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SLOWMATION EXPERIENCES OF PRE-SERVICE TEACHERS VIA DISTANCE EDUCATION DURING THE COVID-19 PANDEMIC DISEASE

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Abstract

The unexpected outbreak of Covid-19 pandemic disease has affected every field of life, especially education. The closure of schools and universities to prevent the spread of the disease has led the countries to take urgent decisions on education. Almost all over the world, the education is being conducted through distance education. This study based on the basic qualitative research design aims to examine the opinions of primary education pre-service teachers on their slowmation experiences via distance education. The data of the study were collected with an interview form and analyzed by using descriptive analysis technique under the predetermined themes. As a result of the data analysis, the following results were obtained: The pre-service teachers were of the opinion that slowmation is an advantageous method. However, it was also found that during the process of producing slow motion animations, the participants faced some difficulties. Despite the difficulties, the pre-service teachers believed that slowmations produced by students and/or teachers could be used easily and effectively in their future career. Finally, it was determined that Covid-19 had some negative effects on the mood of the pre-service teachers and it also affected the opinions of the pre-service teachers on the delivery of instruction.

Keywords: Slowmation, Turkish language teaching course, pre-service teachers, Covid-19, distance education, 21st century skills

INTRODUCTION

The world is now passing through a remarkable crisis, Covid-19, which emerged in Wuhan Province of China in December 2019 and has influenced the whole world, affecting all policies of countries, especially economy, health and education. The event has led the authorities to take radical precautions and decisions regarding education and to take steps to carry on education. This unpredictable event has made it compulsory to carry out teaching and learning activities due to lockdowns via distance education almost all over the world. In Turkey, the first case was seen at the beginning of March 2020 and after that, the government, depending on the recommendations of the science committee, closed schools on the second week of March temporarily and since March 23, all the students from primary to high schools have been receiving online education through internet and TV. Universities, on the other hand, suspended education on March 16 for three weeks and later, they also began to carry on education through distance education.

The effects of Covid-19 has begun to take its place in researches and reports. According to a report by UNESCO (2020), the closure of schools has impacted almost 90% of the world's student population (over 1.57 billion) and at least 63 million primary and secondary teachers. Another group which has been affected by the pandemic is pre-service or future teachers. Now in Turkey and many other countries, they do not have access face-to-face tutorials and in-person supervision at teacher training institutions. They have also lost the chance of practical teaching experience in primary, secondary and high schools. Also, they lost the chance of having micro-teaching experiences which is an important part of teacher training programs in face-to-face education. The report also emphasizes that before the crisis, the world was facing a shortage of qualified and trained teachers with an estimated 69 million new teachers needed all over the world to meet the demand of primary and secondary education by 2030. Along with this pandemic disease, this new situation emerging in education has revealed that teachers and students should develop many skills, especially knowledge, technology and media skills and that authorities must find solutions to sustain and nurture both in-service teachers and pre-service teachers' professional network between teachers at education institutions. The report by UNESCO

(2020) strongly points out that both future teachers and in-service teachers are in need of reform and that they should feel comfortable with the technology to perform the full benefits of the training. However, huge number of teachers lack even the most basic ICT skills (World Education Blog, 2020), which is a great obstacle for their professional development urgently needed at the time of Covid-19 crisis. Therefore, as noted by the studies and reports by some institutions like UNESCO, educators and schools should build an understanding of e-readiness and we must perform a reform on modernizing teacher education programs and bring pedagogical innovation and teachers should have pedagogy for ICTs use and digital literacy. According to Brasnford, Brown and Cocking (2000, cited by Hoban, Macdonald & Ferry, 2009), technology is a powerful tool for learning as it helps us to have a deeper understanding of phenomena as long as we build and manipulate models of these phenomena.

