Pre-Service Mathematics Teachers' Levels of Academic Procrastination and Online Learning Readiness

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ABSTRACT

This article aims to examine the relationship between the online learning readiness and academic procrastination behaviors of the pre-service mathematics teachers. In line with this research purpose, it was examined whether the online learning readiness and academic procrastination differentiate with regard to demographic variables such as gender, grade levels...etc.; and as well as that technical problems occurs during the online learning process, the last minute course and the instructors' impact during the course study process. This research has been conducted with 314 pre-service mathematics teachers that currently attending the Faculty of Education of different universities in Turkey. The results revealed that there is a low-level significant relationship between the academic procrastination tendency and online learning readiness. Besides, the scores of academic procrastination tendency and online learning readiness were found higher among males, first graders, those who have access problems and those who think an instructor is a determinant. The research findings were discussed within the light of related literature.

Keywords: *academic procrastination, online learning readiness, pre-service mathematics teachers.*

INTRODUCTION

The information and communication technologies initiated dynamic changes both in lifestyles of people and also in demands of community. As these changes affected all areas of life, it has been more appreciable in education as well day by day. The schools have been forced to comply with this technological innovation as the information and communication technologies has aligned the education and training with the individual needs (Birgin, Uzun & Mazman Akar, 2019; Ratheeswari, 2018). Moreover, nowadays, with the development of communication technologies, the online education has reached the opportunity of serving to wider learning community with a fast and content-rich education. Information growth, increase in development, support and education needs of the faculties and limited resources alongside of developments in communication technologies such as increase use of technological devices and diffusion of internet have been effective in turning towards the online education (Lindsay, Williams & Howell, 2005). The virtual learning has been widely used in higher education with this change (Hamutoglu et al, 2020).

The online learning provides the education to reach large mass of learners without need the students and the instructors to be in the same environment. Therefore, it enables people to attend the courses even in illness, physical restraint and disaster situations. The online learning has become a necessity in COVID-19 pandemic, as well (Dhawan, 2020). Online education has brought the students flexibility in starting, carrying on and finishing their studies. However, a person should have both required information/skills and affective

properties such as attitude and motivation in order to have the online learning experience in the most efficient way (Yurdugül & Demir, 2017). Online learning readiness [OLR] of the students has also a critical value (Keskin & Yurdagül, 2019). The OLR has a multidimensional structure in the form of computer self-efficacy, internet self-efficacy, online communication self-efficacy, self-oriented learning, student control and motivation towards online learning (Hung, Chou, Chen & Own, 2010). These sub-dimensions are also affinitive with success (Mafenya, 2013). Meanwhile, motivation (Klassen, Krawchuk, & Rajani, 2008; Saraçoğlu & Gökdaş, 2016; Ying & Lv, 2012) and self-efficacy (Klassen & Kuzucu, 2009; Naveed & Ishtiaq, 2015) has been found to be affinitive with the academic procrastination [AP].

AP is defined as delaying the academic tasks such as submitting an assignment or a term paper or last-minute preparation for the exams. Procrastination is not only due to lack of study habits, but also due to complex interaction of cognitive, behavioral and emotional components (Solomon & Rothblum, 1984; Ying & Lv, 2012). In this case, a more explanation is required than the time management and lazzines (Senécal, Koestner & Vallerand, 1995). While the literature was examined, it was found that the AP is related to low academic self-efficacy (Klassen & Kuzucu, 2009; Saraçoğlu & Gökdaş, 2016; Ying & Lv, 2012), low academic motivation (Saraçoğlu & Gökdaş, 2016; Ying & Lv, 2012), high fear of failure, taking risks, laziness, rebellion against control (Saraçoğlu & Gökdaş, 2016). Moreover, the AP is related with the low academic success and self-regulation (Steel & Klingsieck, 2016), as well. The self-regulation is also critical for participation in online learning environment. The self-regulated learning has a positive effect on online learning results (Goda, et al., 2015). The factors related to flexibility regarding time management and communication are also effective inself-regulated learning strategies (Bergamin, Ziska, Werlen & Siegenthaler, 2012).

The online education which offers more flexible environments increases the AP tendency when it is compared with the face-to-face education (Garzón-Umerenkova & Gil-Flores, 2017; Yılmaz, 2017). Because in traditional education, students are regularly exposed to educational materials in their learning environments such as in classes and schools, even if they delay studying. Thereby, the time of studying is extended over a period of time by means of seeing, listening and note takings. However, the students might not have any access to any teaching material until the exam day or the day before the exam (Elvers, Polzella & Graetz, 2003). In a well-designed online learning platform, having the instructors' certain characteristics (e.g. accessible, supportive, open-minded, sympathetic, communicating with students, responsible, respectful, replying the e-mails on time, giving appropriate time for assignement, giving feedback to assignment) may create a positive climate for the online learning (Kaufmann, Sellnow & Frisby, 2015). On the other hand, while some factors like difficulty, time constraints and fear are not effective in AP; the quality of the homework given by the instructor seems more important. The interesting homework that requires using the student's various skills, the reward and social norms perceived by the student and taking clear instruction from the instructor may reduce the AP, as well (Ackerman & Gross, 2005). In terms of undergraduate education, factors like heavy course loads for the teacher candidates and perceived benefits also affect the AP (Balkıs, 2006).

