I WROTE, I WAS EVALUATED, AND I LEARNED AN ALTERNATIVE TEACHING PROCESS IN DISTANCE EDUCATION: WRITING-TO-LEARN

Abstract: Distance education has become an essential part of life on a global scale during the COVID-19 pandemic. This process has driven all education stakeholders, who focus on providing learning outcomes without any loss, to alternative teaching models. The aim of this study is to examine the extent of the effects of writing-to-learn activities integrated into the distance education process on learning. Conducted as an action research, this study consisted of 42 Year 4 undergraduate prospective teachers studying Social Studies Teaching. A variety of writing-to-learn activities and semi-structured interview forms were used as data collection tools. While writing-to-learn activities were evaluated with holistic rubric, the opinions of prospective teachers were analyzed by content analysis. As a result, it was concluded that writing-to-learn activities included in distance education made significant contributions to the development of students throughout the application process. The activities were found effective on learning since they involved students in the process and facilitated permanent learning. It is understood from the opinions of the prospective teachers that an enjoyable and quality learning can be achieved with such activities included in the study, even from a distance. Based on the results, it can be stated that the writing-to-learn model is an alternative learning approach that can be used in distance education.

Keywords: Distance education, COVID-19, writing-to-learn, cognitive learning, feedback, action research

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INTRODUCTION

With digitalization, having gained impetus in this century, information sources, information exchange, and interaction styles have changed considerably (Bulut, Delialioğlu & Lane, 2020). This rapid development of information and communication technologies has naturally caused a great change in people's lives as well as how they learn (Guo, 2010). One of the remarkable changes is the transformation of educational processes into distance education. As a requirement of digital transformation, distance education has become an indispensable element for many institutions (Rumble, 2019). Based on this need, distance education has developed rapidly in universities around the world (Allen & Seaman, 2010; Layne, Boston & Ice, 2013). The main reason for the rapid advancements is the great necessity for institutions, teachers and students to actively use digital technologies to create effective learning environments (Chuang, Thompson & Schmidt, 2003). Digitalization for learning and teaching purposes requires the effective use of digital technologies in all dimensions of education, and the acquisition of digital competencies by relevant stakeholders (Karakuş Yılmaz, 2020).

Although digitalization is not a new concept (Kopp, Gröblinger & Adams, 2019), it has had to be integrated into education very quickly with the sudden outbreak of the COVID-19 pandemic, due to which a new era began in many respects, affecting the whole world in an unprecedented way since the first half of 2020. Since then, the World Health Organization (WHO) has emphasized the importance of physical distance between people in order to prevent the transmission of the virus, and as a result, lockdown measures have been taken to get protected against the infection (WHO, 2020). The new circumstances have forced educational institutions to adopt a digital approach, and traditional face-to-face classroom education has been replaced by distance education, which is provided by using digital tools and resources (Armstrong Mensah, et al., 2020). In this regard, distance education has proved to be the only option for the sustainability of educational institutions (Hassan, et al., 2021). Consequently, teachers, students, and parents have had to face such a new situation (Huber & Helm, 2020). Although the concept of digitalization in schools was a prominent issue long before the pandemic (König, Jager Biela & Glutsch, 2020), the use and investment of educational technology has increased rapidly since the beginning of the COVID-19 pandemic (Li & Lalani, 2020). Despite that, this situation could not save approximately 1.5 billion students from the negative impacts (UNESCO [United Nations Educational, Scientific and Cultural Organization], 2020) of the pandemic. From its own perspective to the global efforts to reduce the negative effects of the pandemic, the present study has focused on an alternative teaching model that is believed to be applicable in distance education.

THEORETICAL FRAMEWORK

In this section, we firstly discussed the distance education process in relation to the theoretical background of the research. Then, we examined the relationship between learning and writing-to-learn method.

DISTANCE EDUCATION

With its history of almost three centuries, distance education (Bozkurt, 2017) has gone through a historical process that first started with teaching by correspondence and then went through various processes through radio/television, open universities, teleconferencing technologies, and internet/web usage as it is today (Moore & Kearsley, 2011). According to Williams, Pabrock and Covington (1999), distance education must be evaluated in three phases which consisted of printed materials, videotapes and radio broadcasts between 1860 and 1960, two-way audio and two-way video broadcasts, and computer floppy disks between 1960 and 1990s, and virtual classrooms, hybrid and internet technologies from 1990s to our day. In summary,

distance education has evolved from a process comprising the use of printed, audio and visual communication tools (Kaya, 2002) into a process carried out through web-based applications (Allen & Seaman, 2011). This transition has enabled the communication channels and styles that affect the whole society, as well as distance education practices, to gain a new form and to be widely sustained (Elitaş, 2017).

Distance education is an e-learning system independent of time and place (Lee & Lee, 2008) with the understanding of education provided "anytime" and "anywhere" (Shachar & Neumann, 2003). In this system, teachers and students are not physically in the same environment (Johnson, 2003), but they interact with each other and with teaching resources through communication technologies (Keegan, 1996; Simonson, et al., 2012). This interaction includes a planned arrangement in which special designs and teaching methods are applied to carry out the course (Moore & Kearsley, 2011). In addition to enabling distant students to have access to education by using various technologies (USDLA, 2021), distance education also allows teachers and students to interact (Yalın, 2001) as well as offering time flexibility (Bunker, 2003), space flexibility (Kaya, 2002), affordability (Pope, 2014), and individuality and independence as a systematic form of education (Uşun, 2006). Distance education includes many features such as multimedia-based teaching, interactive demonstration and guidance, keyboard control, monitoring, interactive classroom management and online exams (Guohong, et al., 2012). Thanks to these features, faster and permanent learning can be achieved (Kember, 1995). Simonson, et al (2003) defined the concept of distance education, drawing upon the following four elements: i) Formal education, which is different from traditional education, notwithstanding the existence of an institutional understanding; ii) the circumstances in which the learners and instructors are separate from each other in terms of time and place; iii) the way of communication achieved through letters, radio, television, and internet simultaneously or non-simultaneously; and iv) teaching design and theories effectively used through the LMS (Learning Management System) between teachers, students, resources, and relevant contents.

With the aim of eliminating the inadequacy of traditional education (Sadeghi, 2019), distance education primarily arose as an alternative to formal classroom settings, (Nakos, Deis & Jourdan, 2002), and turned out to be as effective as face-to-face education (Simonson, Schlosser & Orellana, 2011). Distance education provides a rich knowledge acquisition to the learner by transforming it from the process of passively recording external information into the learner's knowledge selection process (Yangbin & Xinmin, 2010). Compared to conventional classroom education, it provides noteworthy advantages such as rich resources and sharing, as well as interaction and collaboration features of teaching activities (Guo, 2010). In addition to these, the distance education process also develops students' critical and independent thinking, and decision-making skills (Yurdakul, 2015). Apart from the advantages of distance education, some disadvantages need to be considered as well (Altun et al., 2021). Some of the inevitable disadvantages are that since some specific equipment such as computers, webcams, and fixed internet network must be available in order to carry out the distance education process in a sound way, (Brown, 2017), it may be costly to meet them (Ally, 2008); any technical problem that may occur may restrict students and teachers educationally (İşman, 2008); the teaching of courses aimed at instilling in students certain skills and attitudes is difficult with distance education (Uşun, 2006); the creation of quality teaching content in distance education is an arduous process (Ally, 2008); and the amount of time devoted to applied courses is not sufficient and teachers are not competent enough to teach through distance education (Gökbulut, 2020). What is more, some other disadvantages are related to the arguments that social interaction in distance education is rather limited compared to formal education (Sadeghi, 2019) because teachers and students are not in the same physical environment (Uşun, 2006), and learners who lack self-regulation skills have problems in planning and self-study (Bartolome & Steffens, 2015).

Undoubtedly, the use of digital technologies in distance education offers a new set of opportunities for teaching and learning (Chauhan, 2017). However, using digital technologies alone is not enough to have quality distance education (Li & Ma, 2010). Therefore, it is important that the distance education process takes place through different models (König, et al., 2020). One of these learning models is the writing-to-learn model, which can be integrated into distance education.

WRITING-TO-LEARN MODEL

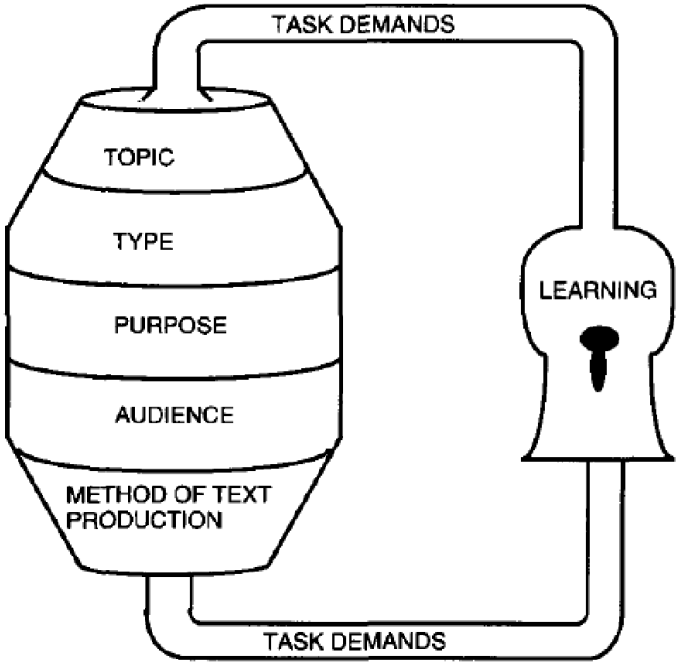
One of the effective tools in the development and settlement of scientific thought is writing (Norris & Phillips, 2003). Being an important part of life, writing is more comprehensive than just letters written on a piece of paper or screen (Deveci, 2018). It is an important tool for students to review, interpret, remember, and reinforce what they have recently learned, as well as transferring them to long-term memory, understanding theoretical information in depth, exploring alternatives outside the subject and developing communication skills. Writing is also an integral part of students' learning processes (Deveci, 2018). Just like reading, writing is the basis of academic learning at different learning levels (Phillips & Norris, 2009). Accordingly, the scientific writing pedagogy that emerged in the last quarter of the last century brought forward that writing is a natural tool of thinking and learning (Nückles et al., 2020). As a tool of learning, writing (Emig, 1977) first stood out with the education reform movement called "writing across the curriculum", and was then used in different education levels in different countries. Hence, since the beginning of 1970s, many educators have seen writing as a means of improving learning and have included it in their teaching processes (Bangert Drowns, Hurley & Wilkinson, 2004).

Writing-to-learn, which is based on the principle that writing can be a powerful strategy for learning the content (Myers, 1984), seems difficult to explain in common terms, yet there are different definitions (Kayaalp & Şimşek, 2021). As the name implies, writing-to-learn is a teaching strategy that includes two multiple complex activities such as learning and writing (Chmarkh, 2021). Writing-to-learn, which denotes learning how to think (Forsman, 1985), is the conscious structuring of existing information to produce a new product rather than transferring existing information into a text (Baaijen & Galbraith, 2018). At this structuring stage, the main purpose of the writing-to-learn approach is not to develop enhanced writing, but to boost enhanced learning (Myers, 1984). Drawing upon writing as a means of learning provides a variety of contributions to the development of students (Rouse, Kiuhara & Kara, 2021). Writing-to-learn activities can serve as a useful tool to fulfil knowledge-building processes that lead to students to understand the subjects deeply, to increase motivation to learn, and to keep the information in long-term memory (Nückles et al., 2020). In this way, writing ensures that what is learned become permanent by transforming ideas into structured knowledge (Rivard & Straw, 2000). The writing-to-learn model, therefore, does not take time from teaching, on the contrary, it improves the teaching content and encourages students to think and synthesize the information in the content (Myers, 1984). This encouragement enables students to reconstruct what they have learned in a completely different form (Klein, 1999).

Writing, which is a critical skill as well as an important tool for learning (Arnold et al., 2017), is generally presented in the form of grammar, syntax, and quotation in undergraduate programs, which strengthens the perception of students regarding writing as a prescriptive structure (Otfinowski & Silva Opps, 2015). However, writing-to-learn offers a unique structure far beyond these aspects (Kayaalp & Şimşek, 2020). Writing-to-learn is not learning how to write. Grammar, spelling and sentence structure are at the forefront in learning how to write, yet, in writing-to-learn, it is essential to focus on the learning content, not the writing skills themselves (Myers, 1984). However, most teachers do not know how to use writing more effectively in the classroom due to a lack of such training during their university education (Dolgin, 1981). Many educators and researchers, who went beyond the established perception

of the use of writing, have turned to research on models where they can easily implement writing-to-learn activities (Gunel, Hand & Mcdermott, 2009). The cognitive process that emerges as a result of the correlation between learning and writing has been discussed by different researchers with different models and theories (Bereiter & Scardamalia, 1987; Flower & Hayes, 1981; Klein, 1999). The most practical and usable model for how to practice writing activities with the purpose of learning is thought to be the writing-to-learn model developed by Prain and Hand (1996: 618). Figure 1 presents the five basic components of the writing-to-learn model developed by Prain and Hand (1996:618).

Prain and Hand (1996:618), who presented a model with the aim of integrating writing into the teaching process as a learning tool, aimed to convey the information acquired during the course to friends, parents, teachers, and consumers (*audience*) in the form of letters, diaries, poems, and stories (*genres*) with the purposes of researching, thinking, interpreting and explaining them etc. *(purpose)* by taking into consideration the connection between ideas or key concepts etc. *(topic)* and using handwriting or typing (*method of text production*). It is noteworthy that the multifaceted effects of writing activities for learning purposes, which can be implemented through these and similar models, have been mentioned in the literature over time in different education levels and disciplines.



