement type and achievement*

Items	1	2	3	4	5
1. Achievement	1				
2. Silent in class behaviors	.18*	1			
3. Oral in class behaviors	.29*	.53*	1		
4. Thinking about course content	.22*	.48*	.48*	1	
5. Out of class behaviors	.15*	.46*	.37*	.37*	1

*p>001

When table 2 is analyzed, achievement as determined by the mid-term English exam results of the participants correlated positively with all aspects of engagement that are silent in class behaviors (r(294)= . 18, p< .05), oral in class behaviors (r(294)= . 29, p< .05), thinking about course content (r(294)= . 22, p< .05), and out of class behaviors (r(294)= . 15, p< .05).

3.4. Predictors of achievement

After determining significant correlations between achievement and engagement types a multiple regression analysis was carried out to identify whether any engagement type is a stronger predictor of achievement compared to others. As a first step, assumptions of normality, linearity, and homoscedasticity was carried out by examining scatterplots and it was seen that no assumption was violated in these respects (Tabachnick & Fidell, 2012) and the sample size (N= 296) was large enough. Moreover, the data was also checked for the multicollinearity by examining whether any of the independent variables were correlated more than 0.90 (Tabachnick & Fidell, 2012) with each other. As correlation coefficients between independent variables were less than 0.90 as can be seen in Table 2, assumption of multicollinearity was also met.

Next, a multiple regression analysis was used to predict students' achievement based on types of engagement and the results are summarized in Table 3.

Table 3. Multiple regression analysis regards predictors of achievement

Source	B	SE B	β	t	p
Silent in class behavior	.00	.38	.00.	.01	.99
Oral in class behaviors	1.86	.56	.23	3.32	.00
Thinking about class content	.55	.38	.10	1.46	.15
Out of class behaviors	.11	.29	.03	.40	.69

$R = .30$; $R^2 = .09$; $F = 7.35$; $P < .00$

A significant regression equation was found ($F(4, 291) = 7.35$, $p<.00$), with an R^2 of .09. As can be seen from the Table 3, oral in class behaviors was the only significant predictor of students' achievement; explaining only .9% variation ($R^2 = .09$).

4. Discussion

The preeminent goal of foreign language education is to help learners achieve competence in a language other than his or her native language. Yet, there are many factors that determine learners' success or failure in mastering a foreign language; and each one of these determinants are worthy of study. In this study the concept of student engagement was studied in relation to achievement in English in the Turkish foreign language learning and teaching context.

This study revealed silent in class to be comparatively more predominant than other types of engagement. It was utterly disappointing to see that participants reported low levels on engagement with respect to oral in class behaviors. Foreign language classes are active learning environments with the goal of fostering communicative competence, which is gradually achieved by synthesizing input. Silent in class behaviors in this respect inhibit the effective synthesis of input (Smith, 1977) and therefore inhibit learning. However, such silent in class behaviors are not uncommon in the Turkish educational context. Tatar (2008) attributes Turkish learners' silent in class behaviors to socio-cultural and educational factors as they still engage in learning in fairly teacher centered classes where they do not orally participate in classes without being called on by the teacher. Another reason behind this might be attributed to the oral incompetence of Turkish foreign language learner. In this respect Baykal (2010) argued Turkish foreign language learners to be insufficient in the communication aspect of foreign languages and further asserted that they were incapable of even producing simple utterances (Baykal, 2010). Other reasons behind Turkish foreign language learners' silence in the classroom are identified as communication anxiety, fear of making mistakes, fear of negative evaluation, concern over accuracy, concern over getting low marks, lack of confidence, low opinion of themselves, lack of fluency, and thinking about personal problems (Baykal, 2010).

As for the relationship between student engagement and achievement, all four types of engagement correlated positively with students' achievement in English. Oral in-class behaviors had the highest level of correlation with student achievement followed by thinking about course content, silent in class behaviors, and out of class behaviors. This result is no surprise as engagement behaviors that facilitate greater cognitive investment are more likely to lead to favorable outcomes; and student achievement no exception in this respect (Greene, DeBacker, Ravindran, & Krows, 2004).

Among all types of student engagement only oral in class behaviors transpired as a significant predictor of student achievement. As languages are for communication; it's no surprise that the primary determinant of student achievement was found to be oral in class engagement. In this respect, zero order correlations supported previous findings that in class engagement is a significant predictor of achievement (Fakeye & Amao, 2013; Syaveny & Johari, 2017; Voelkl, 1995; Zheng & Warschauer, 2015).

Based on the findings and discussion above it is not misleading to conclude that student engagement is a significant element in foreign language learning contexts like the Turkish context and that oral in class behaviors can be associated with student achievement in learning English as a foreign language. Future studies on student engagement can concentrate on teacher and student perceptions reasons behind disengagement and on ways to improve student engagement.

References

Akbari, E., Naderi, A., Simons, R. J., & Pilot, A. (2016). Student engagement and foreign language learning through online social networks. *Asian-Pacific Journal of Second and Foreign Language Education*, *1*(4), 1-22.

Astin, A. W. (1977). *Four critical years: Effects of college on beliefs, attitudes, and knowledge*. San Francisco: Jossey-Bass.

Astin, A. W. (1984). Student involvement: A developmental theory for higher education. *Journal of College Student Personnel*, *25*(4), 297–308.

Astin, A.W. (1993). *What matters in college: four critical years revisited*. San Francisco, CA: Jossey-Bass.

Bahar, M. (2015). Relationship among language tests, portfolio, participation, absence, and later academic achievement at higher education. *International Journal on New Trends in Education and Their Implications*, *6*(2), 187-195.

Ball, I, & Perry, C (2011). Differences in student engagement: investigating the role of the dominant cognitive processes preferred by engineering and education students. *Education Research International*, 2011, 1–8.

Badura, A. S., Millard, M., Peluso, E. A., & Ortman, N. (2000). Effects of peer education training on peer educators: Leadership, self-esteem, health knowledge, and health behaviors. *Journal of College Student Development*, *41*(5), 471-479.

Baykal, D. (2010). *Communicative barriers in Turkish EFL classrooms* (Unpublished master's thesis). Atatürk University, Erzurum, Turkey.

Braxton, J. M., Milem, J. F., & Sullivan, A. S. (2000). The influence of active learning on the college student departure process: Toward a revision of Tinto's theory. *Journal of Higher Education*, *71*(5), 569-590.

Carini, R. M., Kuh, G. D., & Klein, S. P. (2006). Student engagement and student learning: Testing the linkages. *Research in Higher Education*, *47*(1), 1-32.

Casuso-Holgado, M. J., Cuesta-Vargas, A. I., Moreno-Morales, N., Labajos-Manzanares, M. T., Barón-López, F.J., & Vega-Cuesta, M. (2013). The association between academic engagement and achievement in health sciences students. *BMC Medical Education*, *13*(1), 33.

Chapman, E. (2003). Alternative approaches to assessing student engagement rates. *Practical Assessment. Research & Evaluation*, *8*(13). Retrieved from http://PAREonline.net/getvn.asp?v=8&n=13

Chausanachoti, R. (2009). *EFL learning through language activities outside the classroom: A case study of English education students in Thailand*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses.

Çapa-Aydın, Y., Yerin-Güneri, O., Barutçu-Yıldırım, F., & Çağ P. (2015). Predicting college student success: College engagement and perceived English language proficiency. *Çukurova Üniversitesi Eğitim Fakültesi Dergisi*, *44*, 229-240.

Fakeye, D. O. & Amao, T. A. (2013). Classroom participation and study habit as predictors of achievement in literature-in-English. *Cross-Cultural Communication*, *9*(3), 18-25.

Fay, R. E., Aguirre, R. V., & Gash, P. W. (2013). Absenteeism and language learning: Does missing class matter? *Journal of Language Teaching and Research*, *4*(6), 1184-1190.

Fredericks J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: potential of the concept, state of the evidence. *Review of Educational Research*, 74, 59–109.

Frymier, A. B., & Houser, M. L. (2016). The role of oral participation in student engagement. *Communication Education, 65*, 83-104.

Ghanizadeh, A. & Mirzaee, S. (2012). EFL learners' self-regulation, critical thinking and language achievement. *International Journal of Linguistics*, *4*(3), 451-468.

Ghasemi, A. A. & Dowlatabadi, H. R. (2017). Investigating the role of task value, surface/deep learning strategies, and higher order thinking in predicting self-regulation and language achievement. The Journal of Asia TEFL, 15(3), 664-681.

Green, J. M. & Oxford, R. (1995). A closer look at learning strategies, L2 proficiency, and gender. *TESOL Quarterly*, *29* (2), 261-297.

Greene, B. A., DeBacker, T. K., Ravindran, B., & Krows, A. J. (2002). Goals, values, and beliefs as predictors of achievement and effort in high school mathematics classes. *Sex roles: A Journal of Research, 40*, 421 – 458.

Gunuc, S. (2014). The relationship between Student engagement and their academic achievement. *International Journal on New Trends in Education and Their Implications*, *5*(4), 216-231.

Gunuc, S. & Kuzu, A. (2014). Student engagement scale: Development, reliability and validity. *Assessment & Evaluation in Higher Education*, *40*(4), 587-610

Handelsman, M. M., Briggs, W. L., Sullivan, N., & Towler, A. (2005). A measure of college student course engagement. *The Journal of Educational Research*, 98, 184-191.

Hu, S., & Kuh, G. D. (2002). Being (dis)engaged in educationally purposeful activities: The influences of student and institutional characteristics. *Research in Higher Education*, *43*(5), 555-575.

Indiana University Center for Postsecondary Research (2002). *From promise to progress: How colleges and universities are using student engagement results to improve collegiate quality*, Author, Bloomington, IN.

Jansen, E. P. W. A., & Bruinsma, M. (2005). Explaining achievement in higher education. *Educational Research and Evaluation*, *11*(3), 235-252.

Karabıyık, C. (2016). The relationship between attendance and english achievement at ufuk university preparatory school. *Ufuk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 9, 121-130.

Kealey, B. T., Holland, J., & Watson, M. (2005). Preliminary evidence on the association between critical thinking and performance in principles of accounting. *Issues in Accounting Education*, *20*(1), 33-49.

Kelsen, B. A. & Liang, H. (2012). Indicators of Achievement in EFL Classes at a Taiwanese University. *Hindawi Publishing Corporation: Education Research International*, 635964, 1-8.

Keup, J. R. (2005/2006). The impact of curricular interventions on intended second year reenrollment. *Journal of College Student Retention: Research, Theory and Practice*, *7*(1-2), 61-89.

Krashen, S.D. (2003). *Explorations in language acquisition and use: The Taipei lectures*. Portsmouth, NH: Heinemann.

Kuh, G. D. (1993). In their own words: What students learn outside the classroom. *American Educational Research Journal*, *30*(2): 277-304.

Kuh, G. D. (1995). The other curriculum: Out-of-class experiences associated with student learning and personal development. *Journal of Higher Education*, 66(2): 123-155.

Kuh, G. D. (2001). Assessing what really matters to student learning: Inside the national survey of student engagement. *Change*, *33*(3), 10-17, 66.

Kuh, G. D. (2003). What we're learning about student engagement from nsse: Benchmarks for effective educational practices. *Change*, *35*(2), 24-32.

Kuh, G. D. (2009). The National survey of student engagement: Conceptual and empirical foundations. *New Directions for Institutional Research*, *2009*(141), 5-20.

Kuh, G. D. & Cruce, T. M. & Shoup, R. & Kinzie, J. & Gonyea, R. M. (2008). Unmasking the effects of student engagement on first-year college grades and persistence. *The Journal of Higher Education 79*(5), 540-563.

Kuh, G. D., Hayek, J. C., Carini, R. M., Ouimet, J. A., Gonyea, R. M., & Kennedy, J. (2001). *NSSE technical and norms report*. Bloomington, IN: Indiana University Center for Postsecondary Research and Planning.

Kuh, G. D., Kinzie, J., Buckley, J., Bridges, B., & Hayek, J. C. (2007). Piecing together the student success puzzle: Research, propositions, and recommendations. *ASHE Higher Education Report*, *32*(5). San Francisco: Jossey-Bass.

Lee, S. K. F. & Loughran, J. (2000). Facilitating pre-service teachers' reflection through a school-based teaching programme. *Reflective Practice*, *1*(1), 69-89.

Liu, J. (2002). Negotiating silence in American classrooms: Three Chinese cases. *Language and Intercultural Communication*, *2*(1), 37-54.

Manzano, G. (2002a). Burnout y engagement. Relación con el desempeño, madurez profesional y tendencia al abandono de los estudiantes. *Revista de Psicología Social*, *17*(3), 237-249.

Manzano, G. (2002b). Burnout y engagement en un colectivo preprofesional estudiantes universitarios. *Boletín de Psicología, 74*, 79-102.

Manzano, G. (2004). Perfil de los estudiantes comprometidos con sus estudios: Influencia del burnout y engagement. *Anuario de Psicología. Facultad de Psicología. Universitat de Barcelona, 35*, 399-415.

Martínez, I. & Salanova, M. (2003). Niveles de burnout y engagement en estudiantes universitarios. *Relación con el desempeño y desarrollo profesional. Revista de Educación*, *3*(3b), 61-384.

Mazer, J. P. (2012) Validity of the student interest and engagement scales: Associations with Student Learning Outcomes. *Communication Studies, 64*(2), 125-140.

Özkanal, Ü. & Arıkan, N. (2011). The relation between success and absenteeism at Esogu English Preparatory School. *Journal of Language Teaching and Research*, *2*(1), 68-72.

Pace, C. R. (1990). *The Undergraduates: A report of their Activities and college experiences in the 1980s*. Los Angeles: Center for the Study of Evaluation, UCLA Graduate School of Education.

Pascarella, E. T., Seifert, T. A., & Blaich, C. (2008). *Validation of the NSSE benchmarks and deep approaches to learning against liberal arts outcomes*. Paper presented at the

Annual Meeting of the Association for the Study of Higher Education in Jacksonville, FL. Retrieved from http://nsse.indiana.edu/symp10/Seifert_NSSE_Symposium.pdf.

Pascarella, E.T. & Terenzini, P.T. (2005). *How college affects students: A third decade of research* (Vol. 2). San Francisco, CA: Jossey-Bass.

Pascarella, E. T., Whitt, E. J., Nora, A., Edison, M., Hagedorn, L. S., & Terenzini, P. T. (1996). What have we learned from the first year of the National Study of Student Learning? Journal of College Student Development, *37*, 182–192.

Perna, L. W. & Thomas, S. L. (2008). *Theoretical perspectives on student success*. ASHE Higher Education Report, *34*(1). San Francisco: Jossey-Bass.

Pike, G. R. (1999). The effects of residential learning communities and traditional residential living arrangements on educational gains during the first year of college. *Journal of College Student Development*, *40*(3), 269-284.

Pike, G. R. (2000). The influence of fraternity or sorority membership on students' college experiences and cognitive development. *Research in Higher Education, 41*, 117-139.

Pike, G. R., & Kuh, G. D. (2005). First and second-generation college students: A comparison of their engagement and intellectual development. *Journal of Higher Education*, *76*(3), 276-300.

Pike, G. R., Schroeder, C. C., & Berry, T. R. (1997). enhancing the educational impact of residence halls: The relationship between residential learning communities and first-year college experiences and persistence. *Journal of College Student Development*, *38*(6), 609-621.

Salanova, M., Breso, E., & Schaufeli, W. B. (2005). Hacia un modelo de las creen- ´cias de eficacia en el estudio del burnout y del engagement [Towards a model of efficacy beliefs in burnout and engagement research]. *Ansiedad y Estres´*, *11*, 215– 231.

Shulman, L. S. (2002). Making differences: A table of learning. *Change*, *34*(6), 36-45.

Siciliano, E. A. (1978). Absenteeism and language learning. *Hispania*, *61*(1), 102-104.

Smith, L. J. (2009) *Motivation and long-term language achievement: Understanding motivation to persist in foreign language learning* (Unpublished doctoral dissertation).University of Maryland, College Park, Maryland, USA.

Syaveny, N. & Johari, I. (2017). The correlation between class participation and students' english learning achievement at sma negeri 12 padang kec. naggalo west sumatera. International Seminar on Language, Education, and Culture Proceeding, 208-211.

Tabachnick, B. G. and Fidell, L. S. (2012) *Using multivariate statistics*. Pearson Education, London.

Terenzini, P. T., Springer, L., Yaeger, P., Pascarella, E. T., & Nora, A. (1996). First-generation college students: Characteristics, experiences, and cognitive development. *Research in Higher Education*, *37*(1), 1-22.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research*, *45*, 89-125.

Tinto, V. (2005). Moving from theory to action. In A. Seidman (Ed.), *College student retention* (pp. 317-333). Westport: Praeger Publishers.

Tross, S. A., Harper, J. P., Osher, L. W., & Kneidinger, L. M. (2000). Not just the usual cast of characteristics: Using personality to predict college performance and retention. *Journal of College Student Development, 41*, 323–334.

Ucán, J. L. B. (2010) Benefits of using extensive listening in ELT. *Memorias Del VI Foro De Estudios En Lenguas International*, 36-44 [electronic version].

Uğur, E. & Akın, A. (2015). The psychometric properties of Turkish version of the student engagement scale. *SDU International Journal of Educational Studies*, *2*(1), 53-59.

Van Den Berg, M. N. & Hofman, W. H. A. (2005). Student success in university education: a multi-measurement study of the impact of student and faculty factors on study progress. *Higher Education, 50*(3), 413–446.

Voelkl, K. E. (1995) School warmth, student participation, and achievement. *Journal of Experimental Education, 63*, 127-139.

Zheng, B., & Warschauer, M. (2015). Participation, interaction, and academic achievement in an online discussion environment. *Computers & Education, 84*, 78–89.

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A NEW APPROACH IN HIGHER EDUCATION: THE PERCEPTIONS OF PRE-SERVICE TEACHERS RELATED TO FLIPPED LEARNING

Research Article

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Abstract

The purpose of this study was to develop and implement flipped learning materials in the Principles and Methods of Instruction course and investigate the perceptions of pre-service teachers about flipped learning. This study was conducted in the fall semester of 2017-2018 for 11 weeks at a public university located in the Aegean Region in Turkey. This study employed a mixed method research design. There were 30 pre-service teachers in the flipped learning group. In the current study, student questionnaire and interview schedule were implemented. The data were analyzed by using descriptive statistical analysis techniques. For the analysis of the data, SPSS 22.0 was used and alpha level was determined as .05. The data obtained from the interviews were analyzed by using both the content and descriptive analysis techniques. The findings of the study showed that pre-service teachers mostly had positive perceptions about flipped learning processes and materials. They agreed that flipped learning supported and facilitated learning was effective in order to practice theoretical knowledge and contributed to personal development and self-enhancement. Their perceptions were examined and discussed in detail.

Keywords: Flipped learning, pre-service teacher education, videos

1. Introduction

In traditional pre-service teacher training classrooms students come to class to learn the content of lectures from instructors. They take notes, work on assignments, projects, tasks and other activities, usually on their own, outside of the class (Bergman & Sams, 2012; Hamdan, McKnight, McKnight, & Arfstrom, 2013; Talbert, 2012). In this type of teaching, the role of instructors is mainly the transfer of information (Love, Hodge, Grandgenett & Swift, 2014; Talbert, 2014). Foertsch et al. (2002) stated that the traditional instruction was an ineffective way of teaching because of including a passive one-way flow of information from professor to students which is according to Bloom's taxonomy at the lowest cognitive level. Moreover, in traditional classes, students have to perform higher level tasks outside of classes on their own and remote from their instructors' help. Hence, it seems that changing the order of instruction might be an improvement for pre-service teacher education classes. For this purpose, an active teaching approach, flipped learning was proposed (Davies et al., 2013; Missildine et al., 2013; Sams & Bergmann, 2013; Talbert, 2012).

Lage, Platt, & Treglia (2000) defined flipped learning "events that have traditionally taken place inside the classroom now take place outside the classroom and vice versa" (p. 32). It is also known as flipped classroom, inverted classroom, flipped lessons, flipped learning or flipped thinking (Sams & Bergman, 2013). The idea of flipped learning is that instead of allocating time to present a concept through lecturing, the instructor can use limited and

significant class time for more involving activities and group work. The fundamental principle of the flipped learning is that students begin to interact with new concepts outside of the traditional classroom. They study through videos, screencasts or podcasts when and where they feel most comfortable by considering their own learning speed and then they apply what they have learned in the classroom (Abeysekera & Dawson, 2015; Bergman & Sams, 2012; Bormann, 2014; Mason, Shuman, & Cook, 2013; Milman, 2012; Phillips & Trainor, 2014; Talbert, 2014). In this way, face to face part of the class can be allocated for discussions, answering students' questions which were uncovered during pre-class preparation and engaging collaborative learning activities (Ziegelmeier & Topaz, 2015)

In the face-to-face part of the course, students can present a summary of their reflections or face-to-face class time can begin with a short quiz about the content of online lecture. Also, students' pre-class preparation can be assessed thorough in-class student response systems like Kahoot or Socrative, peer discussions and presentations, which may require the utilization of smartphone apps and tablets to answer clicker questions in order to provide immediate feedback about misconceptions or learning gaps as formative assessment (Lage et al., 2000; O'Flaherty & Phillips, 2015; Talbert, 2012). During flipped learning, the face-to-face class time is used for interactive exercises in which the students can apply their new knowledge under the guidance of their instructor together with their peers (Foertsch et al., 2002; (Munir, Baroutiana, Younga, & Carter, 2018). In other words, in flipped learning, in-class activities involve focusing on and internalizing the material with the direct help of peers and the instructor. The consequence can be a more interactive, effective, productive and more student-centered classroom instead of a passive traditional classroom (Talbert, 2012). It can be seen that flipped learning requires a shift from a teacher-centered instruction to a student-centered one, a change in pedagogical practices and the use of technology that focuses on individualized and active learning structures such as differentiated learning, mastery learning, cooperative learning and collaborative learning in which students are engaged in their learning.

In terms of videos, they were stated to be divided into brief parts, the content should be shorter and plain than any other course book (Bergmann & Sams, 2012; Caudill, 2014; Enfield, 2013; Turan, 2015). In the study of Caudill (2014), pre-service teachers in a flipped Applied Child Development course stated teachers' keeping the lecture videos down to a minimum of ten minutes and teaching the most important things were better than long lecturing. Ceylaner (2016) found that some ninth grade students checked the duration of videos before watching them and watched the videos by skipping some parts which were more than five minutes. In the study conducted by Zappe et al. (2009), undergraduate architectural engineering students expressed their ideas that according to them the optimum video length to be around 20 minutes. In the current study, around 21 minutes videos were divided into two or three parts to be managed by pre-service teachers easily.

In the literature, most of the studies investigated the effect of flipped learning on students' achievement together with other cognitive and affective variables. It was determined that flipped learning improved student learning and achievement (Wilson, 2013; Talley & Scherer, 2013; Tune et al., 2013; Davies et al, 2013; Murphree, 2014; Talbert, 2014). In addition, Mason et al. (2013) stated that flipped learning allowed the instructor to include more content and provide better performance of students on quizzes and exams than traditional approach in a Control Systems course in the Department of Mechanical Engineering. On the other hand, some of the studies indicated insignificant differences in student learning (Clark, 2013; Findlay-Thompson & Mombourquette, 2014; McLaughlin et al., 2013; Morin et al., 2013).

In addition to these, learning with videos provides students with access to the course content independent of the space (Alsancak-Sırakaya, 2015; Bergman & Sams, 2012; Guc, 2017). In this way, they had the opportunity of making up the courses by themselves. Similarly, in the study conducted by Alsancak-Sırakaya (2015) senior pre-service teachers taking the Scientific Research Methods course and studying in the Guidance and Psychological Counseling department stated that when they were absent in the course, they had the chance of watching the videos over and over, which might have increased the level of learning similar to current study. Moreover, in the study conducted by Guc (2017), secondary school students stated that they could not learn the subjects taught in the first lesson of the day because of coming to school quite early and being sleepless in other courses taught according to traditional principles. However, they stated that during flipped learning they could study productively and learn when they felt physically and emotionally ready.

Flipped learning provides differentiation by customizing the curriculum for different learning styles to achieve mastery of learning objectives as also stresses by Fulton (2012). Similarly, Mason et al. (2013) stated that flipped learning is proper to teach course material with different teaching methods and involve students with various learning styles like visual, audial, verbal, active or reflective. In this way, learning is personalized for each pre-service teachers since they have the control of their own learning. While quick learners are able to fast forward and work on additional resources to go deeper into the topics (Caudill, 2014), slow learners can rewind to hear the online lectures again, listen as much as they need, pause to reflect on what is being said and view the lectures on a mobile device rather than in a fixed location. O'Flaherty & Phillips (2015) stated one of the multiple justifications for flipped learning that it was seen as a way to promote more participatory and empowering learning experiences for students. It includes multiple communication opportunities between the instructor and students, hence students can ask questions and instructors give immediate feedback which facilitate learning (Ziegelmeier & Topaz, 2015). For example, the inclusion of social media and the online discussion boards in which students can ask questions to the instructor and their peers at any time and get help from both sides diminish the feeling that students are being made to learn on their own (Talbert, 2014).

The results of many studies indicated positive perceptions related to flipped learning (Bergman & Sams, 2012; Berrett, 2012; Bishop & Verleger, 2013; Cibik, 2017; Lee, Lim, & Kim, 2016; Kurt, 2017; O'Flaherty & Phillips, 2015; Reinhardt, 2014; Touchton, 2015; Turan, 2015). On the other hand, the results of the study conducted by Kecskemety and Morin (2014) suggested dissatisfaction with the flipped learning approach for the engineering students and Missildine et al. (2013) reported that nursing students were significantly less satisfied with the flipped learning than traditional instruction. Finally, in the study conducted by Findlay-Thompson & Mombourquette (2014), students were undecided about their responses that they stated both positive and negative ideas about the flipped learning in a business course. Hence, it was thought important to investigate the perceptions of pre- service teachers related to flipped learning.

Moreover, the design of courses using the flipped learning involves some challenges. It requires a heavy responsibility of instructors in terms of preparing materials and pre-class assignments (Enfield, 2013). Furthermore, as also stated by Milman (2012), instructors may not produce high quality videos technically or instructionally. Besides, passing forward or backward in the video with long delays in loading, freezing of the video and downloading the videos sometimes take a long time. Hence, it was thought important to investigate the perceptions of pre-service teachers' related to videos both technically and in terms of contribution to learning.

1.1. The aim of the study and research question

The purpose of this study was to develop and implement flipped learning materials in the Principles and Methods of Instruction course and investigate the perceptions of pre-service teachers related to classroom environment. Based upon the main purpose of the study, the following research question was proposed:

What are the perceptions of pre-service teachers about flipped learning?

2. Method

In this part, research design participants of the study, data collection instrument, data collection procedures and data analysis were explained.

2.1. Research design

In this study, both quantitative and qualitative data were collected. Hence, this study employed mixed method (Creswell, 2012). In this study, quantitative data were collected through survey research design (Cohen, Manion & Morrison, 2007). In this type, data were collected at a particular point in time in order to describe the characteristics, opinions and conditions that exist in the population (Fraenkel & Wallen, 2009). Then, the perceptions of pre-service teachers about the videos used in flipped learning were asked. The responses of pre-service teachers were categorized under themes.

2.2. Participants of the study

The surveys were implemented to 30 pre-service teachers. Among the 30 pre-service teachers, 25 (83.3%) of them were female and 5 (16.7%) of them were male. In the qualitative part of the study, twelve pre-service teachers were selected according to maximum variation sampling method in order to ask their perceptions about videos used in flipped learning. The sample was selected in order to represent the diversity of perspectives or characteristics (Fraenkel & Wallen, 2009; Gall, Gall, & Borg, 2003). In this way, the strength and richness of the data, their applicability and interpretation were ensured better (Cohen et al., 2007). The interviewees were selected purposefully based on their achievements in the Principles and Methods of Instruction course and gender. Among the twelve pre-service teachers nine of them were female and three of them were male. The codes of pre-service teachers and their grades were shown in Table 1.

Table 1. *The codes of pre-service teachers chosen for interviews and their course grades*

Code of the Pre-Service Teachers	Achievement Test Scores	Final Grade
Ga (High Achiever)	83	90
Nu (High Achiever)	63	82
Ra (High Achiever)	75	86
En (High Achiever)	78	82
Me (Low Achiever)	65	73
Fa (High Achiever)	78	87
En (Medium Achiever)	70	79
Mu (High Achiever)	85	88
Bu (High Achiever)	78	87
Ha (Low Achiever)	55	75

Fa (Medium Achiever)	63	78
Me (Medium Achiever)	70	79

Pre-service teachers who have final grades between 70 and 75 were accepted as having low achievement score, the pre-service teachers who have final grades between 76 and 80 were accepted as having medium achievement score and pre-service teachers who have final grades over 81 were accepted as having high achievement score. The codes were comprised of the first and second characters of their names and assigned achievement level of pre-service teachers.

2.3. Data collection instruments and procedures

The study was conducted during the fall semester of 2017-2018 at a public university located in the Aegean Region. The study was implemented at the Classroom Teaching Department-Elementary Education Division in the Principles and Methods of Instruction course which is a three-hour a week course. The course lasted for 15 weeks but except four weeks (one week is orientation week, two weeks are midterm exams, and one week after midterm exams), the treatment process was carried out for 11 weeks. In this study, 'Student Questionnaire' was implemented to answer the research question. Also, pre-service teachers were asked about the videos used in flipped learning.

The perceptions of flipped learning group regarding the video courses, including different habits of watching the videos and their perceptions about the effect of using videos on pre-service teachers' learning were asked through student questionnaire. Moreover, the perceptions of pre-service teachers about the flipped learning applications such as whether group studies affected pre-service teachers' learning positively, developed self-learning skills, supported and facilitated learning, flipped learning took longer time to learn or not, whether it was perceived as distracting because of being so much activities or not were asked through student questionnaire.

The first part of the questionnaire included personal questions and the second part of the questionnaire included 33 items. The categories for the questions 1 to 6 represent (3) always, (2) sometimes, and (1) never, and questions from 7 to 33 represent (5) strongly agree, (4) agree, (3) partially agree, (2) disagree, and (1) strongly disagree.

For the pilot study of the questionnaire, 259 pre-service teachers who learn all of the courses through flipped learning at a private university in Turkey were asked to fill the questionnaire. The Cronbach Alpha reliability coefficient of internal consistency of the questionnaire was found .95 and descriptive statistics methods were used to analyze the data. The questionnaire included positively and negatively constructed statements which were adapted from existing instruments or were newly developed (Clark, 2013; Day & Foley, 2006; Enfield, 2013; Gaughan, 2014; Kecskemety & Morin, 2014; Turan, 2015; Zappe, et al., 2009; Ziegelmeier & Topaz, 2015).

In order to establish validity, the items were checked to by seven experts (two professor, two associate professors, and four assistant professors) in Curriculum and Instruction Department of Ege University, Hacettepe University, Iowa State University and Middle East Technical University as suggested by Turgut & Baykul (2011).

The interviews were recorded after taking the permission of pre-service teachers. They were transcribed and coded. Codes were generated in accordance with the literature about flipped learning (Miles, Huberman, & Saldaña, 2014).

During the orientation period, which was the first week of the semester, pre-service teachers were informed about the course applications and materials that would be used during the semester and they were provided with membership from the Facebook, WhatsApp groups and the course management system that is Edmodo. The experimental process was explained briefly below.

2.3.1. The procedures conducted in the experimental and control Groups

The experimental group was taught by using flipped learning and pre-service teachers were provided with videos which were developed by the researcher before the course. Pre-service teachers were expected to watch video lessons (approximately 21 minutes), summarize the content of the videos in written form and share them on the Moodle system-Edmodo. Each video lesson included pop-up questions which were provided for experimental group pre-service teachers to test whether they learned the subject or not.

In face-to-face part of the course, pre-service teachers were not given additional lecturing but the important points that pre-service teachers did not understand were explained. Then the pre-service teachers in the experimental group were directed to Kahoot or Socrative applications which are online question and answer game activity. The names of the pre-service teachers who took the top three were shared on Facebook group to increase the motivation and engagement of pre-service teachers towards the course.

Finally, pre-service teachers completed a group work in the class which required them to reflect on, discuss, and apply what they have learned theoretically in videos. In the flipped learning, by participating in cooperative and collaborative learning activities, pre-service teachers completed different tasks like preparing sample products, lesson plans and micro teaching applications about different techniques. The pre-service teachers uploaded the classroom assignments to Moodle to be evaluated.

2.4. Data analysis

In the current study, data were collected and analyzed by using descriptive statistical analysis techniques by indicating means (*M*) and standard deviations (*SD*) (Field, 2009; Tabachnick & Fidell, 2007). For the analysis of quantitative data, SPSS 22.0 was used and alpha level was determined as .05. The qualitative data were categorized under themes and sub-themes.

3. Results

In this part, the results obtained from student questionnaire and interviews were presented.

3.1. The results obtained from student questionnaire on flipped learning

Student questionnaire was administered to the pre-service teachers who were involved in the experimental group in order to learn their habits of watching videos and perceptions about video lessons and flipped learning after the treatment process. The results about the habits of watching videos were shown in Table 2.

Table 2. *Descriptive statistics related to pre-service teachers' habits of watching videos*

	Always		Sometimes		Never		M	SD
	f	%	f	%	f	%		
1. I watched the videos carefully.	24	80	6	20	-	-	2.80	.41
2. I was not interested in another thing while watching.	12	40	16	53.3	2	6.7	2.33	.61

3. I watched some parts again.	15	50	14	46.7	1	3.3	2.47	.57
4. I took notes while watching.	26	86.7	4	13.3	-	-	2.87	.35
5. I wrote questions while watching.	4	13.3	13	43.3	13	43.3	1.70	.70
6. I watched videos piece by piece.	14	46.7	15	50	1	3.3	2.43	.57

*The mean scores of items1-6 were evaluated over 3.

According to the results of SQ analysis as shown in Table 2, it was found that while watching the videos, pre-service teachers always took notes (86.7%), watched the videos carefully (80%) and watched some parts again (50%). On the other hand, it was found that 43% of the pre-service teachers never wrote questions to be asked in the class.

In addition to these, according to perceptions of pre-service teachers, as shown in Table 3, pre-service teachers agreed that learning with videos affected their learning positively by providing the opportunity of turning back and watching some parts again and by making up the courses by themselves (100%). Moreover, it increased their interest in the course because of being enriched with audio visuals (90%), increased interaction with the instructor within the class and out of the class (90%) and provided access to the course content independent of the space (86.6%). On the other hand, pre-service teachers disagreed that learning with videos was inefficient due to technical problems (76.7%) and was more difficult than the methods used in other courses (66.7%). The items that take place in Table 3 are the main properties of flipped learning and pre-service teachers showed their ideas positively about this new approach.

Table 3. *Frequencies, percentages, mean scores and standard deviations of pre-service teachers' perceptions of learning with videos*

Learning with videos	Strongly agree		Agree		Partly agree		Disagree		Strongly Disagree		M	SD
	f	%	F	%	f	%	f	%	f	%		
7. was easier.	4	13.3	20	66.7	5	16.7	1	3.3	-	-	3.90	.66
8. provided access to the course content independent of the space.	13	43.3	13	43.3	3	10	1	3.3	-	-	4.27	.78
9. provided self-learning opportunities.	10	33.3	17	56.7	3	10	-	-	-	-	4.23	.63
10. provided learning when and where I wanted.	16	53.3	8	26.7	6	20	-	-	-	-	4.33	.80
11. facilitated practice in face-to face courses.	15	50	13	43.3	2	6.7	-	-	-	-	4.43	.63
12. increased interaction with the instructor in and out of the course.	14	46.7	13	43.3	3	10	-	-	-	-	4.37	.67

13. affected my learning positively because of having the opportunity to go back and watch some parts again.	20	66.7	10	33.3	-	-	-	-	-	-	4.67	.48

Table 3 (Continued)

Learning with videos	Strongly agree		Agree		Partly agree		Disagree		Strongly Disagree		M	SD
	f	%	F	%	f	%	f	%	f	%		
14. made me interested in the course with audial and visually enriched course content.	17	56.7	10	33.3	3	10	-	-	-	-	4.47	.68
15. made it easier for me to follow the course content	15	50	13	43.3	2	6.7	-	-	-	-	4.43	.63
16. affected my learning positively because of giving the opportunity to make up for the lessons I missed by myself.	16	53.3	14	46.7	-	-	-	-	-	-	4.53	.51
17. was inefficient due to technical problems.	-	-	4	13.3	6	20	15	50	8	26.7	2.00	.79
18. was more difficult than the methods used in the other courses.	-	-	4	13.3	6	20	15	50	5	16.7	2.30	.91

*Items 7-18 were evaluated over 5.

According to perceptions of pre-service teachers, as shown in Table 4, in terms of learning contribution, pre-service teachers agreed that flipped learning yielded more learning than the courses taught by other methods (86.7%), supported and facilitated learning and was effective to practice theoretical knowledge (90%). In addition, pre-service teachers agreed that it made learning fun (76.7%) and attracted the attention of pre-service teachers owing to the use of different technologies (63.3%).

Table 4. *Frequencies, percentages, mean scores and standard deviations of pre-service teachers' perceptions about flipped learning*

Flipped Learning	Strongly agree		Agree		Partly agree		Disagree		Strongly disagree		M	SD
	f	%	f	%	f	%	F	%	f	%		
19. supported planned and systematic work.	9	30	14	46.7	6	20	1	3.3	-	-	4.03	.81
20. supported my independent learning skills.	7	23.3	21	70	2	6.7	-	-	-	-	4.17	.53

Table 4 (Continued)

Flipped Learning	Strongly agree		Agree		Partly agree		Disagree		Strongly disagree		M	SD
	f	%	f	%	f	%	F	%	f	%		
21. increased my social interaction.	5	16.7	17	56.7	5	16.7	-	-	-	-	4.10	.66
22. increased my research and exploration ability.	7	23.3	12	40	9	30	2	6.7	-	-	3.80	.89
23. developed my self-learning skills.	12	40	14	46.7	3	10	1	3.3	-	-	4.23	.77
24. took it longer to learn.	-	-	10	33.3	6	20	12	40	2	6.7	2.80	.99
25. made learning fun.	12	40	11	36.7	6	20	1	3.3	-	-	4.13	.86
26. was adopted by me more than the other methods.	11	36.7	15	50	3	10	1	3.3	-	-	4.20	.76
27. yielded more than the courses taught by other methods.	12	40	14	46.7	4	13.3	-	-	-	-	4.27	.69
28. supported and facilitated my learning.	10	33.3	17	56.7	3	10	-	-	-	-	4.23	.63
29. was distracting because there were many activities.	1	3.3	2	6.7	6	20	14	46.7	7	23.3	2.20	.99
30. attracted my attention much because of the use of different technologies.	9		10	33.3	8	26.7	3	10	-	-	3.83	.99

31. provided faster learning.	7	23.3	17	56.7	5	16.7	1	3.3	-	-	4.00	.74
32. was effective in practicing theoretical knowledge.	10	33.3	17	56.7	2	6.7	1	3.3	-	-	4.20	.71
33. affected my learning positively because of involving group work.	12	40	14	46.7	4	13.3	-	-	-	-	4.27	.69

* Items 19-33 were evaluated over 5.

In terms of personal learning and contribution pre-service teachers agreed that flipped learning developed self-learning skills (86.7%), supported independent learning skills (93.3 %), planned and systematic work (76.7%) and increased research and exploration abilities (63.3%). Moreover, in terms of classroom environment perceptions pre-service teachers agreed that it increased social interaction (73.4%). On the other hand, pre-service teachers agreed that flipped learning took longer time to learn (33.3%) and was not distracting because of being so many activities (70%).

3.2. The results obtained from interviews on flipped learning

In addition to these, the perceptions of pre-service teachers about the videos used in flipped learning was asked. The responses of pre-service teachers were categorized under seven sub-themes. They were 1) the perceptions of pre-service teachers about the voice and images of the videos, 2) the quantity of information in the videos, 3) factors effecting the desire to watch videos, 4) recurring watching of videos on learning, 5) appropriateness of time of sending the videos, 6) the obligation to watch the videos before class on pre-service teachers' learning and 7) the internet videos.

3.2.1. Voice and images of the videos

According to the analysis of the interview process, all of the pre-service teachers interviewed generally had positive opinions about the videos. Majority of the pre-service teachers expressed their positive opinions about video lessons. They stated that the voices and images of the videos were clear and understandable. Also, pre-service teachers stated that videos made them interested in the course because of audial and visually enriched course content. There were background music in the videos. At the class, pre-service teachers explained that it was higher in one video and later its level was decreased by the instructor. Some of the responses about the videos used in flipped learning include:

> Mu (High Achiever): *I think the videos were good. The videos were good in terms of listening and summarizing ... the quality of sound was good.*
>
> Me (Medium Achiever): *I could see everything thoroughly…sometimes there were schemas…the videos were good for me…and it's even nicer their being pictured and colored.*
>
> Me (Low Achiever): Of course the sounds and images of the videos were understandable…

In addition to these, pre-service teachers' suggestions to implement flipped learning effectively was asked. According to the perceptions of pre-service teachers, there might be animations in the videos, the instructor should appear in the foreground with gestures and facial expressions, and finally videos should end up with a quiz. Some of the suggestions of pre-service teachers include:

> Mu (High Achiever): *Maybe if you had ended up the videos with test… if there were a 10 or 15 questions-test at the end of the videos, it would be great in terms of learning.*
>
> Me (Low Achiever): *You appear at the margin of the page but I wish you were in the foreground with your gestures and your facial expressions...I said this because maybe I am accustomed to learning this way*.