While considering the teaching process and the characteristics of the instructor, it is really important for the pre-service teachers to have necessary equipments for younger children to be raised. Pre-service teachers have already a special position because they are role models with their behaviors and the ways they perform their duties (Okeke & Drake, 2014). It is considered that the attitudes and the habits of the teachers that they acquire during their student life might affect their professional life and productivity. Therefore, it is important to determine the AP tendencies of the pre-service teachers and to intervene that point. Furthermore, it is obvious that an effective teacher should also be a role model for the students with his thoughts and behaviors and being open to technological developments. Also, that would be a guiding for the students to share their experiences in online learning with their students while they are still pre-service teachers. Hence, it is seen that the AP in digital environment reduces the success of student (Paule Ruiz, Riestra González, Sánchez Santillán & Pérez Pérez, 2015; You, 2015). Therefore, the self-regulated learning strategies, which is critical for both online learning (Goda, et al., 2015; Liaw & Huang, 2013) and AP (Steel & Klingsieck, 2016), should be provided to pre-service teachers. Thus, they will be able to get their students adopt such habits when they become teachers. As the AP is related to self-efficacy (Klassen &

Kuzucu, 2009; Naveed & Ishtiaq, 2015), it seems important for pre-service teachers to experience the strategies that will increase self-efficacy, which is one of the sub-dimensions of online learning readiness, and to have knowledge on this subject. For this reason, it is important to determine the AP and OLR levels of pre-service teachers.

Problem Statement

In the recent times, with the reflection of technological changes in education, tech-advanced mathematics teaching has gained prominence within the field of mathematics education (Kim & Baylor, 2008). Moreover, the effective use of technology in mathematics enables students to improve their conceptual understanding (Kaput & Thompson, 1994). Additionally, teachers are expected to have technological pedagogical content knowledge with the effective involvement of technology in the classrooms (Mishra & Koehler, 2006). Therefore, the pre-service mathematics teachers' [PMTs'] readiness to use computers are expected to be higher.

The situation of re-watching the PMTs' lectures at different times is experienced by the researchers, particularly in online learning during the epidemic process. The absence of PMTs during the courses have also prevented the interaction, especially in the mathematics courses that has a high theoretical and conceptual background. In addition, it is hard to say that all students are ready to online learning (Chung, Noor & Mathew, 2020). This study aims to examine the relationship between the OLR and AP of the PMTS . In accordance with this research purpose, the OLR and AP of PMTs in terms of demographic variables like gender and grade levels; and as well as; the technical problems occur during the online learning process, last-minute courses and the determination of the instructor during the studying process will be discussed. This research is thought to be contribute to the related literature; especially for the executors within the context of online education.

Research Questions

The following research questions were sought within the purpose of this research:

• What is the AP and OLR levels of PMTs?

• How does the AP levels of PMTs vary according to gender, grade level, technical problems occur during the online learning process, last minute courses and the instructor impact at the point of studying?

• How does the OLR levels of PMTs vary according to gender, grade level, technical problems occur during the online learning process, last minute courses, and the instructor impact at the point of studying?

• Do the OLR scores of the PMTs predict their AP behavior significantly?

RESEARCH METHOD

The descriptive survey model, which is one of the quantitative research methods, was used in this study since this research aims to examine the relationship between the OLR and AP of the PMTs.

Participants

The participants of the study consisted of PMTs studying at Faculty of Educations in Turkey. The distribution of PMTs according to gender and grade levels is presented in Table 1.

The sample of the study determined by the convenience sampling method consisted of 319 volunteers PMTs studying at Faculty of Education of Universities in Turkey. While 79% (n = 252) of PMTs were female, the 21% (n = 67) were male. In addition, 25.1% (n = 80) of the PMTs were in the 1st grade, 25.7% (n = 82) were in the 2nd grade, 26% (n = 83) of them were in the 3rd grade and 23.2% of them were in the 4th grade at the time of the study.

Table 1. Descriptive information regarding age and grade levels of the participants

		n	%
Gender	Female	252	79.0
	Male	67	21.0
Grade Level	1st Grade	80	25.1
	2nd Grade	82	25.7
	3rd Grade	83	26.0
	4th Grade	74	23.2

Data Collection Tool

Demographic Information Form, Academic Procrastination Scale (APS) (Çakıcı, 2003) and Online Learning Readiness Scale (OLRS) (İlhan & Çetin, 2013) were used as data collection tools in the study.

Demographic Information Form: In the entire form prepared by the researchers, in order to describe the characteristics of the participants, the questions given in Table 2 were addressed in addition to the variables related to gender and grade level.

Table 2. Frequencies and Rates of Follow-up Questions with Answers in the Demographic Information Form

Questions	Answers	n	%
Have you experienced any technical problems in the online learning process? [Technical problems]	Yes	105	32.9
	No	214	67.1
Which courses do you usually leave to the deadline while studying for courses or exams? [Last minute courses]	Content	60	18.8
	Educational Sciences	92	28.8
	Elective	167	52.4
Does the instructor impact your study time and busy while studying a lesson? [Instructor impact]	Yes	213	66.8
	No	65	20.4
	Indecisive	41	12.8
Total		319	100

To the question “Have you experienced any technical problems in the online learning process?”, while 32.9% (n = 105) of the PMTs answered yes, 67.1% (n = 214) answered no. To the question “Which courses do you usually leave to the deadline while studying for courses or exams?” 18.8% (n = 60) of the PMTs answered content courses, 28.8% (n = 92) answered educational sciences courses and 52.4% (n = 167) answered elective courses. Also, to the question "Does the instructor impact your study time and intensity while studying a lesson?” 66.8% (n = 213) of the PMTs answered yes, 20.4% (n = 65) answered no and 12.8% (n = 41) of the PMTs was indecisive.