(Prain & Hand, 1996:618)

Figure 1. The Writing-to-learn model

In the literature, there are a number of studies conducted on the use of writing for learning purposes at different learning levels (from primary school to university) in social sciences (Kayaalp & Şimşek, 2020; Kayaalp & Şimşek, 2021; Klein & Rose, 2010; Walp, 2013) and in other sciences (Gunel, Hand & Prain, 2007; Klein, Piacente Cimini & Williams, 2007; Nam, Choi & Hand, 2011) as well as on its versatile effects in different fields regarding *academic success* (Caukin, 2010; Greenbowe et. al., 2007), *concept teaching* (Alharbi, 2015; Hohenshell & Hand, 2006), *critical thinking* (Sinaga & Feranie, 2017), *deep learning* (Leffler, 2014), *metacognitive thinking* (Hand, Wallace & Yag, 2004), *attitude towards lessons* (Uzoğlu, 2014) and *communication skills* (Dummer et al., 2008). Among the current studies on writing-to-learn, Chmarkh (2021) reported that writing-to-learn is a teaching strategy that is effective on *learning* in different classes and disciplines, while Nückles et al. (2020) discussed the relationship between writing-to-learn and *self-regulation* and *cognitive load theory*. Taking into consideration the effects of writing on basic thinking processes, Kayaalp et al. (2020) revealed

the impacts of writing-to-learn activities on *critical thinking skills*. In another study, Rouse, Kiuhara, and Kara (2021) also examined the use of writing-to-learn strategy in teaching *subject contents* and *concepts*. Wright et al. (2019) concluded that writing-to-learn is effective in the development of *scientific literacy*. Similarly, Gupte et al. (2021) explained the effect of writing-to-learn activities on students' *meaningful learning*. Balasundram and Karpudewan (2021), who aimed to improve students' *concept learning* through writing, combined writing-to-learn activities with technology, while Sintiawati, Sinega and Karim (2021) intended to improve students' concept learning and communication skills through the strategy of writing-to-learn. Examining the effects of writing on *academic achievement* in medical education, Kim et al. (2021) drew a conclusion that writing has positive effects on both learning and higher-order thinking skills. Finkenstaedt Quinn et al. (2021), who illuminated the importance of writing in the construction of *scientific processes*, developed a model for the application of writing in the classroom in accordance with this purpose.

THE SIGNIFICANCE AND RATIONALE OF THE RESEARCH

Having already been integrated into different teaching experiences from time to time, distance education has now become an indispensable part of life along with the pandemic, which suddenly appeared all around the world. All countries with or without infrastructure for distance education have faced some fundamental problems in this process. This situation has brought along some concerns such as how to assure a quality learning and teaching process, how to make students become active in their learning processes, and how this process can be evaluated objectively even if students are involved in the process. The relevant problems have led both national and international education policy makers, administrators and teachers to seek alternative teaching methods that will enable students to be active in the distance education process and provide them with quality learning and, in the same way, pass the process of objective evaluation of what has been learned. In this context, it is believed that it is important to carry out the course process by using different teaching models in order to increase the quality of teaching in distance education. From this point of view, when the multifaceted effects of writing-to-learn approach (*academic success, permanent learning, active participation, meaningful learning, deep learning, etc*.) are considered as a whole, it is believed that writing-to-learn will minimize learning losses in the distance education process, involve students in the process rather than regarding them as passive recipients of the process, and spotlight them as the dominant part of the process, and transform the assessment process from a result-oriented structure into a process-based evaluation structure. Based on this idea, it is thought that writing-to-learn can be an alternative teaching model in distance education.

The aim of this study is to examine whether writing-to-learn approach, which can be integrated into both face-to-face and distance education processes, is an effective teaching model in distance education. In the light of this aim, answers were sought to the following research questions in the study:

- How is prospective teachers' pace of development in terms of writing-to-learn abilities during the distance education process?
- What are the opinions of prospective teachers about writing-to-learn activities applied during the distance education process?

METHOD

RESEARCH DESIGN

The present study employed the action research design, which is one of the qualitative research approaches. Action research design is a planned and systematic research conducted with the participation of teachers and other stakeholders in educational environments in order to find answers to some questions such as the functioning of educational environments, how teaching

takes place, and what students' learning levels are (Mills, 2014). Action research design has an applied focus and collects data based on qualitative and quantitative approaches or both, as in a mixed research design, but it differs in that it offers solutions to a problem by considering a specific issue (Creswell, 2012). Patton (2014) stated that action research aims to solve some problems/issues that exist in a program or community with no aim to generalize. Action research, which is a process in which participants systematically and thoroughly examine their own educational practices using research techniques (Ferrance, 2000), involves the use of research methods by those who are to use them in order to examine current problems or issues (McMillan & Schumacher, 2014). It is noteworthy that action research is classified in different ways by different researchers. Berg (2001), for example, grouped the types of action research conducted by different researchers into the same category according to their similar characteristics and classified them as *Technical/Scientific/Collaborative Action Research, Applied/Mutual Collaboration/Deliberate Action Research, and Liberating/Developing/Critical Science Research*. The present research drew upon technical/scientific/collaborative action research from among the classification made by Berg (2001). In technical/scientific/collaborative action research, the primary goal is to test an application based on a pre-existing theoretical framework. In this respect, the reason why technical/scientific/collaborative action research was selected for the research is that there was a theoretical framework for writing-to-learn and the research process was carried out in accordance with this framework. In some other studies, the subject is an important factor in choosing action research as a research model. It is noteworthy that researchers who follow an action research model generally focus on three research topics. These research topics can be: i) *evaluating or studying a teaching strategy*, ii) *investigating or defining a problem*, and iii) *a topic of interest to researchers* (Johnson, 2014). In order to increase the quality of teaching in the distance education process and to make students more active during the lessons, the subject of "*evaluating and studying a teaching strategy*", developed by Johnson (2014), was preferred as the research topic in the present study in order to evaluate the effect of writing-to-learn method on learning in the distance education process.

The literature shows that the process followed in studies conducted using an action research design is expressed in different ways by different researchers. Berg (2001) stated that the action research process/cycle has four stages: i) *identifying research questions* ii) *collecting information to answer questions* iii) *analyzing and interpreting information*, and iv) *sharing results with participants*. The action research process/cycle created by Berg (2001) is presented in Figure 2.

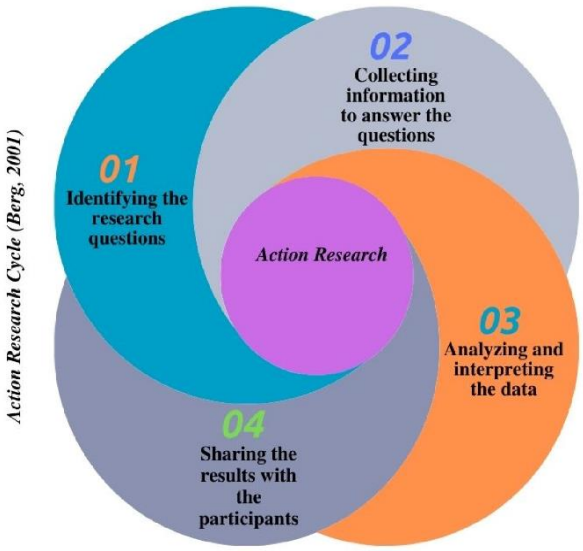


Figure 2. Action research process/cycle

Identifying the research questions/problems: The starting point of the research is the teaching process of prospective teachers in distance education throughout the pandemic. What the researchers considered significant were the concerns that student participation was not at the desired level in the lessons (as of March 2019-2020 spring semester), that this situation negatively affected the students' success as well as the inability to make an objective evaluation. It was determined that such issues stood out as a problem in the interviews with the prospective teachers. Example expressions of participants are given below:

PT3. *"Since our lessons are mostly verbal, we mostly spend time listening during distance education. This makes our learning process monotonous."*

PT11. *"I cannot predict what I have learned or how much I have learned in distance education. That's why I'm worried."*

PT14. *"Some technical problems I have experienced in distance education... For example, I get disconnected just as we are working on a subject. Even after watching the videos, I can't fully understand the subject."*

PT25. *"Since I had the chance to watch the lesson videos later in the distance education system, my desire to follow the lessons regularly weakened. During this process, my motivation dropped a lot."*

It is believed that it is of great importance to integrate different learning/teaching approaches into distance education in order to implement an effective teaching process, to ensure that prospective teachers participate in the course process, and to make an objective evaluation.

Collecting information to answer the questions: The research data were collected through writing-to-learn activities and interviews applied during the distance education course.

Analysing and interpreting the data: The analysis of writing-to-learn activities in the research was carried out simultaneously with the data collection process. The interviews made before and after the implementation were analyzed and interpreted with content analysis.

Sharing the results with the participants: The participants were given feedback about the activities every week, and an overall evaluation was made about their performances. Thanks to feedback, the participants were able to detect and correct their deficiencies.

The action research process prepared and followed accordingly is presented in Table 1.

Table 1. Action Research Process

Activity Application Time (Week)	**Applied Activity**	**Application Process**	**Process Evaluation**
19.11.2020 (Week 1)	I learn by writing letters	The topic of current global issues was discussed with prospective teachers in the online environment in general terms. Then, the participants were asked to write down the information they gained about current global issues in a letter format. The writing-to-learn activity form related to the topic was shared with them. They were also informed about the preparation process of writing-to-learn activities.	The letters sent by the participants via e-mail were evaluated with a standard rubric and the participants were given the necessary feedback.
26.11.2020 (Week 2)	I learn by writing diaries	The feedback about the letters were shared with the participants. The letters written in accordance with the purpose were examined online with the participants. Deficiencies and errors related to the subject were corrected. Then, the world population and population-related problems were discussed in detail. Afterwards, the participants were asked to write down the information they obtained during the course in a diary format. The writing-to-learn activity form related to the topic was shared with them.	The diaries sent by the participants via e-mail were evaluated with a standard rubric and the participants were given the necessary feedback.

03.12.2020 (Week 3)	I learn by writing stories	The feedback about the diaries were shared with the participants. The diaries written in accordance with the purpose were examined online with the participants. Deficiencies and errors related to the subject were corrected. Then, the migration in the world and the problems that arise due to migration were discussed with the participants in the online environment. Afterwards, they were asked to write down the information they obtained during the course in a story format. The writing-to-learn activity form related to the topic was shared with them.	The stories sent by the participants via e-mail were evaluated with a standard rubric and the participants were given the necessary feedback.
10.12.2020 (Week 4)	I learn by writing columns	The feedback about the stories were shared with the participants. The examples of stories written in accordance with the purpose were examined online with the participants. Deficiencies and errors related to the subject were corrected. Then, the topic of international terrorism was discussed comprehensively with the participants. Afterwards, they were asked to express what they learned in a column format. The writing-to-learn activity form related to the topic was shared with them.	The columns sent by the participants via e-mail were evaluated with a standard rubric and the participants were given the necessary feedback.
17.12.2020 (Week 5)	I learn by writing newspaper stories	The feedback given about the columns were shared with the participants. The examples of columns written in accordance with the purpose were examined online with the participants. Deficiencies and errors related to the subject were corrected. Then, the problem of human rights violations in the world was discussed. Afterwards, the participants were asked to write a newspaper story about this problem of rights violations in the world. The writing-to-learn activity form related to the topic was shared with them.	The newspaper stories sent by the participants via e-mail were evaluated with a standard rubric and the participants were given the necessary feedback.
24.12.2020 (Week 6)	I learn by writing interview texts	The feedback given about the newspaper stories were shared with the participants. The examples of columns written in accordance with the purpose were examined online with the participants. Deficiencies and errors related to the topic were corrected. Then, environmental problems in the world were discussed in detail with the participants. Afterwards, they were asked to write an interview article on environmental problems. The writing-to-learn activity form related to the topic was shared with them.	The interview articles sent by the participants via e-mail were evaluated with a standard rubric and the participants were given the necessary feedback.
31.12.2020 (Week 7)	The feedback given about the interview articles were shared with the prospective teachers. Samples of interview texts written in accordance with the purpose were reviewed online with the participation of prospective teachers. Deficiencies and errors related to the subject were corrected. Then the application process was terminated. The participants' opinions were taken on the process.		

STUDY GROUP

This study was conducted with a total of 42 (26 female, 16 male) Year 4 prospective teachers studying in Social Studies Teaching Department of a state university in the 2020-2021 academic year.

DATA COLLECTION

WRITING-TO-LEARN ACTIVITIES

The current study drew upon the writing-to-learn model developed by Prain and Hand (1996:618) regarding the utilization of writing as a learning tool for the purposes of reducing the learning losses of prospective teachers in the distance education process, ensuring their permanent learning, and activating them in the learning process. A variety of writing-to-learn activities were developed by the researchers, taking into account the basic principles of this

model, which was put forward to determine the writing-to-learn capacity of prospective teachers. The activities developed and the basic structure of the activities are given in Figure 3.