3.2.2. The quantity of information in the videos

Pre-service teachers expressed that the videos included sufficient information which helped them to learn the subject. Some of the responses about the quantity of information in the videos included:

> *Fa (High Achiever): In my opinion, the content was pretty sufficient, also the questions related to the content were good.*
>
> *En (Medium Achiever): You split the videos ...If you set an eight-minute video, when we watched this eight-minute video, it was enough. I mean, it was very brief and plain than any other workbook.*
>
> *Me (Medium Achiever): There was enough information about the content… I think the information was enough for me since I like summary information...I could see everything thoroughly...*
>
> *Me (Low Achiever): There was enough information and even there was information that did not exist in some other books.*

3.2.3. Factors affecting pre-service teachers' desire to watch videos

The pre-service teachers stated the incentives as the visual components, the expressions of the instructor together with slides, desire to participate in class activities and discussions and the pop-up questions in the videos as the encouraging elements to watch videos. Some of the responses about the factors effecting pre-service teachers' desire to watch videos included:

> Bu (High Achiever): *There were no elements to reduce my desire to watch videos, but I knew that when I did not watch the video, I would not be able to participate in the class activities when I came to class the next day, which encouraged me to watch videos... I listened to the videos since I wanted to talk in the class.*
>
> Me (Medium Achiever): *There were both questions and in the meantime, you were inserting different videos which were pointed in blue… I think they were quite enough and they were beneficial.*

Ha (Low Achiever): *Since we raced in the lesson, I had so much fun… I watched the videos because I wanted to be always first in them.*

Me (Low Achiever): *There were visual items. There were slides ... the expressions of the instructor together with slides encouraged me to watch videos.*

Furthermore, pre-service teachers explained the internet and the music behind the voice of the instructor as factors that reduced their desire to watch videos. Some of the responses about the factors that reduced pre-service teachers' desire to watch videos included:

Ra (High Achiever): *We did not have powerful internet since we lived in KYK Dorm (Credit and Dormitories Institution - state dorm). Also, the internet lab in the university was not open the time we had time or we had different lessons at the time they were open. Hence, we spent much time to listen and send back to you.*

Fa (High Achiever): *There was a problem only in terms of watching videos ... internet ... I waited 3 hours on the internet ... Edmodo did not open but the other sites opened ... The installation period of Edmodo took more times…I watched most of the homework videos at the state dorm but since I could not send them, because Edmodo was not installed, I came to the university and sent them here.*

Fa (Medium Achiever): *The music in the videos made me drowsy…it was a little suppressing your voice...*

Me (Low Achiever): *I would rather the videos were without music… there would not be any music at all... I wish only the voice of the instructor, and there would not be any sound out of it.*

3.2.4. Recurring watching of videos on learning

Pre-service teachers revealed their perceptions about recurring watching of videos on learning. Pre-service teachers' explanations showed that they would watch the videos whenever they felt the need which would contribute to learning. Also, pre-service teachers stated their having the opportunity to go back and watch some parts again affected their learning positively. Some of the responses for the recurring watching of videos include:

Nu (High Achiever): *The video courses was very good for me. I could stop it, I was taking my note, and then I was going back to beginning of the video when I needed. I was learning by watching the videos again. So, until the video was over, I had been watching it two or three times. Before the course, we were prepared. Also, you were explaining and conducting activities in class. By this way, learning was very permanent. In terms of learning, I benefitted more.*

Me (Medium Achiever): *Naturally, when I did not understand something, I went back and studied again. I will watch all of the videos again before the final exam.*

Me (Low Achiever): *I watched videos once because the videos were short and clear ...but I feel the need to watch them once more before the final exam.*

3.2.5. The appropriateness of time to send the videos

According to the perceptions of pre-service teachers, the time to send the videos were appropriate. Some of the responses about the time to send the videos included:

> Ga (High Achiever): *You were sending the videos in time, we were watching them before the course and taking our notes.*
>
> Fa (High Achiever): *It was appropriate, generally, you sent videos on Friday, and we had at least the weekend to study.*
>
> Me (Medium Achiever): You sent them in two or three day after the course... there was time to summarize ...

On the other hand, one of the high achiever pre-service teacher suggested that videos should be sent a little earlier. The suggestions of this pre-service teacher include:

> Ga (High Achiever): *You sent the videos generally on Friday... if you sent the videos a little earlier, we would watch them earlier and submit you earlier*.

3.2.6. The obligation to watch the videos before class on pre-service teachers' learning

Pre-service teachers explained their perceptions about the obligation of watching videos before class on their learning. They indicated that if the watching of videos were not obligatory, they would not feel the responsibility of watching it. Some of the responses of pre-service teachers include:

> Ra (High Achiever): *If watching the videos were not compulsory, we might not watch them regularly. We might say ourselves that I didn't want to watch them today, and ask ourselves that whether we had to watch them every week. When students felt tired...they could say that "I am tired and I will not study today.*
>
> Me (Middle Achiever): *This obligation is a good thing in terms of learning, but at first this obligation was not good for me because students at first could not think that some obligations would be beneficial for them later hence they should learn it or do the tasks.*
>
> Me (Low Achiever): *I would not have felt any responsibility if you had not forced me… I would watch videos every two or three weeks…It was better in this way, I learned without the content accumulated.*
>
> Ha (Low Achiever): *We watched the videos you sent to us, we summarized and took notes, then we sent them back to you... At first, I thought that this process as a bit pointless, but after a while I understood that we would not study to the course if we did not send the summaries or assignments to you every week ... the videos would stay as you sent.*

3.2.7. Perceptions about the use of internet videos

Pre-service teachers stated that they did not watch internet videos related to the subject to learn the lesson. They stated that the videos sent by the instructor were more understandable and concise to learn the content than the internet videos. Some of the responses of pre-service teachers about the videos used in flipped learning included:

> Bu (High Achiever): *I watched the video on the internet, they were around two hours... they explained the topic in very long times…but with the videos you sent, we could learn the topic in a very short time with clear outline…*
>
> Me (Medium Achiever): *I did not need it because they were too long and I was tired of watching them. Hence, after a while, I got distracted and I never watched the internet videos for this course.*

4. Discussion

According to the results of the study, pre-service teachers agreed that flipped learning supported and facilitated learning, was effective in order to practice theoretical knowledge and contributed to personal development and self-enhancement. In the current study, pre-service teachers watched lecture videos and while watching them, pre-service teachers had the opportunity of turning back and watching some parts again whenever they needed, taking notes, writing questions to be asked in the class which might have affected the learning and perceptions of pre-service teachers positively in the flipped learning group. Similar to the current study, in the study conducted by Enfield (2013), it was reported that majority of students took notes and found it helpful to learn the course. Moreover, in the study conducted by B. Aydin (2016), pre-service teachers explained that they could learn the content according to their own learning speed and they could watch some videos again when they did not understand. Similarly, in the study conducted by Ceylaner (2016), ninth grade students in English course also stated that when they forgot some rules, they had the chance to turn back to the related video and watch the subject again. In this way, according to them, learning was deep and more permanent. Also, Day and Foley (2006) stated that according to Dale's Cone of Learning (1969), videos fall in the middle of the cone in terms of retention and they explained active learning experiences and participating in hands-on learning activities increase the retention of learning as it is in the flipped learning.

In the current study, pre-service teachers who were in the experimental group were presented with course materials in several different formats like slides, the expressions of the instructor together with slides, sample videos from You Tube, and the pop-up questions, which might be another reason for the pre-service teachers' positive perceptions of flipped learning. It can be said that visual and audial materials might have increased participation in class activities by making the activities fun increased the involvement of pre-service teachers with different learning styles and preferences, thus, supported learning. Similarly, Lage et al. (2000) revealed that flipped learning support all students of all learning styles to use methods that best match for them. Umutlu (2016) prepared different video modalities by taking the participants' learning styles which was stated as one of the important variable while examining the effects of the flipped learning on achievement in English.

In addition to these, in the current study, pre-service teachers stated that learning with videos was fun. Furthermore, Kahoot and Socrative softwares, might have increased the fun in the face to face part of the course which in turn affected their perceptions positively. Similarly, in the study conducted by Boyraz (2014), it was found that according to English preparatory class students, learning through videos was fun and they preferred studying

English via videos to studying English by underlining important points from course books. This may also be explained as pre-service teachers perceived the materials used in the flipped learning as attractive.

Moreover, in the current study, it was determined that practicing the theoretical knowledge might be another reason for the pre-service teachers' positive perceptions of flipped learning. They prepared lesson plans, concepts maps participated in micro-teaching activities in order to practice theoretical knowledge. Hence, they might have perceived that they learned more and their learning was permanent. Similarly, in the study conducted by Turan (2015), pre-service teachers also stated that flipped learning was based on practice and increased the permanence of the learning. In this way, they did not memorize the content but they actually learned the content and learning did not take longer time. Hence, it can be suggested that when flipped learning is integrated with group tasks, discussions and active student presentations, it increase the involvement and learning of students without taking much time, as it was also found in the current study.

Furthermore, similar to the current study, in the study conducted by Mason et al. (2013), students explained that they spent significantly fewer hours per week studying outside of the classroom than the students who took the course in the traditional classroom. The reason for this might have stemmed from the fact that pre-service teachers were provided with brief and interactive videos which took less time to watch and summarize the content. In this way, they could focus on the important points while learning instead of reading many pages and did not know which parts to focus on. Hence, it is suggested that videos should be brief and concise in order to not to be students' bored and should include interactive pop-up questions.

In addition to these, learning with videos provided pre-service teachers with access to the course content independent of the space, which might be another reason for the positive perception of pre-service teachers about flipped learning. In this way, they had the opportunity of making up the courses by themselves which is in line with the previous literature (Alsancak-Sırakaya, 2015; Bergman & Sams, 2012; Guc, 2017). In this way, it might be said that flipped learning contributed to individual learning abilities, supported independent learning skills and pre-service teachers had more control over their learning, as stated by pre-service teachers in the student questionnaire. These are some of the important properties of flipped learning and pre-service teachers are positive about flipped learning due to these properties.

In the current study, pre-service teachers stated that learning with videos was easier. In this study, around 21 minutes videos were divided into brief parts, the content was shorter and plain than any other course book, which may be an important reason for the fact that flipped learning affected their learning positively. In the literature, there are many studies supporting this finding (Bergmann & Sams, 2012; Caudill, 2014; Enfield, 2013; Turan, 2015). Even in the study of Ceylaner (2016) it was found that some ninth grade students checked the duration of videos before watching them and watched the videos by skipping some parts which were more than five minutes. Hence, it is suggested that as in the current study, videos should be divided into two or three parts to be managed by pre-service teachers easily.

Moreover, the reason for the positive perceptions of pre-service teachers about flipped learning might have stemmed from video courses prepared by instructor than internet videos. According to content analysis, pre-service teachers stated that they preferred watching video courses prepared by instructor than watching the internet videos about the same topic. Similarly, in the study conducted by Turan (2015), pre-service teachers in the Early Childhood Education department explained their preference to watch the videos prepared by

the instructor instead of ready-made internet videos. Dove & Dove (2017) found that flipped learning with teacher-created videos decreased elementary education pre-service teachers' mathematics anxieties and increased confidence in mathematics more than did instruction that incorporated in-class lectures or third-party videos. One of the reasons for this might be that most of the videos prepared for Principles and Method of Instruction course are prepared by special institutions to prepare pre-service teachers for KPSS examination (Public Personnel Selection Examination), and they are over one hour and include full of terms and extra topics that pre-service teachers are not familiar with. Day & Foley (2006) explained that while preparing web/video lectures, professional production quality is not necessary and evidence from focus groups suggested that informal recordings were found more enjoyable. Hence, it can be said that brief, clear and concise videos prepared by the instructor might have been perceived by pre-service teachers as more understandable to learn the content than the internet videos, which might be the reason for the positive effect of flipped learning according to perceptions of pre-service teachers.

In addition to these, pre-service teachers perceived that flipped learning contributed to student interactivity and collaboration when compared to traditional courses. The pre-service teachers who took part in flipped group expressed an increase in collaboration with their friends and instructors both in the classroom and out of the classroom by using technology, which is in line with previous literature (Baker, 2000; Munir, Baroutiana, Younga, & Carter, 2018). In this way, pre-service teachers cooperated with others when completing assignments and could learn from each other. Similarly, in the study conducted by Ceylaner (2016), ninth grade students stated that they shared a lot with their classmates because of being involved in group tasks. They stated that they solved their problems together and even shared videos via Bluetooth with their classmates to be watched by the peers who did not have internet connection. In the study conducted by Guc (2017), among 13 secondary school students, 11 of them indicated positive opinions about flipped learning on peer learning. Moreover, in the current study, pre-service teachers explained that since everyone would get the same grade from the group work, they communicated with those people even if they were not close friends. Also, they stated that because it was a joint work, all of them put effort. They worked together to achieve their group goals. In other words, their communication with peers during class affected learning positively.

Furthermore, increased faculty-student interaction might be one of the reasons for the positive perceptions of flipped learning group which is in line with the previous literature (Alsancak-Sırakaya, 2015; Bergmann & Sams, 2012; Berrett, 2012; Ceylaner, 2016; Findlay-Thompson & Mombourquette, 2014; Lage et al., 2000; McLaughlin et al., 2013; Milman, 2012; Ziegelmeier & Topaz, 2015). In the current study, during in-class activities the instructor was able to monitor the flipped group's performance and comprehension and when a misunderstanding or any confusion was noticed, they were cleared up immediately. Hence, the instructor has many opportunities to give feedback, which eases the learning process and creates a sense of involvement and acceptance by creating a positive classroom environment. Also, in the current study, pre-service teachers interacted with the instructor out of the class by using social media and the instructor could help them anytime they needed. In the study of Findlay-Thompson and Mombourquette (2014), Introduction to Business Administration students reported that talking to the professor in and out of the class was easier in the flipped learning, which was also the case in the current study. In addition to these, similar to the current study, den Brok, Brekelmans, & Wubbels (2004) indicated that teacher proximity was important for pleasure in courses. Ghaith (2002) showed that the more the learners received academic and personal teacher support rather than peer support, the more they perceived that they could better adjust socially and psychologically at school.

Finally, pre-service teachers mentioned the weaknesses of flipped learning which is in line with the literature (B. Aydın 2016; G. Aydın 2016; Caudill, 2014; Enfield, 2013; Guc, 2017; Milman, 2012; Yavuz, 2016). In the current study, the lack of fast internet connection and the music behind the voice of the instructor were stated as some factors affecting their desire to watch videos. These kinds of technological issues might have affected the satisfaction of pre-service teachers from flipped learning. Similarly, Caudill (2014) stated that the downsides of using technology in a classroom setting were the program crashing, not working applications, and uninteresting or too long videos. In the studies, conducted by Enfield (2013) and Milman (2012), it was displayed that some technical issues like accessing, streaming and downloading the videos annoyed many students and affected their learning negatively. In the study conducted by Guc (2017), for some secondary school mathematics students it was an important issue to open videos because of viruses or other reasons. In the present study, since the videos were divided into parts, the file size was not large. Hence, watching them from their phones or jumping forward or backward in the video did not create a problem. However, because of slow internet speed in the student dormitories, they had problems to open Edmodo.

This study revealed the perceptions of pre-service teachers related to flipped learning. The findings obtained from this study can be taken into consideration by the practitioners to effectively design flipped learning environments. As it was stated by Butt (2014), there is always going to be room for improvement. Whether these improvements take place in lecture videos, learning activities, organization or students' learning experiences, instructors should be open to making changes whenever it is necessary according to grades of their students and the courses they taught.

References

Abeysekera, L., & Dawson, P. (2015). Motivation and cognitive load in the flipped classroom: Definition, rationale and a call for research. *Higher Education Research & Development, 34*(1), 1-14. doi: 10.1080/07294360.2014.934336.

Abeysekera, L., & Dawson, P. (2015). Motivation and cognitive load in the flipped classroom: Definition, rationale and a call for research. *Higher Education Research & Development, 34*(1), 1-14. doi: 10.1080/07294360.2014.934336.

Alsancak-Sırakaya, D. (2015). *Tersyüz sınıf modelinin akademik basari, öz-yönetimli öğrenme hazırbulunuşluğu ve motivasyon üzerine etkisi* [*The effect of flipped classroom model on academic achievement, self-directed learning readiness and motivation]*. (Doctoral dissertation). Gazi University, Ankara.

Aydin, B. (2016). *Ters yüz sınıf modelinin akademik başarı, ödev/görev stres düzeyi ve öğrenme transferi üzerindeki etkisi [The effects of flipped classroom model on academic achievement, homework/task stress level and transfer of learning]*. (Master's thesis). Süleyman Demirel University, Isparta.

Aydin, G. (2016). *Ters yüz sinif modelinin üniversite öğrencilerinin programlamaya yönelik tutum, öz-yeterlik algısı ve başarılarına etkisinin incelenmesi [The investigation of the effect of flipped classroom model on undergraduate students' attitude, self-efficacy and academic achievement towards programming]*. (Master's thesis). Dokuz Eylül University, İzmir.

Baker, J. W. (2000). *The classroom flip: Using web course management tools to become the guide by the side*. In J. A. Chambers (Ed.), Selected papers from the 11th International Conference on College Teaching and Learning (pp. 9-17). Jacksonville, FL: Florida Community College at Jacksonville. Retrieved from http://www.classroomflip.com/files/classroom_flip_baker_2000.pdf

Bergmann, J., & Sams, A. (2012). *Flip your classroom: Reach every student in every class every day.* Alexandria, VA: International Society for Technology in Education.

Berrett, D. (2012). How flipping the classroom can improve the traditional lecture. *The Chronicle of Higher Education.* Retrieved from http://chronicle.com/article/How Flipping-the-Classroom/130857/

Bishop, J. L., & Verleger, M. A. (2013, June). *The flipped classroom: A survey of the research.* Proceedings of American Society for Engineering Education (ASEE) National Conference. Article retrieved from http://www.asee.org/public/conferences/20/ papers/6219/view

Bormann, J. (2014). *Affordances of flipped learning and its effects on student engagement and achievement* (Doctoral dissertation). University of Northern Iowa. Chicago. Retrieved from https://tinyurl.com/y8uxxbjn

Boyraz, S. (2014). *İngilizce öğretiminde tersine eğitim uygulamasının değerlendirilmesi* [*Evaluating flipped classroom/education method in English teaching]*. (Master's thesis). Afyon Kocatepe University, Afyon.

Butt, A. (2014). Student views on the use of a flipped classroom approach: Evidence from Australia. *Business Education & Accreditation, 6*(1), 33-43. Retrieved from http://search.proquest.com/docview/1446438932?accountid=14691

Caudill, N. V. (2014). *Pre-service teachers' perceptions of a flipped classroom: A study of undergraduates enrolled in an applied child development course* (Master's thesis). Graduate Faculty of North Carolina State University, Raleigh, North Carolina. Retrieved from https://tinyurl.com/ybygdadr

Ceylaner, S. (2016). *Dokuzuncu sınıf İngilizce öğretiminde ters yüz sınıf yönteminin öğrencilerin öz yönetimli öğrenmeye hazırbulunuşluklarına ve İngilizce dersine yönelik tutumlarına etkisi* [*Effects of flipped classroom on students' self- directed learning readiness and attitudes towards English lesson in 9th grade English language teaching]*. (Master's thesis). Mersin University, Mersin.

Cibik, B. (2017). *The effects of flipped classroom model on learner autonomy. [Tersyüz eğitim modelinin öğrenen özerkliği üzerine etkileri]. (Master's* thesis). Muğla Sıtkı Koçman University, Muğla.

Clark, K. R. (2013). *Examining the effects of the flipped model of instruction on student engagement and performance in the secondary mathematics classroom: An action research study* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3592584).

Cohen, L., Manion, L. & Morrison, K. (2007). *Research methods in education* (6th Ed.). New York: Routledge.

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research.* Boston: Pearson.

Davies, R. S., Dean, D. L., & Ball, N. (2013). Flipping the classroom and instructional technology integration in a college-level information systems spreadsheet course. *Educational Technology Research and Development, 61*(4), 563-580. doi: 10.1007/s11423-013-9305-6

Day, J. A. & Foley, J. D. (2006). Evaluating a web lecture intervention in a human computer interaction course. IEEE *Transactions on Education, 49*(4), 420-431. doi: 10.1109/TE.2006.879792

den Brok, P., Brekelmans, M., & Wubbels, T. (2004). Interpersonal teacher behavior and student outcomes. *School Effectiveness and School Improvement, 15*(3-4), 407-442. doi: 10.1080/09243450512331383262.

Dove, A., & Dove, E. (2017). Flipping preservice elementary teachers' mathematics anxieties. *Contemporary Issues in Technology and Teacher Education, 17*(3), 312-335. Retrieved from https://citejournal.s3.amazonaws.com/wp content/uploads/v17i3math1.pdf

Enfield, J. (2013). Looking at the impact of the flipped classroom model of instruction on undergraduate multimedia students at CSUN. *Techtrends: Linking Research & Practice to Improve Learning, 57*(6), 14-27. doi:10.1007/s11528-013-0698

Field, A. P. (2009). *Discovering statistics using spss*. (3th Ed.). London: SAGE Publications.

Findlay-Thompson, S., & Mombourquette, P. (2014). Evaluation of a flipped classroom in an undergraduate business course. *Business Education & Accreditation, 6*(1), 63-71. Retrieved from https://tinyurl.com/y95c8898

Foertsch, J., Moses, G., Strikwerda, J., & Litzkow, M. (2002). Reversing the lecture/homework paradigm using eTEACH web-based streaming video software.

Journal of Engineering Education, 91(3), 267-274. doi: 10.1002/j.2168 9830.2002.tb00703.x

Fraenkel, J. R. & Wallen, N. E. (2009). *How to design and evaluate research in education* (7th ed.). New York: McGraw Hill.

Fulton, K. P. (2012). 10 reasons to flip. *Phi Delta Kappan, 94*(2), 20-24. Retrieved from https://doi.org/10.1177/003172171209400205

Gall, M. D., Gall, J. P., & Borg, W. R. (2003). *Educational research: An introduction* (7th ed.). Boston: Allyn-Bacon.

Gaughan, J. E. (2014). The flipped classroom in world history. *History Teacher, 47*(2), 221-244. Retrieved from https://tinyurl.com/y7em57aq

Ghaith, G. M. (2002). The relationship between cooperative learning, perception of social support, and academic achievement. *System 30*, 263–273. doi: 10.1016/S0346 251X(02)00014-3

Guc, F. (2017). *Rasyonel sayılar ve rasyonel sayılarda işlemler konusunda ters-yüz sınıf uygulamasının etkileri [*The effect of the flipped classroom practice on the rational numbers and operations with rational numbers]. (Master's thesis). Amasya University, Amasya.

Hamdan, N., McKnight, P., McKnight, K., & Arfstrom, K (2013). A review of flipped learning. *Flipped Learning Network.* Retrieved from https://tinyurl.com/y9slgecn

Kecskemety, K. M., & Morin, B. (2014, June). *Student perceptions of inverted classroom benefits in a first-year engineering course.* Paper presented at 121st ASEE Annual Conference & Exposition, Indianapolis. Retrieved from https://peer.asee.org/student perceptions-of-inverted-classroom-benefits-in-a first-year-engineering-course

Kurt, G. (2017). Implementing the flipped classroom in teacher education: Evidence from Turkey. *Educational Technology & Society, 20*(1), 211–221. Retrieved from https://www.jstor.org/stable/jeductechsoci.20.1.211

Lage, M. J., Platt, G. J., & Treglia, M. (2000). Inverting the classroom: A gateway to creating an inclusive learning environment. *Journal of Economic Education, 31*(1), 30-43. Retrieved from http://dx.doi.org/10.1080/00220480009596759

Lee, J., Lim, C., & Kim, H. (2016). Development of an instructional design model for flipped learning in higher education. *Education Tech Research Dev, 65*, 427-453. doi: 10.1007/s11423-016-9502-1

Love, B., Hodge, A., Grandgenett, N., & Swift. A. W. (2014). Student learning and perceptions in a flipped linear algebra course. *International Journal of Mathematical Education in Science and Technology. 45*(3), 317–324. doi: 10.1080/0020739X.2013.822582

Mason, G. S., Shuman, T. R., & Cook, K. E. (2013). Comparing the effectiveness of an inverted classroom to a traditional classroom in an upper-division engineering course. *IEEE Transactions on Education, 56*(4), 430-435. doi: 10.1109/TE.2013.2249066.

McLaughlin, J. E., Griffin, L. M., Esserman, D. A., Davidson, C. A., Glatt, D. M., Roth, M. T., Gharkholonarehe, N., & Mumper, R. J. (2013). Pharmacy student engagement,

performance, and perception in a flipped satellite classroom. *American Journal of Pharmaceutical Education, 77*(9), 1-8. doi: 10.5688/ajpe779196.

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd Ed.). United States: SAGE Publications.

Milman, N. (2012). The flipped classroom strategy: What is it and how can it best be used? *Distance Learning, 9*(3), 85-87. Retrieved from https://search.proquest.com/openview/616e91b3df376d82fd5d30c598c665f3 1?pq origsite=gscholar&cbl=29704

Missildine, K., Fountain, R., Summers, L., & Gosselin, K. (2013). Flipping the classroom to improve student performance and satisfaction. *Journal of Nursing Education, 52*(10), 597-599. doi: 10.3928/01484834-20130919-03

Morin, B., Kecskemety, K. M., Harper, K. A., & Clingan, P. A. (2013, June 23-26). *The inverted classroom in a first-year engineering course.* Paper presented at 120th ASEE Annual Conference & Exposition. Retrieved from https://www.asee.org/public/conferences/20/papers/7230/view

Munir, M. T., Baroutian, S., Young, B. R., & Carter, S. (2018). Flipped classroom with cooperative learning as a cornerstone. *Education for Chemical Engineers 23*, 25–33. Retrieved from https://doi.org/10.1016/j.ece.2018.05.001

Murphree, D. S. (2014). Writing wasn't really stressed, accurate historical analysis was stressed: Student perceptions of in-class writing in the inverted, general education, university history survey course. *The History Teacher, 47*(2), 209-219. Retrieved from https://tinyurl.com/ya6wvcvy

O'Flaherty, J., & Phillips, C. (2015). The use of flipped classrooms in higher education: A scoping review. *Internet and Higher Education, 25*, 85-95. Retrieved from http://dx.doi.org/10.1016/j.iheduc.2015.02.002

Phillips, C. R., & Trainor, J. E. (2014). Milennial students and the flipped classroom. *Proceedings of the ASBBS Annual Conference, 21*(1) 519-530. Retrieved from http://asbbs.org/files/ASBBS2014/PDF/P/Phillips_Trainor(P519-530).pdf

Reinhardt, J. Y. (2014). *Improving classroom practice through collaborative inquiry: A case of flipped learning.* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3624225).

Sams, A., & Bergmann, J. (2013). Flip your students' learning. *Educational Leadership, 70*(6), 16-20. Retrieved from https://tinyurl.com/bssk349

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (6th Ed.). Boston: Pearson Education Inc.

Talbert, R. (2012). Inverted classroom. *Colleagues, 9*(1), 1-3. Article retrieved from http://scholarworks.gvsu.edu/colleagues/vol9/iss1/7.

Talbert, R. (2014). Inverting the linear algebra classroom. *Primus, 24*(5), 361-374. doi: 10.1080/10511970.2014.883457

Talley, C., & Scherer, S. (2013). The enhanced flipped classroom: increasing academic performance with student-recorded lectures and practice testing in a flipped stem course. *Journal of Negro Education, 82*(3), 339-347. doi: 10.7709/jnegroeducation.82.3.0339

Touchton, M. (2015). Flipping the classroom and student performance in advanced statistics: Evidence from a quasi-experiment. *Journal of Political Science Education, 11*(1), 28-44. doi: 10.1080/15512169.2014.985105

Tune, J. D., Sturek, M., & Basile, D. P. (2013). Flipped classroom model improves graduate student performance in cardiovascular, respiratory, and renal physiology. *Adv Physiol Educ, 37*(4), 316-320. doi:10.1152/advan.00091.2013

Turan, Z. (2015). *Ters yüz sınıf yönteminin değerlendirilmesi ve akademik başarı, bilişsel yük ve motivasyona etkisinin incelenmesi [The evaluation of flipped classroom method and examination of its effects on academic achievement, cognitive load and motivation]*. (Doctoral dissertation). Atatürk University, Erzurum.

Turgut, M. F., & Baykul, Y. (2011). *Eğitimde ölçme ve değerlendirme (*3rd Ed.). Ankara: Pegem Akademi.

Umutlu, D. (2016). *Effects of different video modalities on writing achievement in flipped English classes* (Master's thesis). Boğaziçi University, İstanbul.

Wilson, S. G. (2013). The flipped class: A method to address the challenges of an undergraduate statistics course. *Teaching of Psychology. 40*(3), 193-199. doi:10.1177/0098628313487461

Yavuz, M. (2016). *An investigation into the effects of flipped classroom applications on the academic success and experiences of the students at secondary school [Ortaöğretim düzeyinde ters yüz sınıf uygulamalarının akademik başarı üzerine etkisi ve öğrenci deneyimlerinin incelenmesi]. (* Unpublished Thesis). Atatürk University, Erzurum.

Zappe, S., Leicht, R., Messner, J., Litzinger, T., & Lee, H. (2009). *Flipping the classroom to explore active learning in a large undergraduate course.* Proceedings of the 2009 American Society for Engineering Education Annual Conference and Exhibition. Retrieved from https://tinyurl.com/y93n7r3j

Ziegelmeier, L. B., & Topaz, C. M. (2015). Flipped calculus: A study of student performance and perceptions. *Primus, 25*(9-10), 847-860. doi: 10.1080/10511970.2015.1031305.

Çerkez, Y., Özbaş, S., & Bağlama, S. (2019). A study of high school students' positive and negative affect in terms of gender differences. *International Online Journal of Education and Teaching (IOJET), 6*(2), 318-325.

http://iojet.org/index.php/IOJET/article/view/610

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A STUDY OF HIGH SCHOOL STUDENTS' POSITIVE AND NEGATIVE AFFECT IN TERMS OF GENDER DIFFERENCES

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Abstract

The objective of this research was to analyse high school students' positive and negative affect schedules and to compare them according to gender, level of class and type of schools such as General High Schools, Anatolian High Schools and Science High Schools. 171 voluntary students in the 11th and 12th grades took part in this study. Data were collected through the Positive And Negative Affect Schedule (PANAS). The research indicated that the positive affect schedule was considerably high in both female and male participants, while the negative affect schedule of both genders was slightly low. However, the positive affect scores of male students were higher than of females but the negative affect scores of male students were lower than of females. Also, the means of negative affect in females were higher than of males among the 11th grades in all school types, and in both the 11th and the 12th grades in General High Schools.

Keywords: affect, gender, high school students, negative, positive

1. Introduction

Affect is a condition as anger, joy, sadness and fear motivating or inhibiting behaviours and affecting the interaction and communication with the environment. It is emphasized in the literature that philosophical and psychological examinations of affect are neglected (Yazici, 2006). The foundation of this accommodates the fact that there are still different views on whether the affect is a cognition, product, feeling, behaviour or motivation (Er et al., 2008). Yet, studying the definitions in literature, affect is defined, for instance, by American psychologist Dr. Daniel Goleman as an agitation or dynamics of mind, feeling and passion; any intense or stimulated mental condition (Ozgen, 2006). Another definition refers to affect as not only a feeling, but also a condition of the mind. Considering all the views, affect is the judgement evaluating the world (Yazici, 2006).

The definitions of affect have been attributed to various hypotheses such as the theories of James-Lange and Cannon Bard and cognitive theory (e.g. Oatley and Johnson-laird, 2014; Weisfeld and Goetz 2013). While the theory by James and Lange indicates that physiological reactions, meaning, physical and facial changes cause the change in affect, cognitive theory is the reflection of one's affect observing the environment and comparing himself/herself with others. Nonetheless, the research conducted suggests that the structure of feeling is formed from two fundamental dimensions independent of each other. These dimensions are positive and negative affect. The positive affect is defined as the active pleasure and joy one gets out of

life, while the negative affect is described as the activation of one's unpleasant emotions such as stress, fear and anger (Dogan & Ozdevecioglu, 2009; Ozdemir 2013). Watson et al., (1988) defined the positive affectivity as "looking at the world with enthusiasm and getting pleasure out of living". In other words, positive affectivity is considering life intensively positive. Within this framework, the level of positive affectivity is determined with one's energy felt towards life and the level of this energy. On the other hand, negative affectivity approaches the world with a negative perspective. Negative affect can arise not only from an individual, but also from organizational and physical conditions (Ozdemir, 2013).

Positive and negative affect occupies an important place in every person's life. The research conducted shows that positive and negative affect is associated with job satisfaction, working performance and life satisfaction (e.g. Dogan & Ozdevecioglu, 2009; Erol-Korkmaz, 2014; Gaudreau et al. 2006; Ozdemir, 2015). The research also indicates that young people have more negative affect than adults, and girls than boys (e.g. Fujita et al., 1991; Mroczek & Kolarz, 1998; Windsor & Anster 2010,). Positive and negative affect schedules of young people need to be known based on the role of affect on thoughts and behaviours, and young people's act of giving different reactions depending on their existing affect, because young people in adolescence period feel different in various situations and their way of expressing feelings can differ positively or negatively. In adolescence many changes occur. A young person changes physically due to his/ her hormones, As an adult, he/she experiences emotional ups and downs. Individuals become occasionally happy and sad during this period and usually cannot explain the reason for that. However, the individuals in this era are expected to grow emotionally mature in the same way they do cognitively and socially while solving all such problems they face (Gul & Gunes, 2009). Therefore, examining the affect of adolescents is of great importance. There are a range of studies in literature analysing the affect in adolescents/young people (e.g. Buz, Pérez-Arechaederra et al., 2015; Ebesutani et al., 2011; Telef, 2013). Meanwhile, a research studying high school students' positive and negative affect has not yet been done. Therefore, it is hoped that the findings in this study specifying the state of students' positive and negative affect will be a good reference for all the education and guidance services in high schools in TRNC (Turkish Republic of North Cyprus).

This study is important in two aspects. Firstly, it is the only research done to specify the most frequently experienced changes in affect in adolescence (Haşimoğlu & Aslandoğan, 2018; Tel, 2014), and the indications of emotional experiences (Larsen et al., 2017). Secondly, it is emphasized in literature that the state of affect among young people is connected with general life satisfaction (e.g. Lyubomirsky et al., 2005), academic satisfaction, attending or missing classes, success variables (e.g. Nickerson et al., 2011), gender, class level and age (e.g. Ozgule & Sumer, 2017; Sarı, 2007). Considering all these aspects, it is crucial that in order to run education and educational activities as required and assure students of their targets, their state of affect is well defined.

The aim of this research was to analyze high school student's positive and negative affect in terms of gender, level of class and type of school. Within the scope of this objective, answers were sought to the questions below:

1. What is the positive and negative affect of female and male high school students?
2. Do positive and negative affect of high school students vary according to gender?
3. Do positive and negative affect of female and male high school students vary according to level of class?
4. Do positive and negative affect of female and male high school students vary according to type of school?

2. Method

2. 1. Model

Screening was used as a model in this study. General screening models are the screening regulations performed within a population consisting of numerous elements on the whole population or a group, example or sample taken out of it in order to have a general judgement on population (Bilgic, 2011).

2.2. The sample

The population of this research included the students studying in high schools of the Ministry of National Education, TRNC. Due to the limitations in conducting this study with the entire population, the sampling method was used and three high schools in Nicosia were randomly selected. In order to collect data, questionnaires were distributed to approximately 300 people in the relevant schools, but 200 questionnaires were returned. 171 of the questionnaires were evaluated (149 11th grade, 21 12th grade, 79 female, 92 male, 67 studying in a general high school, 30 in a Science high school and 74 in an Anatolian high school). The age ranges of the students varied between 16 and 19 (Mean=1.01; Sd:0.07). (Table 1).

Table 1. *Demographic characteristic of high school students*

	Variable	**N**	**%**
Gender	Female	79	46.2
	Male	92	53.8
Type of High School	General High School	67	39.2
	Science High School	30	17.5
	Anatolian High School	74	43.3
Level of Class	11th grade	149	87.1
	12th grade	21	12.3
	No information	1	0.6

2.3. The instrument

In order to determine the demographic characteristics of high school students and to evaluate their positive and negative affect status, questionnaires including “Positive and Negative Affect Schedule” and questions revealing personal details (gender, age, and class) were used in this study.

The Positive and Negative Affect Schedule was developed by Watson et al. (1988) and was adapted to Turkish by Gençöz (2000). The scale included 20 expressions - 10 positive and 10 negative - determining the positive and negative affectivity. 5 Likert type scale was used for evaluation (1=very little; 5=very much). The reliability values of the positive and negative dimensions of the scale were calculated as 0.88 and 0.85 respectively by Gençöz (2000). The reliability values in this research were calculated as 0.88 and 0.81 respectively.

2.4. Analysis

The data obtained from the scales within the scope of this research were analyzed through the SPSS 23 Program. Frequency, percentage, and the independent sample t-test was used in the analysis of the data. Before the independent sample t-test, the distributions of the data were checked for normality and it was observed that Skewness and Kurtosis values of scale and subscales ranged from -1 to +1 according to gender and class level.

3. Results

3.1. Positive and negative affect of high school students

Values regarding the positive and negative affect of high school students are as in Table 2 below.

Table 2. *Positive and negative affect schedules of female and male high school students*

	Female		Male			Female		Male	
Positive	Mean	Sd.	Mean	Sd.	Negative	Mean	Sd.	Mean	Sd.
Interested	3.05	1.02	3.11	1.16	Distressed	3.54	1.26	2.77	1.21
Excited	3.04	1.24	3.22	1.37	Upset	2.84	1.23	2.13	1.22
Strong	3.37	1.19	3.94	1.13	Guilty	1.76	1.08	1.42	.90
Enthusiastic	3.31	1.32	3.68	1.30	Scared	1.79	1.10	1.60	1.13
Proud	3.32	1.38	3.86	1.22	Hostile	1.70	.99	1.84	1.29
Irritable	3.11	1.30	3.33	1.26	Alert	3.53	1.33	2.77	1.53
Inspired	2.96	1.32	3.31	1.35	Ashamed	2.42	1.37	2.15	1.34
Determined	3.59	1.22	3.71	1.25	Nervous	3.38	1.32	2.89	1.54
Attentive	3.21	1.21	3.64	1.19	Jittery	2.91	1.30	2.38	1.31
Active	3.37	1.18	3.73	1.21	Afraid	2.19	1.34	1.49	1.01

While the mean values regarding the positive affect schedules of female high school students vary between 3.59±1.22 and 2.96±1.32, male students' positive affect schedules vary between 3.94±1.13 and 3.11±1.16. While the mean values regarding the negative affect schedules of female high school students vary between 3.54±1.26 and 1.70±0.99, male students' negative affect schedules vary between 2.89±1.54 and 1.42±0.90. According to Table 2, the scores of positive affect of male high school students are higher than of female high students and the scores of negative affect of female high school students are higher than male high school students.

3. 2. Comparison of the positive and negative affect of high school students according to gender

A t-test was conducted to analyse any varieties in the status of students' positive and negative affect in terms of gender. The results are as shown in Table 3.

Table 3. *T-Test Results of PAS and NAS According to Gender*

Dependent Variable	Gender	N	Mean	Sd.	t	df.	P
PAS	Female	79	3.23	0.90	2.48	167	0.01*
	Male	92	3.56	0.80			
NAS	Female	79	2.60	0.80	3.85	167	0.00*
	Male	92	2.14	0.74			

* $p < 0.05$

As it can be observed in Table 3, the positive and negative affect of the female and male students vary. While this result is in favour of the male students in positive affect, it is in favour of the female students in negative affect.

3.3. Comparison of the positive and negative affect of the 11th and 12th-grade students according to gender

The t-test analysis was used in order to determine any varieties in the means of positive and negative affect of the 11th and 12th-grade students according to gender. The results of the analysis are as in Table 4 below.

Table 4. *T-test result for PAS and NAS according to gender in terms of the class*

	Class	Gender	N	Mean	Sd.	t	df.	P
PAS	11th	Female	60	3.27	.87	-1.89	145.0	.06
		Male	87	3.54	.80			
NAS		Female	60	2.53	.74	3.08	145.0	.00
		Male	87	2.14	.75			
PAS	12th	Female	18	3.18	.95	-1.56	19.0	.14
		Male	3	4.07	.55			
NAS		Female	18	2.87	.97	1.25	19.0	.23
		Male	3	2.13	.65			

* $p < 0.05$

As it can be observed in Table 4 above, the mean of the positive affect of the 11th and the 12th-grade male students is higher than of female students. Also the mean of the negative affect of the 11th and 12th-grade female students are higher than of the male students. This finding indicates a meaningful significance in the negative affect schedules of female and male students in the 11th grade.