Academic Procrastination Scale: APS was developed by Çakıcı (2003). The scale is composed of 19 items with one factor, 12 negative and 7 positive items. The high score obtained from the APS is interpreted as the high procrastination behavior. The Cronbach Alpha reliability coefficient was determined as .92 in the scale development phase. However, in this study, the Cronbach Alpha reliability coefficient was found .84.

Online Learning Readiness Scale: The scale developed by Hung, Chou, Chen and Own (2010) was adapted into Turkish by İlhan and Çetin (2013). The original form of OLRS composes of five factors and 18 items. Even though, it is indicated that the factors in the scale can be scored separately (due to the number of items in the factors is 3 or 4), in this study, the OLR levels of the PMTs were determined over the average score obtained from the scale. The high score obtained from the scale indicates that the OLR level is high. The Cronbach Alpha value was found as .95 in the adaptation phase of the scale. However, in this study, the Cronbach Alpha reliability coefficient of the scale was found .83.

Data Collection and Analysis

An online form was generated in order to collect data. The online participation form link was sent to PMTs in order to make the participation voluntary. It was emphasized that participation of PMTSs for the study is voluntary and the findings will only be used within the scope of scientific studies. The scales were given as a whole to the PMTs. During the analysis of the data, the SPSS 20.0 statistics package program was used. Before starting the data analysis, the normality of the distributions was checked, and it was found that the skewness value for APS was .574, the kurtosis value was -.277, the skewness value for OLRS was -0.35 and the kurtosis value was .256. After these values were obtained, t-tests and ANOVA test statistics were used in order to determine the effect of independent variables on dependent variables (George & Mallery, 2010). In addition Pearson correlation coefficient was computed in order to specify the relationships between the variables. Besides, the predictive status of OLR levels of PMTs' AP tendencies was specified by regression analysis.

FINDINGS

In this part of the present study, the findings related to the analysis made regarding the sub-problems specified in the direction of research purpose will be presented.

Sub-Problem 1.Examination of AP and OLR levels of PMTs

The average score ranges were used while determining the AP behavior and OLR levels of PMTs (see below the Table 3). The general procrastination and readiness levels of PMTs are given in Table 3.

Table 3. Frequencies and Rates of Follow-up Questions with Answers in the Demographic Information For General procrastination and readiness levels of PMTs according to gender and grade level

Variable	Answers	AP			OLRS		
		$\bar{X}$	s.d	Level	$\bar{X}$	s.d	Level
Gender	Female	2.34	.710	Low	3.98	.567	High
	Male	2.65	.708	Medium	4.19	.608	High
Grade Level	1st Grade	2.59	.790	Low	3.87	.512	High
	2nd Grade	2.39	.680	Low	4.07	.604	High
	3rd Grade	2,38	.746	Low	4.02	.604	High
	4th Grade	2.25	.620	Low	4.13	.581	High
Technical problems	Yes	2.61	.837	Medium	3.82	.611	High
	No	2.30	.634	Low	4.12	.543	High
Last Minute Courses	Content	2.65	.798	Medium	4.06	.606	High
	Educational Sciences	2.43	.760	Low	4.02	.628	High
	Elective	2.30	.646	Low	4.01	.548	High
Instructor Impact	Yes	2.15	.540	Low	4.09	.587	High
	No	3.24	.729	Medium	3.80	.642	High
	Indecisive	2.39	.493	Low	4.00	.387	High
Total		2.40	.720	Low	4.02	.582	High

1.00-1.80: Very Low, 1.81-2.60: Low, 2.61-3.40: Medium, 3.41-4.20: High, 4.21-5.00: Very High

As can be observed in Table 3, the AP levels of the PMTs were low and their OLR levels were high. Moreover,1st grade PMTs have higher average scores of AP and OLR when compared to the PMTs in other grades. The procrastination behaviors of PMTs who have technical problems during the online learning process are found at medium level. Furthermore, it was also found that PMTs who have no technical problems have higher OLR average scores. The procrastination behavior of PMTs who leave their content courses to the last minute is found to be higher than the those of other PMTs.

Sub-Problem 2. Findings from the analysis made according to AP behavior levels

Within this context, it was examined whether AP behaviors of PMTs differentiate according to various variables. The analysis was performed in order to examine the AP behaviors of the PMTs according to their genders, grade levels, technical problems they have, the left courses to the last minute and impact of the instructor. Findings are presented in Table 4 and Table 5.

Table 4. The results of the t-test performed in order to determine whether AP behaviors of PMTs differentiate according to gender, technical problems they have variables

		n	$\bar{X}$	Sd	t	p
Gender	Female	252	2.34	.710	-3.23	.001**
	Male	67	2.65	.708		
Technical problems	Yes	105	2.61	.837	3.572	.000**
	No	214	2.30	.634		

* p< ,05, ** p< ,01

According to the t-test results in Table 4, it was found that there is a significant difference in terms of the gender variable between APS scores of male and female PMTs (p <.01). It can be said that the male PMTs ($\bar{X}$=2.65) have a higher level of AP behavior than the female PMTs ($\bar{X}$ =2.34). Additionally, it was found that there is a significant difference between the APS scores of PMTs in terms of technical problems during the online learning process (p <.01). Accordingly, the PMTs who have technical problems during the online learning process ($\bar{X}$=2.61) have higher level of AP behavior when compared to those who do not have any technical problem ($\bar{X}$ =2.30).

Table 5. ANOVA results of PMTs' scale scores obtained from AP Scale according to grade level, which lesson they leave most to the last minute, impact of instructor.