In fact, it is not only Covid-19 that has changed the nature of education. The 21st century itself can be said to have brought a new educational understandings, definitions and requirements, which are all now to be considered carefully with Covid-19. 21st century, which is called as the age of information and technology, has had its impact on education as in all areas of life. The definitions of education, student, teacher, class and school have changed. Teaching-learning processes are no longer just the activities that are carried out in the classroom. Teachers are expected to convey information, be a source of information and do their job of teaching, but they are expected to guide their students' development, and offer opportunities for them to carry out their own learning. In addition, teachers are also expected to have 21st century skills (Partnership for 21st Century Skills, P21, 2015) like life and career, learning and innovation, knowledge, media and technology skills, and to further their personal and professional development. On the other hand, students are also expected to be individuals with the 21st century skills and to have creative, critical, problem-solving skills, adapting themselves to innovations, addressing their own learning problems, reaching reliable and different sources of information.

In today's world individuals' being familiar with the emerging technologies begins at the very early ages; for this reason, we can call the generations of this century as digital learners (Han, Shin & Ko, 2017). The needs and interests of these digital learners are quite different from the previous ones. In order to meet the needs of these students and also the educational needs arising from either positive or negative events to be experienced in the future, the education and teaching programs for pre-service and training of in-service and teacher candidates should be in accord with requirements of the century (Ciğerci, 2020).

Previous studies on pre-service teachers' use of technology concluded that technology had little attention in pre-service education programs (Chien, Chang, Yeh, & Chang, 2012; Dawson, 2008; Kirschner & Selinger, 2003; Kurt, 2012) and only a limited number of beginning teachers could use technology in various ways in education settings (Bang & Luft, 2013; Gao, Wong, Choy, & Wu, 2011) and except the basic information and technology lesson, pre-service teachers did not have education on the use of technology for educational purposes like preparing teaching and learning materials, instructing, engaging their students into the activities, etc. (Göktaş, Yıldırım & Yıldırım, 2009; Han & Shin, 2011; Russell, Bebell, O'Dwyer & O'Connor, 2003, Tearle and Golder, 2008). However, these situations have changed in a positive manner in recent years as the faculties of education have begun to revise their programs by including both compulsory and elective courses on basic ICT skills, instructional technologies, distance education, etc. Besides, in order to equip their pre and in-service teachers with the requirements of 21st century, the ministry of education in countries provide training programs on information, technology and media literacy. In Turkey, for instance, the Higher Education Council revised all of the teacher education programs in 2018 and in addition to information technologies course, various compulsory and elective courses such as teaching technologies course, distance education, media literacy, the implementation of science in technology were included in programs. Other studies also emphasize that teacher standards to meet the needs of today's' educational understanding should be described (Orhan, Kurt, Ozan, Som Vural, & Türkan,

2015) and the standards and the technology education for pre-service teachers should focus on the use of educational technologies depending on pedagogical and content knowledge (Karatas, 2014). This means that any education programs on technology for pre-service teachers should be able to combine pedagogical practices, technology skill and content knowledge together.

International Society for Technology in Education (ISTE, 2017) lists 7 standards for teachers: learner, leader, citizen, collaborator, designer, facilitator and analyst. As a learner, teachers should "*set professional learning goals to explore and apply pedagogical approaches made possible by technology and reflect on their effectiveness*." As a leader, teachers should "m*odel for colleagues the identification, exploration, evaluation, curation and adoption of new digital resources and tools for learning."* As a collaborator teacher should "*collaborate and co-learn with students to discover and use new digital resources and diagnose and troubleshoot technology issues*." As a designer, teachers should "*use technology to create, adapt and personalize learning experiences, design authentic learning activities and use digital tools and resources to maximize active, deep learning and explore and apply instructional design principles to create innovative digital learning environments that engage and support learning."* As a facilitator, teachers should "*manage the use of technology and student learning strategies in digital platforms, virtual environments, hands-on makerspaces or in the field*" and finally, as an analyst, teachers should "*use technology to design and implement a variety of formative and summative assessments that accommodate learner needs, provide timely feedback to students and inform instruction*." As we can see under each standard, there are sub-standards on the use of technology.