3.4. Comparison of the positive and negative affect schedules of high school students according to gender in terms of high school types

The t-test analysis was conducted to determine any varieties in the positive and negative affect of the students according to gender in terms of school type. The results of the analysis are as in Table 5.

Table 5. *T-test results for PAS and NAS according to gender in terms of school type*

	School Type	Gender	N	Mean	Sd.	t	df.	P
PAS	General	Female	12	3.21	1.03	-1.72	64.0	.09
		Male	54	3.65	.75			
NAS		Female	12	2.82	.61	3.52	64.0	.00
		Male	54	2.08	.66			
PAS	Science	Female	16	2.89	.87	-.75	27.0	.46
		Male	13	3.16	1.03			
NAS		Female	16	2.37	.89	.63	27.0	.53
		Male	13	2.16	.87			
PAS	Anatolian	Female	51	3.35	.86	-1.04	72.0	.30
		Male	23	3.56	.71			
NAS		Female	51	2.62	.81	1.66	72.0	.10
		Male	23	2.28	.86			

* $p < 0.05$

As it is revealed in Table 5, there is only a significant difference in the negative affect schedules between female and male students at general high school.

4. Discussion

In this research, positive and negative affect schedules of the students studying in high schools in Nicosia were investigated. According to the results, while the positive affect schedules of male high school students are higher than of female students, the negative affect schedules of male students are lower than of female students. In literature it is has been found that the positive and negative affect varies according to gender (e.g. Deniz et al. 2012; Aporicio et al. 2009; Melvin and Molloy 2000; Fujite et al. 1991; Wood et al. 1989). These results can be associated with the differences in both female and male students' biological, psychological, and social developments and changes.

Another result obtained from the study is about the effect of the level of class and school type on the positive and negative affect according to gender. Merely, the means of negative affect of female and male high school students vary in terms of class and school type. According to the results, the mean of negative affect in females was higher than of males among the 11th-grade students in all school types, and in both the 11th and 12thgrade students in General High School. When class levels and affect averages are considered, a high negative affect is observed among the 11th-grade female students and this is associated with gender and age. The connection between affect and age was brought up by Barrick et al., (1989) and Fernandez-Agilar et al., (2018). This finding overlaps with the argument "negative affect decreased with age" by Charles et al., (2001). When school culture and students' affect averages were compared, a high negative affect average was observed among female students in General High School and this was associated with school culture and school climate. This finding matches well with the argument "culture shapes affect in several ways" by Ozgule & Sumer (2017).

In conclusion, gender, class level, and type of school play a great role in high school students' affect schedules. This study was limited with students attending to three types of high schools in Lefkoşa and the Positive and Negative Affect Scale. In future studies, the sampling can be expanded and the Positive and Negative Affect schedules and life satisfaction of the young people in Cyprus can be examined. Studies dealing with "happiness" indicated that happy individuals exhibit positive affect and have a high inclination to reach targets with their positive state of mind (e.g. Lyubomirsky et al., 2005). In future studies, the connection among the variables such as positive and negative affect of high school students, their attendance to school, leaving school, lesson load, etc. can be dealt with. Researches done argue that positive and negative affect is the indication of emotional experience (e.g. Larsen et al., 2017). It is suggested that studies are done in the future to examine the connection between emotional experiences and risky behaviors among the young people in Cyprus.

References

Aparicio, M. D., Moreno-Rosset, C., Díaz, M. D., & Ramírez–Uclés, I. (2009). Gender differences in affect, emotional maladjustment and adaptive resources in infertile couples: a positive approach. *Ann Clin Health Psychol*, 5, 39-46.

Barrick, A. L., Hutchinson, R. L., & Deckers, L. H. (1989). Age effects on positive and negative emotions. *Journal of Social Behavior & Personality*, 4(4), 421-429.

Buz, J., Pérez-Arechaederra, D., Fernández-Pulido, R. & Urchaga, D. (2015). Factorial structure and measurement invariance of the PANAS in Spanish older adults. *The Spanish Journal of Psychology, 18*.https://doi.org/10.1017/sjp.2015.6

Deniz, M. E., Arslan, C., Özyeşil, Z., &İzmirli, M. (2012). Öz-anlayış, yaşam doyumu, negative ve pozitif duygu: Türk ve diğer ülke üniversite öğrencileri arasında bir karşılaştırma. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi, 12*(23), 428 – 446.

Doğan, Y., & Özdevecioğlu, M. (2009). Pozitif ve negative duygusallığın çalışanların performansları üzerindeki etkisi. *Sosyal Ekonomik Araştırmalar Dergisi, 1*(18), 165-190.

Ebesutani C., Smith A., Bernstein A., Chorpita B. F., Higa-McMillan C., & Nakamura B. (2011). A bi-factor model of negative affectivity: Fear and distress components among younger and older youth. *Psychological Assessment, 23*, 679–691.

Er, N., Hosrik, E., Ergün, H., & Serif, M. (2008). Duygu durum değişimlemelerinin otobiyografik bellek üzerindeki etkileri. *Türk Psikoloji Dergisi, 23*(62), 1.

Erol-Korkmaz, H. T. (2014). Çalışanların günlük duygu durumu ve üretim karşıtı davranışları arasındaki ilişki: Genel örgütsel adalet algısının düzenleyici rolü. *Tür kPsikoloji Yazıları, 17*(33), 77-87.

Fernández-Aguilar, L., Ricarte, J. J., Ros, L., & Latorre-Postigo, J. M. (2018). Emotional differences in young and older adults: Films as mood induction procedure. *Frontiers in Psychology*, 9, 1110.

Fujita F., Diener, D. and Sandvik, E. (1991). Gender differences in negative affect and well-being: the case for emotional intensity. *Journal of Personality and Social Psychology, 61*(3), 427-434.

Gaudreau, P., Sanchez, X., & Blondin, J. P. (2006). Positive and negative affective states in a performance-related setting: Testing the factorial structure of the PANAS across two samples of French-Canadian participants. *European Journal of Psychological Assessment, 22*, 240–249.

Gençöz, T. (2000). Pozitifve negative duygu ölçeği: Geçerlik ve güvenirlik çalışması. *Türk Psikoloji Dergisi, 15*(46), 19-26.

Gül, S. & Güneş, İ. (2009). Ergenlik dönemi sorunları ve şiddet. *Sosyal Bilimler Dergisi, 6*(1), 80.

Haşimoğlu, A. & Aslandoğan, A. (2018). Lise öğrencilerinin ergenlik dönemi sorunları ve duygu düzenleme stratejileri arasındakı ilişkinin incelenmesi. *Academic Review of Humanities and Social Sciences*, 1(2).

Larsen, J. T., Hershfield, H., Stastny, B. J., & Hester, N. (2017). On the relationship between positive and negative affect: Their correlation and their co-occurrence. *Emotion*, 17(2), 323.

Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success? Psychological bulletin, 131(6), 803.

Melvin, G. A., & Molloy, G. N. (2000). Some psychometric properties of the Positive and Negative Affect Schedule among Australian youth. *Psychological Reports, 86*, 1209-1212.

Mroczek, D. K. & Kolarz, C. M. (1998). The effect of age on positive and negative affect: A developmental perspective on happiness. *Journal of Personality and Social Psychology, 75*(5), 1333.

Nickerson, C., Diener, E., & Schwarz, N. (2011). Positive affect and college success. *Journal of Happiness Studies*, 12(4), 717-746.

Oatley, K., & Johnson-Laird, P. N. (2014). Cognitive approaches to emotions. *Trends in Cognitive Sciences, 18*(3), 134-140.

Özdemir, A. A. (2015). İş tatmini, pozitif / negatif duygulanım ve yaşam tatmininin etkisi. *Calısma ve Toplum, 46*(3).

Özdemir, A. (2013). Araştırma görevlilerinin çalışma ortamlarındaki tehdit algıları, duygu yapıları ve yaratıcılıkları arasındaki ilişki. *Türkiye Sosyal Araştırmalar Dergisi*, *172*(172), 245-256.

Özgüle, E. T. U., & Sümer, N. (2017). Ergenlikte Duygu Düzenleme ve Psikolojik Uyum: Duygu Düzenleme Ölçeğinin Türkçe Uyarlaması. *Turk Psikoloji Yazıları*, 20(40), 1-18.

Sarı, C. (2008). *Ergenlerin psikolojik belirti düzeyleri ve uyumlarını yordayan bazı değişkenler*. Doktora Tez Çalışması, Selçuk Üniversitesi Sosyal Bilimler Enstitüsü.

Telef, B. B. (2013). Olumlu ve Olumsuz Yaşantı Ölçeği: Ergenler için geçerlilik ve güvenilirlik çalışması. *Anatolian Journal of Psychiatry, 14*(1), 62-68.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063–1070.

Weisfeld, G. E., & Goetz, S. M. (2013). Applying evolutionary thinking to the study of emotion. *Behavioral Sciences, 3*(3), 388-407.

Windsor T. D., & Anstey K. J. (2010). Age differences in psychological predictors of positive and negative affect: A longitudinal investigation of young, midlife, and older adults. *Psychology & Aging, 25,* 641–652.

Wood, W., Rhodes, N., & Whelan, M. (1989). Sex differences in positive well-being: A consideration of emotional style and marital status. *Psychological bulletin*, 106(2), 249.

Yazıcı, A. (2006). William James'in Descartes'in duygu kuramını eleştirisi. *Felsefe Dünyası, 2*(44), 146-158.

Kaymakamoğlu, S. & Yıltanlılar, A. (2019). Non-native English teachers' perceptions about using Turkish (L1) in EFL classrooms: A case study. *International Online Journal of Education and Teaching (IOJET)*, *6*(2), 327-337.

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NON-NATIVE ENGLISH TEACHERS' PERCEPTIONS ABOUT USING TURKISH (L1) IN EFL CLASSROOMS: A CASE STUDY

Case Study

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Abstract

This study investigated 5 non-native English teachers' perceptions on Turkish (L1) use in English language (L2) classrooms in the English Preparatory School context of European University of Lefke in the Turkish Republic of Northern Cyprus (TRNC). The participants were interviewed by using a semi-structured interview and observed by administering a predetermined observation checklist. Gathered data were analyzed to explore the participants' beliefs and classroom practices regarding the necessity of using L1. The participant non-native English teachers' views regarding the reasons of using Turkish (L1) were also explored. The results of the study revealed that the teachers had neutral perceptions about benefiting from Turkish (L1) in their foreign language classes and underscored a place for Turkish (L1) in English (L2) classrooms. In other words, the majority of the participants did not reject Turkish use; however, due to some restrictions such as English medium education system in the teachers' workplace, nationality factors, and teachers' own teaching philosophy brought some different dimensions to this process. Overall, the majority of the teachers supported the use of Turkish whereas only one teacher had the opposite view emphasizing that students can become dependent on L1 help which has a high possibility of inhibiting learners from target language acquisition.

Keywords: Teachers' perceptions, L1 use, L2 maximization.

1.Introduction

The use of L1 has been one of the foremost controversies in English Language Teaching field. This concern divided the prominent educationalists and researchers into different parties. According to some of the educationalists such as Kellerman (1995), Krashen (1981) and Wechsler (1997), the success of teaching English can only be sustained by the monolingual approach by which teachers can provide opportunities for language learners enough target language exposure. There are, on the other hand, theorists who are in favor of the bilingual approach, which suggests the idea of L1 usage in EFL/ESL classes. Educationalists namely Cook (2001), Dedrinos (2006), Larsen-Freeman (2011) and Nation (2003), regard L1 as a fundamental tool for L2 learning. Both groups have counter-views, which promoted on-going arguments throughout the years. The research showed that the notion of using L1 has become the pivotal argument in this field.

1.1.Views Regarding Monolingual Approach

Phillipson (1992, p.73) emphasized that there are "the explicit and implicit values, beliefs, purposes, and activities which characterize the field of ELT and which contribute to the maintenance of English as a dominant language". As a result of this belief, it was proposed that English can be best taught monolingually. Phillipson (1992, p.185) stated that there are some false beliefs lying behind the language teaching field, which make significant contributions to English supremacy and explained the importance of the exclusion of L1 use from language classes as:

> *"English is best taught monolingually*
> *The ideal teacher of English is a native-like speaker*
> *The earlier English is taught, the better the results*
> *The more English is taught the better the results*
> *If other languages are used much standards of English will drop"*

Similarly, the concept called English only policy in which mother tongue is regarded as interference to learning a foreign language (Mouhanna, 2009). In order to debate on this issue, which was a dogma, "critical theory", and "Critical Applied Linguistic" were taken into consideration as a directive perspective (Pennycook, 2001, p.7). It was suggested by Dean, (1994, p.4) that "naturalized" assumptions cannot be drawn with our own conception of reality. Therefore, another essential principle of Critical Applied Linguistic (CAL) is on that the finder of fact suggests extravagant perspectives of varieties in fact by emphasizing that the "transformative mission of critical work or the potential for change through awareness and emancipation" (Pennycook, 2001, p.8). A counteractive view, which emphasized the deliberate use of L1, was emphasized by Cook (2007) noted as follows:

> *"One nation, one people, one language". The importance is highlighted even more by the fact that the students' culture is part of their language and by neglecting their language, the teacher, in a monolingual classroom, neglects their culture which leads to the danger of neglecting their identity as well. What is more, there is no valid database that could confirm the standpoint that the monolingual approach in teaching is the best one. The disregard of the students' mother tongue can, in fact, de-motivate the students and be counterproductive. Therefore, there is neither a scientific nor a pedagogic reason to exclude L1 from the teaching process." (Cook, 2007, online).*

Mouhanna, (2009) stated questioning the monolingual principle is to sustain a flipside and different perception that favors the use of L1 of students, which was regarded as a mean during the learning and teaching process rather than an intervening factor that should be dismissed from the language classes.

1.2. Views Regarding Bilingual Approach

More information on the factors that affect the preference of English teachers when using L1 usage would help to establish a greater degree of accuracy on this matter. Thus, it is necessary to understand why the L1 argument still remained worth questioning. There have been several investigations on to what extend L1 should be used and for what purposes it should be included in English teaching. Previous studies have shown that the way teachers talk is crucial in every kind of classes. The reason why a teacher talk is necessary is to convey the message. The techniques that teacher uses such as giving feedback, asking questions, providing explanations all have importance beyond any doubt. All these mentioned pedagogical strategies have an impact on the effective classroom management likewise target language acquisition of language learners (Nunan, 1995). Similarly, Kafes (2011) referring to Harbord, (1992), who advocated of mother tongue integration, suggested

its usage for several reasons; learning styles, a humanistic approach, and time management. Furthermore, Atkinson, (1987) elaborated on these reasons and he asserted that there could be more reasons on a language proficiency level basis. For instance, evoking language (all levels), comprehension check (all levels), for instructing (early levels), sustaining collaboration for learners, teaching and building up the language (mainly early levels). Moreover, Harmer, (2001), attributing to Harbord, (1992, p. 354), who indicated that the use of first language habit can occur in language classes inevitably among the groups of the students even though the teacher aims to use English frequently to expose students to the target language. In addition to this, another idea of how the use of mother tongue became an important technique in English language teaching was because of the fact that some of the language teachers have sentiment on the first language (L1) that it promotes the second language learning (Schweers, 1999). Furthermore, the effects of L1 usage is not the only instruction but also on the students who are directly involved in this process L1 in language classes. In this vein, Piasecka, (1988, pp. 98-99) exemplified the occasions of the usage on L1 which are: "negotiation of the syllabus and the lesson; record keeping; grammar, phonology, morphology and spelling; discussion of cross-cultural issues; instructions or prompts; explanations or errors; and assessment of comprehension". By evaluating its spread over the lesson, the above-mentioned occasions show how much the use of mother tongue is embedded or put into practice in a language class. Similarly, Deller and Rinvolucri, (2002) indicated the fact that the language learner's mother tongue should be put into practice only in certain situations as follows: *"*

- *Comparing English grammar with the mother tongue's grammar can be very positive for some learners.*
- *Beginners will probably progress at a quicker pace if the use of the mother tongue is allowed in the classroom.*
- *Translation exercises may also be the perfect practice when there is a grammar point that is causing trouble to students."*

Based on the already conducted studies, many reasons for using L1 have been classified. According to Atkinson, (1987) for early levels, L1 can be helpful to understand the complex instructions. There are similarities between the attitudes expressed by Deller and Rinvolucri, (2002) and those described by Sweet, (1964) as suggested that initial point to start teaching a foreign language should be students' own language with its attributes.

These situations above brought up important questions such as: can mother tongue and the second language be used interchangeably? Or should a language teacher decrease the amount of the use of L1 and also should language teachers ignore the L1 and use L2 frequently to sustain enough language exposure for the language learners? The questions have been asked over time with different forms; therefore, there is a rich information pool of this subject in the relevant literature. This shows a degree of importance to be aware of mother tongue usage in a language class where it is supposed over the decades or else English should be the only language in some cases or at least English should be the primary means of communication and the instruction. These questions opened the ways of reanalysis of the existing teaching methods, which were once widely used and lost its effect because of the new language teaching trends were born or added to the existing ones as a result of the needs and the characteristics of students have changed over the periods.

When regarding today's language classrooms, as put emphasis on different factors prevailing the process of learning and teaching English, more specifically in Turkish contexts, some of the researchers are of the vital importance when regarding their studies. The underlying reasons of utilizing L1 in foreign language classrooms and English teachers'

beliefs on valuing L1 in Turkish context were taken under consideration by Salı, 2014; Özçelik, 2013; +Paker & Karaağaç, 2015; Timuçin & Baytar, 2015. Since these conducted studies are recent, it can be seen that there is still a paramount curiosity on L1 choice in L2 classrooms, which strengthens the value of its presence in the field of ELT. Common reasons were proposed in terms of the inclusion of L1 in a study conducted by Paker and Karaağaç, (2015) similar to the previous studies in the past decades. Overall, the results of their study indicated that L1 was used for making jokes, showing concern to the students, showing empathy, to explain difficult concepts or ideas, to talk about administrative information (course policies, announcements, deadlines, etc.), to explain grammar rules, and to talk about the exams. As a final note, Kaynardağ, (2016) attributed to some advantages and disadvantages of L1 usage when teaching English were listed from various studies carried out by Üstünel and Seedhouse, (2005), Cenoz, (2008), Sampson, (2012), Elridge, (1996), Carless, (2007) mentioned as follows:

1.3. Advantages of L1 Use

- *In order to save time when establishing a task, stating instructions in an understandable way especially in lower levels, teachers struggle with sustaining the requirements in a clear way for all learners. It is believed that L1 utilization can ease the process by saving time, (Üstünel & Seedhouse, 2005).*
- *Cenoz (2007) asserted that including L1 can better metalinguistic awareness, particularly for complex grammatical sentences and vocabulary. Using L1 enable learners to make a connection between the existing language knowledge exists in their L1 system and in L2. As a consequence cognitive bridge becomes more strong.*
- *Preventing meaning loss and confusion occurs when teaching new words in the target language (English), students may need more support; therefore, they can reiterate to understand the meanings of words in their own languages. It is assumed that they make connections semantically, (Sampson, 2012).*

1.4. Disadvantages of L1 Use

- *Using L1 includes high possibility for learners to have it as a reference even when it is unnecessary. Thus, overuse of L1 may occur. The objective may not be met when considering the foreign language teaching and learning, (Kaynardağ, 2016).*
- *L2 exposure remains restricted when L1 is used aimlessly. When considering the target language learning settings in which L2 exposure may not be sustained all the time. Hence, students' chance of improving speaking skills in the target language decrease, (Elridge, 1996).*
- *In contrast, what is believed about students' motivation when L1 is neglected, maximizing L2 can also maximize students' motivation too. This creates a situation for learners in which they make sure that they can use their speaking skills by conveying the message. This directly gives students a sense of achievement in the target language, (Carless, 2007).*

All in all, some scholars such as Phillipson (1992), Schäffner (2002), Cook (2007), Ellis (2008), Zainuddin (2011), Özçelik (2013), Salı (2014), Paker & Karaağaç (2015), Timuçin & Baytar (2015) and many other mentioned researchers, who supported the Bilingual Approach, conducted studies to shed light on the idea that supports L1 usage in EFL classrooms by proposing different circumstances of mother tongue usage. These circumstances are such as saving time, clarifying ambiguous grammatical points, checking

for comprehension, supporting students' target language development in a positive way, and etc. On the other hand, Elridge (1996), Auerbach (1993), Pachler and Field (2001), Carless (2007) Krashen (1981), Kellerman (1995), Weschler (1997) and other prominent figures have contributed to the Monolingual Approach throughout the years by promoting reasons of why mother tongue should not be used during teaching foreign languages due to several reasons. Some of the major reasons of L1 exclusion from language classrooms are because of the fact that students' target language development may not be as expected, students may not be autonomous learners during target language learning, teachers code-switching may be demotivating for other foreign students in the classroom. Having said all the crucial assumptions of the prominent scholars with their reasons underlying when to use L1 or when not to use L1 can also be highlighting mark regarding language teachers' code-switching acts in EFL classes.

Although there have been numerous studies conducted on the L1 (mother tongue) use in L2 classrooms in the previous years until so far, there is still no definite answer of whether directly excluding L1 from EFL classrooms or not. Above mentioned groups of educationalists contributed to the L1 debate by bringing different dimensions and showed that the need for L1 usage likely to exist on some occasions in EFL classrooms. The current study particularly focuses on Cyprus Turkish Preparatory School context EFL classroom and teachers' perceptions about L1 usage by benefitting from code-switching from English to Turkish since the number of the studies on this issue is scarce.

2.Method

This study investigated the perceptions of the non-native teachers' about the usage of Turkish (L1) in foreign languages classes, in which English is both the Target Language (TL) and medium of the instruction in an English Preparatory School (EPS) of European University of Lefke (EUL), Northern Cyprus. Furthermore, it investigated the underlying reasons for English teachers using Turkish in their language classrooms, and the factors affecting teachers' code-switching, the pedagogical purposes of using Turkish when teaching English will be another emphasis. For this purpose the following research questions were designed:

1. What are the non-native English teachers' perceptions of the Turkish (L1) usage in EFL classrooms?
2. What are the reasons for non-native English teachers to use Turkish (L1) in EFL classrooms?

The participants of the study were 5 non-native female English teachers out of 21 English teachers selected purposively and voluntarily. Participants particularly were selected by considering their current levels; therefore, especially teachers who were teaching at different levels were chosen within the scope of the study. Since the female English teachers' number outweighed male English teachers' (i.e: there were only 2 male English teachers working), the gender role of teachers was not examined in the present study. The age of the teachers ranged from 25-35. However, their age characteristics and L1 usage relations were not the focus in this study. The instructors had various work experience (3-8 years) in English teaching at the EPS of EUL. 3 instructors out of 5 had 6-8 years and 2 out of 5 had 2-4 years of teaching experience. Furthermore, the educational background of the instructors differed from each other regarding BA, MA. 3 instructors out of 5 were MA graduates and 2 out of 5 were BA graduates. The classes they were teaching were of approximately 25-35 students and the learners were having 5 sessions of English course every day. They were teaching English at different levels (i.e., beginner, elementary, pre-intermediate, intermediate and upper-intermediate).

This study was carried out by following qualitative means of investigation. A case study was employed. In this investigation, the data collection instruments were semi-structured interviews and observations. Each semi-structured interview lasted approximately an hour for each participant and classroom observations were carried out by using a predetermined observation checklist. The collected data were then analyzed qualitatively.

4.Findings

Research Question 1: What are the non-native English teachers' perceptions about L1 usage in EFL classrooms?

Generally, the participants did not reject the need for using Turkish when it is really needed. The participants said that Turkish is not allowed to be used in all cases; therefore, the majority of the participants mentioned some circumstances in which Turkish can be used. For instance, T1 expressed the need for using Turkish when teaching English as follows:

> *"Errr We really we need to use Turkish not in all the cases like if you use some keywords according to the purpose so it will be key for us to save the time and it will be very beneficial when teaching English. If you are stubborn to use English all the time, the students may not understand you and they may have a problem with some grammar points you need to carry on. At that point you may use some quick words that have equivalent in Turkish, it can save time and you can carry your lesson."*

(Teacher 1)

Another participant had a similar view as Teacher 1 as follows:

> *"English should be used mostly. If we really want our students to acquire language, we shouldn't use Turkish to make them get used to the language."*

(Teacher 5)

However, one participant rejected Turkish use directly by considering the strict English medium instruction policy in her workplace. The participant mentioned:

> *"There is a policy to use English while teaching all the time. Therefore, in my lessons I do not prefer using Turkish during teaching English because I believe that if I use Turkish, the students will expect me to use Turkish all the time, so I never use any Turkish words."*

(Teacher 2)

To sum up, even though there is a high awareness of institutional English medium instruction policy, teachers did not deny the fact that they feel the need for Turkish use time to time.

Research Question 2: What are the reasons for non-native English teachers to use L1 in EFL classrooms?

Some participant teachers put emphasis on the students' English proficiency level is the detrimental factor of teachers' L1 choice. They pointed out this view as follows:

> *"Especially for the Beginner levels, I use Turkish because they don't understand anything. You need to use mother tongue more for the Beginner levels." "Yes, of course, there are variations between levels. Because pre-intermediate students can understand you better but Beginner and Elementary students don't understand you."*

(Teacher 3)

> *"…if I have beginner level group I may tend to use Turkish but if I have intermediate level students I don't prefer to use Turkish to make the meaning clear."*

(Teacher 4)

Some participant teachers emphasized using L1 for clarifying grammatical and lexical ambiguities as follows:

> *"As I said before like errr, if the students are having difficulty with a word which they don't understand, they checked it up, but they didn't really understand what the words mean and especially with the Beginner level and the Elementary level, it will be very useful if we use the Turkish equivalent word and then carry on… Umm, or as I said again like in a grammar point or in a vocabulary section if the students have difficulty and then whole class has a difficulty then stop the lesson and just one minute and give the Turkish instruction, Turkish equivalent and then carry on."*
>
> (Teacher 1)

> *"I use Turkish to make instructions more clear and understandable. Also, I use it in order to make students see similarities between two languages. If students do not understand English translation of a word, I try to translate it to their own language to make it more memorable…"*
>
> (Teacher 5)

The majority of the participants did not reject the uses of Turkish but their purposes were to use Turkish to sustain clear understandings especially when explaining abstract words and give instructions in Turkish for further guidance.

4.Discussion

Generally, most of the participants had mainly neutral attitude towards the L1 usage when teaching English; however, only one of the non-native teachers rejected its usage by believing L1 can inhibit the target language acquisition. The other participants did not totally reject Turkish usage; however, when it came to their classroom practices, mismatches have been seen especially for those teachers who did not reject using Turkish up to some extent, but they did not use it in their actual practice when teaching English. Only two non-native English teachers' interview responses and actual pedagogic styles matched in terms of Turkish usage when teaching English. The reasons underlying behind those who accepted the need of using Turkish, but could not use might have been due to multicultural learning context. The reasons for not using L1 in those teachers' classrooms could have been due to multicultural learning setting since foreign students were present in the classes. Teachers' language choice could have been depending on the students' profile, or classroom atmosphere. In contrast, the teachers who used L1 when they were observed had a chance to actuate L1 to some extent because there were no international students in their classes on the observation day.

Non-native English teachers used Turkish for several reasons. The majority of the participants accepted the fact that Turkish could be used to check comprehension, to clarify the meaning, to bring fun into the learning atmosphere, and etc... According to the interview and observation data, the findings have shown that teachers, who were especially teaching at Beginner and Elementary levels, preferred to use Turkish in order to help students when teaching complex grammar topics such as passive voice or reported speech. In a recent study that İyitoğlu (2016) conducted in Turkey revealed that teachers' code-switching reason resembled in terms of its use. It was found that teachers code-switched due to *"clarifying grammatical structures and vocabulary items"* (p.267). Furthermore, teachers who were teaching English to lower levels (Beginner-Elementary) tended to use Turkish for vocabulary to bring Turkish equivalence of ambiguous English words. Unlike teachers who supported Multilingual approach rather than solely applying the Monolingual approach in their classrooms, one teacher (T1) remained to be an advocate of Monolingual approach in her

English classroom. That participant has had a strong Monolingual approach belief although she was aware of the students' mother tongue need (Turkish in this case). She said that she never used Turkish even if students had difficulty in understanding any challenging grammar topics or any abstract words that might confuse students' mind. The participant tried to give more examples as much as she could. That teacher, who had a Monolingual way of teaching style, agreed with this idea because she believed that target language should be used as the only source of input, and she added that when an English teacher wanted to emphasize the importance of using or learning English s/he could use other teaching techniques such as flashcards, body language, miming and etc... in order to avoid using Turkish in the classroom. She added that she never used any Turkish word in her language classes. This was her principle. She has been teaching here for 8 years and she has never used any Turkish words during teaching.

When the reasons for non-native English teachers to use L1 (Turkish) in their classroom were taken into consideration, it can be said that the teacher who supported only Monolingual teaching philosophy in her classroom used Turkish only when the directorate required from her when announcing any important news. Unlike T1, the other non-native teachers used Turkish especially for lower level students who were at Beginner and Elementary proficiency levels. In this case, the students' current levels mattered in terms of teachers' code-switching between Turkish and English. Likewise, Bensen and Çavuşoğlu (2013) conducted a study in an English Preparatory School of a private university in North Cyprus referred to Tien and Liu (2006) who proposed that students with a low proficiency level of English regarded teachers' code-switching effective for better comprehension in EFL classes. Similarly, in this study, the majority of the participants put emphasis that students' language competence level could affect teachers' code-switching when teaching English. Majority of the participants emphasized that the lower levels such as Beginner and Elementary level students were more in need of translation and using their Mother Tongue (Turkish) to learn English better although some of the participant teachers observed there was no significant correlation between teachers' Turkish use and students' target language acquisition success. Most of the non-native teachers found Turkish practical especially when giving instructions, so they tried to simplify their language or they tried to translate the instructions into Turkish to be clearer for all learners.

5. Conclusion

Generally, the majority of the participants were highly aware of English medium instruction in their workplace. On the other hands, participants were also aware of the language learners' Psychological, Cognitive and Linguistic needs. All of the participants asserted that they do their best to increase the target language learning in EFL classes; however, the ways of doing this differ from each other for several reasons. Overall, the result of this study suggests that there are several disadvantages of using L1 proposed by the participants such as students becoming dependent on L1 help and a high possibility of inhibiting from target language acquisition. Although some drawbacks were identified by the participants, the advantages of L1 inclusion in EFL classes outweighed the disadvantages. The majority of the participants benefitted from code-switching in EFL classes due to several reasons such as clarifying grammatical rules and abstract words, managing time efficiently, giving clear instructions, establishing positive learning atmosphere, decreasing students' anxiety level and also following administrative requirements.

6. Implications

This study was conducted with an intention to guide specifically Non-native English teachers in terms of the necessity of Turkish they feel to use in their EFL classrooms.

Although the central focus was non-native English teachers especially working in a language school, the topic of the study applies to all educationalists around the world. The current study can guide institutions, educationalist, curriculum developers, decision-makers, teachers, and teacher-trainers in the future. In other words, this study may also contribute to the policymakers to find opportunities to make necessary changes regarding the current education system. This study should not be regarded as the guideline for only stakeholders, but also it can be seen as a reference for teachers to evaluate their teaching practices and beliefs.

7.Limitations

This study has some limitations. It was conducted with a limited number of participants so the findings of it cannot be generalized to a larger population. Moreover, it is limited in terms of combining students' perceptions with teachers' perception of L1 in L2 since only the teachers were the participants. Also, observing the participant teachers more than once would yield richer data.

8. Implications for Further Research

Further research can be conducted by extending the criteria such as gender difference, work experiences, students' perceptions which would affect English teachers' language preference.

References

Atkinson, D. (1987). The mother tongue in the classroom: A neglected resource? *ELT journal*, *41*(4), 241-247.

Auerbach, E. R. (1993). Reexamining English only in the ESL classroom. *TESOL Quarterly*, *27*(1), 9-32.

Bensen, H. & Çavuşoğlu, Ç. (2013). Teachers' perspectives on and uses of code- switching in adult EFL classrooms. Paper presented at the 1st. Oxford ELT Conference, April 26-27, 2013, Kalkanlı, North Cyprus.

Carless, D. (2007). Student use of the mother tongue in the task-based classroom. *ELT Journal*, *62*(4), 331-338.

Cenoz, J. (2008). The acquisition of pragmatic competence and multilingualism in foreign language contexts. In *Intercultural language use and language learning* (pp. 123-140). Springer, Dordrecht.

Cook, G. (2007, April). Unmarked improvement: values, facts, and first languages. In *IATEFL Conference*, Aberdeen, 18-20.

Cook, V. (2001). Using the first language in the classroom. *Canadian Modern Language Review*, *57*(3), 402-423.

Dean, M. (1994). *Critical and effective histories: Foucault's methods and historical sociology*. London: Routledge.

Dendrinos, B. (2006). Mediation in communication, language teaching and testing. *Journal of Applied Linguistics*, *22*, 9-35.

Deller, S., & Rinvolucri, M. (2002). *Using the mother tongue: Making the most of the learner's language*. Delta.

Eldridge, J. (1996). Code-switching in a Turkish secondary school. *ELT journal*, *50*(4), 303-311.

Ellis, R. (2008). A typology of written corrective feedback types. *ELT Journal*, *63*(2), 97-107.

Harbord, J. (1992). The use of the mother tongue in the classroom. *ELT Journal*, *46*(4), 350-355.

Harmer, J. (2001). The practice of English language teaching. *London/New York*.

İyitoğlu, O. (2016). Code switching from L' to L1 in EFL classrooms. *Croatian Journal of Education*, 18(1), 257-289.

Kafes, H. (2011). A neglected resource or an overvalued illusion: L1 use in the foreign language classroom. *International Journal on New Trends in Education and Their Implications*, *2*(2), 128-140.

Kaynardağ, A. Y. (2017). Shall we forget about L1 when teaching English?. *TÖMER Dil Dergisi*, (167.2).

Kellerman, E. (1995). Crosslinguistic influence: Transfer to nowhere? *Annual review of applied linguistics*, *15*, 125-150.

Larsen-Freeman, D. (2011). Empowering the language learner: A discussion with Diane Larsen. Freeman. [Lecture]. Lecture presented at a continuing education workshop at the New School for General Studies. New York, NY.

Mouhanna, M. (2009). Re-examining the role of L1 in the EFL classroom. *UGRU Journal*, *8*, 1-19.

Nation, P. (2003). The role of the first language in foreign language learning. *Asian EFL Journal*, *5*(2), 1-8.

Nunan, D. (1995). Closing the gap between learning and instruction. *TESOL Quarterly*, *29*(1), 133-158.

Özçelik, N. (2013). Mother tongue use in French foreign languag classrooms. *Turkish Studies-International Periodical for the Languages, Literature and History of Turkish or Turkic*, *8*(10), 541-553.

Paker, T. & Karaağaç, Ö. (2015). The use and functions of mother tongue in EFL classes. *Procedia-Social and Behavioral Sciences*, *199*, 111-119.

Pennycook, A. (2001). *Critical applied linguistics: A critical introduction*. Routledge.

Phillipson, R. (1992). *Linguistic imperialism*. Oxford: Oxford University Press.

Piasecka, K. 1988. The bilingual teacher in the ESL classroom. In Sandra Nicholls and Elizabeth Hoadley-Maidment, eds. Current issues in teaching English as a second language to adults. London: Edward Arnold. 97-107.

Sali, P. (2014). An analysis of the teachers' use of L1 in Turkish EFL classrooms. *System*, *42*, 308-318.

Sampson, A. (2012). Learner code-switching versus English only. *ELT Journal Volume 66(3),* 293-303.

Schäffner, C. (Ed.). (2002). *The role of discourse analysis for translation and in translator training*. Multilingual matters.

Schweers Jr, C. W. (1999). Using L1 in the L2 classroom. In *English teaching forum 37*(2), 6-9.

Sweet, H. (1964). The Practical Study of Languages: A Guide for Teachers and Learners. Language and Language Learning [Series], Number 1.

Timuçin, M., & Baytar, I. (2015). The functions of the use of L1: Insights from an EFL classroom. *Kastamonu Eğitim Dergisi, 23(1),* 241-252.

Üstünel, E. & Seedhouse, P. (2005). Why that, in that language, right now? Code-switching and pedagogical focus. *International Journal of Applied Linguistics*, *15*(3), 302-325.

Weschler, R. (1997). Uses of Japanese in the English Classroom: Introducing the Functional-Translation Method. *Kyoritsu Women's University Department of International Studies Journal*, *12*, 87-110.

Zainuddin, H., Yahya, N., & Morales-Jones, C. A. (2011). Methods/Approaches of teaching ESOL: A historical overview. *Fundamentals of Teaching English to speakers of other languages in K-12 Mainstream Classrooms*, 63-64.

Okumuş-Ceylan, N., (2019). Thoughts on learner autonomy in a computer assisted language learning program. *International Online Journal of Education and Teaching (IOJET)*, *6*(2), 339-354.

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THOUGHTS ON LEARNER AUTONOMY IN A CALL SYSTEM TOGETHER WITH STUDENT PERCEPTIONS

Research Article

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Abstract

In our institution, Quartet (computer software program) was a part of the curriculum which provides the students with the opportunity to work on their own in order to develop their language skills. To what extent the learners benefit from the materials and the time provided for them mainly depends on students since as Dakin suggests (1973) "though the teacher may control the experiences the learner is exposed to, it is the learner who selects what is learnt from them" (p. 16). According to the observations of teachers, some, but not all students worked effectively in lab lessons. This paper aims to identify the students' perceptions about themselves, the teacher, their peers and language learning to have an idea of their autonomy and their thoughts on computer assisted language learning. Data were gathered through a 46-item questionnaire. Frequency tests were used to determine the frequencies and percentages of each item to find out the perceptions of participants on learner autonomy and the usefulness of computer lab lessons. Though the students shoulder the responsibility of learning, most students need guidance of their teachers to set goals for their learning process.

Keywords: learner autonomy, computer assisted language learning

1. Introduction

Language learning has become interesting, easy and enjoyable with many multimedia materials and internet sites. Schools are now providing their students with these materials to enable them to practice their language skills. In our institution, Quartet (computer software program) is a part of the curriculum. Students have two-hour lab lessons each day where they study on their own with this program, observed by the teacher during the education year. According to the observations of teachers, some, but not all students worked effectively in lab lessons. These "some" students can be called autonomous learners since they attended regularly, worked hard, asked questions frequently, identified their weaknesses and strengths, and determined their own pace in lab lessons. The main goal of this paper is to identify their perceptions about themselves, the teacher, their peers and language learning to have an idea of their autonomy.

"Language is the main channel through which the patterns of living are transmitted to the child, through which the child learns to act as a member of society and, …to adopt its culture, modes of thought, … its belief and values" (Halliday, 1978, p.9). For the learner, then language is both a subject of study and a means of receiving a meaningful world from others and is at the same time a means of re-interpreting the world to his own ends" (Barnes, 1979).

Since knowledge of language cannot be defined or even understood without taking into account of the goals and purposes of person who is attempting to gain this knowledge successful language teaching must therefore start from the learner rather than the language and the language learners must be made aware of the fact that they are the most important

element in the learning process. In this way, they learn how to learn for the purposes they design for themselves.

The act of learning is, of course, personal and individual. Learners have the final responsibility of knowing whether or not they know, whatever type of "knowing" that might be, when in real-life situations which are, to paraphrase Halliday, "actively symbolized" by language (Halliday, 1978, p.3). But in order to reach this level of being able to use language to "create meanings of a social kind" and to "participate in verbal contest and verbal display" (Halliday, 1987) the learner has to learn the process of learning and to be able to manage the complex learning network of learning goals, materials, sequencing of the materials, deciding how materials shall be used, deciding on tasks to be done, keeping records and making evaluations. This organization of learning material and mapping pathways through it has been traditionally the responsibility of the teacher. Our definition of what is a good learner has been modified to include those who are "good thinkers and problem solvers whose cognitive strategies enable them to exercise control over their own learning" (Gange, 1980). This metacognitive awareness means that the learner can no longer be regarded as a container into which information is crammed by an autocratic disseminator of knowledge. The learner must be a "participant in the learning process" as Harri-Augstein (1978) puts it where "meaning is a product of social interaction".

2. Learner autonomy

Learners must be enticed to accept responsibility not just for their learning but for the process involved in it. They must be ready to make decisions about how to manage all the complexities involved. As Benson (2001) states, "Learner control of the cognitive processes involved in language learning is a crucial factor in what is learned." Since as Nunan (1996) states, "Learners tend to follow their own agendas rather than those of their teachers" (195b: 135). Dakin (1973, p. 16) supports this statement with his following argument, "though the teacher may control the experiences the learner is exposed to, it is the learner who selects what is learnt from them".