		Sum of Squares	df	Mean Square	F	P	Significant Difference
Grade Level	Between Groups	4.338	3	1.446	2.835	.038*	I-IV
	Within Groups	160.684	315	.510			
	Total	165.022	318				
Last Minute Courses	Between Groups	5.338	2	2.669	5.282	.006**	M-E
	Within Groups	159.684	316	.505			
	Total	165.022	318				
Instructor Impact	Between Groups	59.317	2	29.658	88.663	.000**	Y-N
	Within Groups	105.705	316	.335			Y-I
	Total	165.022	318				N-I

* p< ,05, ** p< ,01,: I: First Grade IV: Fourth Grade; M: Content Courses, E: Elective Courses; Y: Yes, N: No, I: Indecisive

As can be observed in Table 6, there is a statistically significant difference between the average APS scores of PMTs who are studying in different grades [F (3,315) = 2.835, p <.05]. According to the results of the Tukey Test, which was performed in order to find out among which groups have the difference between the AP behavior average scores according to their different grade levels; it was found that first grade PMTs ($\bar{X}$=2.59) have higher levels of AP behavior when compared to fourth grade PMTs ($\bar{X}$ =2.25).

Moreover, a statistically significant difference was found between APS score averages in terms of the courses left by the PMTs to the last minute [F (2,316) = 5.282, p <.01]. According to the results of the Tukey Test, which was conducted to find out which groups have difference between AP behavior average scores according to the courses left for the last time, the PMTs who left the content courses to the last time

($\overline{X}$=2.65) have a higher level of procrastination behavior than the PMTs who left the elective courses to the last minute ($\overline{X}$=2.30).

In addition, for the question "Does the instructor impact on the study time and intensity while the PMTs are working on a course?", a statistically significant difference was found between APS score averages in terms of the answers given to the question [F (2,316) = 29.658, p <.01]. According to the answers given on the impact of the instructor in the course study process, within accordance with the Tukey Test conducted in order to find out in which groups the AP behavior average scores are different, it was found that the PMTs who stated that the instructor has an impact ($\overline{X}$=3.24) have higher level of AP behavior than those who stated that the instructor has no impact ($\overline{X}$=2.39) and those who are indecisive ($\overline{X}$=2.15). Moreover, it was found that the PMTs who were indecisive ($\overline{X}$=2.39) about the instructors' impact during the course study process have a higher level of procrastination behavior than the PMTs who stated that the instructors have impact on the relevant issue ($\overline{X}$=2.15).

Sub-Problem 3. Findings from the analysis made according to OLR levels

In this part, it was examined whether the OLR levels of PMTs differentiated according to various variables. The analysis was performed in order to examine the OLR levels of the PMTs according to their gender, grade level, technical problems they have, the courses left to the last minute and the impact of the instructor and findings are presented in Table 6 and Table 7.

Table 6. The results of the t-test performed in order to determine whether PMTs' OLR differentiate according to the gender and technical problem variables.

		n	$\overline{X}$	Sd	t	p
Gender	Female	252	3.98	.567	-2.69	.007**
	Male	67	4.19	.608		
Technical problems	Yes	105	3.82	.611	-4.339	.000**
	No	214	4.12	.543		

* p< ,05, ** p< ,01

According to the t-test results in Table 6, there is a significant difference between the OLRS scores average of the PMTs in terms of gender variable (p< .01). According to this, the OLR levels of male PMTs ($\overline{X}$=4.19) are higher than the female PMTs ($\overline{X}$=3.98). Additionally, in accordance with the t-test results in Table 6; a significant difference was found between the OLRS score averages of PMTs in terms of the technical problems variable during the online learning process (p< .01). Accordingly, it can be said that the OLR levels of PMTs who have no technical problems during the online learning process ($\overline{X}$=4.12) are higher than those who have technical problems during that process ($\overline{X}$=3.82).

Table 7. ANOVA results of PMTs' scale scores obtained from OLR Scale according to grade level, which lesson they leave most to the last minute, impact of instructor.

		Sum of Squares	df	Mean Square	F	P	Significant Difference
Grade Level	Between Groups	2.888	3	1.446	2.835	.036*	I-IV
	Within Groups	104.911	315	.510			
	Total	165.022	318				
Deadline Courses	Between Groups	.133	2	.067	.196	.822	-
	Within Groups	107.666	316	.341			
	Total	107.799	318				
Instructor impact	Between Groups	4.47	2	2.235	6.835	.0001*	Y-N
	Within Groups	103.330	316	.327			
	Total	107.799	318				

* p< ,05, ** p< ,01,: I: First Grade IV: Fourth Grade; M: Content Courses, E: Elective Courses; Y: Yes, N: No, I: Indecisive

As can be observed inTable 7, a statistically significant difference was found between the OLRS score averages of the PMTs studying in different grades [F(3,315)= 2.835, p< .05]. According to the Tukey Test performed in order to find among which groups the OLR scale average scores differ in terms of their different grade levels, it can be said that the OLR levels of the 4th grade PMTs ($\bar{X}$ =4.13) are higher than the 1st graders ($\bar{X}$=3.87). Additionally, it was found that there is no statistically significant difference between the OLRS score averages in terms of the courses that PMTs left to the last minute [F(2,316)= .196, p> .05]. Therefore, it can be said that the OLR levels of PMTs who left their content courses, educational sciences courses or elective courses to the last minute are generally the same.