There are many ways, methods and technological tools which enable teachers and students to produce their own digital teaching and learning products. One of the ways of integrating technological and digital opportunities into education is “slowmation”. According to Hoban and Nielsen (2010), the advancement in digital technologies make it possible for pre-service teachers to produce their own media products like videos, digital stories and animations. Moreover, Chan and Black (2005) argue that animations are mostly produced by experts and thus, learners use them as consumers. However, if the learners designed and produced their own animations, the limited impact of animations on education would get higher.

Slowmation (Slow Motion Animation)

The slow-motion animation (slowmation) method was introduced in 2005 by Garry F. Hoban, a professor at Wollongong University. The term "slowmation" is abbreviated from "slow motion animation" and it is a new form of stop-motion animation making it easier to make complicated process of creating animations (Hoban, 2005; 2007). Creating a slowmation involves integrating features of clay animation, object animation and digital storytelling (Hoban &Nielsen, 2010). The most important feature of slowmation is that there are two frames, not 24 frames per second as in computer animation (Hoban, 2007). The first application of the slowmation technique was put into practice by making models from paper or other materials, then creating digital photographs that show the small sequential movements of 18 models to obtain an animation effect and placing them in the digital video program (Kervin, 2007). This technique, which simplifies students' ability to make animation, is a new teaching method created against the complexity of digital animations (Kidman, 2015; Vratulis, Clarke, Hoban & Erickson, 2011; Uzun, 2015).

Slowmations, which are 3-4 minutes in length, are like mini movies and can easily be created by pre-service teachers to present their own understanding on concepts in a more comprehensive way (Hoban & Ferry, 2006).

Hoban and Nielsen (2010) developed the 5R technique in creating slowmation.

Step 1: Background Notes: Students must have enough prior knowledge to explain a concept or design an animation. This situation is resolved by research on the subject or by teachers.

Step 2: Storyboard: Students should create their animation by drawing on a piece of paper in the form

of a draft. This can be a narrative or a pictorial sketch. The concept is broken into several scenes which are to be sequenced to bring expected actions into a coherent story.

Step 3: Models: The draft with a storyboard is formed into 2D or 3D models with play dough, cardboard or colored paper. In this way, abstract concepts are made concrete and implemented. At this point, necessary help can be obtained from books, the internet and teachers.

Step 4: Digital Photographs: The models are animated according to the content of the subject to be explained and photographed with a digital camera. Photographing should be done in the order in the storyboard draft. It is advisable that students have a digital still camera mounted on a tripod looking vertically down at the models or across at the plastic models.

Step 5: The Animation: The photos obtained with the digital camera are animated with the help of a computer and animation is created. Finally, the scientific accuracy of the animations is examined by content specialists. The animations can be shared on the Internet and they can be discussed by peers, teachers and field experts.

Hoban, Ferry, Konza and Vialle (2007) state that the purpose of the slowmation is to explain a science concept and the prompts are to explain the scientific concept like audio narration, music, humor, models, labels, etc., while they also state that claymation's purpose is to tell a narrative and the pedagogical prompt of the clay mation is the experience of the art of telling a story. In this context, most of the studies based on slowmation method in literature are on science teaching. However, in this study, it was preferred to make animations based on slowmation method instead of claymation method in Turkish language teaching course with primary school pre-service teachers. As Hoban and Nielsen (2010) stated, the use of claymation in school classrooms are rare and it is time consuming, tiring and boring to make clay models. Besides, in a study by Murtagh (2004) to increase participation of the students with low achievements by using claymation method, it was found out that though there were positive results of the method, claymation process was time consuming and challenging and that it was hard to preserve clay models after sometime as they get dried.

In this study slowmation method was preferred to be used in Turkish language teaching, especially in listening and viewing skill activities although Hoban, Ferry, Konza and Vialle (2007) stated that slowmation animations are effective in teaching abstract concepts in science teaching, while claymation animations can be used narration and sharing the experiences through narratives.