Since there are many options today for language learners outside the classroom context, providing students with essential research strategies has become much more important than making them learn limited amount of knowledge merely in the classroom from the language teacher. In such a learning environment, the role of the teacher is changing from the status of a "genius" who knows all to a "guide" who shows where and how to access knowledge and how to adapt or adopt it. We cannot expect learners to make the leap from total domination in the school classroom to full autonomy in the university. Therefore, emphasis should be focused on providing them with skills and raising an awareness for language learning strategies to teach how to learn languages. Learning how to apply language learning strategies and how to improve their skills may be beneficial to them when they must cope with a vast amount of information for specific tasks in their professional lives.

We wanted to provide our students with materials and an opportunity to develop their language skills through self-study. With this goal in our mind, we based our curriculum on Quartet, which is a computer assisted language learning system that includes a series of course books and multi-media materials for students at beginner to advance levels. According to the examinations of laboratory lesson teachers, some students attended regularly, worked hard, asked questions frequently, identified their weaknesses and strengths, and determined their own pace. Based on their qualifications observed by the teachers, such students can be called autonomous learners as characteristics of an autonomous learner is listed as follows in the literature (Po-ying, 2007; Scharle & Szabo, 2000; St Louis, 2007).

- willing and have the capacity to control or supervise learning
- knowing their own learning style and strategies
- motivated to learn - good guessers
- choosing materials, methods and tasks
- exercising choice and purpose in organizing and carrying out the chosen task
- selecting the criteria for evaluation
- taking an active approach to the task
- making and rejecting hypotheses
- paying attention to both form and content
- willing to take risks

3. Quartet (CALL) system

Littlewood (1996) classifies autonomy as proactive and reactive autonomy. In proactive autonomy, the learner determines objectives, selects methods and evaluates what he has learned. In reactive autonomy, the learner organizes resources autonomously to reach his goal in an initiated direction. Benson (2001) explains proactive autonomy as control over content and reactive autonomy as control over method. This study focuses on learner autonomy in a school context where the students proceed through already defined content; therefore, what we refer to as autonomy should better be regarded as reactive autonomy. In our institution, students have two-hour laboratory lessons every day during which they use the multi-media materials on computer and study the worksheets individually. During these self-study lab lessons, the teacher is present to guide and assist the students when they feel the need and ask for help.

Quartet CALL system offers the following:

- Pronunciation activities provide realistic native speaker models of English and incorporate voice recordings and playback to let students compare their recordings with the models provided.
- Grammar activities include explanations of forms and drills to practice the usage of them.
- Reading texts are provided together with pre-, while-, and post-reading activities in which true-false statements, comprehension questions, information sequence and chart completion tasks are used. New vocabulary is practiced in reading activities through guessing the meaning from the context, matching, and completing the paragraph.
- The program offers short creative writing tasks which oblige students to use their writing and computer skills. These tasks also provide students with an opportunity to read others' writings, giving students the chance to view writing from both reader and writer perspectives.

The students are provided with immediate feedback for the exercises on the computer. When they are unable to comprehend the feedback given, the teacher is there to explain. Also, each level has an achievement test which may raise students' awareness of their own language learning process. By means of the achievement tests, students can recognize their strengths and weaknesses.

4. Review of studies on CALL

The related literature suggests that CALL presents opportunities which help learners to develop autonomy by working individually and directing their own learning without the guidance of a teacher (Beatty, 2003). St Louis (2007) indicated that students started to take control of their learning by participating in decision-making with regard to materials, activities and evaluation and practicing different kinds of exercises that the Internet provides. Thus, he suggested that technology can help students to develop learner autonomy and raise their awareness of learning styles and strategies. Mitra and Steffensmeier (2000) put forward a positive correlation between a computer-enriched environment and students' attitudes towards computers in general, their role in teaching and learning, and their ability to facilitate communication. Beatty (2003) also claims that most educational games prompt peripheral learning, which means that students are unaware of the objectives of the lesson, they only concentrate on the game and accordingly they learn unconsciously. As Kenning and Kenning (1983) state, with visual effects, it is easy to attract learners' attention and maintain their motivation. Movement of words, syllables or characters around the screen, and simple graphic illustrations of some key lexical items are only some examples of how computers can affect learners' motivation in a positive way.

Blin (2004) states that from the beginning, CALL applications give learners control over some aspects of language learning to some extent by promoting independent learning. We, as teachers, expect them to get the utmost advantage of the multimedia materials on the computer for their self-development. However, in order to use the materials effectively while they are studying on their own, they have to be ready and willing to plan their learning, set goals, evaluate their learning process and do their best. That is, they should be autonomous. Individual examinations of teachers during computer laboratory lessons voiced at weekly meetings indicated that some, but not all students attended regularly, worked hard, asked questions frequently, identified their weaknesses and strengths, and determined their own pace.

Depending on these observations and taking into consideration the features of autonomous learners suggested in the literature (Po-ying, 2007; Scharle & Szabo, 2000; St Louis, 2007), we might derive a conclusion and identify these as autonomous learners and the others as less autonomous. Thus, this is an action research study to confirm or disconfirm the implications derived from the individual observations of the teachers. The focus of this paper is finding out their students' perceptions about themselves, the teacher, their peers and language learning to have an idea of their autonomy and confirm our and to identify the effectiveness of the program for the students' self-development.

5. The study

The aim of this research is to find out what students believe about language learning and where they place themselves, teachers, opportunities, feedback, and their classmates in the language learning process. Therefore, the study addresses the following questions:

- Are the students autonomous?
- What is the role of the opportunities to use language in language learning?
- What is the role of the practice in language learning?
- What is the role of the language teacher in language learning?
- What is the role of the students' own effort in language learning?

The questionnaire also includes items related to computer software program; therefore, it addresses the following questions as well:

- Can computer program contribute to language learning?
- Did the students like using the program?

The study was conducted at Zonguldak Karaelmas University Obligatory Preparatory School. The participants were 100 prep school students. They were chosen randomly. In this study, the instrument was used to collect data was a questionnaire. The questionnaire was adapted from "What is important to you in language learning? (www.vuw.ac.nz/lals/research/Docs/QUIZSYS99.pdf)", a published questionnaire that is widely used in research related to learner autonomy in language learning. The questionnaire was conducted in Turkish, students' mother tongue. Responses to questionnaire items represent the data for this study. First, the questionnaires were numbered, and then items were coded. Codes were entered into Statistical Packages for Social Sciences (SPSS 10.0), and SPSS was used to analyze the data. Frequency tests were used to determine the frequencies and percentages of each item to find out the perceptions of participants on learner autonomy and the usefulness of computer lab lessons.

6. The findings

Table 6.1. *The role of the teacher*

No	**Items**	**Totally Agree-Agree**	**Disagree - Totally Disagree**
		Percentages	
1	I believe that the role of the teacher is to tell me what to do.	51	49
3	I believe that the role of the teacher is to help me learn effectively.	**93**	7
7	I believe that the role of the teacher is to tell me what progress I am making.	61	39
13	I believe that the role of the teacher is to tell me what my difficulties are.	59	41
19	I believe that the role of the teacher is to create opportunities for me to practice.	**71**	39
21	I believe that the role of the teacher is to decide how long I spend on activities.	36	64
25	I believe that the role of the teacher is to tell me why we are doing an activity.	**78**	22
28	I believe that the role of the teacher is to set my learning goals.	**65**	35
29	I believe that the role of the teacher is to give me regular tests.	53	47
31	I believe that the role of the teacher is to offer help to me.	58	42

According to the results of Table 6.1., while the students are not sure about whether the teacher should tell them what to do or not, they believe that the teacher should help them learn effectively and create opportunities for learning. Half of the students state that the role of the teacher is to tell them what their difficulties are, and more than half of the students believe that it is the teacher is to tell them what progress they are making. They also believe that the teacher should tell them what to do and why they do an activity; similarly, s/he should also set learning goals for students and tell them what their difficulties are. Also, the teacher should give them regular tests and offer help to them.
According to the results of Table 6.2., almost all students believe that all people learn languages in different ways. Thus, we might think that they are aware of individual differences among language learners.

Table 6.2. *Language learning*

No	**Items**	**Totally Agree-Agree**	**Disagree-Totally Disagree**
		Percentages	
5	I believe that all people learn languages in the same way.	3	**97**
24	I believe that different people learn languages in different ways.	**90**	10

The results of Table 6.3 indicate that most of the students believe that they need to know language learning rules before they can communicate in English. As the language teaching in state primary, elementary or high school is mainly based on the structure of the language, they might believe that they need to produce grammatically correct sentences.

Table 6.3. *Communication in English*

No	**Items**	**Totally Agree-Agree**	**Disagree-Totally Disagr**
		Percentages	
4	I believe that I can communicate in English without knowing the rules.	31	69
22	I believe that I need to know language learning rules before I can communicate in English.	66	34

According to results reported in Table 6.4., the students believe and the literature on error analysis also suggests that making mistakes is a natural part of language learning.

Table 6.4. *Mistakes*

No	Items	Totally Agree-Agree	Disagree-Totally Disagree
		Percentages	
12	I believe that making mistakes is harmful to language learning.	5	**95**
26	I believe that making mistakes is a natural part of language learning.	**96**	4

The results shown in Table 6.5 suggest that students believe that they are not above average at language learning. They consider their level of English as average or below average. In order to practice autonomous behaviors, they should be able to identify their level of English.

Table 6.5. *Level at language learning*

No	Items	Totally Agree-Agree	Disagree-Totally Disagree
		Percentages	
9	I believe that I am average in language learning.	54	46
23	I believe that I am above average at language learning.	26	74

Table 6.6. *Learner Autonomy*

No	Items	Totally Agree-Agree	Disagree-Totally Disagree
		Percentages	
2a	I believe I know how to find my own ways of practicing.	52	33
2b	I am confident about finding my own ways of practicing.	63	37
2c	I am willing to find my own ways of practicing.	**76**	24
2d	I accept responsibility for finding my own ways of practicing.	**72**	28
6a	I know how to check my work for mistakes.	70	30
6b	I am confident about checking my work for mistakes.	65	35
6c	I am willing to check my work for mistakes.	**83**	17
6d	I accept responsibility for checking my work for mistakes.	**74**	26
8a	I believe I know how to explain what I need English for.	**81**	19
8b	I am confident about explaining what I need English for.	**80**	20
8c	I am willing to explain what I need English for.	55	45
8d	I accept responsibility for explaining what I need English for.	70	30
11a	I believe I know how to identify my strengths and weaknesses.	76	24

11b	I am confident about identifying my strengths and weaknesses.	74	25
11c	I am willing to identify my strengths and weaknesses.	**74**	26
11d	I accept the responsibility to identify my strengths and weaknesses.	**84**	32
14a	I believe I know how to ask for help when I need it.	**73**	27
14b	I am confident about asking for help when I need it.	**75**	25
14c	I am willing to ask for help when I need it.	68	16
14d	I accept responsibility for asking for help when I need it.	78	22
16a	I believe I know to how to set my own learning goals.	69	31
16b	I am confident about setting my own learning goals.	68	32
16c	I am willing to set my own learning goals.	**69**	31
16d	I accept the responsibility to set my own learning goals.	**78**	22
17a	I believe I know how to plan my learning.	57	43
17b	I am confident about planning my learning.	57	43
17c	I am willing to plan my learning.	**77**	23
17d	I accept the responsibility to plan my learning.	**72**	28
32a	I believe that I know how to measure my language learning progress.	46	54
32b	I am confident about measuring my language learning progress.	53	47
32c	I am willing to measure my language learning progress.	**80**	20
32d	I accept the responsibility to measure my language learning progress.	**70**	30

Items in Table 6.6. include statements starting with "I believe/ I'm confident/ I'm willing/ I accept". These statements indicate different levels of autonomy where "I believe" indicates a high level of autonomy, "I accept" indicates a low level. Taking this explanation into consideration, the fact that most of the students are willing to find their own ways of practicing and accept this responsibility are indicators for lower level autonomy since they are not confident enough to do it on their own. Most of them define themselves as willing to check their work for mistakes and accept its responsibility.

Since they are in the process of learning and mistakes might be defined as trials leading to the correctness, it is quite understandable that they may not notice their mistakes or know how to correct them. Thus, they do not define themselves as confident to do so. Similarly, most of them just accept the responsibility to identify their strengths and weaknesses and to measure their language learning progress. Although they do not try to strengthen their weak points in general, most of them are eager to ask for help when they need. The fact that they accept the responsibility to plan their own learning and set their learning goals accordingly is an indicator of a high level of autonomy.

As indicated in Table 6.7., the students believe that feedback on their language learning from other people is the most important one. Their own feedback is important one and the feedback on their language learning from their teacher is the least important. As most of them just accept the responsibility to identify their strengths and weaknesses and to measure their language learning progress, their own feedback on their language learning process should be important.

Table 6.7. *Feedback*

No	**Items**	**The least important**	**Important**	**The most important**
		Percentages		
33a	I believe feedback on my language learning that I give myself helps me most.	**60**	34	6
33b	I believe feedback on my language	34	**55**	11

	learning from the teacher helps me most.			
33c	I believe feedback on my language learning from other people helps me most.	6	17	**83**

The results displayed in Table 6.8. indicate that the students believe that their classmates are the most important in providing opportunities to use the language. They themselves are important in providing opportunities to use the language and their teacher is the least important. To exercise autonomous behaviors, they should find opportunities to use the language themselves; however, the fact that they emphasize the ones provided by their peers indicates their low level of autonomy.

Table 6.8. *Opportunities to use language*

No	Items	The least important	Important	The most important
			Percentages	
34a	I believe that opportunities to use the language should be provided by my classmates.	12	16	**72**
34b	I believe that I should find my own opportunities to use the language.	**59**	34	7
34c	I believe that opportunities to use the language should be provided by my teacher.	29	**50**	21

According to the results shown in Table 6.9., the students believe that their classmates are the most important in finding the best ways to learn a language. They themselves are important in finding the best ways to learn a language. Their teacher is the least important in finding the best ways to learn a language. Similar to the results in Table 8, if they were more autonomous learners, they themselves would be the most important to find the best ways for themselves.

Table 6.9. *The ways to learn a language*

No	Items	The least important	Important	The most important
			Percentages	
35a	I believe I can find for myself the best ways to learn a language.	45	**50**	5
35b	I believe that my classmates can show me the best ways to learn a language.	6	15	**79**
35c	I believe the teacher can teach me the best ways to learn a language.	**49**	35	16

Table 6.10. shows that the students believe that the teacher's being an expert at learning languages is the most important. Since they emphasize teacher's expertise at learning languages, they probably would like to regard the teacher as a role model. His being an expert at teaching languages is important. His being an expert at showing them how to learn is the least important.

Table 6.10. *The teacher*

No	Items	The least important	Important	The most important
		Percentages		
36a	I believe the teacher should be an expert at teaching language.	30	**59**	11
36b	I believe the teacher should be an expert at learning language.	6	23	**71**
36c	I believe the teacher should be an expert at showing students how to learn.	**64**	18	18

As seen in Table 6.11., the students believe that what their classmates do in the classroom is the most important in their language learning success. What they do in the classroom or what the teacher does in the classroom is less important. What they do outside the classroom is the least important. Similar to the results in Table 3.8. and 3.9., to exercise autonomous behaviors, they should put themselves at the center of their language learning process in and outside the classroom; however, the fact that they emphasize their peers and their teacher indicates their low level of autonomy.

Table 6.11. *Language learning success*

No	Items	The least important	Less important	Important	The most important
			Percentages		
37a	I believe my language learning success depends on what I do outside the classroom.	**45**	14	16	25
37b	I believe my language learning success depends on what I do in the classroom.	28	**37**	29	6
37c	I believe my language learning success depends on what my classmates do in the classroom.	1	14	38	**47**
37d	I believe my language learning success depends on what the teacher does in the classroom.	26	**35**	17	22

The results in Table 6.12. indicate that students believe their own effort is the least important in successful language learning. The language teacher is more important than their own effort. Practice is important in successful language learning. Opportunities to use the language are more important than practice. Feedback is the most important in successful language learning. To exercise autonomous behaviors, they should be able to give themselves feedback on their strengths and weaknesses, they should find opportunities to practice

language use themselves, and the most important one is that they should believe that their own effort is the most important one; thus, they should spend effort continuously.

Table 6.12. *Language learning*

No	Items	The least important	Less important	Important	More important	The most important
		Percentages				
38a	Feedback plays an important role in successful language learning.	8	8	13	14	**57**
38 b	Opportunities to use the language play an important role in successful language learning.	21	13	22	**33**	11
38c	Practice plays an important role in successful language learning.	7	11	**33**	30	19
38 d	The language teacher plays an important role in successful language learning.	21	**32**	23	18	6
38e	My own effort plays an important role in successful language learning.	**43**	36	9	5	7

According to results shown in Table 6.13., more than half of the students are mostly learners who like to learn with others. 57% of the students like to decide for themselves how and what they learn. According to the definition of autonomy, a learner should have the responsibility to define the contents and progressions. The fact that they identified themselves as learners who like to decide how and what they learn for themselves might be considered as they are ready to foster their autonomy.

Table 6.13. *Learners*

	Describes me	**Well**	**Better**	**Best**
No	**Items**	**Percentages**		
39a	Learners who like to learn with other people.	8	28	**68**
39b	Learners who like to learn with a teacher.	35	45	20
39c	Learners who like to decide for themselves how and what they learn.	**57**	27	16

Most of the students did not use computer to learn English before, and they do not prefer to learn English with a computer.

Table 6.14. *Computer use*

No	Item	Yes	No
		Percentages	
40	Did you use computer before to learn English?	15	**85**
41	I prefer to learn English without using computer.	24	**76**

The results shown in Table 6.15. indicate that most of the students believe that computer program cannot contribute to language learning, and it does not make language learning enjoyable. They believe that using Quartet software program is not useful activity for them, and they did not enjoy it.

Table 6.15. *Quartet program*

No	Items	Totally Agree-Agree	Disagree-Totally Disagree
		Percentages	
42	Computer program can contribute to language learning.	**94**	6
43	Quartet software program can make language learning enjoyable.	25	**75**
44	Using Quartet software program is a useful activity for me.	24	**76**
45	I enjoyed learning English using computer program.	16	**84**

As shown in Table 6.16., the students believe that mostly reading, listening and vocabulary can be developed using computer program. They believe that grammar and writing skills cannot be developed. To develop their writing competence, they might need feedback from their teacher.

Table 6.16. *Language Skills*

No	Items	No	Yes
		Percentages	
46a	Reading	28	**72**
46b	Writing	**82**	18
46c	Listening	22	**78**

46d	Vocabulary	27	**73**
46e	Grammar	64	36

7. Conclusion

Although the students accept the responsibility for planning their learning and set their own learning goals, they believe that the teacher should set learning goals for them. The fact that students do not take the responsibility for setting goals for their own learning and planning it leaving all the responsibility to the teacher indicates lower autonomy. It may partly explain why some students are not able to work effectively during lab lessons. As Oxford (1990) states that "self-direction is particularly important for language learners, because they will not always have the teacher around to guide them" (p.10).

Though the students believe that their own feedback and feedback provided by the teacher is important, feedback from their peers is the most important. Emphasizing feedback from others rather than their own feedback is another sign of a decrease in autonomy. The students believe that the ways to learn a language and opportunities to use the language should be provided by their classmates. They also believe that their language learning success depends on what their classmates do in the classroom. The emphasis they put on their classmates is also a sign of low autonomy.

The students believe that the teacher should firstly be an expert at learning languages, then at showing students how to learn and lastly at teaching language. Taking Turkish education system into consideration, we may regard this as a natural consequence of the education they have gotten since the early years of their school life where the teacher is in the center of the curriculum as the source of the information. Another reason might be the fact that their non-native English teachers are also English language learners in similar contexts. The fact that they want to be guided by their teacher is another sign of low autonomy.

Since the students did not enjoy learning English with Quartet program and did not find it useful, they did not like to learn with this program. Their negative attitudes toward Quartet program can partly explain why some students do not work effectively in lab lessons. The students prefer to learn with using computer; moreover, they believe reading, listening and vocabulary can be developed with using computer program. Therefore, we way state that using a computer language learning program that appeals to students' interests can be useful in language learning. Moreover, for students who are used to a traditional way of language learning making use of these materials can be very difficult and demanding even though CALL applications and materials are considered to be very effective for successful language learning (Chang, 2007; Felix, 2008; Kenning & Kenning, 1983; Pennington, 1989, 1996).

The aim of this research is to find out what students believe about language learning and where they place themselves, teachers, opportunities, feedback, and their classmates in the language learning process. Though they shoulder the responsibility of learning, what we found with this study is that most students need guidance of their teachers to set goals for their learning process. Although lab lessons are considered as self-study time, we might work together with students to set learning goals for them; individually or as a group. Moreover, we might focus on peer feedback to integrate it into evaluation process. This might help them to notice the mistakes easily and find ways to correct them. A further study can be done to find out the level of students' autonomy. The level of each student may be compared with the achievement test results to find out whether they study effectively or not.

7. Pedagogical implications

The fact that students do not take the responsibility for setting goals for their own learning and planning it leaving all the responsibility to the teacher may partly explain why some students are not able to work effectively during lab lessons. When we included self-study in the curriculum, we wanted to provide them with an opportunity to study on their own since Oxford (1990) emphasizes "self-direction is particularly important for language learners, because they will not always have the teacher around to guide them" (p.10). However, as Logan and Moore (2004, p. 1) state we cannot assume that learners know how to learn since as individual observations of students while they are studying on their own indicated that there is a certain number of students who cannot use the time and the materials provided. Tudor (1996, p. 34) supports this stating, "The knowledge and personal qualities that learner involvement requires cannot be taken for granted and need to be developed over time." The findings in this study indicate that most of the students need teachers to set goals for their own learning and to help them learn effectively.

To provide students with life-long learning skills, it is better to train language learners on how to learn languages through language learning strategies rather than providing them teachers whenever they study. Holec (1985, p.3) explains the aim of the training as "preparing learners to direct their own learning so that they may gradually move from a state of dependence on a teacher to the greatest degree of independence or autonomy possible in a particular set of circumstances". Benson (2001, p.146) states that "there is good evidence that learner development programs can be effective in improving language learning performance. As Holec (1979, p. 27) points out, "few adults are capable of assuming responsibility for their learning... for the simplest reason that they have never had the occasion to use this ability". Many researchers have explicitly stressed the importance of learner training for learner autonomy (e.g. Cotterall, 1995; Dam 1995; Dickinson, 1995; Holec, 1981; Huttunen, 1986; Oxford, 1990; Wenden, 1991).

References

Ayres, R. (2002). Learner attitudes towards the use of CALL. *Computer Assisted Language Learning, 15*(3), 241-249.

Bares, D. (1976). *From communication to curriculum*. Harmondsworth: Penguin.

Benson, P. (2001). *Teaching and researching autonomy in language*. London: Longman.

Beatty, K. (2003). *Teaching and researching computer-assisted language learning*. Essex: Pearson Education Limited.

Chang, L. L. (2007). The effects of using CALL on advanced Chinese foreign language learners. *CALICO Journal, 24*(2), 331-353.

Cotterall, S. (1995). Developing a course strategy for learner autonomy. *English Language Teaching Journal, 49*(3), 219-227.

Cotterall, S. (1999). Promoting learner autonomy through the curriculum: Principles for designing language courses. *ELT Journal, 54*(2), 109-117.

Dakin, J. (1973). *The language laboratory and language learning*. London: Longman.

Dam, L. (1995). *Learner autonomy 3: From theory to classroom practice*. Dublin: Authentik.

Dickinson, L. (1995). Autonomy and motivation: A literature review. *System, 23*(2)165-174.

Felix, U. (2008). The unreasonable effectiveness of CALL: What have we learned in two decades of research? *ReCALL, 20*(2), 141-161.

Gagné, R. M. (1977). *The conditions of learning*. New York: Holt, Rinehart and Winston.

Harri- Augstein, S. and Thomas, L.F. (1979). Self-organised learning and the relativity of knowing: towards a conversational methodology. In P.Stringer and D. Bannister (Eds). *Constructs of sociality and individuality*. London: Academic Press, 115-132.

Haliday, M.A.K. (1978). *Language as social semiotic: the social interpretation of language and meaning*. Sydney: Edward Arnold.

Holec, H. (1981). *Autonomy in foreign language learning*. Oxford: Pergamon.

Huttunen, I. (1986). Learning to learn languages: investigating learner strategies and learner autonomy. Report on Workshop 2B. Council for Cultural Cooperation. Council of Europe. Strasbourg.

Logan, S., & Moore, N., (2003). Implementing learner training from a teacher's perspective. Proceedings of the Independent Learning Conference 2003. Published 20 September 2003.

Littlewood, (1996). Autonomy: An anatomy and a framework. *System, 24*(4) 427-435.

Mitra, A., & Steffensmeier, T. (2000). Changes in students' attitudes and student computer use in a computer-enriched environment. *Journal of Research on Computing in Education, 32*(3), 417-433.

Nunan, D. (1996). Towards autonomous learning: Some theoretical, empirical and practical issues, Taking control: Autonomy in language learning, R, Pemberton, et al. Hong Kong University Press.

Oxford, R. L. (1990). *Language learning strategies: What every teacher should know*. Massachusetts: Heinle & Heinle Publishers.

Pennington, M. C. (1989). *Teaching languages with computers*. Houston: Athelstan.

Pennington, M. C. (1996). *The power of CALL*. Houston: Athelstan.

Po-ying, C. (2007). How students react to the power and responsibility of being decision makers in their own learning. *Language Teaching Research, 11*(2), 225-241.

Reinders, H. (2007). *Learner and teacher autonomy, concepts, realities and responses*. Amsterdam: John Benjamins.

Kenning, M. J., & Kenning, M.-M. (1983). *An Introduction to computer assisted language teaching*. Oxford: Oxford University Press.

Scharle, A., & Szabo, A. (2000). *Learner autonomy: A guide to developing learner responsibility*. Cambridge: Cambridge University Press.

St Louis, R. (2007). Helping students become autonomous learners: Can technology help? *Teaching English with Technology, 6*(3). Retrieved from http://www.iatefl.org.pl/call/j_esp25.htm

Wenden, A. (1991). *Learner strategies in learner autonomy*. UK: Prentice Hall.

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THE INNOVATIVE GROUP LEARNING DESIGN: INSTRUCTIONAL GROUP ACTIVITIES

Research Article

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THE INNOVATIVE GROUP LEARNING DESIGN: INSTRUCTIONAL GROUP ACTIVITIES

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Abstract

The Instructional Group Activities Design (IGAD) refers to activities which aim to improve professional development and learning skills, in which a learning-centered teaching process is adopted and students study in small groups. The study aimed to both introduce the IGAD and determine pre-service science teachers' opinions on IGAs that were performed during the practice hours of the course "Special Teaching Methods I." In line with this aim, opinions of 56 pre-service science teachers on the practices were received. An opinion form, which includes open and close-ended questions, was used as a data collection tool. According to the results of the study, pre-service science teachers stated that the practice mostly contributed to their professional and social development areas. Regarding the negative aspects of the practices, pre-service science teachers underlined that they had difficulty regarding time and experienced certain group problems. Based on these findings, positive and negative aspects of the instructional group activities design for teacher training were discussed, and some recommendations were presented.

Keywords: instructional group activities, teacher training, group learning design, science education

1. Introduction

It can be stated that teacher training programs have entered a process of transition towards the social constructivist approach and experience-based and peer learning is the main quality in this new horizon. Inquiry-based learning is mainly considered as the way to ensure experience-based learning. Inquiry-based learning is based on social constructivism, and it is in the center of curriculum reforms made in science teaching in recent years. The content of science reforms consists of the activities carried out with small group studies, expressed with inquiry-based learning and application-based learning terms. As a result, teacher training curricula have entered a transition process towards the social constructivist approach (Lockhorst, 2004), and active learning and cooperation with peers are the main qualities in the new paradigm (Ruys, Van Keer & Aelterman, 2010). According to Forbes (2011), practice-based teacher training programs help candidates in eliminating the disconnection between their programs and the classroom environment.

In practice-based studies carried out in teacher training, this kind of practices was named and used differently. In their studies, while Birren and van den Kieboom (2017) named these practices as core teaching practices, Arias and Davis (2017) named them as a practice-based program, Weiland, Hudson and Amador (2014) named them as research-based practices and core practices, Aydın et al. (2013) named them as CoRe-based mentoring-enriched practicum, and Wilson and Kittleson (2012) named them as reform-based science instruction. However, all of them have significant common features. These features can be summarized as instructional practices, educational design or activities having a structure that aims to develop teaching skills, supports the student-centered and constructivist philosophy, aims to

ensure in-depth conceptual understanding, is generally maintained with small-group studies, and combines theory and practice.

According to Hennissen, Beckers, and Moerkerke (2017), teacher trainers around the whole world try to fill the gap between theory and practice and in this process, different teaching and learning models, such as inquiry learning, project-based learning, practical theorizing, problem-based learning, and research-informed clinical practice, are used. According to Weilan, Hudson and Amador (2014) who state that teacher trainers should focus on the theoretical and practical aspects of any practice, pre-service teachers should perform teaching practices with students and teachers since they can understand the complexity of teaching and develop their professional identity understanding in this way. Among the most important facilitating ways to develop professional teaching identity by pre-service teachers with their professional awareness is their getting involved in practices that combine theory and practice. Although its importance has been discussed sufficiently, according to Korthagent et al. (2001), many studies on teacher training have shown that the connection of theory with practice is insufficient. There are various reasons for this in teacher training. Among the most important ones are the facts that the type of information processing used by teacher trainers is either rational or cognitive, and pre-service teachers do not have sufficient concrete problem-solving experiences to apply theories (Hennissen, Beckers & Moerkerke, 2017). In this case, practices that will allow pre-service teachers to have the experiences in question should be included in training programs.

The content of teacher training programs must have a structure that is parallel to what is expected of students and teachers at grade levels at which science will be taught. At these grade levels, the aim of science teachers is to focus on the development of vision towards science, understanding of questioning and researching processes and using these by associating them with the daily life of students, rather than endeavor to obtain intense abstract information that students cannot associate with their theoretical, daily lives. Nevertheless, teachers are expected to use multiple teaching ways and methods that will help students obtain meta-cognitive skills and scientific process skills, in which students are made active, use research-based teaching strategies and consequently make scientific discussions and become aware of what they know, particularly the co-working skills, and also skills such as creativity and logical thinking, instead of providing scientific information through expository teaching. The teacher competencies in question should be provided to students in teacher training programs. In this case, the fact that pre-service science teachers have significant qualities in terms of content and pedagogical knowledge makes it obligatory for them to get the experience that will develop these and ensures parallelism with the new science teaching approach that is expressed as today's reform-based science teaching. To ensure this, instructional lesson designs that combine theory and practice, allow students to experience the importance and way for meaningful learning and support professional development gain importance in science teacher training programs. Method lessons are at the top of the lessons in which these course designs can be applied in the best way both due to their content and structure that consists of two parts, being theory and practice. Therefore, the Instructional Group Activities Design (IGAD) was addressed in this study, and it was aimed to determine the opinions of pre-service teachers on IGA performed in the "Special Teaching Methods I" course.

1.1. Instructional group activities design (IGAD)

The IGAD aims to increase professional development through teaching skills, in which a learner-centered teaching process is adopted, and includes activities in which pre-service teachers work together in ensuring the achievement of targets. The IGAD consists of six

design components in total, being learning targets and outcomes, task features, and the process of linking theory to practice, guidance, group structuring and interaction, and assessment and feedback. Before explaining the design components, it is necessary to state that these components are related, and the aim here is to present the main structure of the design to lead and guide practitioners, and not to restrict the instruction with stages or components. Practitioners (teaching elements) may adapt, change and update design components during practice when it is necessary for students to achieve learning targets.

The learning targets and outcomes component aims to obtain the content achievements of the lesson and develop teaching skills, and achieving the desired learning results of the IGAD is expected as a result. The lesson achievement dimension includes the achievement of different types of information (phenomenal, procedural, etc.). Nevertheless, when the design is regulated in the form of a group study, it also includes the achievement of skills such as taking responsibility, positive solidarity and commitment, and the ability to express one's thoughts. In the achievement of information, it is especially aimed to expand the information specific to a field, make an association with different fields, and make information in a particular field deeper by using materials, etc. Another learning target is the achievement of social skills. Here, it is especially aimed to develop social skills by such means as learning to discuss, respecting the thoughts and opinions of other people, and learning to think critically and give feedback.

The task features component qualifies the tasks given by the teaching staff to students to achieve their learning targets and contains the decisions on the activities that students should carry out. These activities are explained by the teaching staff before the beginning of practices. The activities in question may include tasks at different levels from a simple research study to the development of a project. Nevertheless, regarding the features of the tasks, it should be emphasized that they encourage students to make discussion and exchange opinions about the ideas and experiences, they can be associated with original and daily life, and they are suitable to the levels and common work.

The component of linking theory to practice generally qualifies the practice process in which procedures take place, and includes how the subjects explained in the theoretical lesson are transformed into activity by students during the practice hour, and the operational procedure and application of the activities. In these application activities, cooperating has been considered as the first central concept. Therefore, the dimension of emphasizing good cooperation rules and conditions, structuring the cooperation by teaching students on cooperation skills or the cooperation process, and reflecting these on practices are covered by the component of linking theory to practice. The second central concept is the operational procedure of IGA to be performed in practices. What is meant here is that possible activities include the fact that the subject both requires the content knowledge, i.e. theoretical knowledge, and its practical application/applications. In the process of linking theory to practice, the teaching staff contributes to the stimulation of students' curious attitudes and creating ideas about the content.

The guidance component explains the guidance, coaching, and support provided to students by the teaching staff during the whole design process. This guidance is not the guidance performed only before the beginning of practices, but it includes permanent guidance activities aimed at performing the tasks given each week. The guidance includes the ability to make students face their behaviors or mistakes and supporting their mutual harmony. At the same time, together with verbal guidance, when needed, it also includes bringing together experts and students and hardware guidance such as the ability to use the right search engines on the internet regarding the search for any subject, or providing tools

for any laboratory experiment. The first part of the group structuring and interaction component means the group composition in addition to the group size. Therefore, information such as the number of individuals in a group, homogeneous/heterogeneous structure, and what will be taken into consideration for heterogeneity is included in this component. Moreover, the process of cooperation in which students try to achieve their learning targets, i.e. interaction, is another part of this component. The interaction addressed here is multi-dimensional interaction. This interaction includes interaction between students and their friends in the group, interaction with other group members in the classroom, and interaction/cooperation between students and the instructor. In the group, there are sub-components such as especially sharing the information on the method/subject learned in the theoretical lesson, dividing the tasks and responsibilities, giving feedback on one another's behaviors and supporting providing help to each other. Moreover, the questions of the teaching staff on how they personally contribute to cooperation and collective product to get information about the project are among the features of the group structuring and interaction component.

The assessment and feedback component is about the measurement procedures used for evaluating the access to learning targets and group activities that combine theory and practice. The feedback consists of peer assessment feedback provided by both the teaching staff and classmates. The component of assessment and feedback does not include focusing only on the product, but also on the mutual working process. The main problem of the study was expressed as "What are the opinions of pre-service science teachers on IGA?" The sub-problems related to this problem are as follows: (1) What are the opinions of pre-service science teachers on the effects of IGA on their professional development?, (2) What are the opinions of pre-service science teachers on the fact to which area/areas (e.g. professional development, social development, etc.) IGA contributes most?, (3) What are the opinions of pre-service science teachers on the positive and negative aspects of IGA?, (4) What are the opinions of pre-service science teachers on the effects of IGA on their knowledge?, (5) What are the opinions of pre-service science teachers on the level of difficulty of IGA?, and (6) What are the opinions of pre-service science teachers on the states of having problems during the process of preparing and carrying out practice activities?

2. Method

The research is a qualitative study conducted on pre-service teachers studying in the Science teaching program of a middle-sized university in the Aegean Region of Turkey. According to Büyüköztürk, Kılıç-Çakmak, Akgün, Karadeniz, and Demirel (2008), some of the most basic features of qualitative studies are direct data collection, making rich descriptions, being process-oriented, the fact that participants reflect their viewpoints, and flexibility in research patterns. It can be said that the study has qualitative features since the data are collected directly, descriptions are made, and it is important to reflect the viewpoints of the participants in this study. This study was conducted in phenomenology design. According to Stamouli and Huggard (2007), in phenomenography research, one can identify how key concepts are understood by the learner. In other words, phenomenology seeks reality in individuals' narratives of their experiences of and feelings about specific phenomena to produce in-depth descriptions of these phenomena (Cilesiz, 2011). In this study, the phenomenography research design was used since it was aimed to determine pre-service teachers' opinions on instructional group activities by using their experiences and to develop a deeper understanding by revealing what they mean for them.

2.1. Participants

The participants of the study consist of 56 pre-service third-grade elementary school teachers studying at the Faculty of Education. The participants in question were purposefully selected among third-grade students since the Special Teaching Methods-I course is taught at this grade level. Moreover, purposeful sampling was used since there was an obligation to reach individuals with experience on the subject to be examined in the study. In conclusion, the selection criteria can be listed as having participated in the IGAD application, having received or receiving the course Special Teaching Methods I, studying in the third grade, and volunteering to participate in the study. 53.6% (n=30) of the pre-service teachers are female, and 46.4% (n=26) are male (Table 1).

Table 1. *Participants' profile*

Gender	f	%
Female	30	53.6
Male	26	46.4
Totally disagree	56	100.0

2.2. Data collection

An opinion form that consists of closed-ended and open-ended questions that aim to determine certain demographic features and opinions of pre-service teachers on IGA was used in the study. Opinion questions are those questions that aim to determine what an individual thinks about a particular subject at a particular time (Balcı, 2007). The questions of the opinion form were created by reviewing the literature and taking the opinions of experts. The components of the IGAD and the determination of the pre-service teachers' general perceptions of IGA were specifically taken into consideration in the preparation of the questions. Therefore, the first one of the questions asked to the pre-service teachers is about the benefits of IGA in terms of professional development. This question is closely related to the "learning targets and outcomes" component of the IGAD; it questions whether the desired learning outcomes are achieved and aims to investigate the opinions of pre-service teachers in terms of ensuring the aim of increasing professional development, which also constitutes the basis of the design. Another question is related to the first one, and it aims to investigate the area/areas to which IGA contributes most. As it is also expressed when explaining the component of learning targets and outcomes, the aim is not perceptional information achievement, but many professional and social outcomes are aimed. In this context, it is aimed to both determine this outcome of IGA and reveal the general perceptions of pre-service teachers with this question mentioned. Based on the fact that the activities carried out may have positive aspects as well as negative ones, the opinions of pre-service teachers on the positive and negative aspects of IGA were asked in the next question. Another design target is to ensure that pre-service teachers can combine their content knowledge and certain application skills. This makes up the "linking theory to practice component" of the IGAD. In this regard, it was thought that IGA would also contribute to the content knowledge of pre-service science teachers. Another question asked to pre-service teachers is related to finding their opinions on the effect of IGA on their content knowledge. Nevertheless, another aspect that should be understood is the difficulty perceptions of pre-service teachers of IGA and whether they have any problem in the process. Therefore, the other two questions asked to pre-service science teachers are related to this, while the first one was arranged as a close-ended question, and the second one was arranged as an open-ended question to understand the reasons. Consequently, it can be said that the questions in the data collection tool were

generally designed to collect in-depth information on the thoughts and assessments of pre-service teachers regarding the effects of IGA.

2.3. Procedures

It can be stated that the IGAD consists of three basic components. These are as follows: (1) Certain main elements to which the Council of Higher Education (2007) that is responsible for raising teachers in Turkey attaches importance regarding teaching training, (2) the application and content structure of the lesson, (3) the program development designs and teacher training policies in the literature. Regarding the first one, the Council of Higher Education says the following about the application of curricula at the faculties of education:

> "…in the implementation of the programs, it is important to start from the experiences first and then achieve the concepts and definitions as a requirement of the constructivist philosophy of new primary school programs. On the other hand, the association of the course subjects with the curricula prepared by the Ministry of Education for the relevant level and enriching them with real-life examples are the other elements to be taken into consideration." (CoHE [YÖK], 2007; p.10)

In the design developed by taking into consideration the elements in question, pre-service teachers were asked to plan and implement their own activities under the guidance of the teaching staff to get the first-hand experience and start from their experiences. Furthermore, the subjects were selected among the 4th, 5th, 6th, 7th and 8th-grade level science subjects in the weeks that fitted the method in order to associate the course subjects with the curricula prepared by the MoNE (Ministry of National Education [MEB]) for the relevant level. In addition to this, pre-service teachers were asked to use cases, materials, posters, scenarios, projects, etc. that would associate science subjects with daily life in accordance with the teaching methods and subjects in the theoretical lesson.