In addition, for the question "the instructors' impact on the studying process of PMTs?", a statistically significant difference was found between OLR score averages in terms of the answers given to the question [F (2,316)= 6.835, p< .01]. According to the answers given about the impact of the instructor on the course studying process of the PMTs, within accordance with the Tukey Test conducted in order to find out in which groups the AP behavior average scores are different, it was found that the PMTs who stated that the instructor has an impact on studying process ($\bar{X}$=4.09) have higher level of OLR level than those who stated that the instructor has no impact ($\bar{X}$= 3.80).

Sub-Problem 4. The relationship between AP levels and OLR levels

The regression analysis was performed in order to test whether OLR levels of PMTs are significant predictors of AP levels. The Pearson correlation analysis was used in order to see the relationships between study variables before the regression analysis. Additionally, assumptions for regression analysis were ensured.

Table 8. The results of the t-test performed in order to determine whether pre-service

Variable	n	R	p
APS OLRS	319	-.268	.000**

** p< ,01

As can be observed in Table 8, it was found that there is a negative and significant relationship between the OLR and AP (p< .01). When the level of the relationship was analyzed, it was found that there was a low level (r = -. 268) relationship between OLR and AP. Then, the regression analysis was performed and presented in Table 9.

Table 9. Simple regression analysis regarding the predictor value of PMTs' OLR scores on AP behavior

Model	Variable	B	SH_B	β	t	R^2	ΔR^2	F
1	Constant	71.31	4.98		14.32**	.072	.070	23.199**
	Online Learning	-.35	.073	-.268	-4.81**			

** p< ,01

In Table 9, the standardized β (Beta) values (effect) (β = -. 268, t = -4.81, p <.01), it can be said that the OLR scores of PMTs are significant predictors of the AP behaviors [F (1,317) = 23.199, p <.01]. From this point of view, it can be stated that the OLR can singly explain 7% of the total variance regarding the AP behavior. In this context, the OLR can be seen as a predictor variable in determining the AP behavior.

DISCUSSION, CONCLUSION AND SUGGESTIONS

In this study, it was aimed to examine the AP behaviors and OLR levels of PMTs. In parallel with the research purpose , it was determined that the AP levels of the PMTs are low. In the study conducted by Vural and Gündüz (2019), researchers found that the PMTs who still attend the formation program have moderate AP behavior. The reason of this difference that emerged in the study can be thought as the PMTs who still attend the Faculty of Education are the participants of this research. Besides, it was found that the OLR levels of the PMTs are high. When the literature was reviewed, it was specified that the PMTs' self-efficacy (Aşkar & Umay, 2001) and readiness related to computers are at low level. The reason of high OLR levels of PMTs in this study can be due to the common usage of communication technologies when it was compared to previous years.

Results of the present study revealed that both AP and OLR scores of the male PMTs are higher than the female PMTs. The various studies which examined the change in terms of gender in AP have obtained different results in the literature. Some studies show that AP does not differ according to the gender (Ajayi, 2020; Klassen & Kuzucu, 2009). However, some other studies show that the AP is higher in male teachers (Naveed & Ishtiaq, 2015; Ying & Lv, 2012). This may be deriving from the fact that the women eager more for courses and manage their time better than men, on the contrary, the men spend more time on leisure activities than the women (Misra & McKean, 2000). Yu and McLellan (2019) also stated that when men's directon towards performance goals combined with their social goals, their academic participation and achievement may decrease. Moreover, in the literature, there is no significant difference between the OLR levels of male and female students (Hung et al, 2010; Rasouli, Rahbania & Attaran, 2016), and there are some other studies which show that the male students have more confidence in using technology (Yau & Cheng, 2012) and their readiness are higher at this point (Teddy So & Swatman, 2010). Besides, it is thought in general that this can be due to the association of computer use with men (Sanders, 2005). However, general computer usage and being well-versed in this issue seems more important than the gender issue.

Another finding of the present study is that the PMTs who have technical problems have more AP behaviors but low OLR than those who do not. It was determined that the PMTs who do not have technical problems during the online learning process have higher OLR levels than those who have technical problems during that process. As a result of the study performed by the Istanbul METU Alumni Association Scholarship Working Group (2020), it was seen that a clear majority of students find the technological infrastructure and working environments of the place they live in insufficient in terms of online learning. Accordingly, it is thought that having access problem may decrease PMTs' motivation. Furthermore, it can be predicted that the students who have access problems believe that they cannot interfere to this situation as an external factor, may cause them to postpone their academic studies regarding the course until at least the access problem is solved.

According to the research findings, elementary school 1st grade PMTs have higher AP behavior than the 4th grade PMTs. The studies examining whether AP differs according to grade levels, that the studies made in different age groups show different results in terms of grade levels. For instance, the AP decreases as age increases while the undergraduate students compared with the graduate students (Naveed & Ishtiaq, 2015). However, the AP levels of the high school 1st grade students were found to be lower than the high school 3rd grade students (Ying & Lv, 2012). According to Ekşi and Dilmaç (2010), it was found that the general procrastination tendency of the PMTs who attend 3rd and 4th grade of the Faculty of Education was higher than the 1st and 2nd grade PMTs. The AP levels of 3rd and 2nd graders are higher than the other graders. The Balkıs (2006) attributed the reason for higher level of AP tendency of 4th grade PMTs by comparison with the 1st grade PMTs to the increased knowledge level of PMTs regarding the education and training process and as well as the environment and the expanding their social surroundings.