The aim of this study is to examine the opinions of pre-service teachers on their slowmation experiences via distance education. The fact that slowmation method was used in the study and that there are not any studies on the use of the method in language art lessons is thought to increase the importance of the study and thus, the study will contribute to the related literature.

METHODS

Research Design

This study, aiming to determine the opinions of teacher candidates about their slowmation experiences and what meaning they get form these experiences, is based on the basic qualitative research design. The reason to use basic qualitative research design is that the design gives answer to such questions as how people interpret and attribute to their experiences, how they construct their worlds (Merriam, 2009).

Participants

The participants of the study are pre-service teachers (2nd and 3rd grade) at primary education department in the spring semester of 2019-2020 academic year and attend the Turkish Language Teaching course. The total number of the pre-service teachers attending the course is 103 in two sections. As the researcher of this study is also the lecturer of the course, the first sampling method was based on convenience sampling. Within the context of the syllabus of the course, all the students (pre-service teachers) are required to prepare lesson plans, activities and teaching materials in one of

the language skills (listening and viewing, speaking, reading and writing) and are expected to perform micro-teaching. 17 pre-service teachers preferred listening and viewing skills and 15 of them (7 males, 8 females) wanted to participate in the research voluntarily, which means that the participants selected themselves (self-selected sample, Connaway and Radford, 2017) for inclusion in the study.

Data Collection

In this study, which aims to determine the opinions of pre-service teachers about their slowmation experiences, the data was collected through semi-structured interviews with pre-service teachers based on the interview method frequently used in qualitative research methods. During the interview consisting of semi-structured questions, researchers can add questions according to the new situations likely to arise, and this type of interview is frequently used in research in the field of education due to its flexibility to add questions (DiCicco-Bloom & Crabtree, 2006).

The draft interview form, which was developed after the literature review of the research topic by the researcher, was presented to the opinions of the two experts (one in the department of educational measurement and evaluation and one in primary education). For the content validity of the interview form, a pilot interview was held with two other students who took Turkish teaching course in previous semester and used digital storytelling method and produced digital stories. Depending on the pilot study, the final form was obtained by making necessary revisions on the questions like instead of asking "what do you think about your experience during the pandemic disease?", the question was revised as "How do you feel about your slowmation experience via distance education due to Covid-19?"

The final interview form consisted of four main questions aiming to get the opinions of the participants' opinions on;

- ✓ the advantages and what they liked about slowmation (if any),
- ✓ disadvantages and what they did not like about slowmation or what they found difficult to cope with during the process (if any),
- ✓ how they can make use of slowmation in their future teaching career.
- ✓ their slowmation experiences via distance education due to Covid-19.

Data Analysis

The data gathered from the interviews were analyzed using the descriptive analysis technique. The features of the descriptive analysis are to summarize and interpret the data gathered through different data collection tools and techniques depending on pre-determined themes. While presenting the findings, the researcher can often give direct quotations from what the participants have said with the aim of presenting the opinions of the participants interviewed or observed. The findings obtained through the analysis are presented to the readers in a summarized and interpreted way (Yıldırım & Şimşek, 2011).

In this study, each of the questions asked to the participants were determined as the themes. In order to give direct quotations from the words of the participants, each was assigned a code like P1 (participant 1), P2.

In the study based on the basic qualitative research design, the descriptive analysis was considered to be appropriate in data analysis as the aim was to determine the experiences of the participants. In descriptive analysis, the data are analyzed in four stages (Yıldırım & Şimşek, 2011): The first stage is to examine the data and establish a conceptual framework and try to identify themes. The second stage is the processing of data according to the thematic framework created. The third stage is to identify the findings and make direct quotations. The fourth stage is the interpretation of the findings through the disclosure, correlation and interpretation of the findings.