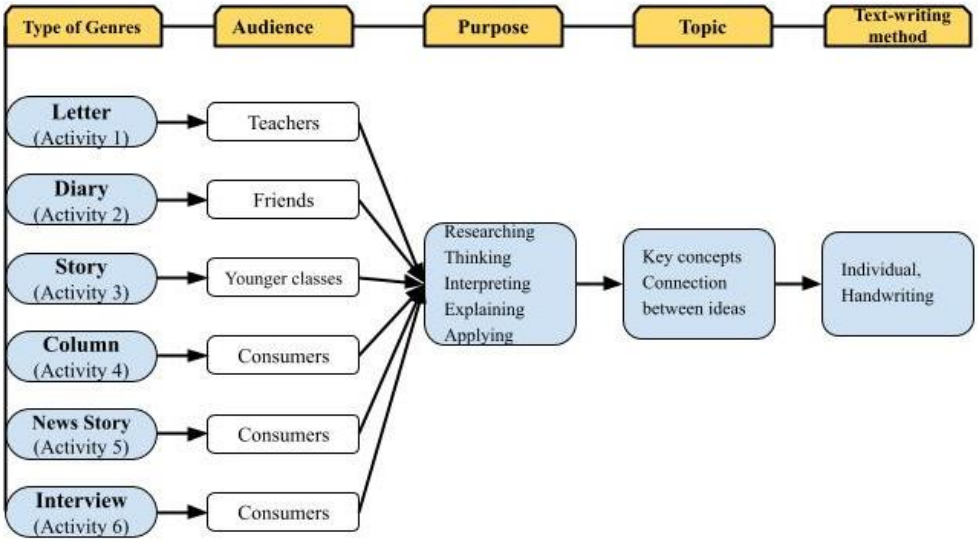


Figure 3. Activities and their bases

As can be seen in Figure 3, a variety of writing-to-learn activities integrated into the distance education process were prepared by the researchers as teaching material.

SEMI-STRUCTURED INTERVIEW FORM

A semi-structured interview form was prepared by the researchers in order to evaluate the prospective teachers' views before and after the application. In line with the prepared interview form, interviews were held with 30 prospective teachers. The participants were informed that the interviews would only be used for research purposes, their identity information would be kept confidential, and their names would be coded (e.g. PT/1, PT/2, PT/3, PT/4,…PT/30).

DATA ANALYSIS

ANALYSIS OF WRITING-TO-LEARN ACTIVITIES

Taking into account the basic components of writing-to-learn model (writing addressee, writing purpose, text production method, writing genre, writing topic) developed by Prain and Hand (1996: 618), "*a holistic evaluation rubric for writing-to-learn activities",* which was developed by Kayaalp (2020), was used in order to analyse the levels of ability concerning the writing activities created by participants in accordance with the writing-to-learn model. The holistic evaluation rubric for writing-to-learn activities is given in Table 2 below.

Table 2. The Holistic Evaluation Rubric for Writing-to-Learn Activities

Levels of Writing-to-Learn	Components
Level 1 (Weak)	The student is not aware of the addressee; his/her goals are unclear; s/he is insufficient in explaining the subject and far from the type of writing with poor handwriting.
Level 2 (Improvable)	The student writes without considering the addressee; his/her writing purposes are unclear; s/he is insufficient in explaining the topic; s/he is aware of the type of writing, but writes without considering that type, and is able to handwrite.
Level 3 (Strong)	The student is aware of the addressee, able to write scientifically appropriate to the subject, and to handwrite in a clear and understandable way, with a clear purpose of writing, and by being aware of the type of writing.
Level 4 (Very Strong)	The student is aware of the addressee, able to write scientifically appropriate to the subject by exemplifying and explaining with a clear purpose for writing, and by using a clear and understandable handwriting, with a distinctive approach, which is suitable for the writing type.

ANALYSIS OF SEMI-STRUCTURED INTERVIEWS

Content analysis was used to analyse the interviews with the prospective teachers. For the data analysis, firstly, the interview data were transcribed, and then, the data were analyzed and coded one by one by three researchers, after which the relevant categories were created. The coding and categorization of each researcher were compared. Upon determining whether there was consistency in the coding process, similar codes were collected under the specified categories. Reliability was calculated with respect to agreement and disagreement using Miles and Huberman's formula [(Reliability = number of consensus / (total number of agreements + disagreements)]. In general, a reliability coefficient of 90% is desirable (Miles & Huberman, 2016). In this study, a 97% score consensus (reliability) was achieved. The codes collected under the appropriate categories were visualized in the "GitMind" (https://gitmind.com) mind map maker. The views of the participants were presented through direct quotations.

RESULTS

The study examined the examples of writing-to-learn activities prepared by the prospective social studies teachers in the context of an online lesson in which current global issues were discussed, and then presented the developmental levels of the prospective teachers in the writing activities on a weekly basis. It also included the opinions of the prospective teachers about writing-to-learn activities applied in the process.

RESULTS RELATED TO THE ACHIEVEMENT LEVELS OF THE PROSPECTIVE SOCIAL STUDIES TEACHERS IN WRITING-TO-LEARN ACTIVITIES

The multiple writing-to-learn activities prepared by the participants in relation to the current global problems course and their achievement levels in the activities were given weekly. The examples of writing-to-learn activity written by the prospective teachers in the first week and their relevant ability levels are presented in Figure 4 and Figure 5.

As shown in Figure 4, the participants wrote a variety of letters in the Current Global Issues lesson.

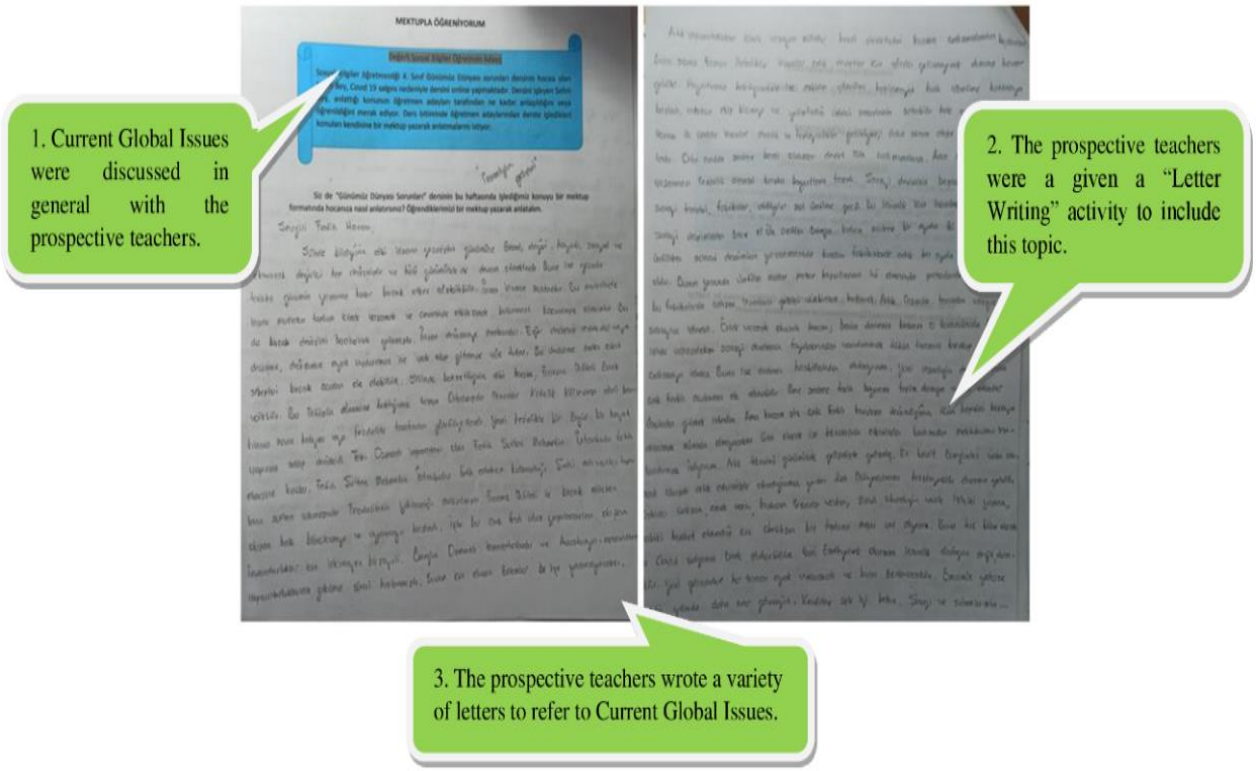


Figure 4. Letter-writing activity as to the writing-to-learn method

The evaluation regarding the letters prepared by the participants in terms of the basic principles of writing-to-learn is given in Figure 5.

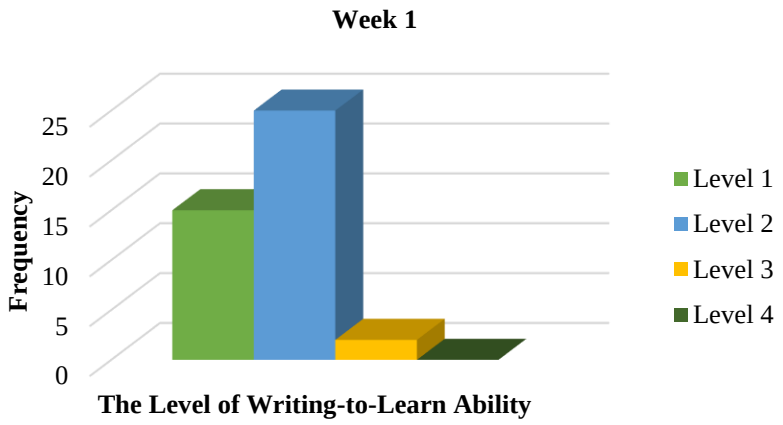


Figure 5. The prospective teachers' levels of writing-to-learn ability in Week 1

As seen in Figure 5, the prospective teachers' level of writing-to-learn ability is generally weak *(f=14)* and improvable *(f=25)*, while only two prospective teachers *(f=2)* presented strong and one prospective teacher *(f=1)* presented very strong levels of writing ability. In other words, the participants tended to write haphazardly, by paying no attention to the type of activity. They created their written assignments independently of the subject, using sentences that give general meanings, without paying attention to the topics covered. They had a shallow writing style in their written products in which scientific knowledge was barely used. As there was no comprehensive information reflecting what they individually learned on the topic, it seems unlikely that any addressee of the article to be sufficiently informed or learn the subject.

The example of the relevant writing-to-learn activity prepared by the prospective teachers in week 2, and their writing proficiency levels are presented in Figure 6 and Figure 7.

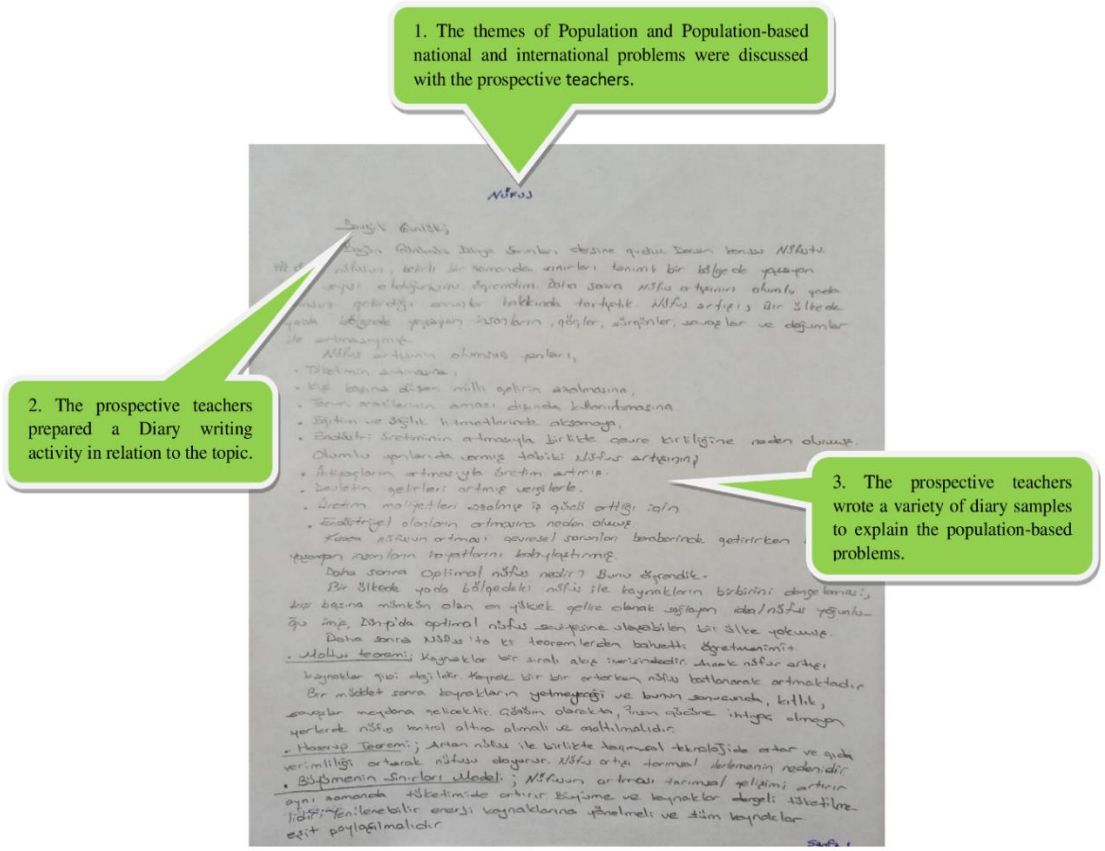


Figure 6. Diary-writing activity as to the writing-to-learn method

As shown in Figure 6, the prospective teachers prepared a variety of diaries on *population growth* and *population-based international problems*, based on the information they acquired in the lesson. Figure 7 presents the evaluation of the diary assignments prepared by the participants in terms of the basic principles of the writing-to-learn model.