In this regard, it was found that the PMTs who leaves the content courses to the last minute have high level of procrastination behavior than the PMTs who leave the elective courses to the last minute. There is no significant difference found between the OLR levels of the PMTs who leave the content courses, educational sciences courses or elective courses. Partially, the relevant AP behavior can be derived from the quality of the academic assignment. Thereafter, it can be said that the negative perception of relevant academic assignment (boring, anxious, difficult, and taking a long time… etc.) may have an effect on procrastination behavior (Bulut & Ocak, 2017). According to Balkıs (2006), content courses at the relevant main departments that accepts students within terms of numerical scores can be deemed more important than the formation courses. Because the pre-service teachers make evaluations regarding the amount of homework, the benefit it will provide and etc. That's why, the students more procrastinate the formation courses. So, in this study, it is seen that the relevant students procrastinate the elective courses, and thus, they prioritize the other courses. The OLR does not differentiate according to the type of courses. According to the relevant studies, it has been observed that the students have positive perceptions like rewatch the video recordings regarding the relevant online learning, flexible opportunities for education and saving of time and…etc. (Serçemeli & Kurnaz, 2020). It can be thought that the course type does not affect the OLR as the aforementioned features are valid for each courses that is available for the students' online learning.

According to the relevant study, both the AP and the OLR scores of the PMTs who thinks that an instructor has an impact on studying process are higher. Some applications made by the instructors such as make students feel the importance of doing their homework on their own, reward the students who fulfill their responsibilities, explain the importance of time using, emphasize that process is valuable, use of difficult questions at the exams and give students regular homework can prevent the AP (Yeşil, 2012). While it is effective on AP at this point, it is also thought that some characteristics of the instructor and the way of deliver a lecture may affect the students. Whereas, Rovai and Barnum (2003) stated that some characteristics of the instructor such as personality, energy and charisma of the relevant instructor may increase the motivation of the students who fail in online education. It is also added that usage of teaching materials such as blackboard in order to clarify the certain points can be effective in students understanding of the lesson. They also indicated that sometimes interruptions delays shall be occurred during the online education and that they find the relevant answers from the written sources themselves. Besides, the researchers affirmed that the students idealized the traditional learning environment.

As a result of the present study, a low-level significant relation has been found between the AP tendency and the OLR. Furthermore, the OLR scores of the PMTs significantly predicts their AP behaviors. While the literature is analyzed, the AP is more performed in online education rather than the traditional education (Garzón-Umerenkova & Gil-Flores, 2017; Yılmaz, 2017). The students are more flexible in their own learning process during the online learning process. They have to do their own time management because of this flexibility. Lay and Schouwenburg (1993) has detected that there is a negative relation between the time management and procrastination. And it was seen that they spend less time for studying than necessary. Thus, the self-regulation increases the participation to the online learning environment (Liaw & Huang, 2013). Besides, the failure in self-regulation is the center of AP (Steel & Klingsieck, 2016). Moreover, the students can use some methods such as giving break, listening to music, waiting for their boredom to pass in order to handle the situations of boredom, depression and loneliness within the online learning conditions. Thus, they can make AP.

The students' profiles participating in online education varies. There are differences among the students participating in online education such as gender, age, marital status, whether they have children, financial status and education level of the student's family, the students' grade level, the learning level at

which the education is given, and as well as the field of education (Sikora, 2002). Furthermore, an adaptive and personalized online learning choices shall be presented to the students (Fırat & Bozkurt, 2020). It is thought that by filling the deficiencies regarding the OLR shall more motivate the PMTs and thus the negative attitudes of the PMTs like AP shall be prevented. Besides these applicable studies, it is thought that also the researchers shall work on the possible results of AP in the digital environments and as well as other psychological variables within this context. One of the limitations of this study is the participation of PMTs attending the Faculty of Education to this study. For the comparison of findings and results of this research, the relevant study might be repeated with the pre-service teachers who attend to different departments of the relevant Faculty of Education and even the university students who are attending different Faculty of Educations.

REFERENCES

Ackerman, D. S., & Gross, B. L. (2005). My instructor made me do it: Task characteristics of procrastination. *Journal of Marketing Education*, *27*(1), 5-13.

Ajayi, O. S. (2020). Academic self-efficacy, gender and academic procrastination. *Epiphany*, *13*(1), 75-84. Doi: http://dx.doi.org/10.21533/epiphany.v13i1.324

Aşkar, P., & Umay, A. (2001). Perceived computer self-efficacy of the students in the elementary mathematics teaching programme. *Hacettepe University Journal of Education*, *21*(21), 1-8. http://www.efdergi.hacettepe.edu.tr/shw_artcl-1020.html

Balkıs, M. (2006). Öğretmen adaylarının davranışlarındaki erteleme eğiliminin, düşünme ve karar verme tarzları ile ilişkisi (The relationship between pre-service teachers' procrastination tendency and their thinking and decision-making styles), Unpublished Doctoral dissertation, Instıtue of Educational Sciences, DEU, İzmir.

Bergamin, P. B., Ziska, S., Werlen, E., & Siegenthaler, E. (2012). The relationship between flexible and self-regulated learning in open and distance universities. *International Review of Research in Open and Distributed Learning*, *13*(2), 101-123. Doi: https://doi.org/10.19173/irrodl.v13i2.1124.

Birgin, O., Uzun, K., & Mazman Akar, S. G. (2019). Investigation of Turkish mathematics teachers' proficiency perceptions in using information and communication technologies in teaching. *Education and Information Technologies*. *25*(1), 487–507. Doi:10.1007/s10639-019-09977-1.