It should be noted that this course, i.e. Special Teaching Methods I, was selected specifically for the implementation and content structure of the lesson, which is the second component. This course is an obligatory course that consists of two hours of theory and two hours of practice. In the course description of the lesson, "science teaching, the main objectives of science teaching, science literacy, concept teaching (misconceptions, mind maps, concept cartoons, V diagrams, etc.), methods and materials used in science teaching, examination of the science and technology curriculum implemented in 4-8th grades (themes, achievements, learning situations, assessment techniques, etc.), examining and assessing course, teacher and student books" take place (CoHE, 2007). In this context, the subjects in the course description of the lesson were taught by the teaching staff (the first author of the study), while the pre-service teachers were asked to apply the activities (in a group work) they prepared within the scope of the task plan of the content taught for that week (e.g. preparing a mind map on different science subjects in the week for mind maps, preparing caricatures in the form of posters and worksheets in the concept cartoons week, etc.).

The program development designs and studies on teacher training in the literature were investigated for the third component that was taken as a basis for the development of the IGAD, and these were used. Although many studies were examined, it can be said that the studies by De Hei, Sjoer, Admiraal and Strijbos (2016) and De Hei, Strijbos, Sjoer and Admiraal (2016) on group learning activities, and especially the studies by Hennissen, Beckers and Moerkerke (2017) aimed at linking theory to practice in teacher training were used, and these studies were accepted as guides.

2.4. Data analysis

The conventional content analysis was used in the analysis of the opinion form questions used to determine the opinions of pre-service teachers on IGA (Hsieh & Shannon, 2005). In the conventional content analysis method, coding categories are derived directly from text data differently from the directed content analysis and summative content analysis. The conventional content analysis was used in this study since the texts containing the answers given by pre-service teachers to the questions related to their opinions on IGA were taken as a basis, and a previously created theory or research finding results were not used as initial codes. Certain stages were created in the study by taking the study by Hsieh & Shannon (2005) as a basis, and the content analysis was performed by applying these stages respectively when performing the analyses. The stages are as follows: (1) performing a general reading of the whole data to see the overall meaning, (2) reading the data word-by-word to get a grasp of the main ideas and concepts (starting to derive the codes), (3) starting to take notes about the text (the researcher creates codes especially by using the words written by the participant). In this process, the researcher codes the remaining interview papers by using the pre-codes created after coding 3-4 interview papers and adds new codes when he/she encounters data that do not fit an existing code), (4) reviewing the data after coding all interview papers and combining certain codes in this process, dividing some of them into sub-categories (the categories are used to organize and group the codes in meaningful clusters), (5) completing the analysis by examining the final codes to turn the results into a hierarchical structure. Performing analyses, coding and creating themes in the study can be explained upon an example as follows: One of the questions asked to the pre-service teachers was 'What do you think about the educational group activities carried out during the period? Assess them in terms of positive and negative aspects.' All student answers to this question were read to see the overall meaning, and then they were reread individually. Notes were taken to create codes for student answers in rereading. One example of the student answers to this question is as follows: 'The activities were good. We had some time-related restrictions. There was not a big problem in the applications. I think a lesson should be like this (Student 1)'. The words 'good activities', 'time restriction' were noted for this answer. After all similar student answers to the question were coded, the appropriate ones were combined. The codes were combined using other similar student answers, and the code 'Good/ perfect/ enjoyable activities' was created. This code was then presented under the 'positive opinions' theme. The 'time restriction' code was placed under the 'negative opinions' theme. A similar application was repeated for all interview questions.

In this study, the analysis results were presented and tabulated as frequency and percentage frequency values. In addition to this, the data analysis was performed by the author of the study twice (at one-month intervals) to increase the reliability of the study, and the consistency between these codings was calculated. The percentage of concordance was examined by comparing the numbers of repeating the codes for each open-ended question (Miles and Huberman, 1994). For both codes, the percentage of concordance was found to be 0.89 as the average of all questions. Furthermore, the process of creating an analytical procedure consisting of 5 stages before the analyses and performing the analyses has a positive effect on the reliability and validity of the study. The examples of the student answers were given in the study together with the content analysis results. The real names of the students were not used when giving these examples, and the students were coded as "Student 1", "Student 2", …. instead of this.

3. Findings

One of the main objectives of the IGAD is to increase professional development as mentioned before. Therefore, the determination of the views of pre-service teachers on the subject was found to be important as a priority. In this context, it was primarily aimed to take the opinions of pre-service science teachers who had IGA experience on the effects of these activities on their professional development. The statement that makes up one of the closed-ended questions asked to pre-service teachers in line with this target is as follows: "I believe that these practice activities we carry out in the Special Teaching methods-I course are beneficial in terms of professional development." The opinions of pre-service science teachers on this proposition are presented in Table 2.

Table 2. *Opinions of pre-service science teachers on the benefit of IGA in terms of professional development*

Codes	n*	%
Totally agree	45	80.3
Agree	10	17.9
Partially agree	1	1.8
Neither agree nor disagree	0	0.0
Disagree	0	0.0
Partially disagree	0	0.0
Totally disagree	0	0.0

n: refers to the number of pre-service teachers. In the study, all numbers shown with the letter "n" express the number of individuals.

As can be understood from Table 2, it can be observed that almost all of the pre-service science teachers who participated in IGA found the activities in these practices beneficial in terms of their professional development. 98.2% (n=55) of the pre-service teachers in total answered this question as "totally agree" and "agree." There was no pre-service teacher that answered it negatively.

Another question asked to the pre-service teachers is as follows: "To which area/areas (e.g. professional development, social development, etc.) do you think the educational group activities you have performed throughout the period will contribute most?" The opinions of the pre-service science teachers on the area/areas to which IGA contributes most are presented in Table 3.

Table 3. *The opinions of pre-service science teachers on the area/areas to which IGA contributes most*

Codes	f*	%**	Examples of Student Opinions
To the area of professional development	50	56.3	It contributed mostly to my professional development. Apart from that, it was nice to create a product with the group. I learned to respect the thoughts. I could express my opinions better when talking about the things that I don't like (Student 14).
To the area of social development	14	15.8	
To the development of content knowledge	5	5.6	
To the development of the ability to make criticism/critical thinking	5	5.6	
To the field of personal development	3	3.5	It contributed to my professional development, social development, and mostly self-development because you cannot get to know yourself before taking a responsibility; you may only learn what you can do, your rights and wrongs when you are given a responsibility (Student 26).
To the psychomotor development area	2	2.2	
To the development of the self-assessment skill	2	2.2	
To the field of creativity	2	2.2	
To the development of the self-expression skill	2	2.2	
To the development of interpersonal communication	2	2.2	The most important thing is professional development, which is followed by personal development and social development (Student 6).
To the development of the skill of taking responsibility	2	2.2	

f*: It is the frequency of the opinions stated by the pre-service science teachers. In other words, each student may have given more than one opinion on the question. Therefore, the sum of the frequencies in question means the frequency of opportunities and not the number of students in the study. This also applies to tables no. 3, 4 and 6 in the study.

%**: The frequency percentage of the opinions stated by the pre-service science teachers. This also applies to tables no. 3, 4 and 6 in the study.

As can be seen from Table 3, the participants of the study made an evaluation that IGA has positive effects on different fields and stated that it contributes to these fields. According to the pre-service teachers, the biggest contribution is made to the professional development area (at a frequency of 56.3%, f=50) and social development area (at a frequency of 15.8%, f=14). Furthermore, pre-service science teachers believe that IGA contributes especially to the content knowledge development and critical thinking skills.

Furthermore, the opinions of the pre-service science teachers that were not included in the table since their answers to this question in the opinion form were repeated only once are as follows: "To the field of self-development," "To the field of self-confidence development," "To the development of the skill of being programmed," "To the field of participating in group works," "To the development of laboratory skills."

Another question asked to the pre-service teachers is "What do you think about the educational group activities carried out during the period? Assess them in terms of positive and negative aspects." The opinions of the pre-service science teachers on this question are presented in Table 4.

Table 4. *Opinions of pre-service science teachers on the positive and negative aspects of IGA*

Theme/ Category	Codes	f	%	Examples of Student Opinions
Positive opinions	Effective/meaningful learning	8	10.1	The activities were good. We had some time-related restrictions. There was not a big problem in the applications. I think a lesson should be like this (Student 1). Practice activities are necessary for learning the subject. They contributed to me a lot in professional terms, in terms of creativity. However, I think it would be better if this lesson was in second grade. To me, third grade is just a year for homework, and we made a great effort to complete the lessons, projects, and homework we have. Although taking such an extensive course in the most intense year and having time restrictions have made us exhausted in terms of completing the practices, one of the reasons for my becoming successful in this course and learning the lesson is certainly practice studies (Student 15). To me, the activities were definitely perfect. They affected me positively because performing such activities was what I wanted for my development at the end of the fifth period. I got this chance with this lesson. I did it gladly. I can say that it made me love my field even more (Student 5).
	Ensuring permanence/permanent learning	7	8.9	
	Good/perfect/enjoyable activities	7	8.9	
	Contribution to content knowledge/love	7	8.9	
	The development of critical skills	5	6.3	
	Ensuring the transfer of what is learned in theory to practice	5	6.3	
	Contribution to professional development	4	5.1	
	The development of creativity	4	5.1	
	Gaining experience	4	5.1	
	Developing imagination	3	3.8	
	Ensuring learning by doing/applying	3	3.8	
	Ensuring the exchange of ideas	3	3.8	
	Ensuring the mastering of the subject	3	3.8	
	Good group works	3	3.8	
	Learning from peers	2	2.5	
	Learning associated with everyday life	2	2.5	
	Contribution to social skills	2	2.5	
Negative opinions	Time restriction	3	3.8	
	The difficulty in preparing a report/doing practice each week	2	2.5	
	Experiencing a difference of opinion with group students	2	2.5	

As can be seen from Table 4, while pre-service science teachers expressed many (at a frequency of 91.1%, f=72) positive opinions on the educational group activities they performed during the period, they expressed very little (at a frequency of 8.9%, f=7) negative opinions. As for the positive opinions of the pre-service teachers, it is understood that they emphasized especially effective learning and expressed an opinion that IGA ensures permanence in learning and contributes to content knowledge. Some (at a frequency of 8.9%,

f=7) of the study participants referred especially to the structure of the activities in positive opinions and defined the activities in question as good, perfect, and enjoyable. Another aspect that is emphasized in positive opinions is skill achievements. The skills that are specifically emphasized by pre-service teachers are critical thinking (at a frequency of 6.3%, f=5), creativity (at a frequency of 5.1%, f=4), and imagination (at a frequency of 3.8%, f=3). As for the negative opinions of the pre-service science teachers on IGA, the most remarkable opinion is the time constraint (at a frequency of 3.8%, f=3), this is followed by the difficulty in preparing a report or doing practice each week, and a difference of opinion with the friends in the group.

Moreover, the answers given by the pre-service teachers to this question in the form categorized as a "positive opinion" but not included in the table since they were repeated only once are as follows: "Contribution to research skills," "Learning how to develop suggestions of solution to the problem," "Gaining cognitive skills," "Learning to respect group members," "Learning to be open to new ideas," and "Ensuring self-recognition." As can also be understood from the answers given, these pre-service teachers also made positive assessments of IGA. Again, an answer to this question that was categorized as a "negative opinion" but that was not included in the table since it was repeated only once is as follows: "Being criticized much by the friends in the classroom."

One of the open-ended questions asked to the pre-service teachers is "Do you think that the practice activities in this course affect your content knowledge? Why?/How?"

48 (85.8%) individuals in total answered the first part of this question positively with the answers "Yes, it affected positively (n=36)" and "I believe that it affected positively (n=12)". 7.1% of the pre-service science teachers gave the following answers by adding certainty to their positive assessments: "It definitely affected me positively (n=2)" and "It definitely affected, positively (n=2)". At the same time, 7.1% of the pre-service teachers in the study gave answers that can be regarded as negative: "It affected me partially positively (n=2)", "It affected me in a way (n=1)", and "No, I don't think so (n=1)".

The opinions of the pre-service science teachers regarding the second part of this question, i.e. the questions "Why?/How?" in terms of the effects of IGA on their content knowledge are presented in Table 5.

Table 5. *Opinions of pre-service science teachers regarding the effects of IGA on their content knowledge*

Theme/ Category	Codes	f	%	Examples of Student Opinions
Curriculum knowledge	Since I am knowledgeable about the subjects specific to my field	12	15.0	Yes, I think that it affects my content knowledge positively. When doing some works (e.g. a V diagram), I have realized that I have misconceptions. In the learning circle, I have learned to integrate the information in the science lesson into life (Student 25).
	Since I review the subjects in the field when preparing an activity	5	6.3	
	Since I am knowledgeable about the subject content of the course books	5	6.3	
	Since I am knowledgeable about the achievements and learning areas specific to my field	5	6.3	
Research/ scientific activity knowledge	Since the practices are based on our content knowledge	12	15.0	I think that it affects my content knowledge positively because the practices were carried out based on our content knowledge. It enabled us to add new information to our content knowledge (Student 1).
	Since I learn through practices	8	10.0	
	Since it requires us to do research related to the field	5	6.3	
Student knowledge	Since it provides permanence to my knowledge	6	7.5	It affected our content knowledge positively because all of our practices were related to the course books in our field (Student 40).
	Since I work on the deficiencies I realize in the practice	3	3.7	
	Since it enables me to realize my misconceptions	3	3.7	
	Since it eliminates/corrects my misconceptions	3	3.7	
	Since it reinforces/develops my knowledge	2	2.5	
Knowledge of teaching methods	Since I am knowledgeable about the methods specific to my field	5	6.3	It positively affected our content knowledge. We recalled a lot of missing information when preparing our projects. We learned the subjects of the 5th, 6th, 7th, and 8th grades and tried to prepare suitable activities for them (Student 43).
	Since the examples of methods specific to the field given in the course stuck in our minds	2	2.5	
Knowledge of measurement and evaluation	Since I have learned alternative assessment methods	2	2.5	It positively developed our creativity and hand skills rather than our content knowledge (Student 11- who said no).
	Since I make a self-peer assessment	2	2.5	

As can be understood from Table 5, pre-service science teachers revealed that IGA has important effects on their content knowledge in different ways. Certain themes were achieved by examining the codes of the answers given by the pre-service teachers to this question. The theme with the most repeated opinions among these is the theme of "curriculum knowledge." The most repeated code under this theme was expressed as "Since I am knowledgeable about the subjects specific to my field" at a frequency of 15% (f=12). Furthermore, it is observed in this theme that pre-service teachers said that IGA affects their content knowledge through their becoming knowledgeable about the subjects in their field, the content of the course books, and achievements and learning areas when preparing the activities. In the research/scientific activity knowledge theme, pre-service teachers especially emphasized that the practices should be based on content knowledge that they learn in this way and they should conduct research when doing this. The pre-service teachers that took part in the study gave student knowledge examples with such answers as ensuring the permanence of the knowledge (f=6) and becoming aware of misconceptions (f=3) and correcting them (f=3). Apart from this, the most repeated answer by the pre-service science teachers in the theme of teaching methods is to be knowledgeable about the methods specific to the field (f=5). The theme that makes up the opinions of the pre-service teachers regarding the question of the contribution to the content knowledge apart from this is the measurement and evaluation knowledge theme. As can be understood from this theme, some pre-service teachers reported knowledge about self-peer assessments (f=2) in IGA and the alternative measurement evaluation and assessment methods used in the practices (f=2) and associated this with the content knowledge.

Moreover, the answers given by the pre-service teachers to the "why/how?" part of this question in the opinion form but not included in the table since they were repeated only once are as follows: "Since it concretizes abstract information," "Since it enables me to associate the subjects with daily life," "Since the unique examples given in the lesson reinforce our knowledge," "Since I develop my knowledge with creative ideas," "Since it shows the applicability of the information," "Since it makes me understand the value of information," and "Since my self-confidence increases."

Another closed-ended question asked to the pre-service science teachers is as follows: "State your opinion about the level of difficulty of these practice activities we have performed in the special teaching methods course." The opinions of the pre-service science teachers regarding the level of difficulty of IGA in relation to this question are presented in Table 6.

Table 6. *Opinions of pre-service science teachers on the level of difficulty of IGA*

Codes	n	%
Very easy	1	1.8
Easy	16	28.6
Hard	37	66.1
Very hard	2	3.5

As can be seen from Table 6, more than half of the pre-service science teachers (66.1%) qualified IGA as "difficult." Contrary to this, 28.6% of the pre-service teachers reported that these activities performed in the Special Teaching Methods-I course are easy.

Another subject that is tried to be determined is whether pre-service science teachers have any problem during the process of preparing and performing practice activities. Another

question asked to the pre-service teachers in this context is as follows: "Did you have any problem during the process of preparing and performing practice activities? If "Yes," what?"

42 (75%) of the pre-service science teachers answered the first part of the question as "yes," and 14 (25%) answered it as "no." The opinions of the pre-service science teachers on the "What?" part of the question, regarding what kind of problem or problems are experienced during the preparation and realization part of IGA, which is the second part, i.e. continuation of the question, are as shown in Table 7.

Table 7. *Opinions of pre-service science teachers on the situation of having problems during the preparation and realization process of IGA*

Theme/ Category	Codes	f	%	Examples of Student Opinions
Group-based problems	The failure of group members to meet regularly	9	14.6	Finding new things was difficult. We were asked to do a lot of research. Sometimes problems were experienced in terms of gathering all group members (Student 17).
	Group problem (without any explanation)	8	13.0	
	The failure of group members to perform their duties	6	9.7	
	The problems of sharing tasks among group members	3	4.8	
	The implementation of the ideas of dominant individuals in the group	3	4.8	Yes, we had some problems. These are problems generally caused by our group members. We also had "time" problems. There were restraints at a time when we had homework in other lessons (Student 28).
	Intra-group differences of opinion	2	3.2	
	Intra-group clashes/conflicts	2	3.2	
	Communication problems with group members	2	3.2	
Time-based problems	Time restraints	15	24.3	
	The difficulty of doing research/homework every week	2	3.2	
	The long duration of preparing an activity	2	3.2	Yes. Sometimes the duration was felt restricted. Sometimes, I had difficulty in finding creative and unique practices (Student 54).
Activity/practice-based problems	Difficulty in creating unique products	3	4.8	
	The difficulty in finding materials/tools	3	4.8	
	Difficulty in finding original/creative ideas	2	3.2	

Upon examining the opinions of pre-service science teachers on the situation of having problems during the process of preparation and realization of IGA, it is observed that most of them (75%) have certain problems. When these problems are grouped, it is observed that they are mainly gathered under three categories. These categories are "group-based problems" that

include certain problems brought about by working together with the group, "time-based problems" regarding the pre-service teachers' obligation to spend important time, and "activity/practice-based problems" that include certain problems related to the structure of activities or practices. Upon examining group-based problems, it is observed that problems related to the failure of group members to meet regularly (14.6%) and problems related to the failure of group members to fulfill their responsibilities (9.7%) are at the top of the list of most important problems. 24.3% of the pre-service science teachers have time-related problems in their IGA. Moreover, some pre-service teachers (4.8%) stated that the stage of preparing activities is very long. At the same time, some pre-service teachers (12.8%, f=8) said that they experienced activity and practice-based problems and explained this by associating especially with having problems during the process of creating products, having problems in finding tools, and having difficulty in finding creative ideas.

4. Discussion and conclusions

Since the classroom environment in Turkey requires much more than theoretical knowledge can give, it is observed that even pre-service teachers with adequate methods and content knowledge experience difficulty in putting their knowledge into practice (Şen, 2009). Therefore, it is quite important for pre-service teachers to carry out educational activities that will allow them to put their theoretical knowledge into practice, develop their content knowledge and create their own ways of learning-teaching-thinking. In this context, an educational group activity was designed in the present study, and it was aimed to evaluate its results in the context of their opinions.

It is quite an important result that almost all of the pre-service teachers have reported an opinion that IGA is beneficial in terms of professional development. This situation that can be presented as a proof showing the power of design can be interpreted as the fact that small-group studies based on experience and active learning can be used especially in method lessons. Furthermore, considering the assessments of the pre-service science teachers regarding to which area IGA contributes most, more than half of them (at a frequency of 56.3%, f=50) stated that this contribution is made to their professional development. This result is important in two aspects. Firstly, it is necessary to note that one of the objectives of the development of educational group activities in which pre-service teachers participate is to contribute to increasing the teaching skills of pre-service teachers. In this case, it can be said that the IGAD developed for the study is effective, and its aim of development was achieved to a large extent when the results obtained from the opinions of the pre-service teachers are interpreted. Secondly, it can be said that the belief of the pre-service teachers that IGA increases their professional development most will also increase their level of professional awareness/consciousness (here, awareness/consciousness was used with the meaning of "the belief and awareness of any teacher of the way of how and by which means to teach in the classroom environment regarding their field"). This is very important in many aspects. Especially when the close relationship between professional awareness and future educational practices and professional identity development is taken into consideration, it can be stated that the experiences gained will provide them ease in their professional lives and act as a catalyst in their practice-based activities. According to Weiland, Hudson, and Amador (2014), studies show that the professional awareness/consciousness skill can be learned early and the teaching experience has the potential to support development further together with the constant professional development. The study by Ucar and Sanalan (2011) shows that the understanding of pre-service teachers regarding high-quality science teaching is created by teacher's training programs. Therefore, it can be expressed that it is necessary to ensure that pre-service teachers gain experiences with similar educational designs in science teacher training programs, whereby increasing their professional awareness and developing their

understanding of science teaching. The second most repeated opinion of pre-service teachers regarding the area to which IGA contributes most is the social development area. This can be associated with the working of pre-service teachers in small groups in IGA. Furthermore, as it is clearly specified in the "learning targets and outcomes" component of the IGAD, another learning target of the design is the achievement of social skills. This component aims to develop social skills through such means as learning to make discussions, respecting each other's thoughts and opinions, critical thinking, and giving feedback. In this case, it can be said that the opinions of pre-service teachers that IGA contributes to the field of social development with important achievements brought about by group work are shaped, and consequently, it is revealed that another target of the design is expected.

According to the pre-service teachers, the most positive aspect of IGA is that it ensures effective/meaningful learning. This result is quite significant because effective/meaningful learning is a pre-condition for the realization of conceptual understanding in science teaching. The findings of the study by Avraamidou (2013) have shown that the meaningful learning-teaching experiences obtained by pre-service teachers in their courses at the university show that they perceive them as critical in shaping their science teaching tendencies. According to the author, these experiences are especially affected by inquiry-based studies, contemporary theoretical discussions, open-air field studies, good-humored classroom environment and its features, and teachers. These findings support making and using teacher training lesson designs that aim to support pre-service science teachers in including them in meaningful learning experiences. Furthermore, according to Wilson and Kittleson (2012) who stated that it is hard to plan meaningful science learning, one of the most significant aims of science teacher training programs is related to meaningful science learning/perceiving science. In this case, the fact that the pre-service teachers expressed their opinion that IGA ensures meaningful learning at this frequency can be interpreted as the fact that it also serves the objectives of science teacher training programs.

Another most repeated opinion by pre-service science teachers on the positive aspects of IGA is that it ensures meaningful learning. Furthermore, the pre-service teachers associated one of the reasons for the contribution to their content knowledge in the question that asks them to make an assessment on the effects of IGA on their content knowledge with ensuring the permanence of their knowledge. In this case, one of the most important effects of IGA according to the pre-service science teachers that took part in the study is its contribution to meaningful learning. According to Özgür and Tosun (2012), ensuring permanent learning in students is one of the main targets of higher education just as in all curricula, and now learning has turned into a phenomenon that must last lifelong. In this case, it can be said that the positive opinions of pre-service teachers are very important, and they contribute to the realization of one of the main targets of higher education. Some of the participants that took part in the study defined the activities in question as good, perfect and enjoyable especially by referring to the structure of the activities in their positive opinions. Furthermore, more than half of the same participant group qualified these activities as "hard." This contradiction can be explained by individual differences of thought such as the level of participation into the activities in question, attitudes towards IGA practices, or the thought that the time spent in these practices is too much. Indeed, when the opinions of the pre-service teachers on the negative aspects of IGA were examined, time constraint and the difficulty in doing practice/preparing a report each week were expressed. According to de Saint Léger and Mullan (2014), the time spent on the tasks in group works and the workload are factors that should not be disregarded. The time factor may constitute a pedagogical obstacle for students that do not spend or wish to spend the time necessary to "discuss and apply" with group members. In this case, solutions, such as changing, increasing or making flexible the time

given to pre-service teachers according to the difficulty of the task in educational practices in which the workload is high, such as IGA, can be offered. Therefore, it may be a better option to make the time flexible in activity weeks with the high workload (such as project-based learning practice when pre-service teachers develop a project in this week) rather than performing a different activity each week necessarily. Thus, the time spent on the task will be correlated with the general weighting of the task (workload).

In science teaching, the subject content knowledge includes the substantive knowledge and syntactic knowledge about science knowledge, and extensive knowledge of how it is used for understanding the scientific practices of a discipline and developing scientific knowledge (Arias and Davis, 2017). In this context, while it can be said to what extent the content knowledge is important for performing the educational practices related to this field, on the contrary, the open relationship between IGA and content knowledge can be easily observed based on the fact that content knowledge is formed by understanding the scientific practices related to science. Therefore, one of the questions asked to pre-service science teachers on IGA is related to its effect on content knowledge. 93% of the pre-service science teachers believe that IGA affects their content knowledge positively and increases their content knowledge in different ways. Similarly, in the study carried out by Hennissen, Beckers and Moerkerke (2017) on the basis of a three-stage theory for the purpose of linking theory to practice in teacher training, the conceptual knowledge of pre-service teachers that makes up their content knowledge increased after the practices. Wilson and Kittleson (2012) stating that teacher trainers should encourage pre-service science teachers to get the science lessons that will help them build a solid content basis indicate that the insufficiency of their science content knowledge may lead them to use educational approaches that lack conceptual depth in classes they will teach in the future. As can also be understood from here, the applicability of the desired practical education approaches is closely related to the subject area knowledge. In this context, the opinions of pre-service science teachers regarding the effects of the activities applied on their content knowledge are of great importance.

Science teachers are expected to be knowledgeable about student learning, teaching strategies, the curriculum and evaluation, and most importantly, they are expected to arrange these components so that they ensure the meaningful learning of students (Aydın et al., 2013). The opinions of pre-service science teachers on why and how IGA affects their content knowledge are gathered exactly in the components expressed by Aydın et al. (2013). The themes of the opinions collected are curriculum knowledge, research/scientific activity knowledge, education methods knowledge, and measurement and evaluation knowledge. It can be said that the sum of these themes also makes up the content of pedagogical content knowledge. In the curriculum knowledge theme, pre-service teachers are of the opinion that their content knowledge increased thanks to their being knowledgeable about the subjects specific to their field, being knowledgeable about the content of the course books and being knowledgeable about the achievements and learning areas specific to their field. While they showed being knowledgeable about the methods specific to their field in the teaching methods knowledge theme as the reason, they showed learning the alternative assessment methods and making a self-peer assessment as the reason under the theme of measurement and evaluation knowledge. Considering all these results, it can be said that the pre-service science teachers had the opportunity to develop pedagogy with the content knowledge related to science through IGA and they had field experience in relation to this.

In the last twenty years, an increase occurred in the use of group learning activities in many professional programs and disciplines of universities. Nevertheless, the transition from individual learning activities to group learning activities has not been easy both for students and teaching staff (Wosnitza & Volet, 2013). Group work is to ensure that students produce

more complex level studies than they complete individually. In this process, peers learn from one another, they realize the gaps in their learning, express their knowledge and skills in relation with those of other people, and consequently, this is a privileged opportunity for them (de Saint Léger & Mullan, 2014). However, it is inevitable that problems are encountered in group studies. In this study, the pre-service science teachers stated that they experienced certain problems related to the failure of group members to regularly meet in IGA practices and the failure of group members to fulfill their responsibilities. The fact that some of the group members did not participate in the studies effectively may have led other group members to have problems by disappointing them. In a similar way, a series of negative problems regarding the past experiences of the pre-service teachers in relation to group works in subjects such as group management, communication, distribution of work, group dynamics, targets and the level of contribution of other group members to the study were reported in the study carried out by Volet and Mansfields (2006). In the studies carried out by the authors, the extent to which the personal targets of students are fulfilled also comes out as a factor that leads to the development of their current attitudes towards group studies. In this case, creating positive attitudes towards group studies can be regarded as an option by means of learning the expectations of pre-service teachers at the beginning of such educational designs that include intensive group studies and conducting discussions that will support creating their personal targets in relation to the lesson. Furthermore, it can be stated that taking the wishes of students into consideration rather than the efforts of ensuring heterogeneity in the process of creating groups may reduce such problems. On the other hand, it will be more accurate to bring solutions to group problems instead of giving up group studies in such educational practices. From the perspective of social constructivism, students learn better through interaction with one another in the group. According to Zedda, Bernardelli, and Maran (2017), who indicate that group studies increase both cognitive and social skills of students, the design of programs that include group studies will enable pre-service teachers to increase the efficiency of education and learn the professional skills that they can transfer to their students. In this context, it can be expressed that arranging practices such as active learning-based IGAD that incorporates the elements of reform-based science teaching and has the features of supporting professional development in the form of group studies by developing precautions that will solve the group problems will be both in compliance with today's learning theories and help pre-service teachers in gaining the desired teaching skills.

In teacher training, it is necessary to discuss any kind of professional development program, and even those with the most positive effects. Since the educational needs of students, the interaction between the expectations of education systems and their effects will be different, it is necessary to do research, try, discuss and think about professional development programs (Avalos, 2011). For this reason, although pre-service science teachers have quite important achievements according to the opinions of pre-service science teachers, IGAD should be applied at different universities and to different pre-service teachers, and the results should be discussed. Apart from this, it is important to apply the designs in question in practical lessons apart from special teaching methods and assess their results. According to one of the suggestions in the multi-dimensional study by Yücel-Toy (2015) in which the researcher performed the thematic analysis of pre-service teacher training studies in Turkey, studies on what the education process of special teaching lessons should be and how the structure of the lesson can be designed are also needed. In this context, discussing what to do to increase the effectiveness of IGA practices in the special teaching methods course or the thoughts and perceptions of students from which other dimensions may be investigated can be suggested. Furthermore, the outputs of the IGAD applied in the study were not compared with the outputs of the classroom environment in which no such application was made. In

this context, the outputs of IGA can be evaluated by comparing its results both qualitatively and quantitatively with an experimental and control group study in future studies.

References

Arias, A. M & Davis, E. A. (2017). Supporting children to construct evidence-based claims in science: Individual learning trajectories in a practice-based program. *Teaching and Teacher Education*, 66, 204-218.

Avalos, B. (2011). Teacher professional development in teaching and teacher education over ten years. *Teaching and teacher education, 27*(1), 10-20. http://repositorio.uchile.cl/bitstream/handle/2250/124416/Avalos_Beatrice.pdf?seq DOI: 10.1177/0022487109348479 (Retrieved from the website on September 4, 2017)

Avraamidou, L. (2013). Prospective elementary teachers' science teaching orientations and experiences that impacted their development. *International Journal of Science Education, 35* (10), 1698-1724. DOI: 10.1080/09500693.2012.708945

Aydın, S., Demirdöğen, B., Tarkın, A., Kutucu, S., Ekiz, B., Akın, F.N., Tüysüz, M. & Uzuntiryaki, E. (2013). Providing a set of research-based practices to support preservice teachers' long-term professional development as learners of science teaching. *Science Education, 97*(6), 903–935.

Balcı, A. (2007). *Research in social sciences: Methods, techniques and principles*. Ankara: PegemA Publishing.

Ball, D. L., & Forzani, F. M. (2009). The work of teaching and the challenge for teacher education. *Journal of teacher education, 60*(5), 497-511. http://sites.psu.edu/aplng587/wp-content/uploads/sites/8058/2015/12/Ball_Forzani_2009.pdf (Retrieved from the website on September 4, 2017)

Birren, J. M & van den Kieboom, L. A. (2017). Exploring the development of core teaching practices in the context of inquiry-based science instruction: An interpretive case study. *Teaching and Teacher Education*, 66, 74-87.

Büyüköztürk, Ş. (2008). *Scientific research methods*. Ankara: PegemA Publishing.

Cilesiz, S. (2011). A phenomenological approach to experiences with technology: current state, promise, and future directions for research. *Educational Technology Research and Development, 59*, 487-510. DOI: 10.1007/s11423-010-9173-2

CoHE (Yükseköğretim Kurulu) [YÖK] (2007). Education faculty teacher education degree programs [Eğitim fakültesi öğretmen yetiştirme lisans programları.], Ankara. http://www.yok.gov.tr/documents/10279/30217/E%C4%9E%C4%B0T%C4%B0M+FAK%C3%9CLTES%C4%B0%20%C3%96%C4%9ERETMEN+YET%C4%B0%C5%9ET%C4%B0RME+L%C4%B0SANS+PROGRAMLARI.pdf/054dfc9e-a753-42e6-a8ad-674180d6e382 (Retrieved from the website on June 17, 2017)

Darling-Hammond, L. (2006). Constructing 21st-century teacher education. *Journal of Teacher Education, 57*(3), 300-314. DOI: 10.1177/0022487105285962. https://chalkboardproject.org/sites/default/files/Constructing-21st-Century-Tchr-Ed.pdf (Retrieved from the website on September 4, 2017)

De Hei, M. S. A., Sjoer, E., Admiraal, W. & Strijbos, J. W. (2016). Teacher educators' design and implementation of group learning activities. Educational Studies, 42(4), 394-409. http://dx.doi.org/10.1080/03055698.2016.1206461

De Hei, M. S. A., Strijbos, J. W., Sjoer E. & Admiraal, W. (2016). Thematic review of approaches to design group learning activities in higher education: The development of

a comprehensive framework. *Educational Research Review,* 18, 33-45. http://dx.doi.org/10.1016/j.edurev.2016.01.001

De Hei, M. S. A., Admiraal, W., Sjoer, E. & Strijbos, J. W. (2017). Group learning activities and perceived learning outcomes. *Studies in Higher Education.* https://doi.org/10.1080/03075079.2017.1327518

De Saint Léger, D. & Mullan, K. (2014). "A good all-round French workout" or "a massive stress?": Perceptions of group work among tertiary learners of French. *System,* 44,115-126. http://dx.doi.org/10.1016/j.system.2014.03.005

Forbes, C. T. (2011). Preservice elementary teachers' adaptation of science curriculum materials for inquiry-based elementary science. *Science Education,* 95, 927-955. DOI 10.1002/sce.20444

Hennissen, P., Beckers, H. & Moerkerke, G. (2017). Linking practice to theory in teacher education: A growth in cognitive structures. *Teaching and Teacher Education,* 63, 314-325.

Hsieh, H., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research, 15*(9), 1277-1288.

Korthagen, F. A., Kessels, J., Koster, B., Lagerwerf, B., & Wubbels, T. (2001). *Linking practice and theory: The pedagogy of realistic teacher education.* Routledge. http://www.dl.icdst.org/pdfs/files1/8def2fb45db95cab3719a793f85a605e.pdf (Retrieved from the website on September 4, 2017)

Lizzio, A., Wilson, K. & Simons, R. (2002). University students' perceptions of the learning environment and academic outcomes: Implications for theory and practice. *Studies in Higher Education 27* (1), 27–52. Doi:10.1080/ 03075070120099359

Lockhorst, D. (2004). *Design principles for a CSCL environment in teacher training.* The IVLOS Series. Published by IVLOS Institute of Education of Utrecht University (Instituut voor LerarenopleidingOnderwijsontwikkeling en Studievaardigheden). https://pdfs.semanticscholar.org/3ed6/8e8f8735f9ad42c642e5731586b81d2826b4.pdf (Retrieved from the website on June 21, 2017)

Miles, B. M., & Huberman, A. M. (1994). *Qualitative data analysis* (2nd ed.). London: Sage Publications.

MoNE (Milli Eğitim Bakanlığı) [MEB] (2013). *Primary education institutions (Primary and elementary schools) science course (3, 4, 5, 6, 7 and 8 grades) curriculum.* Ankara: Author. http://ttkb.meb.gov.tr/program2.aspx?islem=1&kno=213 (Retrieved from the website on June 21, 2017)

National Research Council (NRC) (1996) *National science education standards.* National Academy Press, Washington, D.C. https://www.csun.edu/science/ref/curriculum/reforms/nses/nses-complete.pdf (Retrieved from the website on July 03, 2017)

Özgür, H. & Tosun, N. (2012). Examination the deep and surface learning approaches of pre-service teachers in terms of some variables. *Mehmet Akif Ersoy University Journal of Education Faculty*, 24, 113-125.

Ruys, I., Van Keer, H. & Aelterman, A. (2010). Collaborative learning in pre-service teacher education: an exploratory study on related conceptions, self-efficacy and

implementation. *Educational Studies, 36*(5), 537-553. http://dx.doi.org/10.1080/03055691003729021

Shawer, S. F. (2017). Teacher-driven curriculum development at the classroom level: Implications for curriculum, pedagogy and teacher training. *Teaching and Teacher Education, 63*, 296-313.

Stamouli, I & Huggard, M. (2007). *Phenomenography as a Tool for Understandıng Our Students.* International Symposium for Engineering Education, Dublin City University, Ireland. http://doras.dcu.ie/447/1/Stamouli-huggard_ISEE07.pdf (Retrieved from the website on December 31, 2018)

Ucar, S. & Sanalan, V. A. (2011). How has reform in science teacher education programs changed preservice teachers' views about science? Journal of Science Education and Technology, 20 (1), 87-94. doi:10.1007/s10956-010-9236-5

Volet, S., & Mansfield, C. (2006). Group work at university: Significance of personal goals in the regulation strategies of students with positive and negative appraisals. *Higher Education Research and Development, 25*(4), 341–356.

Weiland, I. S., Hudson, R. A. & Amador, J. M. (2014). Preservice formative assessment interviews: The development of competent questioning. *International Journal of Science and Mathematics Education, 12*, 329-352.

Wilson, R. E. & Kittleson, J. M. (2012). The role of struggle in pre-service elementary teachers' experiences as students and approaches to facilitating science learning. *Research in Science Education,* 42, 709-728. doi:10.1007/s11165-011-9221-x

Wosnitza, M. & Volet, S. (2013). Trajectories of change in university students' general views of group work following one single group assignment: significance of instructional context and multidimensional aspects of experience. *European Journal of Psychology of Education, 29,* 101-115. DOI 10.1007/s10212-013-0189-y

Yücel-Toy, B. (2015). A thematic review of preservice teacher education research in turkey and reflections of teacher education policies. *Education and Science, 40* (178), 23-60. doi:10.15390/EB.2015.4012

Zedda, M., Bernardelli, S. & Maran, D.A. (2017). Students' satisfaction with the group work method and its performance evaluation: a survey in an Italian university. *International Journal of Instruction, 10*(3), 1-14. https://doi.org/10.12973/iji.2017.1031a

Okyar, H., & Demir, Y. (2014). An investigation into Turkish EFL learners' stereotyped thoughts and exposure to English: A correlational study. *International Online Journal of Education and Teaching (IOJET), 6*(2), 379-391.

http://iojet.org/index.php/IOJET/article/view/540

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AN INVESTIGATION INTO TURKISH EFL LEARNERS' STEREOTYPED THOUGHTS AND EXPOSURE TO ENGLISH: A CORRELATIONAL STUDY

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AN INVESTIGATION INTO TURKISH EFL LEARNERS' STEREOTYPED THOUGHTS AND EXPOSURE TO ENGLISH: A CORRELATIONAL STUDY

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Abstract

This study aims to investigate tertiary EFL learners' stereotyped thoughts about foreign languages, the extent of their exposure to English, and the potential relationships between these variables, also in relation to their proficiency level. 124 EFL students in the preparatory school of a state university in Turkey participated in the study. Two quantitative data collection instruments were distributed to the participants: *Stereotyped Thoughts About Foreign Languages Scale* (Ünal, 2015) and *Exposure to English Scale* (Gökcan & Çobanoğlu-Aktan, 2016). Descriptive statistics and correlations were used to analyze the data. The results showed that the participants held a moderate level of stereotyped thoughts and exposure to English. Moreover, significant and positive relationships were revealed between L2 exposure and (1) proficiency level and (2) the two dimensions of stereotyped thoughts: *collectivity* at a weak level and *trying to change people* at a moderate level. However, L2 exposure correlated significantly and negatively with *taking it personally* and *exaggerated generalization* at a weak level. Concerning the relationships between proficiency level and the dimensions of stereotyping, *the "Must" rule*, *taking it personally* and *excessively self-sacrificing* showed significant and negative relationships with proficiency level weakly, while *exaggerated generalization* correlated with proficiency at a moderate level.

Keywords: L2 exposure, stereotypes, foreign languages, attitudes

1. Introduction

A variety of factors have been historically and theoretically mentioned as being significant in learning a second/foreign language. Among the most significant of these is sufficient and comprehensible language input for successful acquisition of a language (Harmer, 2007; Krashen, 1985, 1991; Krashen & Terrell, 1995). The term *input* here refers to learners' exposure to spoken and written language, in other words, it includes experiencing the target language through listening and reading (Gass, Behney & Plonsky, 2013; Gass & Mackey, 2007). Considering the essential role of exposure in language learning, many researchers (e.g. Bahrani & Sim, 2012; Bahrani & Soltani, 2012; Caravolas & Bruck, 1993; Durrant & Schmitt, 2010; Ellis, 1999; Ellis & Collins, 2009; Hernandez, 2008; Marsden, 2006; Okyar & Yangın Ekşi, 2017; Rodrigo, Krashen & Gribbons, 2004; Rott, 1999; Sonbul & Schmitt, 2013) conducted studies in search for the link between language input and language learning from various perspectives.