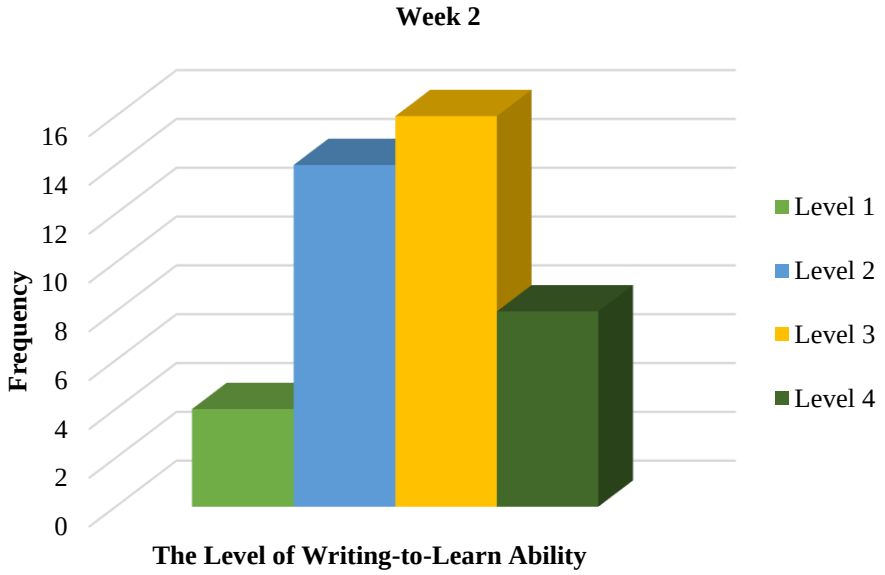


Figure 7. The prospective teachers' level of writing-to-learn ability in Week 2

Figure 7 shows that the participants in the present study gathered around two ability levels, namely improvable (*f=14*) and strong (*f=16*) in terms of writing-to-learn ability. The number of participants who were able write at a very strong level turned out to increase (f=8), and the participants moved away from the level referring to weak ability (*f=4*) in terms of writing-to-learn proficiency, thanks to the feedback they received. In other words, depending on the feedback given in the first week, the participants tended to write more specific to the type of activity that they were supposed to write. They also seemed more successful at accurately converting the learned information into a different writing form (diary). However, although most of the participants could achieve this in the introduction of their texts, they later tended to move away from the type of writing as they proceeded in the text. In addition, it was observed that most of the participants were still far from expressing the learned subject in a scientifically correct, comprehensive, and clear way.

The type of writing-to-learn activity prepared by the participants in week 3, and their writing ability levels are presented in Figure 8 and Figure 9.

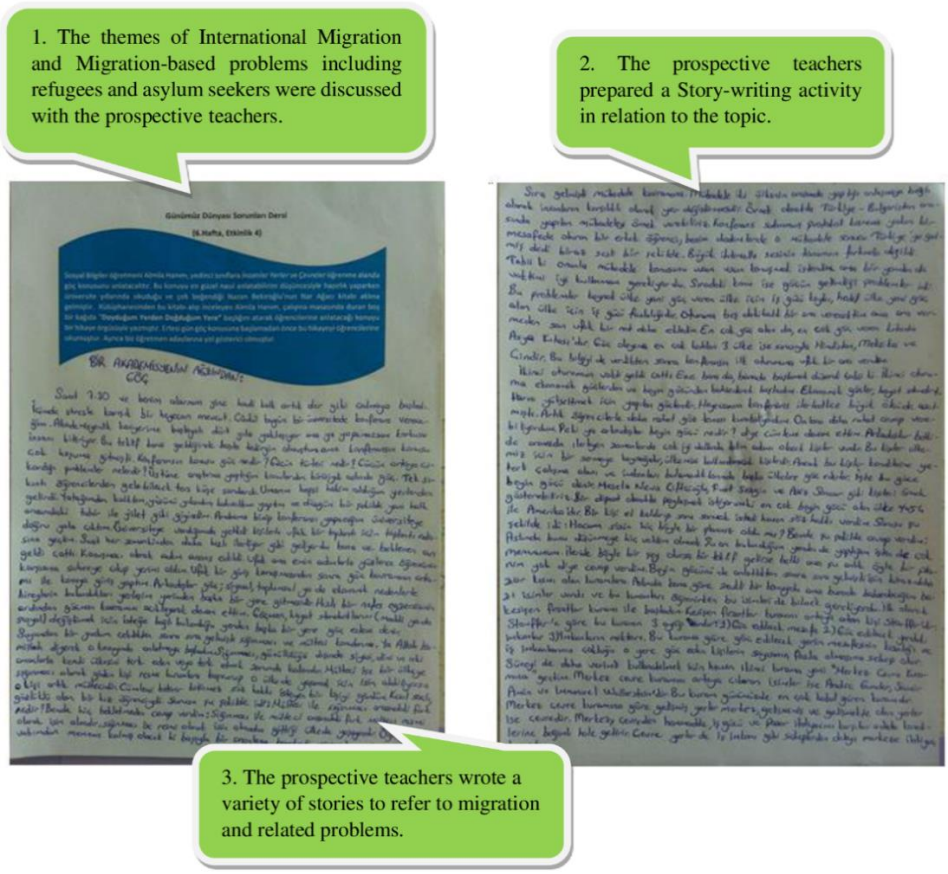


Figure 8. Story-writing activity as to the writing-to-learn method

As shown in the example in Figure 8, the participants prepared different stories about *migration* and *international problems arising due to migration*, based on the information they gathered in the lesson. The evaluation of the stories prepared by the participants in terms of the basic principles of the writing-to-learn model is given in Figure 9.

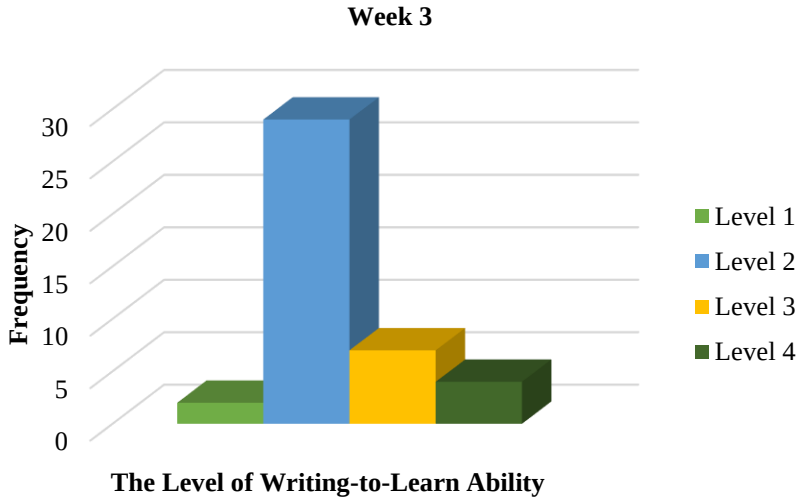


Figure 9. The prospective teachers' level of writing-to-learn ability in Week 3

Figure 9 demonstrates that the two-week feedbacks were effective on the improvement in the participants' level of writing-to-learn ability. While the number of participants at weak *(f=2)* level decreased, the number of those at the improvable (*f=29*) level remained constant.

Similarly, while seven of the participants (*f=7*) reached the strong level, four of them *(f=4)* reached being able to write at a very strong level. To put it differently, the participants started to include the appropriate subject content in accordance with the writing-to-learn model in the story-writing activity. In addition, it was observed that the participants began to write unique examples of story-writing that are scientifically effective and include plenty of examples and explanations. The type of writing-to-learn activity prepared by the participants in week 4, and their levels of writing-to-learn ability are presented in Figure 10 and Figure 11.

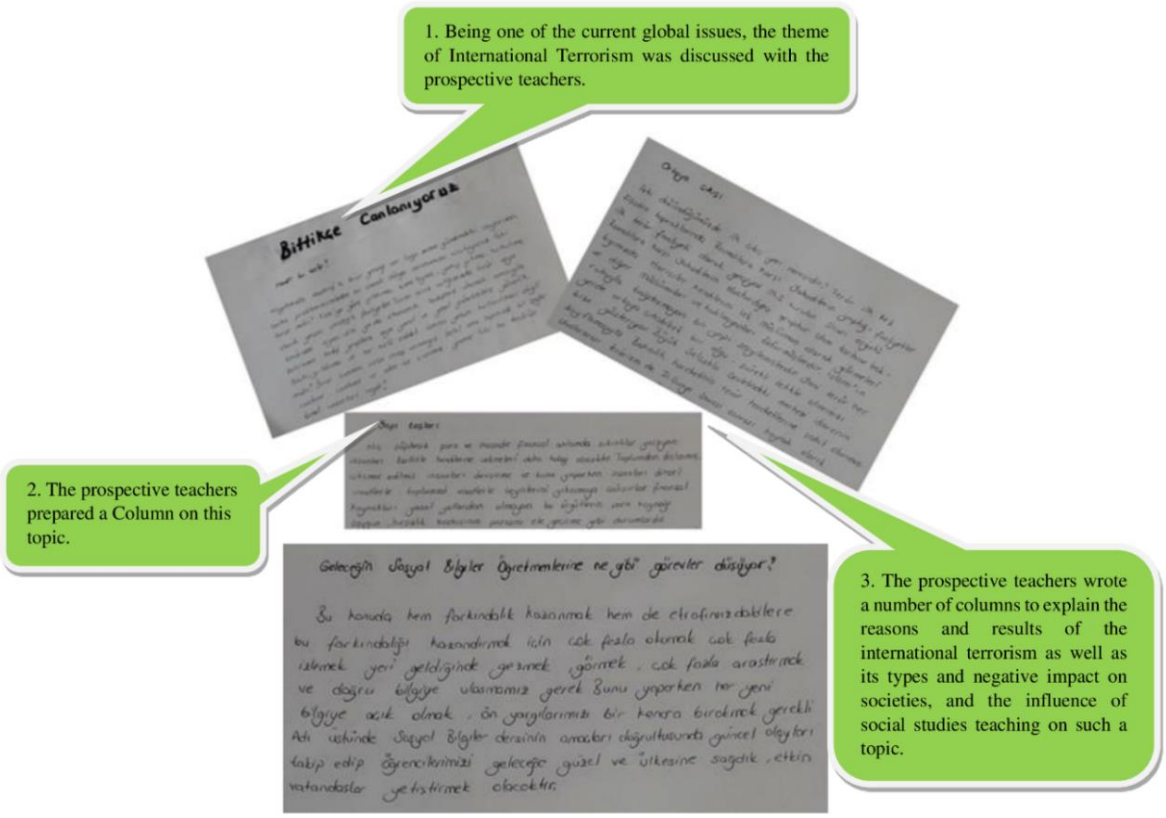


Figure 10. Column-writing activity as to the writing-to-learn method

As shown in the example in Figure 10, the participants prepared different newspaper columns on *terrorism* and *international problems arising from terrorism*, based on the information they learned in the lesson. Figure 11 presents the evaluation of the columns prepared by the participants in terms of the basic principles of writing-to-learn.

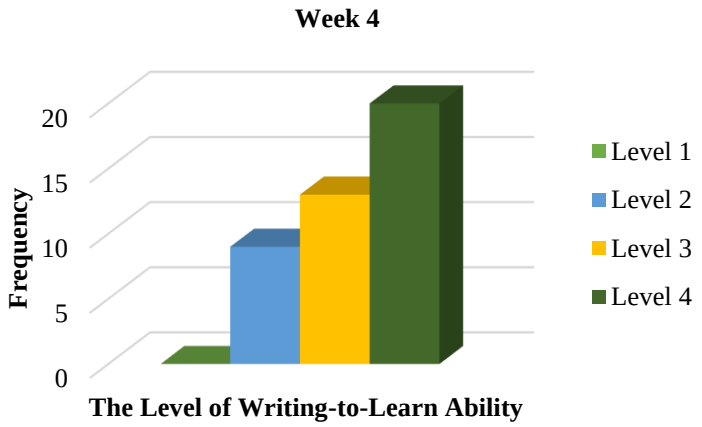


Figure 11. The prospective teachers' level of writing-to-learn ability in Week 4

Figure 11 indicates that the participants made significant progress as a result of the three-week feedback. While twenty (*f=20*) participants included what they learned in a type of writing at a very strong level (Level 4), thirteen *(f=13)* of them were able to write at a strong level (Level 3). While only 9 (*f=9*) participants were at the improvable (Level 2) level, there were no participants left at the weak level (Level 1). In other words, it appeared that the participants made progress in transforming the information they learned into a newspaper column. While conveying the relevant information, the level of using scientifically accurate and comprehensive information seemed to have improved considerably. Still, there were some participants who were undecided about the type of writing. Figure 12 and Figure 13 illustrate the type of writing-to-learn activity prepared by the participants in week 5, and their writing ability levels.