In this study, interview questions were prepared in a way to form a conceptual framework for evaluating pre-service teachers' slowmation experiences from different perspectives and research

questions were determined as main themes. Therefore, a thematic framework for data analysis was formed based on the interview questions. After the conceptual framework was created, the data obtained from each research question was coded separately by the researcher and an outside researcher in measurement and evaluation department. Based on this coding, sub-themes for the previously determined themes were created. The consensus was achieved by comparing the individual coding made by the two researchers. There was a consensus on 32 codes out of 35 codes between the researcher and outside researcher. By applying Miles & Huberman (1994) intercoder reliability formula (32/(32+3)), the reliability rate was found to be .91. For the three codes that cannot be reached on consensus, consensus was achieved by applying to another expert in primary education department. After these procedures, the stage of identifying the findings was initiated.

In order to ensure internal validity in the research, direct quotations were made from the answers given by the pre-service teachers to the questions. In order to ensure the external validity of the research, the preparation of the data collection tool, application of the data tool and analysis stages are explained in detail. The findings were compared with the findings obtained in the literature.

Research Process

For this study, at the beginning of the semester (February, 2020) the researcher, also the lecturer of the course, gave his lectures on Turkish Language Teaching Program for primary school students prepared by the Ministry of National Education (2019), teaching language skills (listening and viewing, speaking, reading, writing) for the first six weeks. During these lectures, each student was required to choose one of the language skills or language areas for which he/she was to prepare lesson plans, activities and do micro-teaching depending on his/her lesson plans. The researcher also announced the students that he would make a research on the use of technology in teaching listening and viewing. He gave a notice to the students asking them to participate and give certain information in the research.

At the fifth week of the semester, the researcher held a meeting with those who were willing to prepare lesson plans and activities on listening and viewing skills. The researcher, taking necessary permission from the administration of the education faculty, gave detailed information about the research. Those 15 students out of 17 accepted to participate in the study voluntarily. The study lasted for seven weeks beginning form the fifth to eleventh week of the semester. At the fifth and sixth week of the semester, the lecturer held workshops on slowmation with the participants, during which they gained theoretical framework of what slowmation is, what the phases of preparing slow motion animations and how they could adapt their animations with the goals of listening and viewing skills listed in Turkish teaching program for the third and fourth grade primary school students. Also, during the workshops a sample slow motion animation was created by the participants together. However, with the decision of the Turkish government and Higher Education Council, the universities were closed and the education was carried out via distance education (online and offline).

During the lockdown, the participants continued their studies on slowmation at home and the researcher and the participants carried out the stages of slowmation on distance learning platforms such as Edmodo, zoom, etc. The participants used software programs or applications such as Stop Motion, Youcut Video Editor, UnShot, Viva Video, iMovie and shared their products on Edmodo, Whatsapp and/or Google drive. The researcher and the participants made comments on the animations. The final products, the slow motion animations, prepared on the themes like art, national culture, health and sport, nature and universe, science and technology, emotions, time and space, the world of children listed in the 3rd and 4th grade primary education Turkish teaching program (2019), were shared on the third and fourth weeks of April on Edmodo and Google Drive. The researcher sent all participants an interview form via e-mail in which there were four questions answered in detail by the participants.

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FINDINGS

1. The findings on advantages of slowmation experiences

The opinions of the teacher candidates about the advantages of slowmation include "skill development" and "teaching and learning environment" sub-themes. In the following table, themes, sub-themes, codes and quotations from the interviews are given (Table 1).