Related to L2 input, to mention but a few, Rott (1999) investigated the effects of quantity of input, i.e. the frequency of exposure on the learning of the target words. In her study,

learners were exposed to the target words in reading texts twice, four or six times, and it was noticed that the more the learners encounter the target words, the more effectively they learn. Considering this finding, it can be argued that the quantity of input, that is to say, amount of exposure plays an important role in L2 learning. Shehata (2008) investigated the correlation between EFL and ESL learners' exposure to collocations and their collocational knowledge. With this purpose in mind, she included two groups in her study: Arabic students learning English as a second language in the U.S., and Arabic students learning English as a foreign language in Egypt. In order to see the learners' perceived amount of exposure to English, a questionnaire was delivered to the participants. Additionally, students' collocational knowledge was assessed through productive and receptive tests. The results of the analysis showed a moderate positive correlation between the learners' self-reported amount of exposure and their collocational knowledge. When the analysis was conducted separately for each group, it was seen that the correlation was strong for the ESL group while it was moderate for the EFL group. Moreover, Matsumura (2003) reported a positive correlation between the amount of L2 exposure and development of pragmatic competence of language learners. Along similar lines, Trofimovich and Baker (2006) revealed the productive effect of exposure on stress timing, while Leow (1998) found that multiple exposure to morphological forms promoted students' ability to produce these forms. These results overall show the fundamental role of exposure to the target language for successful language learning.

Since there is a positive link between sufficient language exposure and successful language learning (Harmer, 2007), it seems crucial for language learners to be exposed to the target language to the greatest extent possible. However, ample exposure to target language may not be easily possible for learners who learn English as a foreign language. This is because in foreign language learning contexts—contrary to second language learning contexts—the target language is not a medium of communication outside the classroom (Brown, 2007a; Van den Branden, 2007; VanPatten & Benati, 2010). As a case in point, students in Turkey learn English as a foreign language, and therefore they do not have plenty of opportunities to hear and practice English outside the classroom while on the other hand digital technologies seem to pave the way for more language exposure in EFL contexts. Therefore, it is worth scrutiny to find out the amount of Turkish EFL learners' exposure to English both inside and outside the classroom. Language teachers might think that they provide as much English input as possible in class; however, approaching the issue from the other side of the coin, i.e. from the viewpoint of learners can be very helpful to get more detailed information. Moreover, learners' self-reported exposure to L2 can help to determine what they do for their own learning outside the class.

In addition to language exposure, other factors such as motivation, self-confidence, anxiety, attitude, in other words, personality factors can also impact on the learning of the target language (Brown, 2007a; Gass et al., 2013; Krashen, 1981). To put it another way, individual differences are involved in the language learning process in a way that affects the achievement of language learners (Carrasquillo, 1994). Along these lines, another concept that may have an important role in language learning process is *stereotyping*. In the most general sense, stereotyping refers to "some type of attitude toward the culture or language in question" (Brown, 2007b, p. 192). The term attitude is crucial since a plethora of studies mentioned the facilitative effects of positive attitudes on leading to language learning gains (e.g., Csizér & Kormos, 2014; Krashen, 1981). With this in mind, stereotyping in relation to L2 learning is worth investigating. While some studies addressed stereotyping within the framework of L2 culture (e.g. Heusinkveld, 1985; Nguyen & Kellogg, 2010; Nikitina, 2015; Itakura, 2004; Stephens, 1997), others also included different variables such as gender stereotypes (Demir & Yavuz, 2017; Lewandowski, 2014; Oliveira, 2008; Tajeddin & Janebi

Enayat, 2010) in relation to L2. As different from these studies, depending on Ünal (2015), the current study focuses on stereotyped thoughts of learners about foreign languages. Ünal (2015) highlighted the need for studies related to learners' stereotyped thoughts about foreign languages. To that end, he designed a study considering Dökmen's (1997) classification of stereotyped thoughts that affect daily life and learning process. These stereotyped thoughts are categorized as exaggerated generalization, polarization, taking it personally, the must rule, trying to change people, excessively self-sacrificing, regret, collectivity. Each of them is elaborated by Dökmen (1996, p. 80-86) as follows:

Exaggerated generalization: Generalization refers to the thought that something (e.g. an event or a situation) is true all the time for everyone. People who make exaggerated generalizations miss the difference between the whole and the piece, and they like using the words such as "everyone, always, all the time, and never" (p. 80). For instance, the sentence *I will never succeed in English* is typical of an exaggerated generalization. These kinds of negative generalizations are discouraging and they may cause lack of self-confidence.

Polarization (all or nothing): It refers to the extreme attitudes toward the events. In polarization, there is either black or white, that is to say, there is no gray. Therefore, people with this kind of stereotyped thought perceive events as *all-or-nothing*. As a case in point, a student might conceive of proficient speakers of English as respectable in comparison to those who are not.

Taking it Personally: It refers to a person's state of feeling responsible for other people's problems even though he/she is not involved in them. This involves self-accusation. To exemplify, a student may not believe in his/her hard work to be sufficient to succeed in English.

The "Must" Rule: It refers to the thought that some of the rules can never change. The following sentences exemplify the nature of the "must" rule for L2 learners:

- "*It is a prerequisite for me to take private English courses to be successful."*

Trying to Change People: This refers to the effort to change people in a way that they think and act the way we do. The following is an example for this categorization.

- *"I direct people around me to learn a foreign language."*

Excessively self-sacrificing: The exact opposite of *trying to change people* is excessively self-sacrificing. For excessively self-sacrificing people, other people's thoughts are more important than their own. These people sacrifice their own desires, and try to behave and act the way other people want them to as the following example shows:

- *"I learn the foreign language because my family wants."*

Regret (I wish I had…): Regret means a feeling of sadness as a result of some events that happened in the past. The expressions such as *I wish I had not gone there, I wish I had not said that* are typical examples of regret which make us unhappy (p. 85). It is exemplified as follows:

- *"I wish I had studied more to learn a foreign language."*

Collectivity (To put all eggs in one basket): A person can have various roles and traits such as being beautiful, a housewife, a landlord, and so on. Collectivity refers to a person's perception of all these traits and roles collectively without differentiating among them. For instance, if an employee starts to conceive of himself as a useless person as a result of a punishment because of his/her one mistake at work, then this is called collectivity. A person

has many different roles and being unsuccessful in one area does not mean that this person is totally unsuccessful in many other areas. Collectivity for L2 learners is exemplified below:

- *"My writing ability shows my foreign language knowledge."*

Ünal (2015), based on the above-mentioned stereotyped thoughts, developed a scale related to learners' stereotyped thoughts about foreign languages, which served as a springboard for the researchers to handle stereotyping from a different perspective. Investigating L2 learners' stereotyped thoughts about foreign languages and their relationship with learners' proficiency level may shed light on the possible reasons behind their success and failure in L2 learning. In addition to this, learners' self-perceived exposure to English in relation to their proficiency level can help to gain deeper insights into the effects of L2 exposure on L2 learning. Considering the need for research on these issues, the present study aimed to address the following research questions:

1. What are Turkish EFL learners' stereotyped thoughts about foreign languages?
2. What is the extent of exposure to English among Turkish EFL learners?
3. Do EFL learners' stereotypes about foreign languages, their exposure to English, and English proficiency correlate?

2. Method

2.1. Participants

The participants of this study are tertiary-level EFL learners in the English preparatory program of a state university in Turkey. Having been sampled conveniently out of the compulsory English classes at the end of 2017-18 academic year, a total of 124 intermediate-level participants were involved in the study, which corresponds to almost one third of the whole population. 34% of the participants were females (n=42) while 66% were males (n=82). The distribution of the research participants in relation their departments is as follows: civil aviation management (49%, n=61), engineering faculty (31%, n=38), and international relations (20%, n=25).

2.2. Data collection instruments

Two scales were utilized in the data collection process of the study. The first one was oriented toward measuring the amount of exposure to English (Exposure to English Scale), and the second one allowed for revealing students' stereotyped thoughts about foreign languages (Stereotyped Thoughts About Foreign Languages Scale). Both of the scales were developed in a similar context as in the current study, i.e. in the Turkish EFL context with Turkish EFL learners, and were applied in their mother tongue.

Stereotyped Thoughts About Foreign Languages Scale was developed by Ünal (2015) with 313 university students. In order to generate factors and check the suitability of the scale for factor analysis, *Bartlett's test of sphericity* and the *KMO* index (Kaiser-Mayer-Olkin) were calculated. KMO index was calculated as .810 while *Bartlett's test of sphericity* had a significant value ($p<.01$), which were eligible results for exploratory factor analysis. The emergent stereotyped thoughts about foreign languages scale consisted of 42 items under 8 factors. The scale items were based on a *five*-point Likert scale ranging from "strongly disagree" to "strongly agree". Cronbach's alpha reliability coefficient for the whole instrument was reported as 0.876.

Developed by Gökcan and Çobanoğlu-Aktan (2016) with 505 students, the 20-item *Exposure to English Scale* was arranged into five dimensions as a result of exploratory factor analysis, induced by a significant *Bartlett's test of sphericity* value ($p<.01$) and a KMO index of .932. The whole scale had an alpha reliability coefficient of 0.907. In the current study, the

scale measured exposure to English based on the frequency words ranging from "never" to "always".

2.3. Data analysis

The item scores in both of the scales were directly input into SPSS 23 software, i.e. no reverse coding was made. This is because in the first scale, all the items elicited stereotyped thoughts irrespective of negativeness/positiveness of the phrasings, while the second scale revealed exposure to English through frequencies. The results with regard to the students' stereotyped thoughts about foreign languages and their exposure to English were evaluated within the following limit values as specified in the original scale developed by Ünal (2015), respectively: "strongly disagree" (1.00 – 1.79), "disagree" (1.80 – 2.59), "undecided" (2.60 – 3.39), "agree" (3.40 – 4.19) and "strongly agree" (4.20 – 5.00) for the first scale, and "never" (1.00 – 1.79), "rarely" (1.80 – 2.59), "sometimes" (2.60 – 3.39), "usually" (3.40 – 4.19) and "always" (4.20 – 5.00) for the second scale. In the present study, alpha reliability coefficients were calculated as 0.862 for the *Stereotyped Thoughts About Foreign Languages Scale*, and 0.810 for the *Exposure To English Scale*.

In the reporting of the data, descriptive statistics such as mean, percentage and standard deviation were utilized. In addition, before the statistical analyses, Kolmogorov-Smirnov and Shapiro-Wilk tests were conducted to check for the distribution of the data in terms of normality. As a result of the *p* value that is lower than .05 and therefore signals that the data did not show normal distribution, non-parametric tests were opted over parametric tests. In this respect, Spearman's correlation was performed in order to reveal possible correlations in place of Pearson correlation test.

3. Results

3.1. Turkish EFL learners' stereotyped thoughts about foreign languages

Table 1 shows the mean scores received by the eight dimensions of the stereotyped thoughts about foreign languages scale as well as the average score on the whole instrument. Considering the reference ranges specified, it is seen that the participants hold a moderate level of stereotyped thoughts about foreign languages ($\bar{x}$=2.86). With reference to the dimensions of the scale, *regret* and *collectivity* demonstrate the highest mean scores ($\bar{x}$=3.72, sd=4.402; $\bar{x}$=3.40, sd=4.381, respectively. Reference range is *agree* for both dimensions). On the other hand, *excessively self-sacrificing*, *taking it personally*, and *exaggerated generalization* receive the lowest mean scores ($\bar{x}$=1.96, sd=2.899; $\bar{x}$=2.35, sd=3.398; $\bar{x}$=2.35, sd=5.427, respectively. Reference range is *disagree* for all the three dimensions). The remaining three dimensions fall within *undecided* category in a descending order as *the "must" rule* ($\bar{x}$=3.14, sd=4.774), *trying to change people* ($\bar{x}$=2.98, sd=4.967) and *polarization* ($\bar{x}$=2.87, sd=5.099).

Table 1. *Results related to the stereotyped thoughts about foreign languages scale*

Dimension	N	$\bar{x}$	SD
Exaggerated generalization	124	2.35	5.427
Trying to change people	124	2.98	4.967
Regret	124	3.72	4.402
Polarization	124	2.87	5.099
Collectivity	124	3.40	4.381
The "Must" rule	124	3.14	4.774
Taking it personally	124	2.35	3.398

Excessively self-sacrificing	124	1.96	2.899
Total	124	2.86	

As shown in Table 2, the four top rated items of the scale belong to *regret* dimension (at *agree* level, $\bar{x}$=4.02, sd=1.189; $\bar{x}$=4.01, sd=1.016; $\bar{x}$=4.00, sd=1.119; $\bar{x}$=3.98, sd=1.158, respectively). These items include regretfulness regarding the students' past negligences of beginning to study earlier and harder, dedicating enough time and importance to a foreign language. The fifth most rated item, which sees it as a prerequisite to practice a foreign language with an accompanier in order to succeed, belongs to *the "Must" rule* dimension (at *agree* level, $\bar{x}$=3.81, sd=1.054).

Concerning the first three least rated items, the students seem not to be holding excessively self-sacrificing dispositions. (at *disagree* level, $\bar{x}$=1.83, sd=1.010; $\bar{x}$=1.90, sd=1.078; $\bar{x}$=1.98, sd=1.024, respectively). These items reflect the students' reluctance to renounce the opportunity of learning a foreign language for the sake of their families. As for the other least rated items, they do not tend to make exaggerated generalizations such as never being able to learn a foreign language and believing to make the same error all the time (at *disagree* level, $\bar{x}$=2.06, sd=.917; $\bar{x}$=2.10, sd=1.019, respectively).

Table 2. *The most and the least rated items in the stereotyped thoughts scale*

Most rated items	$\bar{x}$	**SD**
I wish I had started learning a foreign language earlier. (regret)	4.02	1.189
I wish I had allowed more time to learn a foreign language. (regret)	4.01	1.016
I wish I had grasped the importance of learning a foreign language earlier. (regret)	4.00	1.119
I wish I had studied more to learn a foreign language. (regret)	3.98	1.158
In order to succeed in a foreign language, there certainly must be somebody around me with whom I can speak that language. (the "Must" rule)	3.81	1.054
Least rated items	$\bar{x}$	**SD**
I learn a foreign language because my family wants me to do so. (excessively self-sacrificing)	1.83	1.010
I can renounce an opportunity of foreign language education if my family does not want it. (excessively self-sacrificing)	1.90	1.078
I can give up learning a foreign language in order not to get my family into financial trouble. (excessively self-sacrificing)	1.98	1.024
I think I will always make the same error in a foreign language. (exaggerated generalization)	2.06	.917
I think I will never succeed in learning a foreign language. (exaggerated generalization)	2.10	1.019

"strongly disagree" (1.00 – 1.79), "disagree" (1.80 – 2.59), "undecided" (2.60 – 3.39), "agree" (3.40 – 4.19) and "strongly agree" (4.20 – 5.00)

3.2. The extent of exposure to English

When the extent of exposure to English is examined, as seen in Table 3, the students show a moderate level of exposure to English ($\bar{x}$=2.87 out of 5.00, in *sometimes* range). While their biggest sources of exposure are multimedia ($\bar{x}$=3.71, sd=3.320, in *usually* range) and school ($\bar{x}$=3.61, sd=3.137, in *usually* range), they get the least exposure from the text ($\bar{x}$=2.12, sd=4.595, in *rarely* range) and friends ($\bar{x}$=2.43, sd=2.276, in *rarely* range) dimensions.

Table 3. *Results related to extent of exposure to English*

Dimension	**N**	$\bar{x}$	**SD**
Text	124	2.12	4.595
Multimedia	124	3.71	3.320
School	124	3.61	3.137
Friends	124	2.43	2.276
Software	124	3.01	2.521
Total	124	2.87	

"never" (1.00 – 1.79), "rarely" (1.80 – 2.59), "sometimes" (2.60 – 3.39), "usually" (3.40 – 4.19) and "always" (4.20 – 5.00)

Moreover, a scrutiny of the featured exposure items reveals that the students get the most exposure, in a descending order, from the lessons being taught in English ($\bar{x}$=4.34, sd=.835), English songs ($\bar{x}$=4.17, sd=.960) and films ($\bar{x}$=3.99, sd=.975), teacher talk in English ($\bar{x}$=3.97, sd=.945) and English TV series ($\bar{x}$=3.90, sd=1.015). On the other hand, they are least exposed to English newspapers ($\bar{x}$=1.69, sd=.868), short messages in English ($\bar{x}$=1.81, sd=.974), and magazines ($\bar{x}$=1.82, sd=996).

3.3. Correlations between exposure, stereotyped thoughts and English proficiency level

The correlations between/among students' level of exposure to English, English proficiency as understood from their year-end scores, and the dimensions of their stereotyped thoughts were examined through Spearman correlation coefficient. As shown in Table 4, slightly though, the students' exposure to English and their proficiency level correlated positively and significantly (r =.232, p<.01), which means as the amount of exposure increases, so does the level of proficiency, and vice versa. What is more, by dividing the exposure scale items into two categories (peripheral exposure items such as teacher, school, friends etc. as opposed to personal exposure items such as watching English films, TV series, reading magazines etc.), an effort was made to understand the potential relationships between proficiency level and (1) *peripheral* and (2) *personal* exposure, separately. As a result, a significant positive relationship was revealed only between proficiency level and personal exposure (r =.223, p<.05 at a weak level).

When the potential relationships between the level of exposure and the dimensions of stereotyped thoughts are investigated, it is seen that significant positive relationships were observed between exposure and (1) *trying to change people* (r =.401, p<.000 at a moderate level), and (2) *collectivity* (r =.216, p<.05 at a weak level) whereas exposure correlated with (1) *taking it personally* (r = -.252, p<.01) and (2) *exaggerated generalization* (r = -.205, p<.05) weakly and negatively. However, no significant relationships were observed between exposure and (1) *regret*, (2) *polarization*, (3) *the "Must" rule* and (4) *excessively self-sacrificing* dimensions (p>.05 in all cases).

With reference to the relationships between proficiency level and the dimensions of stereotyped thoughts, (1) *the "Must" rule* (r = -.239, p<.01 at a weak level), (2) *taking it personally* (r = -.256, p<.01 at a weak level), (3) *excessively self-sacrificing* (r = -.209, p<.05 at a weak level) and (4) *exaggerated generalization* (r = -.468, p<.000 at a moderate level) showed significant and negative relationships with proficiency level. On the other side, there were not significant relationships between proficiency level and (1) *trying to change people*, (2) *regret*, (3) *polarization*, and (4) *collectivity* (p>.05 in all cases).

Table 4. *Correlations between exposure, stereotyped thoughts and proficiency level*

		exposure	ex. generalization	trying to change people	regret	polarization	collectivity	the "Must" rule	taking it personally	ex.self-sacrificing	proficiency level
exposure	r	1,000	-,205*	,401**	,086	,102	,216*	-,008	-,252**	-,154	,232**
	Sig. (2-tailed)	.	**,022**	**,000**	,340	,259	**,016**	,934	**,005**	,089	**,009**
	N	124	124	124	124	124	124	124	124	124	124
ex. general.	r	-,205*	1,000	-,151	,270**	,203*	,002	,356**	,511**	,407**	-,468**
	Sig. (2-tailed)	,022	.	,094	,002	,024	,979	,000	,000	,000	,000
	N	124	124	124	124	124	124	124	124	124	124
trying to change p.	r	,401**	-,151	1,000	,286**	,147	,327**	,194*	-,137	-,009	,073
	Sig. (2-tailed)	,000	,094	.	,001	,104	,000	,031	,131	,921	,421
	N	124	124	124	124	124	124	124	124	124	124
regret	r	,086	,270**	,286**	1,000	,288**	,129	,247**	,002	,020	-,011
	Sig. (2-tailed)	,340	,002	,001	.	,001	,152	,006	,980	,828	,906
	N	124	124	124	124	124	124	124	124	124	124
polarization	r	,102	,203*	,147	,288**	1,000	,311**	,168	,159	,158	,031
	Sig. (2-tailed)	,259	,024	,104	,001	.	,000	,061	,078	,080	,734
	N	124	124	124	124	124	124	124	124	124	124
collectivity	r	,216*	,002	,327**	,129	,311**	1,000	,085	,009	-,050	-,093
	Sig. (2-tailed)	,016	,979	,000	,152	,000	.	,346	,920	,584	,303
	N	124	124	124	124	124	124	124	124	124	124
the "Must" rule	r	-,008	,356**	,194*	,247**	,168	,085	1,000	,202*	,021	-,239**
	Sig. (2-tailed)	,934	,000	,031	,006	,061	,346	.	,024	,820	,008
	N	124	124	124	124	124	124	124	124	124	124
taking it personally	r	-,252**	,511**	-,137	,002	,159	,009	,202*	1,000	,490**	-,256**
	Sig. (2-tailed)	,005	,000	,131	,980	,078	,920	,024	.	,000	,004
	N	124	124	124	124	124	124	124	124	124	124
ex.self-sacrificing	r	-,154	,407**	-,009	,020	,158	-,050	,021	,490**	1,000	-,209*
	Sig. (2-tailed)	,089	,000	,921	,828	,080	,584	,820	,000	.	,020
	N	124	124	124	124	124	124	124	124	124	124
proficiency level	r	,232**	-,468**	,073	-,011	,031	-,093	-,239**	-,256**	-,209*	1,000
	Sig. (2-tailed)	,009	**,000**	,421	,906	,734	,303	**,008**	**,004**	**,020**	.
	N	124	124	124	124	124	124	124	124	124	124

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

4. Discussion

One of the prominent findings of this study was that the tertiary-level EFL learners' exposure to English was at a moderate level and the most reported type of exposure to English was through multimedia and school, respectively. The least reported source of exposure to English, on the other hand, was through texts. It is worth noting that the learners' proficiency levels correlated positively with their exposure to English. This finding seems to be in line with those of many other studies (e.g. Matsumura, 2003; Rott, 1999; Shehata, 2008) which reported positive relationships between the amount of exposure and L2 development. At the same time, this finding of the present study supports the claims of some theorists and methodologists (e.g. Harmer, 2007; Krashen, 1985, 1991; Krashen & Terrell, 1995) who highlight the positive link between sufficient L2 exposure and language gains. With regard to exposure, another featured result of this study was that the students' personal exposure, rather than peripheral exposure, was significantly and positively correlated with their proficiency levels. This shows that learners' personal struggle to get target language input outside the class (e.g. by reading magazines, watching English TV series, listening to English songs etc.) can have more positive effects on their L2 development in comparison to

the exposure provided in formal instructional settings (e.g. teacher talk). This may also be the result of the fact that when learners take responsibility for their own learning beyond the classroom (see Benson, 2011), they can become more successful in L2 learning. This personal effort is very crucial for EFL learners given the fact that there are no "ready-made contexts for communication beyond their classroom" (Brown, 2007a, p. 134) in EFL contexts unlike the case in ESL contexts. Therefore, in EFL contexts, learners' voluntary efforts to be exposed to L2 through a variety of ways beyond the classroom seem to have facilitative effects on their L2 proficiency development.

As is the case with the learners' general exposure to L2, analyses also revealed a moderate level of stereotyped thoughts about foreign languages. Among the eight dimensions of stereotyped thoughts, *regret (I wish I had…)* was the most frequently reported stereotype by the learners. This highlights their expressions of regret regarding not spending more time or not making more efforts for learning English. The second most rated dimension of stereotyped thoughts by the learners was *collectivity*. Learners having the stereotype of collectivity think that their success in one aspect of a language (e.g. grammar) indicates their level of knowledge in L2. However, the success of a learner in one language skill does not necessarily generalize to every aspect of L2. The least rated dimensions of stereotyped thoughts were *excessively self-sacrificing*, *taking it personally*, and *exaggerated generalization*, respectively. First of all, these results indicate that learners do not want to give up learning a foreign language for the sake of others (e.g. their families). With this in mind, it can be said that learners tend to adopt positive attitudes toward learning foreign languages. This is especially important given that learners become more successful in learning a foreign language when their attitudes toward the target language is positive (Eshghinejad, 2016; Fakeye, 2010; Oroujlou & Vahedi, 2011). When the low scores regarding the dimensions *taking it personally and exaggerated generalization* are taken into account, it can be deduced that the students do not have very negative stereotyped thoughts about learning foreign languages. As for the results related to the relationship between learners' stereotyped thoughts and proficiency level, *exaggerated generalization, excessively self-sacrificing, taking it personally and the "Must" rule* are in negative correlation with the learners' proficiency level. This finding may imply that when learners' negative generalizations and stereotyped thoughts are eliminated, their L2 development can be promoted.

As to the correlations between L2 exposure and the dimensions of stereotyped thoughts, it was seen that the highest positive relationship was between L2 exposure and *trying to change people* at a moderate level. On this basis, it can be said that when learners feel the benefits of exposure to L2, considering this usefulness, they try to change other people, in other words, encourage others to engage more with the target language (e.g. leading others to learn and speak English, to read texts and watch TV programs in English, etc.). In addition to this, the negative correlations between exposure to L2 and *exaggerated generalization* and *taking it personally* indicates that more exposure to L2 can help to minimize making exaggerated and unfavorable generalizations and taking it personally. For instance, one's biased misconception of never being able to learn a foreign language could be disposed through his/her exposure to foreign languages, of course depending on the quality and quantity of input.

With respect to the relationships between proficiency level and the dimensions of stereotyped thoughts, there was a moderate and negative correlation between the learners' proficiency level and exaggerated generalization. To put it another way, as the learners' proficiency level increases, they tend to make less generalization (e.g. I can never learn a foreign language) about learning foreign languages. Furthermore, other three dimensions of

stereotyped thoughts, namely, *the "Must" rule, taking it personally* and *excessively self-sacrificing* were also negatively correlated with proficiency level. From this point forth, it can be reasoned that stereotyped thoughts seem to have some serious potential to negatively affect learners' achievement in L2. Therefore, as a consequence, it seems to be a worthwhile investment to help learners get rid of these stereotyped thoughts.

5. Conclusion and Suggestions

This study was conducted to find out the EFL learners' self-reported level of exposure to English and their stereotyped thoughts about learning English as well as their relationship with learners' English proficiency. One of the important findings of the study is that the students' level of exposure to English was moderate, and there was a positive relationship between the students' level of exposure and proficiency levels in English. Therefore, considering the central role of L2 input both inside and outside the classroom, it seems necessary to create opportunities for EFL learners to receive large amount of language input. On this basis, language classes can be equipped with modern technologies that provide as much authentic exposure to L2 as possible. Besides, it would be better to inform learners about different kinds of L2 resources for using outside the class so that they can get plenty of opportunities to meet the target language. Another important thing to mention here is that the students reported to receive the least exposure from the texts and their friends, respectively. Keeping this in mind, sources of L2 input can be enriched by exposing students to extensive reading and by increasing students' interaction through English-spoken cafes and clubs so that the lack of exposure to the language in non-English speaking countries like Turkey can be compensated.

Another important finding of the study is that the students' had a moderate level of stereotyped thoughts about foreign languages. Moreover, it was highlighted that there was a negative relationship between some types of stereotyped thoughts (e.g. *the "Must" rule, taking it personally, excessively self-sacrificing, exaggerated generalization)* and the students' proficiency level. In the light of this result, it seems a real necessity to eliminate the negative effects of these stereotyped thoughts for more effective L2 learning. Therefore, future studies need to be done on how to minimize the negative effects of learners' stereotyped thoughts on learning foreign languages. Moreover, this study examined the aforementioned concepts through quantitative measurements, and for this reason, further research can add a qualitative dimension to get deeper insights into the effects of L2 exposure and stereotyped thoughts on L2 learning. Besides, this study focused only on learners' self-reported level of L2 exposure and stereotyped thoughts. Considering this, further research can also include observational methods to see how learners' self-reported L2 exposure and stereotyped thoughts are reflected to their L2 learning process. Lastly, in order to validate the conclusions obtained from this study, future studies can explore these issues by including larger sample sizes in different EFL contexts.

References

Bahrani, T., & Sim, T. S. (2012). Audiovisual news, cartoons, and films as sources of authentic language input and language proficiency enhancement. *The Turkish Online Journal of Educational Technology, 11*(4), 56-64.

Bahrani, T., & Soltani, R. (2012). Language input and second language acquisition. *Journal of Education and Practice, 3*(3), 39-42.

Benson, P. (2011). *Teaching and researching autonomy* (2nd Ed.). Harlow: Pearson Education.

Brown, H. D. (2007a). *Teaching by principles: An interactive approach to language pedagogy* (3rd ed.). White Plains, NY: Pearson.

Brown, H. D. (2007b). *Principles of language learning and teaching*. White Plains, NY: Pearson.

Caravolas, M., & Bruck, M. (1993). The effects of oral and written language input on children's phonological awareness: A crosslinguistic study. *Journal of Experimental Child Psychology, 55*, 1-30.

Carrasquillo, A. L. (1994). *Teaching English as a second language: A resource guide.* New York: Garland Publishing.

Csizér, K., & Kormos, J. (2014). The ideal L2 self, self-regulatory strategies and autonomous learning: A comparison of different groups of English language learners. In K. Csizér & M. Magid (Eds.), *The impact of self-concept on language learning* (pp. 73-87). Bristol: Multilingual Matters.

Demir, Y., & Yavuz, M. (2017). Do ELT coursebooks still suffer from gender inequalities?: A case study from Turkey. *Journal of Language and Linguistic Studies, 13*(1), 103-122.

Dökmen, Ü. (1996). *Communication conflicts and empathy: A framework for Turkish cultural understanding.* Istanbul: System publishers.

Dökmen, Ü. (1997). *İletişim çatışmaları ve empati.* Ankara: Sistem Yayıncılık.

Durrant, P., & Schmitt, N. (2010). Adult learners' retention of collocations from exposure. *Second Language Research, 26*(2), 163-188.

Ellis, N., & Collins, L. (2009). Input and second language acquisition: The roles of frequency, form, and function. Introduction to the Special Issue. *The Modern Language Journal, 93*(3), 329-335.

Ellis, R. (1999). *Input-based approaches* to *teaching grammar:* A review of classroom-oriented research. *Annual Review of Applied Linguistics, 19*, 64–80.

Eshghinejad, S. (2016). EFL students' attitudes toward learning English language: The case study of Kashan University students. *Cogent Education, 3*(1), 1-13.

Fakeye, D. (2010). Students' personal variables as correlates of academic achievement in English as a second language in Nigeria. *Journal of Social Sciences, 22*, 205–211.

Gass, S. M., & Mackey, A. (2007). Input, interaction and output in second language

acquisition. In B. VanPatten & J. Williams (Eds.), *Theories in second language acquisition: An introduction* (pp. 175-199). Mahwah, NJ: Lawrence Erlbaum Associates.

Gass, S. M., Behney, J., & Plonsky, L. (2013). *Second language acquisition: An introductory*

course (4th ed.). New York: Routledge.

Gökcan, M., & Çobanoğlu Aktan, D. (2016). İngilizceye maruz kalma ölçeğinin geçerlik ve güvenirliğinin incelenmesi. *Uluslararası Çağdaş Eğitim Araştırmaları Kongresi*, 283-295.

Harmer, J. (2007). *The Practice of English Language Teaching* (4th ed.). Pearson: Longman.

Hernandez, T. A. (2008). The effect of explicit instruction and input flood on students' use of discourse markers on a simulated oral proficiency interview. *Hispania, 91*, 665-75.

Heusinkveld, P. (1985). The foreign language classroom: A forum for understanding cultural stereotypes. *Foreign Language Annals, 18*(4), 321-325.

Itakura, H. (2004). Changing cultural stereotypes through e-mail assisted foreign language learning. *System: An International Journal of Educational Technology and Applied Linguistics, 32*(1), 37-51.

Krashen, S. (1981). *Second language acquisition and second language learning*. Oxford: Pergamon Press.

Krashen S. (1985). *The Input hypothesis: Issues and implications*. New York: Longman.

Krashen, S. (1991). The input hypothesis: An update. In J. E. Alatis (Ed.), *Linguistics and language pedagogy: The state of the art* (pp. 409-431). Washington, DC: Georgetown University Press.

Krashen, S., & Terrell, T. (1995). *The natural approach: Language acquisition in the classroom*. New York: Phoenix ELT.

Leow, R. P. (1998). The effects of amount and type of exposure on adult learners' L2 development in SLA. *The Modern Language Journal, 82*(1), 49-68.

Lewandowski, M. (2014). Gender stereotyping in EFL grammar textbooks. A diachronic approach. *Linguistik Online, 68*(6), 83-99.

Marsden, E. (2006). Exploring input processing in the classroom: An experimental comparison of processing instruction and enriched input. *Language Learning, 56*(3), 507-566.

Matsumura, S. (2003). Modelling the relationships among interlanguage pragmatic development, L2 proficiency, and exposure to L2. *Applied Linguistics, 24*(4), 465-491.

Nguyen, H. T., & Kellogg, G. (2010). "I had a stereotype that American were fat": Becoming a speaker of culture in a second language. *Modern Language Journal, 94*(1), 56-73.

Nikitina, L. (2015) *Country stereotypes and L2 motivation: A study of French, German and Spanish language learners. Studies in Linguistics, 37*, 483-509.

Okyar, H., & Yangın Ekşi, G. (2017). A comparative study on the effects of negative evidence and enriched input on learning of verb-noun collocations. *European Journal of English Language Teaching, 3*(1), 1-16.

Oliveira, S. (2008). Texto visual, estereótipos de gênero e o livro didático de língua estrangeira (*Visual text, gender stereotypes and L2 textbooks*). *Trabalhos em Linguistica Aplicada, 47*(1), 91-117.

Oroujlou, N., & Vahedi, M. (2011). Motivation, attitude, and language learning. *Procedia-Social and Behavioral Sciences, 29*, 994-2000.

Rodrigo, V., Krashen, S., & Gribbons, B. (2004). The effectiveness of two comprehensible-input approaches to foreign language instruction at the intermediate level. *System, 32*(1), 53-60.

Rott, S. (1999). The effect of exposure frequency on intermediate language learners' incidental vocabulary acquisition and retention through reading. *Studies in Second Language Acquisition, 21*(1), 589-619.

Shehata, A. (2008). *L1 influence on the reception and production of collocations by advanced ESL/EFL Arabic learners of English.* Unpublished MA dissertation, Ohio University, USA.

Sonbul, S., & Schmitt, N. (2013). Explicit and implicit lexical knowledge: Acquisition of collocations under different input conditions. *Language Learning, 63*(1), 121–159.

Stephens, K. (1997). Cultural stereotyping and intercultural communication: Working with students from the People's Republic of China in the UK, *Language and Education, 11*(2), 113-124.

Tajeddin, Z., & Janebi Enayat, M. (2010). Gender representation and stereotyping in ELT textbooks: A critical image analysis. *TELL, 4*(2), 51-79.

Trofimovich, P., & Baker, W. (2006). Learning second language suprasegmentals: Effect of L2 experience on prosody and fluency characteristics of L2 speech. *Studies in Second Language Acquisition, 28*(1), 1-30.

Ünal, M. (2015). Developing a scale for stereotyped thoughts about foreign languages. *International Journal of Eurasia Social Sciences, 6*(19), 218-233.

Van den Branden, K. (2007). Second language education: Practice in perfect learning conditions? In R. DeKeyser (Ed.), *Practice in a second language: Perspectives from applied linguistics and cognitive psychology* (pp. 161–179). Cambridge: Cambridge University Press.

VanPatten, B., & Benati A. (2010). *Key terms in second language acquisition*. London: Continuum.

Punar, N. and Uzun, L. (2019). The effect of the Skype ™ Conference Call on English speaking anxiety. *International Online Journal of Education and Teaching (IOJET)*, *6*(2), 393-403.

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THE EFFECT OF THE SKYPE ™ CONFERENCE CALL ON ENGLISH SPEAKING ANXIETY

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Abstract

As a result of the globalized world, technology has become the center of our lives and changes a lot of things such as our education and communication. Educational institutions have started to use some online communication platforms such as Skype ™ while teaching a second language. This research examines the effect of Skype ™ on foreign language learners' speaking anxiety levels and tries to find out the differences in foreign language speaking anxiety levels between the traditional speaking lesson and the Skype ™ Conference Call lesson. Twenty-one B1-B2 level adult English language learners participated in this study and a true experimental research design was used. The data were analyzed by paired samples t-test analysis of pre- and post-tests of participants. The results indicated that Skype ™ had an impact on foreign language learners' speaking anxiety because it reduced the anxiety levels of learners in the experimental group.

Keywords: CALL, Foreign language speaking, Anxiety, Skype ™, English speaking

1. Introduction

In every part of our lives, we can encounter any kind of technology, for the era we live in is highly technology-centered. Because of the technological developments, educational areas have also given a lot of importance to using technology in teaching and learning processes. Schools and other educational institutions have started to implement Information and Communication Technologies (ICT) in their lessons and also, Computer-assisted Language Learning (CALL) has gained in importance. CALL includes ICT use in foreign language education, in the learning-teaching process, and it is not just related to using computers in lessons, it also includes using specific software, web-based learning materials, virtual educational environments such as Second Life for language education, and Computer-mediated Communication (CMC) tools such as online chat and e-mails. One of these CMC tools used in language education is Skype ™ and some studies have been made about the role of Skype ™ on students' four language skills (Gao, 2015). Besides, to determine the foreign language speaking anxiety levels of foreign language learners, some studies have been conducted by using Second Life. However, as Second Life is difficult to use, Oh and Nussli (2014) suggested that this kind of research can be carried out by using Skype ™. The aim of this paper was to determine the differences in English speaking anxiety levels between face-to-face and Skype ™ speaking groups. The results should show us how the speaking lesson

on Skype ™ affected their speaking anxiety. Therefore, the results of the present study will help us understand as well as compare the efficiency and usefulness of the technology-enhanced education compared to education in traditional settings specifically with regard to teaching and learning speaking, and/or improving speaking and communicative skills of the foreign language learners.

2. Literature review

2.1. The effect of technology on foreign language speaking anxiety

Technology, which at first consisted of obsolete or abandoned tools of today such as overhead projectors and cassette players, started to be used in education in the 1960s. With the developments in technology, education has become globalized day by day and educational institutions have been changing their operation systems, and this change also affects the students' learning (Lim & Khine, 2009). In the 1960s, an approach came into existence which is now known as CALL. Levy (1997) defines CALL as the use of computers in language learning and teaching. Chapelle (2002) also defines CALL as using technology in foreign language education in a wide range of areas. Today, the CALL approach does not consist of just computers; it also includes Web 3.0 tools claimed as the 'social web' by Pegrum (2009), tables, smartphones, authentic materials such as animations, , etc., online games, virtual environments and online environments. There are a lot of studies about the beliefs and attitudes of English as a Foreign Language (EFL) teachers and students towards CALL (Saglam & Sert, 2012; Gilakjani & Leong, 2012; Ozel & Arikan, 2015; Ionescu, 2017). The results of these studies are almost the same; all teachers and students think that CALL has an important role in language learning and that it should be integrated in an absolute way. With this common opinion, on the other hand, virtual educational environments started to be used in language education. The effect of virtual environments on language learning has been researched so far. It has been found that virtual environments, mostly Second Life, improve students' motivation for language learning (Kamali, 2012; Beluce & Oliveria, 2015; Uzun, 2017). It can be said that the more motivation there is, the more learning there will be. Based on this belief, Lan (2015) carried out an action research study. He used contextual EFL learning and conducted his research in Second Life. As a result of his study, it was found that, in addition to contextual learning benefits, virtual environment learning also increases students' general learning. Other studies also reported that using virtual environments helps students improve their speaking and listening skills (Rahoyu & Jacobson n.d.; Bautista, 2013; Gao, 2015; Shahri & Ashraf, 2016; Guzel & Aydin, 2016). Apart from the effect of virtual environments on language learning, some studies have been made about their effect on foreign language speaking anxiety. Guzel and Aydin (2014) reviewed the articles about the effects of Second Life on foreign language speaking anxiety (FLSA) and as a general result, most of the studies concurred that Second Life reduces the FLSA levels of foreign language learners (Abal, 2012; Grant, Huang & Neofitou, 2013; Oh & Nussli, 2014). Oh and Nussli (2014) stated in their research that the use of 3D environments was hard to use and that it needed technical requirements. They had to teach it to both students and lecturers to carry out their research. Because of this difficulty, they suggested using alternative online platforms for other studies to be conducted. Skype ™ is regarded as one of these online platforms. It is software designed for communication throughout the world with everyone. It can be used on both mobile phones and computers, even on tablets. It enables users to make free one-to-one calls and conference calls, send messages and share files (Skype ™, n.d.). It can also be used for educational purposes. There are some studies about the effect of Skype ™ on language learning. These studies also concluded that using Skype ™ language education improves students' motivation and enhances their speaking skills (Correa, 2015; Khan, Khan & Ayaz, 2016). However, the

attempt to specify the effects of Skype ™ on speaking anxiety is highly limited. This study aims to determine the effect of Skype ™ on FLSA by making a comparison with face-to-face classroom environments.