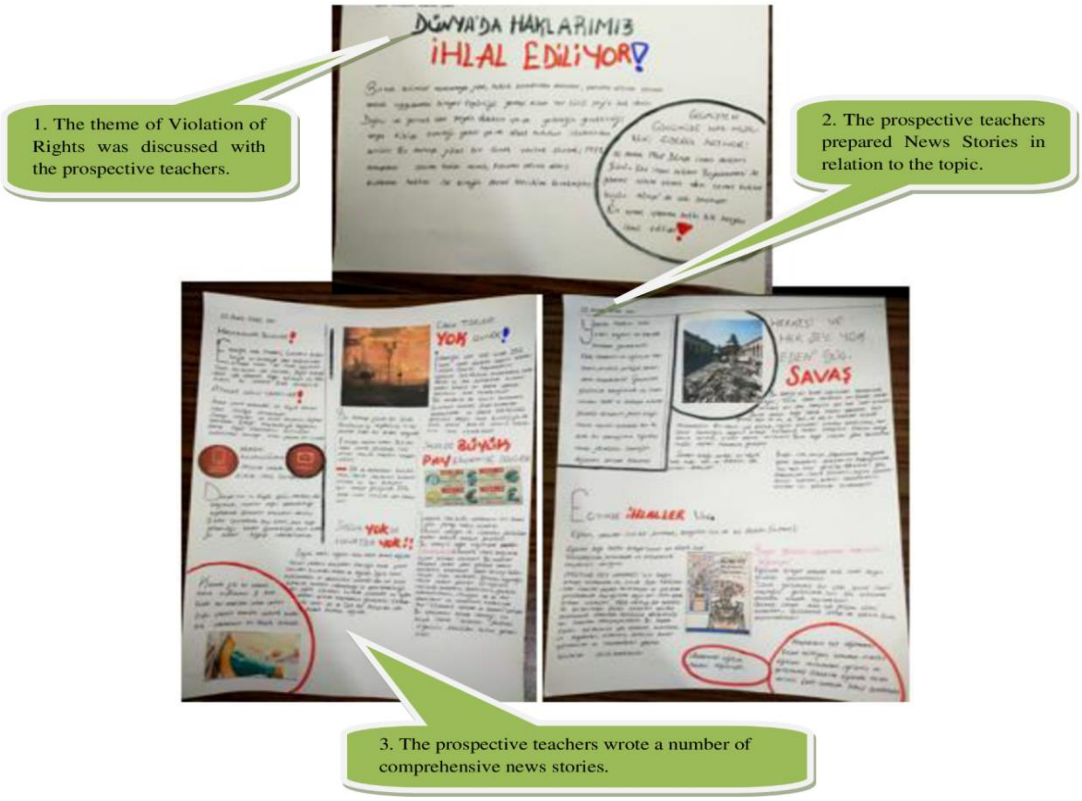


Figure 12. Newspaper story-writing activity as to the writing-to-learn method

As can be seen in the example in Figure 12, the participants prepared various newspaper stories on *international problems arising from the violation of rights* based on the information they learned in the lesson. The evaluation of the newspaper stories prepared by the participants in terms of the basic principles of writing-to-learn is given in Figure 13.

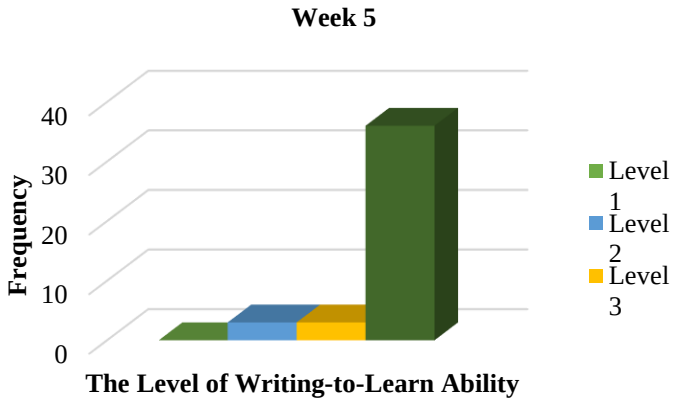


Figure 13. The prospective teachers' writing-to-learn proficiency levels in Week 6

Figure 13 shows that the participants made a considerable improvement. While the majority of prospective teachers (*f=36)* wrote very strong newspaper stories in terms of writing-to-learn model, three (f=3) of them wrote at a strong level, and three (*f=3*) of them wrote at an improbable level. No prospective teacher was found at the weak level (Level 1). In other words, the participants were able to create writing-to-learn activities in a unique structure by taking into account the information they learned in line with a certain purpose and considering the possible addressees. In this process, they reached a very strong level in using scientific information correctly and relating to the information they learned with various explanations, examples, and visual aids. The type of writing-to-learn activity prepared by the participants in week 6, and their writing levels are presented in Figure 14 and Figure 15.

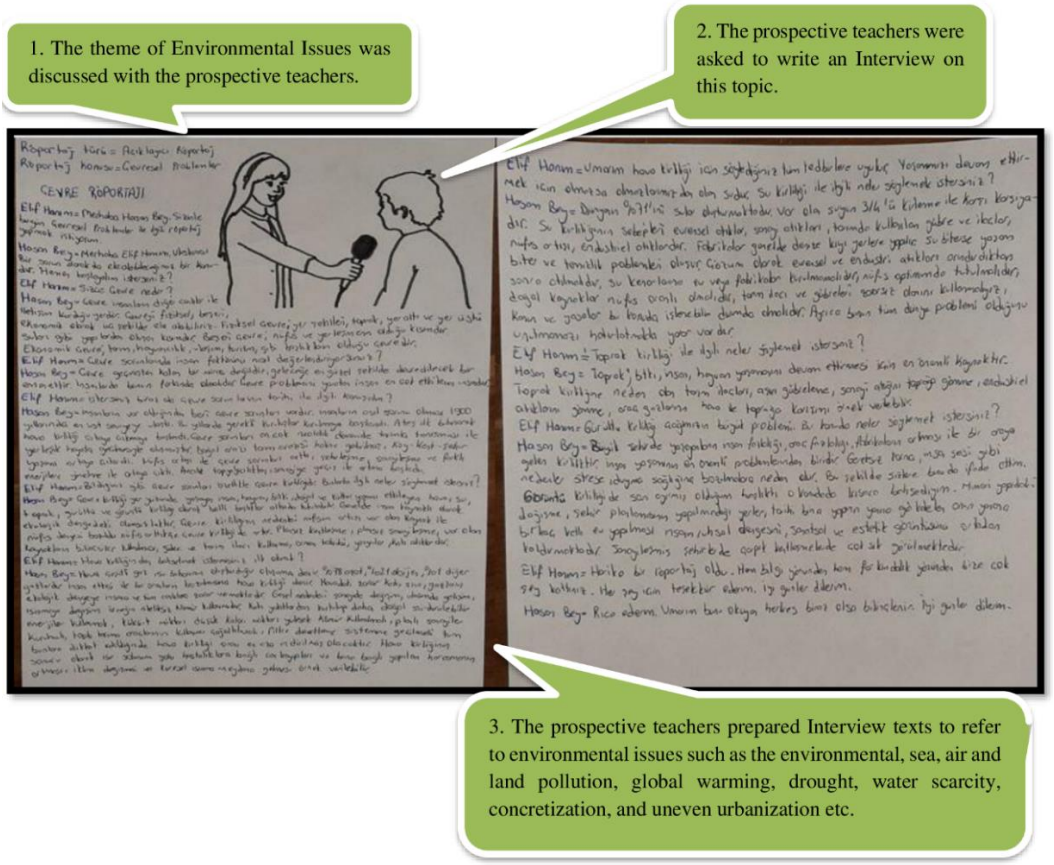


Figure 14. The interview articles writing activity as to the writing-to-learn method

As shown in the example given in Figure 14, the participants prepared various interview articles on *international environmental problems* based on the information they learned in the lesson. The evaluation of the interview articles prepared by the participants in terms of the basic principles of writing-to-learn is given in Figure 15

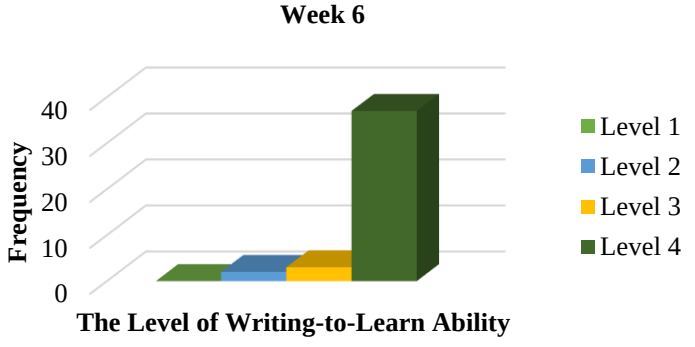


Figure 15. The prospective teachers' level of writing-to-learn ability levels in Week 6

Figure 15 shows that the level of improvement that the participants made in the fifth week continued in the sixth week. In Week 6, thirty-seven (*f=37*) participants seemed to be able to use the information they learned in an interview text at a very strong (Level 4) ability level, while three (*f=3*) of them showed strong (Level 3) ability, and two (*f=2*) of them turned out to have improvable ability (Level 2) in writing. As in the fifth week, there is no prospective teacher with a weak level (Level 1) in terms of writing for learning purposes in the sixth week. As in week 5, no participant remained in the weak ability level (Level 1) range in terms of writing-to-learn in week 6. In other words, it is clearly seen that the participants made a significant improvement in terms of presenting the information in a different form by drawing on what they learned in the fifth week and after, as a result of the direct impact of four-week feedback. The participants reached a level where they can convey the knowledge they gained in a clear, understandable, and a comprehensive way, through different fonts.

THE RESULTS RELATED TO THE PROSPECTIVE SOCIAL STUDIES TEACHERS' WRITING-TO-LEARN ACTIVITIES APPLIED IN DISTANCE EDUCATION

In the distance education process, different writing-to-learn activities were included for six weeks in order to effectively involve the prospective teachers in the learning processes. The multiple writing activities carried out with the participants seemed to improve their writing-to-learn ability. In this sense, the factors that were effective in that improvement or the factors underlying the participants' improvement in the writing-to-learn ability are very important. In other words, the answer to the question, "Why and how did the writing-to-learn activities carried out during the distance education process affect learning?" needs considerable attention, and the present study, therefore, attempted to reveal the possible answers through the opinions of the participants. The results obtained are presented in Figure 16.

As is seen in Figure 16, the participants made evaluations from different perspectives about writing-to-learn activities used in the distance education process. It is remarkable that the effects of writing-to-learn activities such as providing *cognitive learning* and *permanence of knowledge* gained in the lessons, developing *imagination* and *activating higher-order thinking* skills come to the fore among the evaluations.

Regarding the multiple effects of writing-to-learn activities integrated into the distance education process, PT6 said, "*Writing can be a tool for learning because the more our sense organs are active while learning, the better the learning occurs. Just as hearing and seeing enable learning, writing provides as much. Personally, I learn more easily when I take notes while listening to the lesson, and even what I learn becomes permanent. Even though we have been taught via distance education, I think we have been going through an effective process*", emphasizing that writing-to-learn activities facilitate learning in distance education and ensure permanent knowledge. Just like PT6, another participant, PT1 also made a comprehensive assessment of the effects of activities, and said, "*I think that every activity we do adds a lot to us. First of all, I learned while thinking. I both had fun and learned by writing the information we gained in different formats. In the distance education process, we both learned and put the knowledge into practice. Under these extraordinary circumstances, where we are far from face-to-face education, I think we have increased the efficiency we could get from the lesson to a higher level thanks to writing activities*", stating that it is possible to learn by having fun in the distance education process. The participants further made mention of the aspects indicating that writing-to-learn activities activate different skills, which are very important components of learning processes as well as the action of learning itself. In this respect, PT16 said, "*Learning begins where the act of reading, which is a form of learning, is put on paper. When we think about individual differences, it is obvious that some people learn by reading, some by listening, and some by writing. 'Spoken words fly; written words remain'. In this way, writing encourages students to think and helps them put their thoughts into writing."* PT22 said, "*Before preparing assignments on the type of writing every week, I researched the characteristics of that genre,*

found examples, and read them. This allowed me to do research", and drew attention to the effectiveness of writing-to-learn activities on research skills. Likewise, PT15 stated that writing-to-learn improves higher-order thinking skills and said, "*Writing strengthens the pre-preparation process for students to acquire knowledge. Students can improve themselves in terms of interpreting the information and taking their knowledge to the next level. In this way, critical and creative thinking skills develop."*