Bulut, R., & Ocak, G. (2017). The Reasons Affecting Academic Procrastination Behaviors of Prospective Teachers. *E-International Journal of Educational Research*, *8*(2).75-90. Doi: 10.33200/ijcer.731976

Chung, E., Noor, N. M., & Mathew, V. N. (2020). Are you ready? An assessment of online learning readiness among university students. *International Journal of Academic Research in Progressive Education and Development*, *9*(1), 301–317. Doi:10.6007/IJARPED/v9-i1/7128

Çakıcı, D.Ç. (2003). Lise ve üniversite öğrencilerinde genel erteleme ve akademik erteleme davranışının incelenmesi. (Investigation of general procrastination and academic procrastination behavior in high school and university students). Unpublished master's thesis. Graduate School of Educational Sciences. Ankara University. Ankara.

Dhawan, S. (2020). Online Learning: A Panacea in the Time of COVID-19 Crisis. *Journal of Educational Technology Systems*, *49*(1), 5-22. Doi: 0047239520934018

Ekşi, H., & Dilmaç, B. (2010). An Examination of General Procrastination, Decisional Procrastination, and Academic Procrastination With Respect to Trait-Anxiety among a Group of College Students. *Journal of Uludag University Faculty of Education*, *23*(2), 433-450.

Elvers, G. C., Polzella, D. J., & Graetz, K. (2003). Procrastination in online courses: Performance and attitudinal differences. *Teaching of Psychology*, *30*(2), 159-162. https://doi.org/10.1207/S15328023TOP3002_13

Firat, M., & Bozkurt, A. (2020). Variables affecting online learning readiness in an open and distance learning university. *Educational Media International*, *57*(2). 112-127, Doi: 10.1080/09523987.2020.1786772

Garzón-Umerenkova, A., & Gil-Flores, J. (2017). Academic procrastination in non-traditional college students. *Electronic Journal of Research in Educational Psychology*, *15*(3), 510-532.

George, D., & Mallery, M. (2010). *SPSS for Windows step by step: A simple guide and reference, 17.0 update* (10a ed.) Boston: Pearson.

Goda, Y., Yamada, M., Kato, H., Matsuda, T., Saito, Y., & Miyagawa, H. (2015). Procrastination and other learning behavioral types in e-learning and their relationship with learning outcomes. *Learning and Individual Differences*, *37*(1), 72-80. https://doi.org/10.1016/j.lindif.2014.11.001.

Hamutoglu, N. B., Gemikonakli, O., Duman, I., Kirksekiz, A., & Kiyici, M. (2020). Evaluating students experiences using a virtual learning environment: satisfaction and preferences. *Educational Technology Research and Development, 68*(1), 437-462. https://doi.org/10.1007/s11423-019-09705-z

Hung, M.L., Chou, C., Chen, C.H., & Own, Z.Y. (2010). Learner Readiness for Online Learning: Scale Development and Student Perceptions. *Computers & Education*, *55*(3), 1080-1090. DOI: 10.1016/j.compedu.2010.05.004

İlhan, M., & Çetin, B. (2013). The validity and reliability study of the turkish version of an online learning readiness scale. *Educational Technology Theory and Practice*, *3*(2), 72-101.

İstanbul ODTÜ Mezunları Derneği Burs Çalışma Grubu [Istanbul METU Alumni Association Scholarship Working Group] (2020). Covid-19 Process Distance Education Evaluation Research. Retrieved 01 July 2020 from https://odtumist.org/wp-content/uploads/2020/05/UZAKTAN-E%C4%9E%C4%B0T%C4%B0M-SUREC%C4%B0-ARA%C5%9ETIRMASI-052020.pdf.

Kaput, J. J., & Thompson, P. W. (1994). Technology in mathematics education research: The first 25 years in the JRME. *Journal for Research in Mathematics Education*, *25*(6), 676-684.

Kaufmann, R., Sellnow, D. D., & Frisby, B. N. (2015). The development and validation of the online learning climate scale (OLCS). *Communication Education*, *65*(3), 307–321. doi:10.1080/03634523.2015.1101778

Keskin, S., & Yurdugül, H. (2019). Factors affecting students' preferences for online and blended learning: Motivational vs. cognitive. *European Journal of Open, Distance and E-learning*, *22*(2), 72-86.

Kim, C., & Baylor, A. L. (2008). A virtual change agent: Motivating pre-service teachers to integrate technology in their future classrooms. *Journal of Educational Technology & Society*, *11*(2), 309-321.

Klassen, R. M., Krawchuk, L. L., & Rajani, S. (2008). Academic procrastination of undergraduates: Low self-efficacy to self-regulate predicts higher levels of procrastination. *Contemporary Educational Psychology*, *33*(4), 915-931. https://doi.org/10.1016/j.cedpsych.2007.07.001

Klassen, R. M., & Kuzucu, E. (2009). Academic procrastination and motivation of adolescents in Turkey. *Educational Psychology*, *29*(1), 69-81. https://doi.org/10.1080/01443410802478622

Lay, C. H., & Schouwenburg, H.C. (1993). Trait procrastination, time management, and academic behavior. *Journal of Social Behavior and Personality*, *8*(8), 647- 662.

Liaw, S. S., & Huang, H. M. (2013). Perceived satisfaction, perceived usefulness and interactive learning environments as predictors to self-regulation in e-learning environments. *Computers & Education*, *60*(1), 14-24. https://doi.org/10.1016/j.compedu.2012.07.015

Lindsay, N. K., Williams, P. B., & Howell, S. L. (2005). *Academic, economic, and technological trends affecting distance education*. In Encyclopedia of Distance Learning (pp. 7-15). IGI Global

Mafenya, P. N. (2013). An investigation of first-year students' pedagogical readiness to e-learning and assessment in open and distance learning: An university of South Africa context. *Mediterranean Journal of Social Sciences*, *4*(13), 353-360.