2.2. Gender and foreign language speaking anxiety

FLSA has been researched extensively as an important factor in foreign language education (e.g. Bergström, 2017; Cagatay, 2015; He, 2017; Luo, 2014; Mede and Karairmak, 2017). There are also studies that have investigated the effect of and/or relationship between gender and FLSA (e.g. Dewaele et al., 2016; Dewaele and Al-Saraj, 2015; Gargalianou et al., 2015; Öztürk and Gürbüz, 2013). Although there is no clear-cut consensus in the literature related to the effect of gender on FLSA, the majority of the research suggests that the anxiety level of females is usually higher. Researchers have also had interest in how foreign language anxiety is influenced by classroom social factors (Effiong, 2016). However, there are hardly any studies that compare and/or contrast gender differences in face-to-face and online environments such as Skype with regard to FLSA.

Dewaele et al. (2016) investigated gender differences in foreign language enjoyment and foreign language classroom anxiety. According to their findings, females have more fun but also experience more anxiety in foreign language classes compared to males who seemed to worry less about their mistakes, and thus, were more confident. Similarly, Gargalianou et al. (2015) observed that females experience higher levels of foreign language anxiety due to personality traits such as being emotional and conscientious. Likewise, Öztürk and Gürbüz (2012) reported that female students get more anxious than male students while speaking in English in classroom.

The theoretical background of this study is based on the socio-affective filter (Dulay & Burt, 1977), the Affective Filter Hypothesis by Krashen (1982) and CALL (Levy, 1997). The term ‘affective filter’ was firstly used by Dulay and Burt (1977), and then Krashen reviewed it and related it to SLA. Within the Affective Filter Hypothesis, there are three related categories and one of these is anxiety. According to Krashen (1982), the lower the anxiety level, the more language acquisition occurs. In this study, considering the CALL approach, it is expected that Skype ™ should reduce the level of FLSA of learners.

3. Research questions

This study aims to determine the difference in FLSA levels between the face-to-face traditional classroom and the Skype ™ Conference Call classroom. The main purpose of this paper is to find out the effect of Skype ™ on FLSA of adult learners and for this aim, the following research questions are asked:

- What are the general FLSA levels of B1-B2 adult English language learners?
- Is there a difference in FLSA levels of learners between the face-to-face speaking lesson and the Skype ™ Conference Call lesson?
- Does gender affect the students’ FLSA levels?

4. Methodology

A true experimental research design was used in this research. There were two groups, namely the control and experimental groups, and all of the participants were selected randomly.

4.1. Participants

14 female and 7 male, in total 21, English language learners were chosen randomly from a private language school in Bursa. All of the participants were at B1-B2 level and all of them

were adult learners. Besides, their native speaker teacher was also involved in the study as the instructor of the lesson.

The participants were separated into two groups. One of them was the control group consisting of 10 (5 male, 5 female) learners, and the other was the experimental group consisting of 11 (9 female, 2 male) learners. The starting age for the English language learning background of the participants was almost the same, as most of them had started to learn English between the ages of 10-13.

4.2. Instruments

As data collection tools, two scales were used. The first scale was a five-point Likert scale, which was used for pre-test. This was modified based on the scale used by Akkakoson (2016). In this scale, the general English speaking anxiety levels of the participants were identified. The second tool was an ordinal scale constructed by Abal (2012). Participants reported their anxiety level based on 5 levels (1=low anxiety, 5=high anxiety) during the speaking lesson.

The reliability analysis was done in SPSS 24, and Cronbach's Alpha for the General English Speaking Anxiety Scale was 0.641. Cronbach's Alpha for the English Speaking Anxiety Scale based on Activity Type was 0.763.

In addition, 4 different topics were used for the students to speak about during their speaking lesson. These were; complaining about something they had bought, talking about the movies they had watched, talking about the books they had read, and inviting a friend for dinner in a restaurant.

4.3. Procedure

Firstly, the educational counsellor of the private language school was contacted. After obtaining permission to conduct the research, one of the native speaker teachers (NST) at the school was assigned for this study by the educational counsellor. The research questions, significance of the research and procedure were explained to the NST. The scales were given to her and she specified the two groups, one for the control group, and one for the experimental group. In the first part, she gave the pre-test scale to the students before the speaking class. The participants filled in this scale based on their general English speaking anxieties. In both classes, the NST used the same topics offered in advance for speaking. The control group conducted a face-to-face speaking lesson, as usual. The participants filled in the second anxiety scale after this face-to-face class. For the experimental group, the NST determined a time for themselves to meet on Skype ™ Conference Call. All of the students participated in the Skype ™ lesson at the same time as their teacher. They also talked about the same topics as the control group. Their teacher sent the second anxiety scale via online forms and all of the students completed it just after the lesson had finished.

Both of the lessons lasted about 20 minutes. The completed scales were taken from the school and the Skype ™ group scales were sent online. The data were coded in SPSS 24. The frequencies were analyzed. The groups were split into two as face-to-face group and Skype ™ group, and pre-test and post-test results were analyzed via paired samples t-test.

5. Results

In the first part of this study, general FLSA levels of adult learners were revealed. The pre-test results were analyzed and the frequencies were determined. The face-to-face group pre-test mean was 2.77, and the Skype ™ group pre-test mean was 3.07. According to independent samples t-test results, the p-value was not smaller than 0.05 (p=0.086). Therefore, this suggested that there was not a difference in general FLSA level between the

groups, although numerically it seemed to be higher in the experiment group (3.07). The results are also shown in Table 1. This answers the first research question of this study. The mean FLSA level of the adult participants of the present study is 2.92 out of 5.

Table 1. *Pre-test results of face-to-face and Skype ™ groups*

	Groups	N	Mean	P value	SD
Pre-test	Face-to-face	10	2.77	0.086	0.070
	Skype ™	11	3.07		0.146

In the second part, post-tests were analyzed. According to independent samples t-test results (p=0.158), it was observed that there was no difference in post-tests between the groups, although numerically it seemed that the FLSA of the experiment group has decreased (2.51). The results are demonstrated in Table 2.

Table 2. *Post-test results of face-to-face and Skype ™ groups*

	Groups	N	Mean	P value	SD
Post-test	Face-to-face	10	2.97	0.158	0.582
	Skype ™	11	2.51		0.828

The next step was analysis of the pre- and post-test results between groups. According to the data, which are statistically insignificant, the FLSA of the control group has slightly increased (from 2.77 to 2.97) whereas the FLSA of the control group has decreased (from 3.07 to 2.51). Paired samples t-test was used, and paired sample statistics for face-to-face group pre-test and post-test results are shown in Table 3.

Table 3. *Paired samples statistics between groups*

Groups		Mean	N	SD
Face-to-face	Pre-test	2.77	10	0.221
	Post-test	2.97		0.582
Skype™	Pre-test	3.07	11	0.487
	Post-test	2.51		0.828

As a result of the comparison of pre-test and post-test of the face-to-face group (p=0.299), p was higher than 0.05, so there was no significant difference between the tests. However, p-value was revealed as 0.025 for the Skype ™ group between the tests and this means there was a significant difference between pre- and post-test results of the experiment group. The results are presented in Table 4.

Table 4. *Answers for the second research question*

Groups		**Mean**	**SD**	**p value**
Face-to-face	Pre-test vs. Post-test	-0.196	0.563	0.299
Skype™	Pre-test vs. Post-test	0.566	0.710	0.025

As the final step of this study, to obtain an answer for the third research question, independent samples t-test was used to analyze the gender differences by just considering pre-test results. The mean for females was 3.01 and for males, it was 2.78. p=0.000. p<0.05, so there was a difference between genders. The results suggested that FLSA of the females was higher compared to their male counterparts. The results are presented in Table 5.

Table 5. *One-sample test for gender differences according to pre-test results*

Gender		**N**	**Mean**	**SD**	**p value**
Female	Pre-test	14	3.01	0.468	0.000
Male	Pre-test	7	2.78	0.179	

6. Discussion

This study aimed to determine the effect of Skype ™ on FLSA and find out the FLSA level differences between face-to-face and Skype ™ groups. There were two groups in this study. The control group had a traditional face-to-face speaking lesson, and the experimental group had a Skype ™ Conference Call speaking lesson. All of the students talked about the same topics and the results were analyzed in SPSS 24. 21 adult English language learners participated in this study. All of them had started to learn English between the ages of 10-13. They are now the students of a private language school.

10 of them were in the control group, and 11 of them were in the experimental group. All of the students filled in the general FLSA scale as the pre-test. According to the results of the pre-test, there was a difference between face-to-face and Skype ™ groups. The mean for the face-to-face group was 2.77 and for the Skype ™ group it was 3.07. p=0.086. So, at the beginning of the study, the general FLSA level of the Skype ™ group was higher than that of the face-to-face group. Both groups had moderate levels of FLSA. Cagatay (2015) made a study of EFL students' FLSA levels in Turkey and also Akkakoson (2016) made a similar study in Thailand. As a result of both these studies, it was found that the students had moderate levels of FLSA, which is similar to the result of this study.

Secondly, post-test results were compared between groups and no significant differences were found (p=,158, p>,05). The mean for the face-to-face group was 2.97 and for the Skype ™ group it was 2.51. Again, the level of FLSA was at a moderate level.

In order to answer the second research question, the pre- and post-test results between groups were analyzed and the results were as expected. According to paired samples t-test results for the face-to-face group, p=0.299. The results of the pre-test showed that the mean for the face-to-face group was 2.77. In the post-test, this mean increased and became 2.97. However, the p-value was higher than 0.05, so this increase was not the determiner and showed no significant difference between pre-and post-test results. The learners had

moderate levels of FLSA at the beginning and after the speaking lesson their levels of FLSA remained the same.

However, according to paired samples t-test results for the Skype ™ group, there was a significant difference between pre- and post-test results. At the beginning of the lesson, the mean of their general FLSA level was 3.07. This showed that they had moderate levels of anxiety. After the speaking lesson in Skype ™, according to their post-test results, the mean decreased to 2.51 and p=0.025. Because the p-value was smaller than 0.05, this meant that their FLSA level was higher in general, but that having a Skype ™ Conference Call lesson decreased their speaking anxieties.

As it was found before, online environments such as Skype ™ have a positive effect on learners' FLSA levels. Considering these results, this study matches up with the results of the studies about Second Life (Abal, 2012; Grant, Huang & Neofitou, 2013; Oh & Nussli, 2014). If students use Skype ™ for communication and foreign language speaking purposes, their FLSA levels are likely to decrease. So, as Krashen's Affective Filter Hypothesis (1982) claims, less anxiety means more learning.

In the last part of this study, general FLSA levels were compared between the genders. 14 females and 9 males participated in this study and according to their pre-test results, the mean for females was 3.01 and for males, it was 2.78. p=0.000. So, the p-value was smaller than 0.05 and this showed that females became more anxious about speaking English than males did. This result corresponds with a study about the impact of gender on the FLSA level of learners conducted by Ozturk and Gurbuz (2013). They also found that gender affected the FLSA and that females were more anxious than males about speaking a foreign language.

7. Conclusion

This study tried to find out the general FLSA levels of B1-B2 level adult learners, the differences in FLSA levels between a traditional speaking lesson and a Skype ™ Conference Call speaking lesson, and finally the impact of gender on FLSA levels. According to the data analysis collected from the two groups, by using pre-tests, the foreign language learners had a moderate level of FLSA. By comparing pre- and post-tests between groups, while the Skype ™ group's anxiety level decreased, the FLSA levels of the face-to-face group showed an increase, although this increase was not important. In this respect, the important result of this study is the level of FLSA of the Skype ™ group, since the online environment made them less anxious about speaking English. The other thing we can understand from this study is that gender had an impact on the FLSA levels of adult learners. According to the results, females stated that they became more anxious while speaking English in the lesson than males did.

The reason for the results obtained in this study is the era we live in. It is highly technology-centered and all people use it one way or another. Today, most adults, even children, use their mobile phones to communicate more than they use face-to-face communication. They claim that they feel more relaxed while speaking on the phone without seeing each other. Because of this way of thinking, online environments for communication have been gaining in importance and this affects the way we live, think, and even learn. Virtual environments such as Second Life or online environments such as Skype ™ have a great influence on learners' motivation and FLSA. This is something that cannot be denied.

8. Pedagogical implications

Considering the observations and findings revealed in the present study, we would suggest that online speaking environments as well as technology-enhanced communication opportunities should be employed in educational settings as it has been revealed that anxiety

levels drop significantly when compared to face-to-face applications that are carried out traditionally in the classrooms. Technology tools such as Skype might be particularly employed with female students who were revealed to feel a higher level of anxiety compared to their male counterparts. Therefore, Skype and other online communication tools can be used at least for assessment of the speaking skills of the students if not for regular classes, which in fact is possible through the principles of blended and flipped learning. Moreover, online speaking assessment won't bring serious concerns related to cheating as the process will require the student and instructor to see and hear each other synchronously in real time.

9. Limitations and suggestion for further research

This research was carried out with just 21 adult learners. The number of participants was highly limited. On the other hand, the number of males who participated in this study was also low. For further research, more participants can be used for data collection and this study can be replicated.

Another way to replicate this study is to make more than one face-to-face and Skype ™ Conference Call lesson. After each speaking lesson, participants can report their FLSA levels based on that specific lesson and after collecting much more data, the data can then be analyzed and generalized. Because of the limited time and limited participants, this study is hard to generalize for all.

The underlying reasons why adults feel less anxious while speaking in an online environment can be identified by conducting other research and searching for ways to improve speaking skills with less anxiety.

References

Abal, A. (2012). *A comparison of the effects of classroom and multi-user virtual environments on the perceived speaking anxiety of adult post-secondary English language learners.* (MA Thesis). Retrieved from http://digitalcommons.fu.edu/etd/806

Akkakoson, S. (2016). Speaking anxiety in English conversation classrooms among Thai students. *Malaysian Journal of Learning and Instruction, 13*, 63-82.

Bautista, M. P. M. (2013). Immersive learning environments to foster speaking skills in EFL. Retrieved from https://www.researchgate.net/publication/286443961_Immersive_learning_environments_to_foster_speaking_skills_in_EFL_Martha_Pilar_Mendez_Bautista

Beluce, A., C. & Oliveria, K., L. (2015). Students' motivation for learning in virtual environments. *Paideia, 25*(60), 105-113.

Bergström, M. (2017). Foreign language speaking anxiety in the Swedish school context: A comparative study of foreign language speaking anxiety and EFL course levels at Swedish upper secondary school. Retrieved from http://urn.kb.se/resolve?urn=urn:nbn:se:lnu:diva-67650

Cagatay, S. (2015). Examining EFL students' foreign language speaking anxiety: The case at a Turkish state university. *Procedia – Social and Behavioral Sciences, 199*(2015), 648-656.

Chapelle, C. (2002). Computer-assisted language learning. In R. Kaplan (Ed.). *The Oxford Handbook of Applied Linguistics.* (pp. 495-505). New York: OUP.

Correa, Y., C. (2015). Skype ™ conference calls: A way to promote speaking skills in the teaching and learning of English. *PROFILE Issues in Teachers' Professional Development, 17*(1), 143-156. http://dx.doi.org/10.15446/profile

Dewaele, J. M., & Al-Saraj, T. M. (2015). Foreign Language Classroom Anxiety of Arab learners of English: The effect of personality, linguistic and sociobiographical variables. *Studies in Second Language Learning and Teaching*, *5*(2), 205-228.

Dewaele, J. M., MacIntyre, P. D., Boudreau, C., & Dewaele, L. (2016). Do girls have all the fun? Anxiety and enjoyment in the foreign language classroom. *Theory and Practice of Second Language Acquisition*, *2*(1), 41-63.

Dulay, H. & Burt, M. (1977). Remarks on creativity in language acquisition. In M. Burt, H. Dulay & M. Finnochiaro (Eds.). *Viewpoints on English as a Second Language.* (pp. 209-233). New York: Regents.

Effiong, O. (2016). Getting them speaking: Classroom social factors and foreign language anxiety. *Tesol Journal*, *7*(1), 132-161.

Gao, X. (2015). The role of Skype-mediated chats in foreign language classrooms (Abs.). *First Asia Pasific Conference on Contemporary Research.* Retrieved from: https://apiar.org.au/wp-content/uploads/2015/10/APCCR_BRRABS804_EDU.pdf

Gargalianou, V., Muehlfeld, K., Urbig, D., & Van Witteloostuijn, A. (2015). *The effects of gender and personality on foreign language anxiety among adult multilinguals* (No. 2015-002). Schumpeter Discussion Papers. Retrieved from: https://www.econstor.eu/handle/10419/111688

Gilakjani A. P., & Leong L. M. (2012). EFL teachers' attitudes toward using computer technology in English language teaching". *Theory and Practice in Language Studies 2*(2012) 630-636

Grant, S., Huang, H., & Neofitou, S., P. (2013). Language learning in virtual worlds: The role of foreign language and technical anxiety. *Journal of Virtual Worlds Research, 6*(1), 1-9.

Guzel, S. & Aydin, S. (2014). A review of research on the effects of Second Life on speaking anxiety. *Ataturk Universitesi Sosyal Bilimler Enstitusu Dergisi, 18*(3), 233-242.

Guzel, S. & Aydin, S. (2016). The effect of second life on speaking achievement. *Global Journal of Foreign Language Teaching, 6*(4), 236-245.

He, D. (2017). How to cope with foreign language speaking anxiety effectively? The case of university students in China. *Electronic Journal of Foreign Language Teaching*, *14*(2), 159-174.

Ionescu, A., (2017). The use of ICT and CALL with high school students. *Journal Plus Education 17*(1). 233-239

Kamali, T. (2012). *Students' experiences and perceptions of anxiety, motivation, and self-confidence in speaking English during task-based language learning activities in Second Life: The case of METU.* (MA Thesis, METU). Retrieved from DOI: 10.13140/RG.2.1.4646.9846v

Khan, I. U., Ayaz, M. & Khan, S. (2016). Using Skype to develop English learners' speaking motivation. *Sci. Int. (Lahore), 28*(5), 41-48.

Krashen, S. (1982). Principles and practice in second language acquisition. Pergamon Press Inc.

Lan, Y. (2015). Action research: Contextual EFL learning in a 3D virtual environment. *Language Learning & Technology, 19*(2), 16-31.

Levy, M., (1997). Computer assisted language learning, context and conceptualization. Oxford,UK: Clarendon Press

Lim, C. P. & Khine, M. S. (2009). Connecting schools to their communities: The South-east Asian experience. In J. Zajda & D. Gibbs (Eds.). *Comparative Information Technology: Languages, Societies and the Internet* (pp. 79-88). Australia. Springer Science.

Luo, H. (2014). Foreign language speaking anxiety: A study of Chinese language learners. *Journal of the National Council of Less Commonly Taught Languages*, 15, 99-117.

Mede, E., & Karaırmak, Ö. (2017). The predictor roles of speaking anxiety and English self efficacy on foreign language speaking anxiety. *Journal of Teacher Education and Educators, 6*(1), 117-131.

Oh, K. & Nussli, N. (2014). Technology-enhanced language learning: A case study of a global classroom in Second Life. *International Journal on Advances in Life Sciences, 6*(3&4), 240-251.

Ozel, A. G. & Arikan, A. (2015). The use of the internet and web 2.0 tools among EFL instructors. *Mediterranean Journal of Humanities 5*(1). 313-325

Ozturk, G. & Gurbuz, N. (2013). The impact of gender on foreign language speaking anxiety and motivation. *Procedia – Social and Behavioral Sciences, 70*, 654-665. Retrieved from https://doi.org/10.1016/j.sbspro.2013.01.106

Pegrum, M. (2009). From blogs to bombs. Crawled: NWA Publishing.

Rahayu, P. & Jacobson, M. J. (n.d.). Speaking self-efficacy and English as a foreign language: Learning processes in a multi-user virtual environment. *Centre for Research on Computer Supported Learning and Cognition.* The University of Sydney

Saglam, A. L. G. & Sert, S. (2012). Perceptions of in-service teachers regarding technology integrated English language teaching. *Turkish Online Journal of Qualitative Inquiry, 3*(3), 1-14. Retrieved from http://dergipark.gov.tr/tojqi/issue/21396/229371

Shahri, H., M. & Ashraf, H. (2016). On the effect of Second Life (an online virtual world) on pre-intermediate Iranian EFL learners listening and speaking abilities. *International Journal of English Language and Literature Studies, 5*(1), 8-19.

Skype ™ (n.d.). What is Skype? Retrieved from https://support.skype.com/en/faq/FA6/what-is-skype

Uzun, L. (2017). Using the Second Life digital Environment for FL education: A postmodern perspective. *Teaching English with Technology, 17*(2), 42-54.

Şimşek, U. & Baydar, A. (2019). Impact of jigsaw and teams-games tournaments (TGT) on social studies preservice teachers' epistemological beliefs. *International Online Journal of Education and Teaching (IOJET), 6*(2), 405-414.

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IMPACTS OF JIGSAW AND TEAMS-GAMES-TOURNAMENTS (TGT) ON SOCIAL STUDIES PRESERVİCE TEACHERS' EPISTEMOLOGICAL BELIEFS

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Abstract

Classroom practices of teachers are affected by their personal epistemological beliefs and cooperative learning methods are taking a large place in today's education world. By implementing two different cooperative learning methods in a college of education course, this study examined the effects of jigsaw and teams games tournaments (TGT) on epistemological beliefs of social studies preservice teachers. 30 students participated in the research who attended 4th grade at Artvin Coruh University Social Studies Education department at 2015-2016 academic year. Data were collected with Schommer Epistemological Questionnaire and analyzed by independent groups t-test. The findings elicited that jigsaw is significantly more effective that TGT on social studies preservice teachers' epistemological beliefs in general and for two of the dimensions measured: "the belief that learning depends on effort", and "the belief that learning depends on ability". But for the dimension, "the belief that there is only one unchanging truth", there was no significant differences between two methods.

Keywords: cooperative learning, jigsaw, TGT, epistemological beliefs, teacher education.

1. Introduction

Researches regarding teacher education show that belief focused structures affect teachers' in class behaviors and activities; and teachers' epistemological beliefs affect their in-class activities and pedagogical applications (Chan, & Elliott, 2004; Hofer, 2001). Thus, preservice teachers' epistemological beliefs are important, because they affect teachers' learning to teach in class behaviors, teaching methods and applications (Aypay, 2010; Hofer & Pintrich, 1997; Schommer, Crouse, & Rhodes, 1992; Tanasa & Wang, 2010). "Epistemology is a philosophical concept concerned with the nature and justification of human knowledge" (Bakari, 2000, p.1). And epistemological beliefs could be explained as "individuals' thinking and beliefs about knowledge and knowing, which typically includes beliefs about the definition of knowledge, how knowledge is constructed, how knowledge is evaluated, where knowledge resides, and how knowing occurs" (Burr & Hofer, 2002, p. 201). Developmental approaches regarding beliefs on epistemology assert that epistemological development is unidimensional and occurs in an orderly manner. On the contrary, Marlene Schommer suggested a multidimensional classification as a system approach: In the first dimension, individual believes that structure of the knowledge is simple or complex. In the second

dimension, knowledge is certain or not, in the third dimension, learning occurs fast or in time, and in the fourth dimension, learning ability is inborn or can be developed in time (Schommer-Aikins, 2004). According this classification, it is assumed that individuals have multiple epistemological beliefs and rather than an ordinary process, they can skip contextual steps. The structures of personal epistemological beliefs are multi-dimensional and they develop simultaneously (Hofer, 2000; Hofer, 2001; Tanase & Wang, 2010). Studies related with teacher education indicate that epistemological beliefs of pre-service teachers show parallelism with their beliefs on teaching and their in-class applications (Chan & Elliot, 2004; Chai, 2010; Önen, 2011). Furthermore, these studies show that epistemological beliefs which affect teachers' in-class applications in such manner are affected preservice teachers' applications during the education they got as well. Zeichner and Tabachnick (as cited in Ng, Nicholas & Williams, 2010) stated that "preservice teachers' beliefs are shaped by the many hours they experienced as students and that these beliefs remain hidden while they are undergoing teacher education courses, but surface when they start teaching and have classes of their own."

In his study, Şimşek (2013) compared the effects of conventional method, jigsaw, and reading-writing-presenting (RWP) methods on of 193 students' epistemological beliefs in civic education course and he found that jigsaw and RWP are more effective than the conventional method. Again, Bergom, Wright, Brown, and Brooks (2011) measured the effects of a cooperative method named "hevruta" on college students' epistemological beliefs and founded positive results. Keen-Rocha (2008) determined positive effects of cooperative learning applied in chemistry course on epistemological beliefs of college students. And Bakari (2000) specified the improvement of college students' epistemological beliefs in campus life via cooperative experiences.

In cooperative learning, students simply work in small groups and actualize learning by helping each other's learning. Cooperative classrooms are places that students convene and interact in groups; and teacher strolls among the groups and helps who needs (Açıkgöz, 2003). Also, in cooperative learning these "five variables mediate the effectiveness of cooperation: positive interdependence, individual accountability, promotive interaction, the appropriate use of social skills, and group processing" (Johnson & Johnson, 2009, p. 366). And in cooperative learning "the role of the teacher as a facilitator, assisting students with small group and social skills and helping to solve any contentious issues that may arise is extremely important" (Ferguson-Patrick, 2018, p. 93).

Student teams achievement divisions (STAD) and jigsaw are "two well-researched and highly touted cooperative learning methods" (Zetty, 1992, p. 2) And teams games tournaments (TGT) are similar to STAD but in TGT student representatives compete between groups (Bayrakçeken, Doymuş & Doğan, 2013). That means it is different from not only STAD but also from the other cooperative methods; TGT has cooperation in groups but also competition between groups. Studies regarding TGT show that the method has positive effects on academic achievement (Salam, Hossain, & Rahman, 2015; Gonzales, Jennings & Manriquez, 2014); attitude towards mathematics (Salam, Hossain, & Rahman, 2015); anger control, coping with depression (Wodarski & Feit, 2011); satisfaction (Gonzales et al., 2014); working together, individual and social reliance (Şahin, 2011); effective learning, peer relations and satisfaction in classroom (Harmandar & Çil, 2008).

Jigsaw, on the other hand, is an appropriate method to be used especially in social studies course (Lie, 1992). It "was developed by Aronson" (Avşar & Alkış, 2007, p. 198). Studies regarding TGT show that the method has positive effects on academic achievement, self-confidence, social development (Johnson, Johnson, & Stanne, 2000), study habits and active

participations to the course (Şimşek, Örten, Topkaya, & Yılar, 2014), creativity (Demir, 2012), speech ability, construction positive learning environment, student-teacher interaction, and understanding ability (Lin, 2010).

It is an expected situation that these two methods which have several benefits in cognitive and affective domains to affect students' epistemological beliefs as well. Thus, the purpose of this study is to determine the effects of jigsaw and TGT on epistemological beliefs of social studies preservice teachers. Research questions were developed as following:

1. Is there any significant difference between jigsaw and TGT groups' pretest and posttest score means of epistemological beliefs?
2. Is there any significant difference between jigsaw and TGT groups' pretest and posttest score means of the sub-dimension "beliefs that pertain to learning depend on afford" of epistemological beliefs?
3. Is there any significant difference between jigsaw and TGT groups' pretest and posttest score means of the sub-dimension "beliefs that pertain to learning depends on ability" of epistemological beliefs?
4. Is there any significant difference between jigsaw and TGT groups' pretest and posttest score means of the sub-dimension "beliefs that pertain to single certain truth" of epistemological beliefs?

2. Method

The independent variables of the study were two cooperative learning methods, jigsaw and TGT. And the dependent variable of study was epistemological beliefs of social studies preservice teachers. To measure the effects of these two methods on independent variable without a control group a pretest posttest design was chosen.

2.1. Study Group

Thirty 4th graders who attended in Artvin Çoruh University Faculty of Education Social Studies department in 2015-2016 academic year participated in the study. The participants were divided into two homogenous groups: jigsaw (n=15) and TGT (n=15) implementation groups. The homogeneousness of two groups was determined according to the grade point averages of the previous year.

2.2. Data Collection Tool

The original form of the scale namely Schommer Epistemological Questionnaire (SEQ) that measure epistemological beliefs overall and four independent dimensions; "fixed ability," "simple knowledge," "certain knowledge," and "quick learning", is 5-Point Likert type scale and was developed by Schommer (1990). Deryakulu and Büyüköztürk (2002) translated and adapted the scale into Turkish. They did validity and reliability studies and determined that the Turkish version of the scale has three factors consisted of 34 items. Due to the difference in structure of the new scale from the original one, different names given to the factors (Deryakulu, 2004). The first factor "beliefs that pertain to learning depend on afford" includes 18 items, the second factor "beliefs that pertain to learning depends on ability" includes 9 items, and the third factor "beliefs that pertain to single certain truth" includes 7 items. First 17 items in the first factor are reverse, 18th item is straight coded. All the items in the second and the third factors are straight coded. Higher scores show immature, undeveloped, naïve beliefs and lower scores show mature, developed, sophisticated beliefs. Cronbach's Alpha values of the scale are found as 0.83 (1st factor), 0.62 (2nd factor), 0.59 (3rd factor), and 0,71 (overall scale).

2.3. Implementation

The SEQ was applied to jigsaw and the TOT groups as pretest, then "Developing Thinking Skills" course is taught both experimental groups for 12 weeks, two hours a week.

At the end of the implementation process the SEQ applied to both groups as posttest. Data were analyzed using SPSS 17.0. software (SPSS, Inc., Chicago, IL, USA). Implementation process of two methods in experimental groups are described as following.

2.3.1. Jigsaw

Students in jigsaw group were separated into five heterogeneous original groups according to the previous year's GPA". Each group has 3 members.

Tittles	1st OG	2nd OG	3rd OG	4th OG	5th OG
1st subtittle →	Apt1	Bpt1	Cpt1	Dpt1	Ept1
2nd subtittle →	Apt2	Bpt2	Cpt2	Dpt2	Ept2
3rd subtittle →	Apt3	Bpt3	Cpt3	Dpt3	Ept3

Figure 1. Jigsaw original groups and distribution of tittles

Creating the original groups, subtitles were distributed to each member of the original groups as in Figure 1. Then resources, materials and subtitles they were responsible of were given each member of the groups. After that, members left from the original groups and went the expert groups created as in Figure 2. Each expert group was responsible of one of the subtitles.

1st Expert group:	Apt1,	Bpt1,	Cpt1,	Dpt1,	Ept1
2nd Expert group:	Apt2,	Bpt2,	Cpt2,	Dp2,	Ep2
3rd Expert group:	Apt3,	Bpt3,	Cpt3,	Dpt3,	Ep3

Figure 2. Creating jigsaw expert groups

Members of each expert groups were prepared to their subtitle together. This preparation included individual and group studies in homes, dormitories and libraries. They took their materials to next class, studies on them together, discussed, put their studies together and reviewed in 30 minutes. After these studies, each expert group prepared reports regarding their subtitles. During the studies the researcher worked as a guide when required. Finishing their studies in expert groups, the participants returned to the original groups and made presentations about their expertise area. This part of the study took also 30 minutes. This included questions-answers and discussions. At the end of the process, all participants took a four-question multiple-choice quiz.

2.3.2. TGT

In TGT dividing participants into groups was like in jigsaw implementation. Classes started with researcher's 30-minute presentation. Then, getting ready for the tournaments participants worked on the work sheets that handed out for another 30 minutes. Again, during these studies the researcher worked as a guide when required. For the tournament stage by receiving one person from each group (like constructing expert groups jigsaw), tournament

tables were designed. Each participant represented her own group at these tables. Participants tried to gain points for their groups with answering the questions prepared by the researcher beforehand. Points gained were compared and groups were put in an order to their achievement level.

3. Findings

For the first problem of the research, scores that received from overall epistemological scale which was applied as pretest and posttest were compared. The independent t-test results were given in Table 1.

Table 1. *Independent t-test results of the overall SEQ scores*

Test type	Groups	N		t	p
Pretest	Jigsaw	15	127,47	,310	,207
	TGT	15	125,80		
Posttest	Jigsaw	15	150,87	4,963	,014
	TGT	15	130,47		

According to the data in Table 1, while there is no significant difference found between jigsaw and TGT pretest scores (t=3,1; p>0,05), there is a significant difference between the posttest scores (t=4,963; p<0,05).

For the second problem of the research, scores that received from "beliefs that pertain to learning depend on afford" sub-dimension of the scale which was applied as pretest and posttest were compared. The independent t-test results were given in Table 2.

Table 2. *Independent t-test results of the scores of the first sub-dimension of the SEQ*

Test type	Groups	N		t	p
Pretest	Jigsaw	15	72,13	-,632	,286
	TGT	15	73,93		
Posttest	Jigsaw	15	84,87	5,059	,006
	TGT	15	75,40		

According to the data in Table 2, for the first factor of the SEQ, while there is no significant difference found between jigsaw and TGT pretest scores (t= -0,632; p>0,05), there is a significant difference between the posttest scores (t=5,059; p<0,05).

For the third problem of the research, scores that received from "beliefs that pertain to learning depends on ability" sub-dimension of the scale which was applied as pretest and posttest were compared. The independent t-test results were given in Table 3.

Table 3. *Independent t-test results of the scores of the second sub-dimension of the SEQ*

Test type	Groups	N		t	p
Pretest	Jigsaw	15	35,13	1,219	,023
	TGT	15	32,60		
Posttest	Jigsaw	15	40,27	3,107	,000
	TGT	15	34,40		

According to the data in Table 3, for the second factor of the SEQ, there are significant differences found between jigsaw and TGT pretest (t=1,219; p<0,05) and posttest (t=3,107; p<0,05) scores.

For the fourth problem of the research, scores that received from "beliefs that pertain to single certain truth" sub-dimension of the scale which was applied as pretest and posttest were compared. The independent t-test results were given in Table 4.

Table 4. *Independent t-test results of the scores of the third sub-dimension of the SEQ*

Test type	Groups	N		t	p
Pretest	Jigsaw	15	20,20	,533	,373
	TGT	15	19,27		
Posttest	Jigsaw	15	25,73	3,213	,289
	TGT	15	20,67		

According to the data in Table 4, for the third factor of the SEQ, there is no significant difference found between jigsaw and TGT pretest (t=0,533; p>0,05) and posttest (t=3,213; p>0,05) scores.

4. Results, discussion and implications

As the result of this study which compares two cooperative learning methods, jigsaw and TGT regarding their impacts epistemological beliefs of social studies preservice teachers, it can be said that in overall epistemological beliefs and first two dimensions, which are "beliefs that pertain to learning depend on afford" and "beliefs that pertain to learning depends on ability", jigsaw is more effective than TGT. But, in the third dimension, "beliefs that pertain to single certain truth", a significant difference does not seem between the effects of two methods. With these results, the study supports Slavin's (as cited in Baydar & Şimşek, 2018, p. 66) opinions since "jigsaw contains more constructed peer tutoring and reading practices for meaning than TGT", it seems jigsaw is more appropriate than TGT for social studies teaching. This superiority of jigsaw and its convenience, especially for social studies courses, were expressed by different researchers as well. According to Ascher (1986, p. 3), jigsaw is useful for "social studies, and other subjects in which a subject can be divided into discrete areas of expertise." As it was explained in the implementation section, in jigsaw, each student was assigned to read a different text. Students who are responsible of the same texts were collected together in expert groups. They discussed in those groups and became experts of their parts. As Lee, Ng, and Jakops (1997, p. 11) stated "the expert team's job was

to learn, create, or discover concepts and information which they would later teach to the members of their home team." Finishing their job in expert groups, they returned to their original groups. The important thing in this part of the study is each member of the original groups understands the whole text. Each member is responsible of her part, her friends' success and their comprehensions. For this reason, jigsaw is suitable also for the processes such as cognitive awareness, critical and creative thinking, questioning, decision making, problem solving, and concept development (Alkaya, 2006). "Further, the use of heterogeneous groups improves the chances that students will encounter of range of perspectives, thus, hopefully improving their perspective-taking ability" (Lee et al., 1997, p. 11). With these characteristics, jigsaw's effects on students' beliefs about "what knowledge is, how knowledge is constructed and evaluated, where it resides, and how knowing occurs" (Burr & Hofer, 2002, p. 201), is an expected result.

The findings of the study show similarity with Baydar and Şimşek's (2018) study which measures the impacts of jigsaw and the STAD on epistemological beliefs of social studies preservice teachers. In the study, the same scale was used as in this study and for all three of the dimensions, jigsaw's effects are significantly higher. This study's findings overlap with the findings of Koç's (2013) study which shows significant difference between effects of jigsaw II and the conventional teaching method on epistemological attitude in science education course. The results of this study support findings of Şimşek's (2013) study, as well. In the study, Şimşek compared three cooperative learning methods, jigsaw, reading-writing-presentation, and the conventional teaching method in terms of their effects on college students' epistemological beliefs in civic education course.

This study is a concrete example of how jigsaw changes preservice teachers' epistemological beliefs in social studies teacher education and suggests studies with different cooperative methods that would serve for the same area.

References

Açıkgöz, K. Ü. (2003). *Aktif öğrenme [Active learning]*. İzmir: Eğitim Dünyası Yayınları.

Alkaya, F. (2006). *Eleştirel düşünme becerilerini temel alan fen bilgisi öğretiminin öğrencilerin akademik başarılarına etkisi [Impact of science teaching based on critical thinking skills on students' academic achievement]. (*Yüksek lisans tezi). Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü, Hatay.

Ascher, C. (1986). *Cooperative learning in the urban classroom.* Clearinghouse on Urban Education. New York.

Aypay, A. (2010). Teacher education student's epistemological beliefs and their conceptions about teaching and learning. *Procedia-Social and Behavioral Sciences, 2* (2), 2599-2604.

Avşar, Z., & Alkış, S. (2007). İşbirlikli öğrenme yöntemi "Birleştirme I" tekniğinin sosyal bilgiler derslerinde öğrenci başarısına etkisi. [The Effect of Cooperative Learning "Jigsaw I" Technique on Student Success in Social Studies Course]. *İlköğretim Online, 6*(2).

Bakari, R. S. (2000). *Epistemological development of African-American student: Perspectives on knowledge, culture, and experiences (*Unpublished doctoral dissertation). University of Northern Colorado, Greeley.

Baydar, A. & Şimşek, U. (2018). Birleştirme ve öğrenci takımları başarı bölümleri yöntemlerinin sosyal bilgiler öğretmen adaylarının akademik başarılarına etkisi. [The impact of Jigsaw and STAD on social studies pre-service teachers' academic achievement]. *Studies in Educational Research and Development, 2*(1), 32-46.

Baydar, A. & Şimşek, U. (2018). Birleştirme ve öğrenci takımları başarı bölümleri yöntemlerinin sosyal bilgiler öğretmen adaylarının epistemolojik inançlarına etkisi. [The Impact of Jigsaw and Student Teams Achievement Divisions on Social Studies Pre-service Teachers' Epistemological Beliefs]. *Mediterranean Journal of Educational Research, 12*(23), 57-73.

Bayrakçeken, S., Doymuş, K., & Doğan, A. (2013). *İşbirlikli öğrenme modeli ve uygulanması [Cooperative learning model and its application]*. Ankara: Pegem Akademi Yayınları.

Bergom, I., Wright, M. C., Brown, M. K., & Brooks, M. (2011). Promoting college student development through collaborative learning: A case study of hevruta. *About campus, 15* (6), 19-25.

Burr, J. E., & Hofer, B. K. (2002). Personal epistemology and theory of mind: Deciphering young children's beliefs about knowledge and knowing. *New Ideas in Psychology, 20* (2), 199-224.

Chai, C. S. (2010). Teachers' epistemic beliefs and their pedagogical beliefs: A qualitative case study among Singaporean teachers in the context of ICT-supported reforms. *Turkish Online Journal of Educational Technology, 9* (4), 128-139.

Chan, K. W., & Elliott, R. G. (2004). Relational analysis of personal epistemology and conceptions about teaching and learning. *Teaching and Teacher Education, 20*(8), 817-831.

Demir, K. (2012). An evaluation of the combined use of creative drama and jigsaw II techniques according to the student views: case of a measurement and evaluationcourse. *Procedia-Social and Behavioral Sciences,* 47, 455-459.

Deryakulu, D. & Büyüköztürk, Ş. (2002). Epistemolojik inanç ölçeğinin geçerlik ve güvenirlik çalışması [Validity and reliability of epistemological belief scale.]. *Eğitim Araştırmaları, 2*(8): 111-125.

Deryakulu, D. (2004). Üniversite öğrencilerinin öğrenme ve ders çalışma stratejileri ile epistemolojik inançları arasındaki ilişki [The relationship between university students' learning and study strategies and epistemological beliefs]. *Kuram ve Uygulamada Eğitim Yönetimi Dergisi, 10* (2), 230-249.