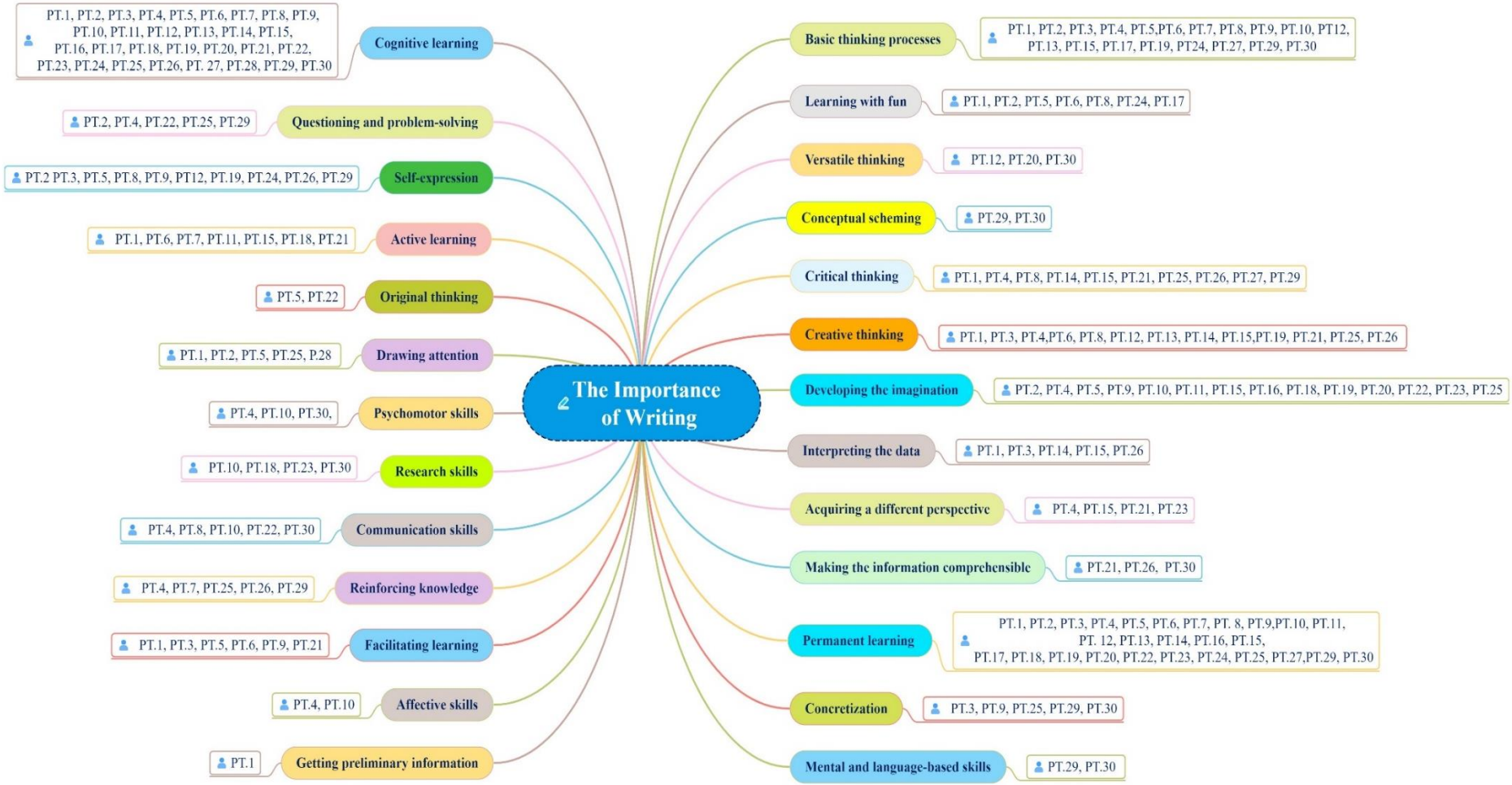


Figure 16. The importance of writing-to-learn model

In addition to these, PT26 stated that writing-to-learn provides an opportunity for prospective teachers to express themselves and said, "*Writing has enabled us to develop in many ways. In particular, it allowed students who could not express themselves verbally to express themselves better by writing.*" Discussing a different aspect of writing-to-learn applied in the distance education process, PT.5 said, "*The writing activities we used in the lesson prevented the lesson from being static. Even in distance education, it made the students more interested in the lesson and give them the opportunity to show what they learned in the lesson in a different way from the exams",* indicating that it is possible to increase the students' interest and attention to the learning process in distance education by making use of the writing-to-learn activities.

One of the factors in the effectiveness of the writing-to-learn activities in distance education as regards the prospective teachers' multidimensional development is that such activities are subject to a process-based evaluation phase and the participants are provided with weekly feedback in return of assignments. Figure 17 presents the results obtained from the participants' opinions regarding the feedback on writing-to-learn activities during distance education.

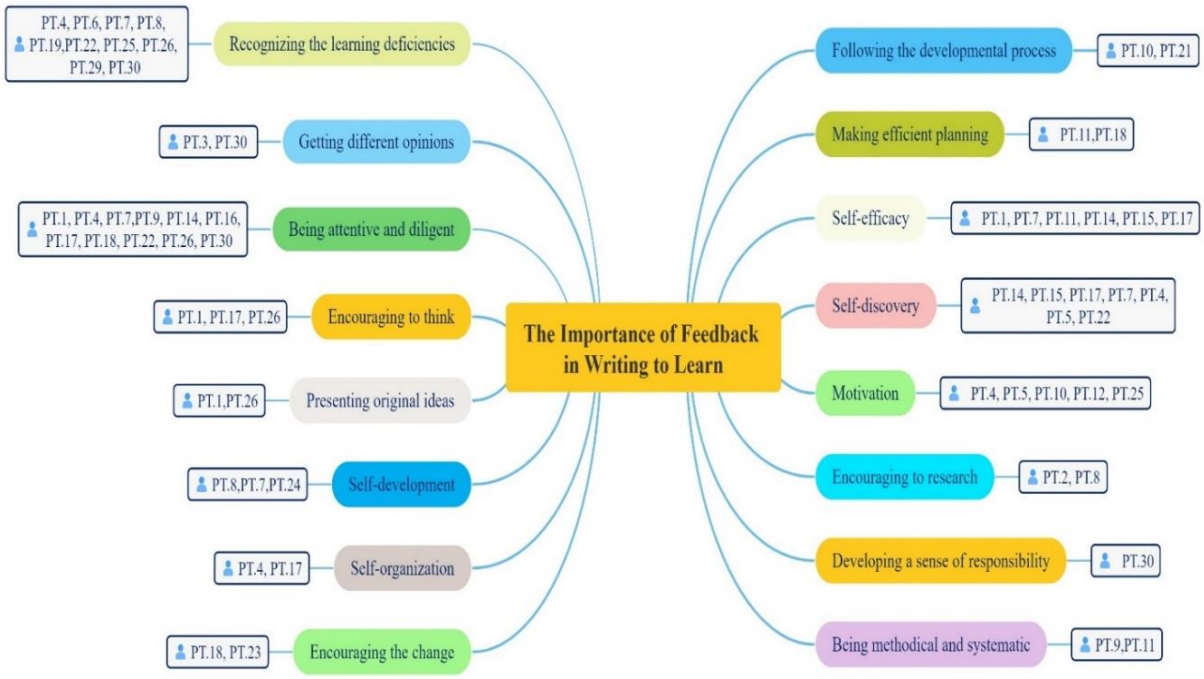


Figure 17. The importance of feedback in the writing-to-learn model

Figure 17 illustrates that the feedback given to the writing-to-learn activities in the distance education process has generated positive changes in the participants' learning process, especially in noticing the learning deficiencies, being more attentive and diligent, and developing self-discovery through the activities they do. In terms of the feedback given to the writing-to-learn activities integrated into distance education, PT1 said, "*First of all, I think the evaluation was made in an objective way. I saw this very clearly in the feedback given to us after the activities. When it comes to what kind of change occurred in me, I saw that my skills such as thinking and paying more attention to the subject in the following week's assignment improved thanks to the feedback our professor gave us every week*", emphasizing that the feedback results in attentiveness and diligence. Regarding the positive contribution, PT30 said, "*The feedback made a positive impact on me in every aspect. It allowed me to see my shortcomings, other ideas about a subject and gain knowledge. By noticing my shortcomings, I have become more attentive while doing my other homework*", revealing the importance of the feedback. With a similar approach, PT5 said, "*As we receive feedback after each assignment, and we are shown the best assignments in the class and are also explained about which parts*

are better or missing with their reasons, I have started to look objectively and correct my deficiencies." From a different perspective PT12 said, "*It is important for people to receive positive or negative feedback on what they do, especially, to find out where it went wrong. So are the feedbacks we received in this course, even though we sometimes got low grades, we always waited for the result with curiosity. This has been motivating for us in this process.*" PT5 further said, "*I think the feedback motivated me just like everyone else. It really motivated me that my assignment got the grade I deserved, and that the more I did the better my grade, and that the grading was fair.*" Participants drew attention to the fact that the feedback including necessary explanations was quite effective on their motivation. Stating that the feedback provided positive contributions such as eliminating learning deficiencies and boosting motivation in them, as well as offering chances for self-improvement, PT29 said, "*Receiving feedback has made it possible for me to see my shortcomings and do better work because each feedback given is just a step in taking you to the better; over time, you can get even the most perfect result."*

DISCUSSION

This study examined the impact of writing-to-learn activities integrated into the distance education process on the learning and evaluation processes of prospective teachers. The initial result revealed that the activities carried out in line with the writing-to-learn model in the distance education process not only improved the writing skills of the prospective teachers for learning purposes but also had positive effects on their learning. The findings of the present study and those of many studies dealing with the effects of the writing-to-learn model, by considering its different aspects, have a lot in common (Aktepe & Yıldız, 2020; Ellis Robinson, 2015; Hohenshell & Hand, 2006; Kayaalp & Şimşek, 2020; Kim et al., 2021; Klein & Rose, 2010; Rouse, Kiuhara & Kara, 2021; Walp, 2013). The effect of writing-to-learn activities on learning can be explained by different reasons. Figure 18 illustrates this intertwined relationship between writing, feedback and learning, which is at the root of these reasons.

Figure 18. The relationship between writing, feedback and learning

Figure 18 shows the relationship between writing, feedback and learning as discussed in a universal context rather than a particular causality. Instead of a single reason, this study focused on the whole that is revealed by different reasons. Many researchers, who are a part of this whole, primarily discussed the relationship between writing and learning in terms of thinking processes. Caniglia (2016) summarized this situation, asserting that "writing is thinking." Also, Forsman (1985) stated that if students are allowed to activate their thinking processes in the classroom environment, they can achieve significant mental development regardless of age. One of the most effective ways to achieve this is writing (Forsman, 1985). Writing not only provides students with opportunities to think and rethink about a topic (Abel, Hauwiller & Vandeventer, 1989), but also contributes to students' critical thinking about what they have learned and to analysing the connection between ideas (Hübner, Nückles & Renkl, 2010). While writing a sentence or paragraph about the content, students select, combine and organize what they know or learn, which further improves the thinking process (Dolgin, 1981). Thus, writing about any subject, above all, allows students to clarify their thoughts about that subject, to understand, and learn the subject better (Goggin, 1985). Writing-to-learn activities build learning environments that allow meaningful writing (Gunel, Hand & Mcdermott, 2009). In this construction process, Chmarkh (2021) emphasizes the reality that learners can potentially store and internalize more information according to how much they interact with relevant content and materials, and process them in the writing-to-learn model as a writing and teaching strategy, while Reilly (2007) stresses that the act of writing itself affects learning because it requires hands, eyes, and brain to work in an integrated manner. Approaching the causality between writing and learning from a different angle, Bangert Drowns et al. (2004) revealed that as students write about the learned subject, the time they get into contact with the subject increases and they build new knowledge, thereby resulting in deeper learning. In this deep learning process, the act of writing functions as a memory aid for students (Boscolo & Mason, 2001). Carefully prepared writing activities help students organize the various pieces of information presented in the classroom, thereby reinforcing the information and associating it with previous information (Holbrook, 1987). Subsequently, students can integrate the knowledge and ideas they have learned with their previous knowledge (Rouse et al., 2021). Thus, a unique learning product comes out (Kayaalp & Şimşek, 2021). Participating in writing-to-learn activities allows students to search, recall, and evaluate the information coming from episodic and semantic memory, and to transform the resulting information into text (Klein, 1999). Thanks to this opportunity, learning takes place as the knowledge and thoughts formed in the brain during the writing process are made evident through writing (Prain & Hand, 1996). This reveals the possible results that students participating in writing-to-learn activities better understand, learn, restore and remember the content for a longer period of time (Myers, 1984). In addition, the feedback received through peer reviews on writing-to-learn activities during the application process allows students to better understand the content and concepts (Finkenstaedt Quinn et al., 2021), as well as detecting and correcting their mistakes (Gupte et al., 2021); and continuous feedback increases students' awareness of their thoughts (Emig, 1977). Thus, students who are positively affected by the feedback given during the writing process can develop their academic self-regulation and self-efficacy skills, and achieve meaningful learning.

The positive effects of writing-to-learn model has been comprehensively revealed in different meta-analysis studies that deal with the learning outcomes derived from universal causes of writing-to-learn with a holistic approach (Bangert Drowns et al., 2004; Graham & Perin, 2007; Graham, Kiuhara & Mackay, 2020). Likewise, Klein and Boscolo (2016), who examined the trends of writing-to-learn that develops in time, and Chmarkh (2021), who synthesized the results of experimental studies conducted on writing-to-learn between 2004-2019, clearly pointed out the critical effects of writing-to-learn model on learning. Being apparent in the

findings of the present study, the positive effects of the writing-to-learn model on learning overlap with the results of previous meta-analysis studies and those examining the trends in writing-to-learn.