Misra, R., & McKean, M. (2000). College students' academic stress and its relation to their anxiety, time management, and leisure satisfaction. *American Journal of Health studies*, *16*(1), 41-51.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, *108*(6), 1017-1054.

Naveed, T. & Ishtiaq, S. (2015). Relationship between Procrastination & Self Esteem among Male & Female University Students. *European Academic Research*, *3*(2), 2459- 2470.

Okeke, C. I. O., & Drake, M. L. (2014). Teacher as role model: the South African position on the character of the teacher. *Mediterranean Journal of Social Sciences*, *5*(20), 1728-1728.

Paule Ruiz, M. P., Riestra González, M., Sánchez Santillán, M., & Pérez Pérez, J. R. (2015). The procrastination related indicators in e-learning platforms. *Journal of Universal Computer Science*, *21*(1), 7-22.

Rasouli, A., Rahbania, Z., & Attaran, M. (2016). Students' readiness for E-learning application in higher education. *Malaysian Online Journal of Educational Technology*, *4*(3), 51-64. http://www.mojet.net/frontend//articles/pdf/v4i3/v4i3-5pdf.pdf

Ratheeswari, K. (2018). Information communication technology in education. *Journal of Applied and Advanced Research*, *3*(S1), 45-47. http://dx.doi.org/10.21839/jaar.2018.v3iS1.169

Rovai, Alfred P., & Kirk T. Barnum. (2003). On-line course effectiveness: An analysis of student interactions and perceptions of learning. *Journal of Distance Education*, *18*(1), 57-73. http://www.ijede.ca/index.php/jde/article/view/121

Sanders, J. (2005). Gender and technology in education: A research review. Retrieved 23 June 2020 from http://www.josanders.com/pdf/gendertech0705.pdf.

Saraçoğlu, A. S., & Gökdaş, İ. (2016). Variables that predict academic procrastination behavior in prospective primary school teachers. *Journal of Educational Science Research*, *6*(1), 43-61.

Senécal, C., Koestner, R., & Vallerand, R. J. (1995). Self-Regulation and Academic Procrastination. *The Journal of Social Psychology, 135*(5), 607–619.doi:10.1080/00224545.1995.9712234.

Serçemeli, M., & Kurnaz, E. (2020). A research on students' perspectives to distance education and distance accounting education in the Covid-19 pandemia period. *International Journal of Social Sciences Academic Researches, 4*(1), 40-53.

Sikora, A.C. (2002). *A profile of participation in distance education: 1999-2000. Post secondary education descriptive analysis reports*. National Center for Education Statistics (ED),Washington, DC.; MPR Associates, Berkeley, CA.

Solomon, L. J., & Rothblum, E. D. (1984). Academic procrastination: Frequency and cognitive-behavioral correlates. *Journal of Counseling Psychology, 31*(4), 503-509.

Steel, P., & Klingsieck, K. B. (2016). Academic procrastination: Psychological antecedents revisited. *Australian Psychologist*, 51(1), 36–46. doi:10.1111/ap.12173.

Teddy So, K. K., & Swatman, P. (2010). *The diminishing influence of age and gender on e-learning readiness of teachers in Hong Kong. Lecture notes in computer science*, 477–488. doi:10.1007/978-3-642-14657-2_43

Yılmaz, M. B. (2017). The Relation between Academic procrastination of university students and their assignment and exam performances: The situation in distance and face-to-face learning environments. *Journal of Education and Training Studies*, 5(9), 146-157. Doi:10.11114/jets.v5i9.2545

Ying, Y., & Lv, W. (2012). A study on higher vocational college students' academic procrastination behavior and related factors. *International Journal of Education and Management Engineering*, 2(7), 29-35. https://doi.org/10.5815/ijeme.2012.07.05

You, J. W. (2015). Examining the Effect of Academic Procrastination on Achievement Using LMS Data in E-learning. *Educational Technology & Society*, 18 (3), 64–74. https://eric.ed.gov/?id=EJ1070043

Yu, J., & McLellan, R. (2019). Beyond academic achievement goals: The importance of social achievement goals in explaining gender differences in self-handicapping. *Learning and Individual Differences*, *69*(1), 33-44. https://doi.org/10.1016/j.lindif.2018.11.010

Yurdugül, H., & Demir, Ö. (2017). An investigation of Pre-service Teachers' Readiness for E-learning at Undergraduate Level Teacher Training Programs: The Case of Hacettepe University. *Hacettepe University Journal of Education, 32*(4), 896-915. Doi: 10.16986/huje.2016022763

Yau, H. K., & Cheng, A. L. F. (2012). Gender difference of confidence in using technology for learning. *Journal of Technology Studies, 38*(2), 74-79. https://eric.ed.gov/?id=EJ982821

Yeşil. R. (2012). Solutions for the problem of academic procrastination according to prospective teachers. *Educational Research and Reviews, 7*(17), 372-383.

Vural, L., & Gündüz, G. F. (2019). The Relationship between Academic Procrastination Behaviors and Cognitive Awareness Levels of Prospective Teachers. *Elementary Education Online, 18*(1), 307-330. http://ilkogretim-online.org.tr/index.php/io/article/view/2865>