Ferguson-Patrick, K. (2018). The importance of teacher role in cooperative learning: the effects of high-stakes testing on pedagogical approaches of early career teachers in primary schools. *Education 3-13, 46*(1), 89-101.

González, A., Jennings, D., & Manriquez, L. (2014). Multi-faceted impact of a team game tournament on the ability of the learners to engage and develop their own critical skill set. *International Journal of Engineering Education, 30*(5) 2014, 1213-1224.

Harmandar, M., & Çil, E., (2008). The effects of science teaching through team game tournament technique on success levels and affective characteristics of students. *Journal of Turkish Science Education, 5*(2), 26.

Hofer, B. K., & Pintrich, P.R. (1997). The development of epistemological theories: Beliefs about knowledge and knowing and their relation to learning. *Review of Educational Research, 67*(1), 88 – 140.

Hofer, B. K. (2000). Dimensionality and disciplinary differences in personal epistemology. *Contemporary Educational Psychology,* 25, 378-405.

Hofer, B. K. (2001). Personal epistemology research: Implications for learning and teaching. *Educational Psychology Review, 13*(4), 353-383.

Johnson, D.W., Johnson, R.T. and Stanne, M.B. (2000). *Cooperative Learning Methods: A Meta-Analysis*. University of Minnesota, Minneapolis: Cooperative Learning Center, www.co-operation.org/pages/cl-methods.html.

Johnson, D. W. ve Johnson, R. T. (2009). An educational psychology success story: Social interdependence theory and cooperative learning. *Educational Researcher, 38* (5), 365-379.

Keen-Rocha, L. S. (2008). *Personal epistemological growth in a college chemistry laboratory environment (*Unpublished doctoral dissertation) University of South Florida, Tampa.

Koç, Y. (2013). Fen bilimleri dersinin öğretiminde Jigsaw II tekniğinin etkisi [The impact of Jigsaw technique II on science teaching]. *Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 10*(24), 165-179.

Lee, C., Ng, M., & Jacobs, G. M. (1997). *Cooperative learning in the thinking classroom: research and theoretical perspectives.* Paper presented at the International Conference on Thinking, Singapore.

Lie, A. (1992). Jigsaw: Cooperative learning for EFL students. *Cross Currents*, 19(1), 49-52.

Lin, L. L. (2010). *Perspectives of teachers and students toward cooperative learning jigsaw tasks in Taiwanese EFL classrooms (*Unpublished doctoral dissertation). Alliant International University, San Diego.

Ng, W., Nicholas, H., & Williams, A. (2010). School experience influences on preservice teachers' evolving beliefs about effective teaching. *Teaching and Teacher Education, 26*(2), 278-289.

Önen, A. S. (2011). The effect of candidate teachers' educational and epistemological beliefs on professional attitudes. *Hacettepe Üniversitesi Eğitim FakültesiDergisi, 41*, 293-301.

Salam, A., Hossain, A., & Rahman, S. (2015). Effects of using teams games tournaments (TGT) cooperative technique for learning mathematics in secondary schools of Bangladesh. *Malaysian Online Journal of Educational Technology, 3*(3), 35-45.

Schommer, M. (1990). Effects of beliefs about the nature of knowledge on comprehension. *Journal of Educational Psychology, 82*(3), 498-504.

Schommer-Aikins, M. (2004). Explaining the epistemological belief system: Introducing the embedded systemic model and coordinated research approach. *Educational psychologist, 39*(1), 19-29.

Schommer, M., Crouse, A., & Rhodes, N. (1992). Epistemological beliefs and mathematical text comprehension: Believing it is simple does not make it so. *Journal of educational psychology, 84*(4), 435.

Şahin, A. (2011). Türkçe öğretmeni adaylarının takım oyun turnuvaları tekniğinin uygulanmasına yönelik görüşleri [The perceptions of preservice Turkish teachers about team tournaments technique]. *Ekev Akademi Dergisi. 46*(1), 489-498.

Şimşek, U. (2013). The Effects of cooperative learning model on students' epistemological beliefs in civics lesson. *E-International Journal of Educational Research, 4*(1), 29-46.

Şimşek, U., Örten, H., Topkaya, Y., Yılar, B. (2014). Sosyal bilgiler öğretmen adaylarının işbirlikli öğrenme teknikleri hakkındaki görüşleri [Perceptions of preservice social science teachers about cooperative learning techniques]. *Turkish Journal of Social Research 18* (1), 231-257.

Tanase, M., & Wang, J. (2010). Initial epistemological beliefs transformation in one teacher education classroom: Case study of four preservice teachers. *Teaching and Teacher Education, 26*(6), 1238-1248.

Wodarski, J. S., & Feit, M. D. (2011). Adolescent preventive health and Team-Games-Tournaments: Five decades of evidence for an empirically based paradigm. *Social Work in Public Health, 26*(5), 482-512.

Zetty, N. (1992). *A comparison of the STAD and Jigsaw cooperative learning methods in a college-level microcomputer applications course (*Unpublished doctoral dissertation). West Virginia University, Morgantown.

Ünsal, S., & Ağçam, R. (2018). A swot analysis of teacher-parent communication in education: evidence from Turkey. *International Online Journal of Education and Teaching (IOJET), 6*(2), 416-430.

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A SWOT ANALYSIS OF TEACHER-PARENT COMMUNICATION IN EDUCATION: EVIDENCE FROM TURKEY

Research Article

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A SWOT ANALYSIS OF TEACHER-PARENT COMMUNICATION IN EDUCATION: EVIDENCE FROM TURKEY

Abstract

This study was designed to explore strengths, weaknesses, opportunities and threats driven by teacher-parent communication (TPC, henceforth) from the perspectives of teachers and students based on teacher views. A phenomenological design was adopted in the study of which sampling was constituted by 10 Turkish teachers of different subject areas working at state middle schools. The data were collected via semi-structured interviews with these teachers and examined through content analysis. Based on the preliminary findings, the teachers believe that TPC has certain strengths such as enhancement of students' feeling of worthiness and their sense of belonging to the school, and improvement of their motivation and in-class performance, and facilitation of the learning process. The teachers also reported that it helps students develop a sense of responsibility and improve self-confidence, and reduce student misbehaviors. As for the TPC-driven strengths from teachers' perspective, they stated that it facilitates recognition of students from different angles, makes positive contributions to the learning process, improves teacher status and prestige, and reduces teachers' workload through collaboration with parents. The study discusses strengths, weaknesses, possible threats and opportunities of TPC in detail.

Keywords: teacher-parent communication, school success, SWOT analysis

1. Introduction

It is widely accepted that a number of formal and informal factors influence students' success, motivation and school commitment in their educational life. Parents could be considered the most significant among the most prominent informal factors (Erdoğan & Demirkasımoğlu, 2010). As the positive correlation between parental involvement in educational process and students' academic achievement, and development of more positive stance towards school have been reported in various studies (i.e. Bogenschneider, 1997; Boonk et al., 2018; Castro et al., 2015; Cook, Dearing, & Zachrisson, 2018; Dinç & Keşli-Dollar, 2017; Kikoti, 2018; Gonzalez-DeHass, Willems, & Holbein, 2005; Steiner, & Cassano, 2017; Smith, & Sheridan, 2018), researchers have paid significant attention to the role of families in students' academic achievement in recent years (Rogers, Theule, Ryan, Adams, & Keating, 2009). In a similar vein, Mahler (2011) contends that quality of communication among teacher-student-parents plays an important role in identifying the students' level of school commitment. It is also known that the positive communication between teachers and parents contributes to student learning outcomes.

The initial studies on parental involvement in education on student success were conducted by Coleman (1996) (cited in Shaw, 2008). According to Coleman (1996), such factors as family structure, family income and parental working hours are more effective on students' academic achievement than school (Shaw, 2008). Teacher-parent collaboration and communication have a crucial part not only in improving students' academic success but helping them learn about their individual rights, responsibilities and assignments, and organising these into behavioural patterns (Aydın, 2005). Furthermore, parental involvement in education influences quality of schools and education (Schneider, 2018). As a matter of fact, teacher-parent cooperation is indicated among the features of effective schools (Balcı,

2001; Đurišić, & Bunijevac, 2017; Walner, & Hiatt-Michael, 2017). There are two types of approaches towards the roles of parents in educational process. In the first type, parents view schools as institutions, and get involved in the educational process through communication with teachers and participation in school activities (Dearing, Kreider, Simpkins, & Weiss, 2006; Hill & Taylor, 2004). In the second type, parents focus relatively on student behaviours related to their academic development (i.e., assisting them with homework assignments) (Zeith, Reimers, Fehrmann, Pottebaum, & Aubey, 1986; Hoover-Dempsey et al., 2001). Establishment of effective teacher-parent cooperation is essentially significant both for students' academic achievement and their future life in general. Gürşimşek (2010) defines teacher-parent cooperation, or parental involvement in a broader sense, as a process of communication and collaboration which is established in order to support students' development and education. Likewise, Şahin and Ünver (2005) postulate that effective teacher-parent collaboration is needed for quality education, and that the parties in concern are required to establish communication-based on mutual trust and sincerity.

Various definitions have been proposed for teacher roles for over a century. Today teachers are supposed to fulfill such roles as refereeing, nursing, parenting, advocacy, and social work in addition to facilitating learning (Milne & Plourde, 2006). The role of "communicator" might also be included in the list. In this sense, teachers are required to take initiative and directive roles in communicating with parents in order to establish and sustain it efficiently. Erkan (1996) emphasizes that the teachers take an integrative role during this process. In a recent study, Kraft and Dougherty (2013) concluded that the frequent TPC has positive outcomes such as improving students' school commitment, fulfilling their responsibilities, participating in classroom activities and completing homework assignments. In an earlier study, Biber (2003) investigated socio-economic levels of first-grade students and communication style of their families, and reported that parents of lower socio-economic background tend to communicate with teachers through their children and to visit school on an irregular basis for an unknown period of time. Studying the feasibility of parent-centred collaborative learning in English language teaching, Dinç and Keşli-Dollar (2017) concluded that parents play a significant role in their children's language development and learning process, and contribute to their academic attainment.

The existing literature has shown that TPC is of high significance for students, teachers and parents. Since it needs to be explored through an in-depth analysis, SWOT analysis technique was adopted in the present research. The obtained findings are believed to constitute a prominent source of information for the establishment of more effective TPC. Besides, they are believed to shed light into the regulations to be committed by the decision-makers for realizing TPC at a systematic and theoretical level. Lastly, the study is hoped to provide practical implications for both teachers and parents via its findings on TPC-driven strengths, weaknesses, opportunities and threats from the perspective of teachers and students. Accordingly, the following research questions were addressed.

1. What are the teachers' views on TPC-driven strengths and weaknesses from the perspective of students?

2. What are the teachers' views on TPC-driven opportunities and threats from the perspective of students?

3. What are the teachers' views on TPC-driven strengths and weaknesses from the perspective of teachers?

4. What are the teachers' views on TPC-driven opportunities and threats from the perspective of teachers?

Methodological design of the study is introduced in the following section.

2. Method

2.1. Participants

The phenomenological research design was utilized in this study. Phenomenological research aims to fundamental structure and facts behind experiences (Merriam, 2013), and focuses on phenomena of which we are aware but about which we do not have an in-depth knowledge (Yıldırım & Şimşek, 2011). TPC was considered as a phenomenon in this research, and teachers' views on it were examined through SWOT analysis. Sources of information in phenomenological research are the individuals or groups who experience the focused phenomenon and who could speak out on it (Yıldırım & Şimşek, 2011, p. 74). Hence, sampling of the study was constituted by 10 teachers working at state middle schools located in Şanlıurfa Province, Turkey. In order to obtain as various data sets as possible and different points of view, the maximum diversity sampling was used; namely, the participants were chosen among teachers of different subject areas, teaching experience, and gender. Likewise, the teachers who were working at schools located in districts of different socio-economic background were included in the study. Demographic information about the participants is given in Table 1.

Table 1. *Demographic information about teachers*

Participant	Gender	Subject Area	Teaching Experience (Year)
T1	Female	Turkish Language	4
T2	Male	Counselling	2
T3	Male	Mathematics	1
T4	Female	English as a Foreign Language	3
T5	Male	Physical Education	6
T6	Male	Natural Sciences	2
T7	Male	Social Sciences	15
T8	Female	Music	12
T9	Male	Mathematics	4
T10	Female	Turkish Language	6

As illustrated in Table 1, 4 female and 6 male teachers participated in the present study. Their professional experience ranges from 1 to 15 years. At the time of data collection, 2 teachers were working at middle schools located in a village while 3 teachers were working at schools of high socio-economic level and 5 at schools of relatively lower socio-economic level which are located in the city centre.

2.2. Data Collection and Analysis

Data were gathered from 10 teachers working at state middle schools in Turkey through a semi-structured interview of which questions were developed by the researchers. The elicited data were examined through SWOT Analysis, which is a method used in revealing internal factors, strengths, weaknesses, and external factors of the examined programme, institution,

or process, and opportunities and threats for the institution or process in concern (Gökmenoğlu & Eret, 2010). SWOT analysis aims to identify the strengths and weaknesses of an organisation and the opportunities and threats in the environment, and hence, strategies are developed which may build on the strengths, eliminate the weaknesses, exploit the opportunities or counter the threats. (Dyson, 2002, p. 632). By identifying opportunities and threats, strengths and weaknesses, organizations can develop strategies based on their strengths, vanish weaknesses, gain maximum profit using opportunities and neutralize threats (Kangas, Kurtila, Kajanus, & Kangas, 2003, cited in Shariatmadaria, Sarfarazb, & Hedayat, 2013, p. 887).

The elicited data were coded based on the categorical analysis, and tabulated in order to provide a detailed picture of the findings. The study also offers direct quotes from teachers' views from which categories and codes were set for the sake of validity (Patton, 1987). Lastly, for the sake of reliability, expert opinion was elicited from two faculty members specialized in testing and assessment while coding the data. The following section presents and discusses findings.

3. Findings

The first research question of the study investigated TPC-driven strengths and weaknesses from the students' perspective. The related findings based on teacher views are provided in Table 2.

Table 2. *TPC-driven strengths and weaknesses from students' perspective*

Strengths	***f***	**Weaknesses**	***f***
Feeling of worthiness	1	Increase in misbehaviours due to parents not visiting schools	2
Improving commitment to school	2	Psychological pressure and violence	2
Increase in desired behaviours	2	Getting spoiled by exploiting TPC	1
Increase in academic performance	2	Developing a negative attitude towards teachers	1
Increase in school and peer orientation	2	Decreased motivation & feeling of loneliness	1
Increase in female students' school attendance	1	Increase in undesired behaviours/ misbehaviours	1
Facilitated learning process	1		

As given in Table 2, the teachers stated that TPC has certain strengths for students such as feeling worthy, improved school commitment, increase in academic performance and facilitation of the learning process. The following extracts were drawn from the interviews with the teachers.

"*Students become more committed to school, and feel worthy when they know that their teachers and parents are in contact with each other. In such a case, s/he becomes happy since they believe that his/ her parents care about him/ her.*" (T1)

"*We usually observe improvement in students' behaviours when we communicate with their parents. We also observe that they tend to act in a more mature way, to do assigned tasks on time, and to get prepared for the classes*." (T7)

"*When students are aware of their parents and teachers are in contact, they pay more attention to the way they communicate with their friends, and the way they behave towards their teachers and friends. In consequence, they try to behave their teachers and friends in a more respectful and moderate manner*." (T10)

"*I am working in a village where education does not receive enough attention from parents and female students are not allowed to go to school. Thanks to our home visits and regular phone calls, a few more parents began to attend parental meetings, and send their daughters to the school. Furthermore, we observed positive changes in students' behaviours, and communicate with them in a more efficient way*." (T3)

Teachers reported that TPC might have some weaknesses from the perspective of students such as exposure to psychological pressure and violence from parents, parents' reluctance to attend parental meetings, increase in student misbehaviour, and causing students to develop a negative attitude towards teachers. The following are the remarks of a female Turkish language teacher with an experience of four years.

"*I am working with the students whose parents are mostly indifferent to their children's education and intolerant of criticism. They are mostly illiterate people of low socio-economic level. So, I need to be much more careful while criticising their children. Otherwise, the students may face psychological and/ or physical pressure from their parents*." (T6)

"*The school I am working at is located in a village where is mostly populated by seasonal workers. They do not generally control their children's behaviours, reward them for their academic success or provide negative reinforcement against their undesired behaviours. So, the students become indifferent to classes and home assignments. Consequently, they become less eager to attend classes*." (T8)

In the absence or deficiency of TPC, students are likely to feel lonely and/ or become less committed to school, and their academic success is likely to decrease. The following are the expressions obtained from teacher interviews.

"*Students tend to make false friends to display misbehaviours, and acquire bad habits once they are aware of the lack of communication between their parents and teachers*." (T5)

"*Students are likely to develop negative attitude towards their teachers, to behave disrespectfully towards them, to skip classes, and to show symptoms of oppositional defiant disorder*." (T2)

The second research question was posed to find out TPC-driven opportunities and threats from the perspective of students. The related findings are given in Table 3.

Table 3. *TPC-driven opportunities and threats from students' perspective*

Opportunities	***f***	**Threats**	***f***
Learning to take responsibility	2	Development of dependent personality disorder	2
Preparation for the future	2	Feeling of uneasiness with himself/ herself	2
Gaining self-awareness	1	Loss of confidence in teachers	2
Increasing self-confidence	1	Decrease in academic performance	1
Eliminating of undesired behaviours	1		
Improving feeling of worthiness	1		

As can be seen in Table 3, there is a relatively balanced distribution between the opportunities and threats entailed by TPC based on teachers' views. Namely, the teachers believe that it helps students learn to take responsibility, get prepared for the future, gain self-awareness, and improve their self-confidence. In addition, it facilitates the elimination of the undesired student behaviors and improving their feeling of worthiness. It might, on the contrary, trigger development of dependent personality disorder in students, and cause them to feel uneasy in the classroom, to lose confidence in their teachers and to fail to attain desired academic achievement. The related teachers' views are exemplified in the following quotes:

"*TPC facilitates classroom management keeping students under control. As they become aware of their responsibilities, they begin to try to fulfill them, to do homework assignments on time, and to attend classes on time*." (T2)

"*Students' parents feel proud and happy when the teachers inform them about the success their children have attained. In addition, the students become conscious of their own potential, think about what they can do, and act. In such a case, their self-confidence increases, and they endeavor to prove themselves*." (T8)

"*I got many benefits from TPC during my career. I work in collaboration with both their parents and school consultancy staff especially when the students display undesired behaviors. In such a case, they begin to act more carefully because they are convinced that they are precious for all of us -including their parents and teachers*." (T4)

The teachers' responses pertaining to TPC-driven threats from the perspective of students were categorized into four groups. First, it might cause students' loss of trust in teachers. Second, it might lead them to feel uneasy. Third, it might cause a decline in their academic achievement. Lastly, it might cause them to develop a dependent personality disorder. Some of the related views are presented in the following extracts.

"*My subject area requires me to communicate with the parents at a regular and frequent basis. A negative TPC is likely to influence the students in a negative way. Namely, they tend to feel inadequate and to feel embarrassed by their family. As a result, their motivation for classes mostly declines*". (T2)

"*Students whose parents frequently visit school sometimes feel anxious because they think that they are being kept under control. Besides, they might lose confidence in their teachers believing that they share every piece of information about them with their parents. Hence, they are likely to hesitate to express themselves with confidence, and to negotiate with the teachers*." (T9)

The third research problem of the study was intended to cover TPC-driven strengths and weaknesses from the teachers' perspective. The findings elicited from the interviews with the teachers are demonstrated in Table 4.

Table 4. *TPC-driven strengths and weaknesses from teachers' perspective*

Strengths	***f***	**Weaknesses**	***f***
Recognition of students from different angles	2	Abusing the goodwill (demanding a higher grade, passing class)	1
Parental contribution to education	3	Students' developing fallacious belief on teachers' unfair treatment toward them	1

Improving teachers' status and prestige in parents' eyes	1	Parental interference with formal education	1
Collaboration between teachers and parents	1	Interruption of education by parents' untimely wishes to meet	3
Reducing teachers' workload	1	Communication problems (e.g. misunderstandings)	1

As shown in Table 4, teachers are of the opinion that TPC facilitates recognizing students from different angles, makes positive contributions to learning process, improves teachers' prestige, and reduces teachers' workload through collaboration with parents. The following are the extracts on related opinions of the teachers driven from the interviews.

"*I can create a learning environment that is appropriate for the students' cognitive and emotional development level when I know them better from different angles. I can also provide them with emotional support based on their psychological state and external circumstances*." (T4)

"*Thanks to TPC, we teachers have in-depth knowledge about both students' and their parents' mentality, their socio-cultural and economic background, and customs and traditions, which will be useful in our teaching*." (T6)

"*TPC improves teachers' prestige in the eye of the parents, which is reflected upon their children. Namely, they display more respectfully towards us when they see we are respected by their parents*." (T1)

As for TPC-driven weaknesses from the perspective of teachers, teachers mostly reported that the educational process is interrupted by parents' untimely wish to visit the school. Exploiting teachers, parental interference with formal education, and communication problems could be identified as the other negative aspects of TPC reported by the teachers. A male teacher with 6 years of experience in physical education complains,

"*Parents sometimes disregard the fact that we are teachers and act in an unacceptable manner. They sometimes attempt to abuse our goodwill and to request us to give unmerited grades to their children*". (T5)

"*Socio-economic and educational profile of the district where we are working is of great significance for TPC. It is generally hard for us to initiate and sustain healthy communication with uneducated parents with a low socio-economic background. What is more, some of them do not have a good command of Turkish mostly because they speak a different mother tongue, which negatively influences the quality of our communication. They, most of the time, misunderstand us*." (T6)

"*Some parents overstep and try to interfere with the learning environment –classroom design, classroom management, methods and techniques as well as teaching materials to use in the classroom*." (T7)

The last research question of the study aimed to explore TPC-driven opportunities and threats from teachers' perspectives. The related responses are summarized in Table 5.

Table 5. *TPC-driven opportunities and threats from teachers' perspective*

Opportunities	***f***	**Threats**	***f***
Preventing undesired student	2	Parents' imposing psychological pressure	2

behaviours		on teachers	
Effective expression of teachers' views	1	Threat of parental complaint against teachers	1
Increasing confidence in teachers	1	Parents' displaying disrespectful behaviours towards teachers	1
Parental support for supplying school needs	1	Teachers' exposure to violence	1

The teachers' views on TPC-driven opportunities have revealed that it might be beneficial for them in that it helps preventing undesired student behaviours, enables teachers to express themselves more effectively, and increases students' confidence in teachers. Another TPC-driven opportunity reported by the teachers is that parents might display awareness of the school and classroom needs through TPC, and try to supply them within the bounds of financial possibilities. In this vein, the male school counsellor with 2 years of experience in middle schools states that TPC offers teachers with the opportunities to know their students well, to know about their strengths and weaknesses, and to act sensitively towards them. Another male teacher with 2 years of experience in teaching natural sciences underlines that TPC gives him a chance to eliminate student-driven misunderstandings through face-to-face communication, which he believes eliminates the communication breakdown between the two stakeholders. The most experienced teacher of the sampling group states,

"*Teachers seize the opportunity to predict possible management problems, and to develop strategies to prevent them using TPC. They also have a chance to deal with the problems and to offer permanent solutions to them*." (T7)

As for TPC-driven threats from the perspective of teachers, the participants highlight that teachers might be exposed to psychological pressure, that teachers might be threatened with official complaints, that parents might act disrespectfully towards the teachers, and that teachers might be exposed violence from students or parents. A male teacher with 4 years of experience in mathematics teaching expresses,

"*Parents may not be eager to accept the (ugly) truths about their children. In such a case, they mostly blame teachers and learning environment for the students' failure. They also threaten teachers with dialling 147 complaint line affiliated to the Ministry of National Education (MoNE).*" (T9)

"*Parental interviews with negative outcomes may lead parents and/ or students to bully teachers, or to develop negative stance towards them*." (T4)

The following section is motivated to outline the afore-mentioned findings elicited from teacher interviews, and to offer practical implications for teachers, school administrators, prospective teachers, parents as well as students.

3. Discussion

The findings of the study have demonstrated that TPC offers certain strengths from the students' perspective such as enhancing feeling of worthiness, improving school commitment, increasing students' academic performance, and facilitating the learning process. In other words, TPC has several positive influences on the students' academic and social development. This particular finding overlaps with Hill and Taylor (2004) who reported that students' academic success is increased by the positive relationship between teachers and parents, and Garbacz et al. (2015) who concluded that congruent parent-teacher communication improves children's social skills. It is also in line with Bicer et al. (2013) who

found that TPC contributes to learning mathematics and Biber (2003) who concluded that TPC is the most significant factor that influences students' success and positive behaviours. That is, development of desired student behaviours, and achievement in education are likely to occur thanks to an efficient collaboration between parents and school of which initiation and sustainability is overwhelmingly influenced by TPC. In order to derive optimal benefit from this communication, both teachers and parents are supposed to fulfill a set of responsibilities. It requires effort and time from the perspective of teachers, which might reduce teachers' motivation for building communication with parents. Communication tools and social networks could be utilized in order to eliminate this problem and to improve the communication between teachers and parents (Strayhorn, 2010; Bicer et al., 2013; Cumbee, 2017; Tłuściak-Deliowska, 2018).

Concerning TPC-driven weaknesses from students' perspectives, teachers mentioned exposure to parental violence and psychological pressure, siding against teachers, and increase in undesired student behaviours. In the light of this finding, it could be suggested for teachers to pay serious attention to their way of communication, and to predict how they might be interpreted by the parents for the purpose of attaining intended outcomes from TPC. They could also be recommended to adopt a meticulous way of communication with the parents especially whose children display behavioural problems or who has low academic achievement. It should be reminded that the use of accusatory, judicial and complaining expressions are likely to trigger parental violence on students, and to increase parental indifference to the education of students who display relatively lower academic performance than their peers (Erdoğan & Demrikanoğlu, 2010). This recommendation is in perfect agreement with Demirbulak (2000) who noted that TPC is limited to convey complaints about students to their parents. Yapıcı and Yapıcı (2003), on the other hand, stress that parental violence on students has to do more with parents' unconsciousness about how to handle their children's undesired behaviours than TPC.

The teachers mostly remarked that parents begin to interfere with the formal educational process as a TPC-driven weakness from the perspective of teachers. This finding confirms Erdoğan and Demirkasımoğlu (2010) who found that teachers and school administrators feel uncomfortable with the parents' interference in school and educational affairs/ concerns. TPC and teacher-parent interaction should be initiated and sustained very carefully in order to improve the quality of education and to improve students' academic achievement. Accordingly, a consensus is strongly needed among the relevant stakeholders on how and to what extent parents are involved in educational process. In order to attain such consensus and to build consciousness in parents, students' parents should be informed through contact meetings on their rights and liabilities in TPC, and how to use these rights (Erdoğan and Demirkasımoğlu, 2010). Another finding elicited from the interviews concerning TPC-driven weaknesses from the perspective of teachers is that educational process is interrupted by parents' untimely demand for interview with teachers. To overcome this weakness, it is suggested that TPC should be held at regular basis and systematically. Alternatively, organization of parental meetings and regular social activities is considered beneficial in this sense (Gökçe, 2000). The finding in concern coincides with Açıkalın (1989) who reported that parents expect teachers and school administrators to communicate with them more frequently.

The present findings have also shown that especially parents of low socio-economic level are unwilling to communicate with the teachers, which extensively overlaps with Balkar (2009). Most of the researchers and educators attribute this to parental indifference to the students' education. According to Finders and Lewis (1994), however, educators should try to identify the factors that prevent parents from getting involved in their children's education.

It is considered beneficial to improve communication between school staff and parents through school administrators and teachers' showing sympathy towards parents with the aim of identifying and eliminating such factors (Balkar, 2009).

The participant teachers reported that TPC offers them with the opportunity to prevent students' undesired behaviours, which is in parallel with Aslanargun (2007) who advocates that steps to take for strengthening TPC are likely to improve academic achievement of the students, and to prevent discipline problems in schools, and Cheng and Chen (2018) who concluded that the mediating role of parents contributes to effective classroom management.

4. Conclusion

The current research was carried out with a specific focus on TPC to reveal its strengths, weaknesses, threats and opportunities from the perspective of teachers and students. The research findings have revealed that TPC positively affects students' academic, social and emotional development (strength from the students' perspective), and helps teachers get to know their students better and receive parental support for their teaching (strengths from the teachers' perspective). Concerning the weaknesses, it was shown that it may result in exposure to parental violence and psychological pressure (weakness from the students' perspective), and undesired parental interference in formal educational processes and interruption of education by parents' untimely wishes to meet (weaknesses from the teachers' perspective). The study also indicated that TPC could offer such opportunities as encouraging students to take responsibilities (opportunity from the students' perspective) and prevention of undesired student behaviours (opportunity from the teachers' perspective). Lastly, it was demonstrated that TPC might entail undesired consequences such as development of dependent personality disorder (threat from the students' perspective), and parental psychological pressure on teachers (threat from the teachers' perspective). Overall, it could be concluded that TPC is likely to result in desired outcomes in education once it is employed by exploiting the strengths and opportunities it offers and developing strategies to handle its weaknesses and the threats it might entail.

4.1. Practical Implications

In the light of the aforementioned findings, the following practical implications have been suggested for the benefit of all stakeholders of education particularly teachers, school administrators, and prospective teachers.

1. Legislative regulations should be made in order to realize TPC in a systematic and planned way.

2. Teachers might be recommended to take the phenomenon of individual differences in education into account in their classroom and to keep in mind that there might also be individual differences in communication. Hence, they are suggested to use a common and comprehensible language that facilitates sustaining communication especially with parents whose children display low academic performance.

3. Teachers should have detailed information about their students before meeting their parents, and inform them about their children' personal and academic development.

4. Technology might be effectively utilized in TPC in order to save time and energy for both parties. The use of modern communication tools might be encouraged (e.g. phone, email, school bulletin, social media, and school blog).

5. Physical facilities might be offered at school for effective TPC (e.g. allocation of a parental meeting room and arrangement of parental meeting hours on a particular day when

teachers are not assigned with courses), and parental meetings should be held on a regular basis.

6. Parents should be convinced that teachers are educational experts, and that their practical applications and recommendations are only intended to increase students' academic achievement, and social, moral and emotional development.

7. Schools are the institutions that are designed to meet educational needs of the societies; however, they need to work in an effective collaboration with parents in developing desired habits in students.

8. Teachers could be suggested to conduct home visits especially for the students who are not allowed to go to school, and to inform their parents about the significance of education and school attendance for their children.

9. Educational events like seminars and conferences might be organized in order to raise parental consciousness of education and the significance of their involvement in their children's education, and to increase their confidence in schools.

10. In-service training activities could be organized especially in order to improve communication skills of primary school teachers who are typically the first to contact with parents in the countries where pre-school education is not compulsory.

4.2. Limitations of the Study

The present study is limited in methodological design and sampling. It required the qualitative analysis of views elicited from 10 teachers of different subject areas who were working at state middle schools in Turkey. So, it might be furthered to analyze strengths, weaknesses, opportunities and threats driven by TPC based on views obtained from a larger sampling of teachers. Future studies could also investigate whether teachers significantly differ in their views on TPC with respect to the educational level of the schools they are working. Namely, teachers working at state primary schools, middle schools and high schools might be interviewed to reveal their views about pros and cons TPC. Likewise, teachers working at state schools and private schools might be compared in this concern. Finally, parents and students' views on TPC might be explored in a further research to be conducted in the future.

References

Açıkalın, A. (1989). Organizational and administrative dimensions of parental expectations from private and state high schools. *Hacettepe University Faculty of Education Journal, 4*, 85-9.

Aslanargun, E. (2007). The review of literature on school-parent cooperation and students' school success. *Manas University Journal of Social Sciences, 18*, 119-135.

Aydın, İ. (2005). Relationship between school and environment. In Y. Özden (Ed.). *Handbook of Education and School Management*, 161-185. Ankara: Pegem Academy Publications.

Balci, A. (2001). *Effective schools and school improvement*. Ankara: Pegem Academy Publications.

Balkar, B. (2009). A qualitative research on parents' and teachers' views about school-family association. *Çukurova University Faculty of Education Journal, 36*, 105-123.

Biber, K. (2003). Teacher-parent communication based on socio-economic status of 1st graders' families. *Educational Administration: Theory and Practice, 35*, 360-373.

Bicer, A., Capraro, M., & Capraro, R. (2013). The effects of parent's SES and education level on students' Mathematics achievement: Examining the mediation effects of parental expectations and parental communication. *The Online Journal of New Horizons in Education, 3*(4), 89-97.

Bogenschneider, K. (1997). Parental involvement in adolescent schooling: A proximal process with transcontextual validity. *Journal of Marriage and Family, 59*(3), 718-733.

Boonk, L., Hieronymus J. M. Gijselaers, Ritzen, H., & Brand-Gruwel, S. (2018). A review of the relationship between parental involvement indicators and academic achievement. *Educational Research Review, 24*, 10-30. https://doi.org/10.1016/j.edurev.2018.02.001

Castro, M., Expósito-Casas, E., López-Martín, E., Lizasoain, L., Navarro-Asencio, E., & Gaviria, J. L. (2015). Parental involvement on student academic achievement: A meta-Analysis. *Educational Research Review, 14*, 33-46. https://doi.org/10.1016/j.edurev.2015.01.002

Cheng, Y. H., & Chen, Y. C. (2018). Enhancing classroom management through parental involvement by using social networking apps. *South African Journal of Education, 38*(2), 1-14. https://doi.org/10.15700/saje.v38ns2a1427

Cook, K. D., Dearing, E., & Zachrisson, H. D. (2018). Is parent–teacher cooperation in the first year of school associated with children's academic skills and behavioral functioning? *International Journal of Early Childhood, 50*(2), 211-226. https://doi.org/10.1007/s13158-018-0222-z

Coleman, G. (1996). *African American stories of overcoming adversity: Joy Cometh in the morning*. Westport, CT: Greenwood Publishing Group, Inc.

Dearing, E., Kreider, H., Simpkins, S., & Weiss, H. B. (2006). Family involvement in school and low-income children's literacy: Longitudinal associations between and within families. *Journal of Educational Psychology, 98*, 653-664.

Cumbee, C. M. V. (2017). *Elementary teachers' use of technology for teaching and parent communication in low socio-economic classrooms: A case study*. Unpublished doctoral dissertation. Northcentral University, USA.

Demirbulak, D. (2000). A study on teacher-parent meetings. *Journal of National Education, 146*. Retrieved from http://yayim.meb.gov.tr/dergiler/146/demirbulak.htm

Dinç, A., & Keşli-Dollar, Y. (2017). The role of parental involvement on language development of Turkish EFL learners. *Journal of Language Education and Research, 3*(1), 52-74.

Đurišić, M. & Bunijevac, M. (2017). Parental involvement as an important factor for successful education. *Center for Educational Policy Studies Journal, 7*(3), 137-153. Retrieved from https://ojs.cepsj.si/index.php/cepsj/article/view/291

Dyson, R. G. (2002). Strategic development and SWOT analysis at the University of Warwick. *European Journal of Operational Research, 152*(1), 631-640.

Erdoğan, Ç., & Demirkasımoğlu, N. (2010). Teachers' and school administrators' views of parent involvement in education process. *Educational Administration: Theory and Practice, 16*(3), 399-431.

Erkan, S. (1996). Classroom teaching in future educational system. *96th Symposium on Developments and Improvements in Modern teacher Training*, Hacettepe University, Ankara, 30 September-4 October 1996.

Finders, M., & Cyntia, L. (1994). Why some parents don't come to school. *Educational Leadership, 51*(8), 50-54.

Garbacz, S. A., Sheridan, Koziol, N. A., Kwon, K., Holmes, S. R. (2015). Congruence in parent-teacher communication: Implications for the efficacy of CBC for students with behavioral concerns. *School Psychology Review, 44*(2), 150-168. https://doi.org/10.17105/spr-14-0035.1

Gonzalez-DeHass, A. R., Willems, P. P., & Holbein, M. F. (2005). Examining the relationship between parental involvement and student motivation. *Educational Psychology Review, 17*, 99–123. DOI: 10.1007/s10648-005-3949-7

Gökçe, E. (2000). Developing of school parent cooperation in primary schools. *Pamukkale University Faculty of Education Journal, 7*, 204-209. Retrieved from http://egitimdergi.pamukkale.edu.tr/makale/sayı7/30

Gökmenoğlu, T. & Eret, E. (2011). Curriculum development in Turkey from the viewpoints of research assistants of curriculum and instruction department elementary. *Education Online, 10*(2), 667-681.

Gursimsek, A. I. (2010). Factors effecting parent involvement in early childhood education. *Educational Sciences and Practice, 9*(18), 1-19. Retrieved from http://www.ebuline.com/pdfs/18Sayi/EBU18.pdf on 29 October 2016.

Hill, N. E., & Taylor, L. C. (2004). Parental school involvement and children's academic achievement: Pragmatics and issues. *Current Directions in Psychological Science, 13*: 161-164.

Hoover-Dempsey, K. V., Battiato, A. C., Walker, J. M., Reed, R. P., DeJong, J. M., & Jones, K. P. (2001). Parental involvement in homework. *Educational Psychologist, 36*, 195-209.

Kangas J., Kurtila M., Kajanus M., & Kangas A., (2003). Evaluating the management strategies of a forestland estate-the S-O-S approach. *Journal of Environmental Management, 69*, 349-358.

Kikoti, J. W. (2018). *Parents' participation in improving students' academic performance in Sumbawanga municipal community secondary schools, Tanzania* (Unpublished master's thesis). The Open University of Tanzania.

Kraft, M. A. & Dougherty, S. M. (2013). The effect of teacher-family communication on student engagement: Evidence from a randomized field experiment. *Journal of Research on Educational Effectiveness, 6*(3), 199-222.

Mahler, J. (2011). *The fragile success of school reform in the Bronx*. The New York Times Magazine, MM34.

Merriam, S. B. (2013). *Qualitative research: A guide to design and implementation*. San Francisco: John Wiley & Sons.

Milne, A., & Plourde, L. (2006). Factors of a low-SES household: What aids academic achievement? *Journal of Instructional Psychology, 33*(3), 183-193.

Patton, M. Q. (1987). *How to use qualitative methods in evaluation*. USA: Sage Publications.

Rogers, M. A., Theule, J., Ryan, B. A., Adams, G. R., & Keating, L. (2009). Parental involvement and children's school achievement. *Canadian Journal of School Psychology, 24*(1), 34-57.

Shariatmadaria,M., Sarfarazb, A. H. & Hedayat, P. (2013). Using SWOT analysis and SEM to prioritize strategies in Foreign exchange market in Iran. *9thInternational Strategic Management Conference. Procedia - Social and Behavioral Sciences, 99*, 886-892.

Shaw, C. A. (2008). *A Study of the Relationship of Parental Involvement to Student Achievement in a Pennsylvania Career and Technology Center* (Unpublished doctoral dissertation). The Pennsylvania State University, Pennsylvania, USA.

Schneider, B. (2018). Parents, their children, and schools: An introduction. In B. Schneider, & J. S. Coleman (Eds.), *Parents, Their Children, and Schools*, 1-12. New York: Routledge.

Smith, T. E., & Sheridan, S. M. (2018). The effects of teacher training on teachers' family-engagement practices, attitudes, and knowledge: A Meta-analysis. *Journal of Educational and Psychological Consultation,* 1-30. https://doi.org/10.1080/10474412.2018.1460725

Steiner, L. & Cassano, C. (2017). An intervention to support teachers in building on children's home literacy backgrounds. *Journal of Family Diversity in Education, 2*(3), 19-40. Retrieved from http://familydiversityeducation.org/index.php/fdec/article/view/98

Strayhorn, T. L. (2010). When race and gender collide: Social and cultural capital's influence on the academic achievement of African American and Latino males. *The Review of Higher Education, 33*(3), 307-332.

Şahin, F. T., & Ünver, N. (2005). Parental involvement in pre-school education programs. *Kastamonu Faculty of Education Journal, 13*(1), 23-30.

Tłuściak-Deliowska, A. (2018). Creating a collaborative school culture to ensure the whole school development. Why it is important and why it's not easy? In R. Dorczak (Ed.), *Leading and Managing for Development,* 71-79.

Walner, W. D. & Hiatt-Michael, D. B. (2017). Family involvement in Protestant Christian schools. In D. B. Hiatt-Michael (Ed.), *Family Involvement in Faith-based Schools,* 59-75. Information Age Publishing.

Yapıcı, M. & Yapıcı, G. (2003). Problems faced by primary school teachers. *University and Society: Journal of Science, Education and Idea, 3*(3).

Yıldırım, A. & Şimşek, H. (2011). *Qualitative research methods in social sciences*. 8th Edition. Ankara: Seçkin Publications.

Zeith, T. Z., Reimers, T. M., Fehrmann, P. G., Pottebaum, S. M., & Aubey, L. W. (1986). Parental involvement, homework, and TV time: Direct and indirect effects on high school achievement. *Journal of Educational Psychology, 78*, 373-380.

ENDNOTE

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