The results of this study are similar to those of different studies approaching the subject within the scope of their own research, as is the case in the studies evaluating the positive effects of writing-to-learn on learning from a holistic perspective. Gupte et al., (2021), for example, revealed that writing-to-learn activities create a bridge between previous and newly learned knowledge, develop students' "*problem solving skills*", and enable meaningful learning. Tynjala (1998), who approaches this intermediary role of writing from another perspective, also pointed out that thanks to writing, new information is built on old information, which is a step towards "*easier recalling and effective learning*". This result is in conformity with the findings of both Gupte et al., (2021) and this study, which was carried out in integration with distance education. In the same way, with the intention of improving students' cognitive learning in the social studies course through the use of multiple writing-to-learn activities, Kayaalp and Şimşek (2020) revealed in their study that writing-to-learn activities that have an "*interesting, intriguing and entertaining structure that leads students to different thinking processes*" show important effects on academic achievement, as presented in the current study. Similar findings obtained from different studies make the statement of Kim et al., (2021), saying, "*writing allows us to find out what we know or do not know about what we are trying to learn*" (Kim et al., 2021) even more understandable. Kabataş Memiş (2014), who dealt with the effects of non-traditional writing styles on university students, concluded that the activities are *both beneficial and instructive* for students, suggesting a result similar to that of this study. In a similar fashion, Ray Parsons (2011) focused on concept-teaching and academic achievement through writing-to-learn activities, and came up with results to support the present study and similar studies by emphasizing the positive effects of the writing-to-learn model. Adapting non-traditional writing styles to chemistry class, Kingir (2013) reported the emergence of the capacity to improve both concept learning and course success through letter-writing, one of the types of writing-to-learn activities. Such improvement was observed in this study, which was integrated with distance education, as is the case in other similar studies. Addressing the effects of writing-to-learn on learning processes from a broad perspective, Dummer et al. (2008) asserted that the contribution of writing to critical and innovative thinking skills in the learning process provides students with deep learning, and hence, clarified the concept of deep learning, which was also mentioned in this study. In addition to Karaçağıl (2014)'s emphasis on the contribution of writing-to-learn model to "*remembering what has been learned easily*" in the social studies course, Ay and Başıbüyük (2018)'s conclusion about the positive effects of the writing-to-learn model on "*creative thinking and communication skills*", make the results of the present study even more meaningful. In particular, Doğan and İlhan (2016), who based their conclusion on the opinions of prospective teachers regarding the writing-to-learn model, asserted that the model "*provides increase in knowledge, leads to active participation, motivates for research, and enables permanent learning*", which is quite consistent with the findings of this study.

CONCLUSION AND SUGGESTIONS

The recent pandemic, which has affected the whole world, has exposed the stakeholders of education (teachers, students, parents and policy makers) to the concerns in relation to how to build a quality learning-teaching process in distance education, how to involve students in this process, and how to objectively evaluate the learning outcomes gained in the process. On the grounds of such meaningful questions about distance education, this research sought practical answers to these basic questions through writing-to-learn activities, with a holistic understanding (providing quality learning, activating the student in the learning process and

objective evaluation) rather than reductionism (only one dimension of the phenomenon). Writing, which keeps strengthening its place as a tool of learning, has always managed to preserve its place among learning tools. Although technological developments have pacified many elements of education, it is possible to integrate writing with developing technology and new education models. The results of this research prove this integration. As a result, the writing-to-learn activities included in the distance education process helped students to learn easily and reduced their learning losses. In addition, writing-to-learn activities made students a part of the process, even from a distance, and drew them to the centre of their own developmental processes. Also, the evaluations made as regards the process increased students' awareness of learning and improved their academic self-regulation skills.

This study was integrated into a course with intensive verbal content. Further studies may be conducted by adapting the model to the content of digital courses. This research employed handwriting as the text production method. Similar studies can be conducted through the use of various digital learning tools in the future.

REFERENCES

Abel, Frederick J., James G. Hauwiller & Nancy Vandeventer. "Using writing to teach social studies". *The Social Studies,* 80 (1) (1989): 17-20.

Aktepe, Tuba and Yıldız, Ali. "Primary school students and teachers' opinions on writing for learning purposes". *The Journal of Academic Social Science,* 8 (110) (2020): 211-229. doi: 10.29228/ASOS.46347

Alharbi, Fahad. "Writing for learning to improve students' comprehension at the college level". *English Language Teaching,* 8 (5) (2015): 222-234.

Allen, I. Elaine & Jeff Seaman. "*Class differences: Online education in the United States".* Babson Survey Research Group. The Sloan Consortium, 2010.

Allen, I. Elaine & Jeff, Seaman. "Going the distance: Online education in the United States", Babson Survey Research Group. Pearson, 2011.

Ally, Mohamed. "Foundations of educational theory for online learning". T. Anderson and F. Elloumi (Eds.), In *Theory and practice of online learning* (pp.15–44). Edmonton: Athabasca University Press, 2008.

Altun, Taner, Akyıldız, Salih, Gülay, Ahmet and Özdemir, Caner. "Investigating education faculty students' views about asynchronous distance education practices during Covid-19 isolation period". *Psycho-Educational Research Reviews* 10 (1) (2021): 34-45.

Armstrong-Mensah, Elizabeth, Kim Ramsey-White, Barbara Yankey & Shannon Self-Brown. "COVID-19 and distance learning: Effects on Georgia State University school of public healty students." *Frontiers in Public Healty,* 8. (2020): 1-10. doi: 10.3389/fpubh.2020.576227.

Arnold, Kathleen M., Sharda Umanath, Kara Thio, Walter B. Reilly, Mark. A. McDaniel & Elizabeth J. Marsh. "Understanding the cognitive processes involved in writing to learn". *Journal of Experimental Psychology: Applied,* 23 (2) (2017): 115.

Ay, Alpaslan and Başıbüyük, Adem. "Opinions about writing activities for learning purposes of social studies teacher candidates". *International Journal of Erzincan Social Sciences Institute,* 11 (1) (2018): 33-42.

Baaijen, Veerle M. & David Galbraith. "Discovery through writing: Relationships with writing processes and text quality". *Cognition and Instructio*n, 36 (3) (2018): 199-223. doi:10.1080/07370008.2018.1456431

Balasundram, Nilavathi & Mageswary Karpudewan. "Exploring the use of a writing-to-learn activity embedded with multiple modes using 'Popplet'on pre-university students' alternative conceptions on transition metals". *Chemistry Education Research and Practice,* 22 (2) (2021): 263-281.

Bangert-Drowns, Robert L., Marlene M. Hurley & Barbara Wilkinson. "The effects of school-based writing-to-learn interventions on academic achievement: A meta-analysis". *Review of Educational Research,* 74 (1) (2004): 29-58.

Bartolome, Antonio & Karl Steffens. "Are MOOCS promising learning environments?". *Media Education Research Journal,* 22 (44) (2015): 91–99. doi:10.3916/C44-2015-10.

Bereiter, Carl & Marlene Scardamalia. *The psychology of written composition.* [e- book reader version] 1987. Retrieved from https://www.taylorfrancis.com/books/9780203812310

Berg, Bruce L. *Qualitative research methods for the social sciences.* Boston: Allyn and Bacon, 2001.

Boscolo, Pietro & Lucia Mason. *"Writing to learn, writing to transfer".* In Writing as a learning tool (pp. 83-104). Springer, Dordrecht, 2001.

Bozkurt, Aras. "The past, present and future of the distance education in Turkey". *Açıköğretim Uygulamaları ve Araştırmaları Dergisi,* 3 (2) (2017): 85-124.

Brown, C. "Benefits of distance learning". Retrieved from https://www.eztalks.com/elearning/benefits-of-distance-learning.html, 2017.

Bulut, İbrahim Hakkı, Ömer Delialioğlu & Chad, H. Lane. "Beyond Acceptance: A new model for technology engagement in 21st century learning". M. Montebello (Ed.), In *Handbook of research on digital learning* (pp. 262-283). 2020. IGI Global. https://doi.org/10.4018/978-1-5225-9304-1.ch016.

Bunker, L. Ellen. "The history of distance education through the eyes of the international council for distance education". M. G. Moore and W. G. Anderson (Eds.), In *Handbook of distance education* (pp. 49–66). New Jersey: Lawrence Erlbaum Associates, 2003.

Caniglia, Joanne. "Writing to learn mathematics through formulating problems". K. J. Dowdy and Y.Gao (Eds.), In *Pump It Up* (pp. 105-109). SensePublishers, Rotterdam, 2016.

Caukin, Nancy S. "*Science writing heuristic: A writing-to-learn strategy and its effect on student's science achievement, science self-efficacy, and scientific epistemological view"* Unpublished Doctoral Dissertation. Tennessee State University, 2010.

Chauhan, Sumedha. "A meta-analysis of the impact of technology on learning effectiveness of elementary students". *Computers & Education,* 105 (2017): 14-30. https://doi.org/10.1016/j.compedu.2016.11.005

Chmarkh, Mustapha. "Writing to learn' research: A synthesis of empirical studies (2004-2019)". *European Journal of Educational Research*, 10 (1) (2021): 85-96. https://doi.org/10.12973/eu-jer.10.1.85

Chuang, Hsueh Hua, Ann Thompson & Denise Schmidt. "Issues and barriers to advanced facuty use of technoogy". C. Crawford, N. Davis, J. Price, R. Weber and D. Willis (Eds.), Proceedings of SITE 2003. In *Society for Information Technology & Teacher Education International Conference* (pp. 3449-3452). Albuquerque, New Mexico, USA: Association for the Advancement of Computing in Education (AACE).

Creswell, John W. *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. New Jersey: Pearson Education, Inc., 2012.

Deveci, Tanju. "Writing for and because of lifelong learning". *European Journal of Educational Research*, 8 (1) (2019): 1-7. doi: 10.12973/eu-jer.8.1.1

Doğan, Yakup and İlhan, Nail. "Prospective teachers' views related to using writing to learn activities in "science and technology teaching" course". *Adıyaman University Journal of Educational Sciences,* 6 (1) (2016): 1-22.

Dolgin, Ann B. "Teach social studies through writing". *The Social Studies*, 2 (1) (1981): 8-10.

Dummer, Trevor J. B., lan G Cook, Sara L. Parker, Giles A. Barrett & Andrew P. Hull. "Promoting and assessing 'deep learning'in geography fieldwork: An evaluation of reflective field diaries". *Journal of Geography in Higher Education,* 32 (3) (2008): 459-479.

Elitaş, Türker. "*New communication technologies in distance education licence period*" Unpublished Doctoral Thesis. Atatürk University Distance Education Center, 2017.

Ellis-Robinson, Tammy. "*The effect of poetry as a write to learn activity on content acquisition, content area writing proficiency, and classroom engagement in an inclusive middle school social studies setting: A mixed methods study"* Unpublished Doctoral Dissertation. State University of New York at Albany, 2015.

Emig, Janet. "Writing as a mode of learning". *College Composition and Communication*, 28 (2) (1977): 122-128.

Ferrance, Eileen. *Themes in education: Action research*. LAB at Brown University, 2000.

Finkenstaedt Quinn, Solaire A., Michael Petteson, Anne Gere & Ginger Shultz. "Praxis of writing-to-learn: A model for the design and propagation of writing-to-learn in STEM". *Journal of Chemical Education,* 98 (5) (2021): 1548-1555.

Finkenstaedt Quinn, Solaire A., Noelle Polakowski, Brenda Gunderson, Ginger V. Shultz & Anne R. Gere. "Utilizing peer review and revision in STEM to support the development of conceptual knowledge through writing". *Written Communication,* (2021): 07410883211006038.

Flower, Linda & John R. Hayes. "A cognitive process theory of writing". *College Composition and Communication,* 32 (4) (1981): 365-387.

Forsman, Syrene. "Writing to learn means learning to think". Roots in the sawdust: *Writing to learn across the disciplines* (1985): 162-174.

Goggin, William F. "Writing to learn: A message for history and social studies teachers". *The Social Studies,* 76 (4) (1985): 170-173.

Gökbulut, Bayram. "Distance education students' opinions on distance education". *In Enriching teaching and learning environments with contemporary technologies* (pp. 138-152). IGI Global. 2020.

Graham, Steve & Dolores Perin. "A meta-analysis of writing ınstruction for adolescent students". *Journal of Educational Psychology,* 99 (2007): 445-476. doi. 10.1037/0022-0663.99.3.445

Graham, Steve, Sharlene A. Kiuhara & Meade MacKay. "The effects of writing on learning in science, social studies, and mathematics: A meta-analysis". *Review of Educational Research,* 90 (2) (2020): 179-226.

Greenbowe, Thomas J., Jason R. Poock, K. K. Burke & Brian M. Hand. "Using the science writing heuristic in the general chemistry laboratory to improve students' academic performance". *Journal of Chemical Education,* 84 (8) (2007): 1371.

Gunel, Murat, Brian Hand & Mark Andrew McDermott. "Writing for different audiences: Effects on high-school students' conceptual understanding of biology". *Learning and Instruction*, 19 (4) (2009): 354-367.

Gunel, Murat, Brian Hand & Vaughan Prain. "Writing for learning in science: A secondary analysis of six studies". *International Journal of Science and Mathematics Education,* 5 (4) (2007): 615-637.

Guo, Chun-cai. "Remark on the new development of modern distance education*". Journal of Educational Science of Hunan University,* 1 (2010).

Guohong Gao, Li Ning, Xiao Wenxian & Wan Wenlong. "The Study on the development of ınternet-based distance education and problems". *Energy Procedia,* 17 (2012): 1362-1368 doi: 10.1016/j.egypro.2012.02.253

Gupte, Trisha, Field M. Watts, Jennifer A. Schmidt-McCormack, Ila Zaimi, Anne R. Gere & Ginger V. Shultz "Students' meaningful learning experiences from participating in organic chemistry writing-to-learn activities". *Chemistry Education Research and Practice,* 22 (2) (2021): 396-414.

Hand, Brian, Carolyn W. Wallace & Eun-Mi Yang. "Using a Science Writing Heuristic to enhance learning outcomes from laboratory activities in seventh-grade science: Quantitative and qualitative aspects". *International Journal of Science Education,* 26 (2) (2004): 131-149.

Hassan, Sehar un Nisa, Fahad, D. Algahtani, Rafad Zrieq, Badr K. Aldhmadi, Anira Atta, Rawan M. Obeidat & Adel Kadri. "Academic self-perception and course satisfaction among university students taking virtual classes during the COVID-19 pandemic in the Kingdom of Saudi-Arabia (KSA)". *Education Science,* 11 (134) (2021): 1-14. https://doi.org/ 10.3390/educsci11030134.

Hohenshell, Liesl M. & Brian Hand. "Writing-to-learn strategies in secondary school cell biology: A mixed method study". *International Journal of Science Education,* 28 (2-3) (2006): 261-289.

Holbrook, Hilary Taylor. "Writing to learn in the social studies". *The Reading Teacher,* 41 (2) (1987): 216-219.

Huber, Stephan G. & Christoph Helm "COVID-19 and schooling: evaluation, assessment and accountability in times of crises reacting quickly to explore key issues for policy, practice and research with the school barometer". *Educational Assessment, Evaluation and Accountability,* 32 (2020): 237-270. https://doi.org/10.1007/s11092-020-09322-y

Hübner, Sandra, Matthias Nückles & Alexander Renkl. "Writing learning journals: Instructional support to overcome learning strategy deficits". *Learning and Instruction,* 20 (1) (2010): 18-29.

İşman, Aytekin. *Uzaktan eğitim.* Ankara: Pegem A Yayıncılık, 2008.

Johnson, Andrew Paul. *Eylem araştırması el kitabı.* Y. Uzuner, Y. ve M. Özten Anay (Çev. Eds.), Ankara: Anı Yayıncılık, 2014.

Johnson, Judith. L. "*Distance education: The complete guide to design, delivery, and improvement".* New York: Teachers College Press, 2003.

Kabataş-Memiş, Esra. "Students' views about the non-traditional writing". *Procedia-Social and Behavioral Sciences,*116 (2014): 1735-1738.

Karaçağıl, Canan. "*The effect of using writing to learn activities in social studies on students' academic achievement"* Unpublished Master's Thesis. Muğla Sıtkı Koçman University, 2014.

Karakuş-Yılmaz, Türkan. "Öğrenme ve öğretimde dijitalleşme ve web araçları". M. A. Özerbaş (Ed.), *Öğretim teknolojileri* içinde (ss.179-216). Ankara: Pegem Akademi, 2020.

Kaya, Zeki. *Uzaktan eğitim*. Ankara: Pegem A Yayıncılık, 2002.

Kayaalp, Fatih and Şimşek, Ufuk. "(Do) spoken words fly and written words remain (?): An analysis on the impacts of using writing-to-learn activities in the social studies class on cognitive learning, and students' views". *International Journal of Eurasian Education and Culture,* 5 (10) (2020): 1242-1314.

Kayaalp, Fatih and Şimşek, Ufuk. "Sosyal bilgiler öğretiminde öğrenme amaçlı yazma". S. Polat and B. Aksoy (Eds.), *Kuramdan uygulamaya sosyal bilgiler öğretiminde çağdaş öğrenme ve öğretme yaklaşımları* içinde (ss.47-69). Ankara: Pegem Akademi, 2021.

Kayaalp, Fatih, Meral, Elif, Şimşek, Ufuk and Şahin, İbrahim Fevzi. "A search for a method to improve critical thinking skills in social studies teaching: Writing-to-learn". *Review of International Geographical Education (RIGEO),* 10 (3) (2020): 400-430. doi: 10.33403rigeo.719222

Keegan, Desmond. *Foundation of distance education.* New York: Routledge,1996.

Kember, David. *Open learning courses for adults : A model of student progress*. Educational Technology Publications, Englewood Cliffs, NJ:07637. 1995.

Kim, Songeui, Ji Won Yang, Jaeseo Lim, Seunghee Lee, Jungjoon Ihm & Jooyong Park. "The impact of writing on academic performance for medical students". *BMC Medical Education,* 21 (1) (2021): 1-8.

Kingir, Sevgi. "Using non-traditional writing as a tool in learning chemistry". *Eurasia Journal of Mathematics, Science & Technology Education,* 9 (2) (2013): 101-114. doi: 10.12973/eurasia.2013.922a

Klein, Perry D. & Mary A. Rose. "Teaching argument and explanation to prepare junior students for writing to learn". *Reading Research Quarterly,* 45 (4) (2010): 433-461.

Klein, Perry D. & Pietro Boscolo. "Trends in research on writing as a learning activity". *Journal of Writing Research,* 7 (3) (2016): 311-350.

Klein, Perry D. "Reopening inquiry into cognitive processes in writing-to-learn". *Educational Psychology Review,* 11 (3) (1999): 203-270.

Klein, Perry D., Sabrina Piacente-Cimini & Laura A. Williams. "The role of writing in learning from analogies". *Learning and Instruction,* 17 (6) (2007): 595-611.

König, Johannes, Daniela, J. Jager-Biela & Nina Glutsch. "Adapting to online teaching during COVID-19 school closure: Teacher education and teacher competence effects among early career teachers in Germany". *European Journal of Teacher Education,* 43 (4) (2020): 608-622, doi.org/10.1080/02619768.2020.1809650

Kopp, Michael, Ortrun Gröblinger & Simone Adams. "Five common assumptions that prevent digital transformation at higher education institutions". *INTED2019 Proceedings* (2019)*:* 1448–1457. https://doi.org/10.21125/inted.2019

Layne, Melissa, Wallace, Boston & Phill Ice. "A longitudinal study of online learners: Shoppers, swirlers, stoppers, and succeeders as a function of demographic characteristics". *Online Journal of Distance Learning Administration,* 16 (2) (2013) Corpus ID: 143138663.

Lee, Jong-Ki & Woong-Kyu Lee. "The relationship of e-Learner's self-regulatory efficacy and perception of e-Learning environmental quality". *Computers in Human Behavior,* 24 (2008): 32-47. doi:10.1016/j.chb.2006.12.001

Leffler, Angela K. "*Writing in the elementary science classroom: Teacher beliefs and practices within a narrowing curriculum"* Unpublished Doctoral Dissertation. Ball State University, Indiana. 2014.

Li, Qing & Xin Ma. "A meta-analysis of the effects of computer technology on school students' mathematics learning". *Educational Psychology Review,* 22 (3) (2010): 215-243. http://dx.doi.org/10.1007/s10648-010-9125-8.

Li, Cathy & Farah Lalani. "*The COVID-19 pandemic has changed education forever*". World Economic Forum. 2020 https://www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning/

McMillan, James & Sally Schumacher. *Research in education: Evidence-based inquiry* (7th Ed.). London: Pearson, 2014.

Miles, Matthew. B. & A. Michael Huberman. *Nitel veri analizi.* S. Akbaba ve A. A. Ersoy (Çev. Eds.), Ankara: Pegem Akademi, 2016.

Mills, Geoffrey E. Action research: A guide for the teacher researcher (5th Ed.). Pearson, 2014.

Moore, Michael & Greg Kearsley. *Distance education: A system view of online learning*. (3rd Ed.), Belmont, CA: Wadsworth Centage Learning, 2011.

Myers, John W. *Writing to learn across the curriculum.* Fastback 209. Phi Delta Kappa, Eighth St. and Union Ave., Box 789, Bloomington, IN 47402, 1984.

Nakos, George, E., Michael H. Deis & Louis Jourdan. "Students' perceptions of on-line courses: An exploratory study". *Turkish Online Journal of Distance Education,* 3 (1) (2002): 58–66.

Nam, Jeonghee, Aeran Choi & Brian Hand. "Implementation of the science writing heuristic (SWH) approach in 8th grade science classrooms". *International Journal of Science and Mathematics Education,* 9 (5) (2011): 1111-1133.

Norris, Stephen P. & Linda M. Phillips. "How literacy in its fundamental sense is central to scientific literacy". *Science Education,* 87 (2) (2003): 224-240.

Nückles, Matthias, Julian Roelle, Inga Glogger-Frey, Julia Waldeyer & Alexander Renkl. "The self-regulation-view in writing-to-learn: Using journal writing to optimize cognitive load in self-regulated learning". *Educational Psychology Review,* (2020): 1-38. doi:10.1007/s10648-020-09541-1

Otfinowski, Rafael & Marina Silva Opps. "Writing toward a scientific identity: Shifting from prescriptive to reflective writing in undergraduate biology". *Journal of College Science Teaching,* 45 (2) (2015): 19-23.

Patton, Michael Quinn. *Nitel araştırma ve değerlendirme yöntemleri* M. Bütün ve S. B. Demir (Çev. Eds.), Ankara: Pegem Akademi, 2014.

Phillips, Linda M. & Stephen P. Norris. "Bridging the gap between the language of science and the language of school science through the use of adapted primary literature". *Research in Science Education,* 39 (3) (2009): 313-319.

Pope, Justin. "What are MOOCs good for?". *MIT Technology Review*, 118 (1) (2014): 68–71.

Prain, Vaughan & Brian Hand. "Writing for learning in secondary science: Rethinking practices". *Teaching and Teacher Education,* 12 (6) (1996): 609-626.

Ray-Parsons, Michelle. "*Effects of writing to learn in pre-calculus mathematics on achievement and affective outcomes for students in a community college setting: A mixed methods approach"* Unpublished Doctoral Dissertation. Colorado State University, 2011.

Reilly, Edel Mary. "*Writing to learn mathematics: A mixed method study"* Unpublished Doctoral Dissertation. Indiana University of Pennsylvania, 2007.

Rivard, Leonard P. & Stanley B. Straw. "The *effect of talk* and writing on learning science: An exploratory study". *Science Education,* 84 (5) (2000): 566-593.

Rouse, Amy Gillespie, Sharlene A. Kiuhara & Yusuf Kara. "Writing-to-learn in elementary classrooms: A national survey of US teachers". *Reading and Writing,* 34 (2021): 2381-2415.

Rumble, Greville. *The planning and management of distance education.* London: Routledge. 2019.

Sadeghi, Manijeh. "A shift from classroom to distance education". *International Journal of Research in English Education*, 4 (1) (2019): 80-88. doi:29252/ijree.4.1.80.

Shachar, Mickey & Yoram Neumann. "Differences between traditional and distance education academic performances: A meta-analytic approach". *The International Review of Research in Open and Distributed Learning*, 4 (2) (2003):1-20. https://doi.org/10.19173/irrodl.v4i2.153.

Simonson, Michael, Charles Schlosser & Anymir Orellana. "Distance education research: A review of the literature." *Journal of Computing in Higher Education,* 23 (2-3) (2011): 124. doi:10.1007/s12528-011-9045-8.

Simonson, Michael, Sharon Smaldino, Michael Albright & Susan Zvacek. *Teaching and learning at a distance: Foundations of distance education*. (5th. Ed.) Boston MA: Pearson Education, 2012.

Simonson, Michael, Sharon Smaldino, Michael Albright & Susan Zvacek. *Teaching and learning at a distance*. Upper Saddle River, NJ: Merrill. Prentice Hall, 2003.

Sinaga, Parlindungan & Shelly Feranie. "Enhancing critical thinking skills and writing skills through the variation in non-traditional writing task". *International Journal of Instruction,* 10 (2) (2017): 69-84.

Sintiawati, Rita, Parlindungan Sinaga & Saeful Karim. "Strategi writing to learn pada pembelajaran ıpa smp untuk meningkatkan penguasaan konsep dan keterampilan komunikasi siswa pada materi tata surya". *Journal of Natural Science and Integration,* 4 (1) (2021): 1-10.

Tynjala, Paivi. "Writing as a tool for constructive learning: Students' learning experiences during an experiment". *Higher Education,* 36 (2) (1998): 209-230.

UNESCO (United Nations Educational, Scientific and Cultural Organization). COVID-19 educational disruption and response. 2020.

USDLA (United States Distance Learning Association): Definition of distance learning. http://www.usdla.org. 2021.

Uşun, Salih. *Uzaktan eğitim.* Ankara: Nobel Yayınları, 2006.

Uzoğlu, Mustafa. "Determining the effects of using different writing activities on the academic achievements secondary school 7th grade students and their attitudes towards the course". *Educational Research and Reviews,* 9 (20) (2014): 1065-1070.

Walp, David. "*Reflective writing in a high-ability middle school social studies classroom"* Unpublished Master Thesis. Moravian College, 2013.

WHO (World Health Organization). Coronavirüs disease (COVID-19) Situation Report. 2020.

Williams, Marcia. L., Kenneth Pabrock & Barbara Covington. *Distance learning: The essencial guide.* London: New Delhi Thousand Oaks. SAGE Publications, 1999.

Wright, Katherine Landau Tracey S. Hotges, Wendi K. Zimmer & Erin M. McTigue. "Writing-to-learn in secondary science classes: For whom is it effective?". *Reading & Writing Quarterly,* 35 (4) (2019): 289-304.

Yalın, Halil İbrahim. *Öğretim teknolojileri ve materyal geliştirme*. Ankara: Nobel Yayınları, 2001.

Yangbin Xie & Sang Xinmin. "Learning assessment and resource evaluation: Two tough battles of distance education". *Modern Distance Education Research*, 7 (2010).

Yurdakul, Bünyamin. "Uzaktan eğitim". Ö. Demirel (Ed.), *Eğitimde yeni yönelimler* içinde (ss. 271–286). Ankara: Pegem Akademi, 2015.

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