Table 1. Themes, sub-themes, codes and quotations on the advantages of slowmation

1st Theme: Advantages of Slowmation			
Sub-themes	**Codes**	**F**	**Sample quotations**
Skills Development	21st century skills (learning-innovation skills, and information, media and technology skills)	15	*You write a text or a story, you use an application, you use technology and multimedia and you yourself produce something new, which is great for me (P5).* *This was a new experience for me, and I tried this for the first time in my life. Despite some difficulties, I searched for information on the internet, for example on how to use an application and how to make something new by using the technology (P10).*
	Creative writing	1	*Writing the stories for our animations, thinking about the events, characters, setting all develop creative writing (P8).*
Teaching-Learning Environment	Amusing and pleasant	5	*... enjoyable and amusing, easy to handle the process and produce animations (P14)*
	Permanent learning	4	*... and it also leads to permanent learning (P6).*
	Achieving the objectives of a lesson	1	*we can reach the objectives and aims of a lesson (P11).*
	Healthy relationships between students and teachers	1	*It also enables permanent learning and healthy relations between teachers and students (P3)*

According to findings of the study, the participants were of the opinion that the experience of producing animations will be very helpful for them as they will be teachers in the near future and that this experience contributed to them in various ways. The most remarkable benefit of the experience was found to be the contribution of slowmation to the development of 21st century skills (Partnership for 21st century learning, P21, 2015) of the participants like learning and innovation skills (creativity, critical thinking and problem solving) and information, media and technology skills (accessing, evaluating and using information, creating media products, applying technology effectively). Almost all of the participants believe that as it was their first experience with making animations, they searched for information from various information resources, learned how to use a software program or an application, gained new knowledge, developed and used their creative thinking, problem solving and production skills, turning a written text into an audio visual product by using different multimedia and technology tools, and developed solutions on how to make and teach abstract concepts in Turkish teaching and also other lessons in a more concrete way. All these skills are included in 21st century skills.

Besides the impact of slowmation on skill development, the participants stated that the experience of slowmation in teaching and learning environment would create an amusing and pleasant atmosphere

and that it was key to permanent learning. While one participant thought that the objectives of a lesson could be achieved by slowmation, another one believed that slowmation experiences could build healthy relationships between teachers and students.

2. The findings on disadvantages/difficulties of slowmation

The opinions of the teacher candidates about the disadvantages/difficulties of slowmation include "process" and "equipment and material" sub-themes. In the following table themes, sub-themes, codes and quotations from the interviews are given (Table 2).

Table 2. Themes, sub-themes, codes and quotations on the disadvantages/difficulties of slowmation

2nd Theme: Disadvantages/Difficulties of Slowmation			
Sub-themes	**Codes**	**f**	**Sample quotations**
Process	Taking so many photos	7	*After writing the story and arranging drawings, materials ect, I had to take photos. I can't remember how many photos I had taken as. But I know for sure that I took so many photos (P7).*
	Voice recording	6	*Voice recording took my time as I tired many times to arrange my voice and tone (P11).* *I had to record my voice for a few times as I thought that I was not able to give the mood of the story (P15).*
	Application/software	5	*I had difficulty in using the application on my mobile phone. I had to do some stages ever and ever again (P1).*
	Arranging the speed of the video	3	*It was difficult to adapt the time and duration of voice recording with the time and duration of the animation (11).*
	Time consuming	2	*The process is very demanding and take so long time. You must arrange many things and you have to have control over them (P4).*
	Story writing	1	*Writing my own story was stressful and hard. There are many factors that we had to consider; the level of the students, the language, the length of the story etc. (P5).*
	Storyboard	1	*I wish we had not had to make a storyboard for our animations. It was difficult to make it (P10).*
	Creating setting	1	*I wrote my story. Ok but while making my animation, I had difficulty in creating the setting. I had to go over it several times (P5).*
Equipment & Material	Using mobile phones	8	*It was difficult to hold the mobile phone fixed while going over the pictures (P2).* *it was really very difficult to hold the mobile phone on the right hand and change the pictures or scenes with the left hand (P9).*
	Lack of material	4	*I had some difficulties. I live in a village and most of the time my internet connection is not good. Because of Covid, we must stay at home, and we cannot go out, so I could not get some necessary materials for my animation (P1).*

When the answers of participants were analyzed, it was found out that the participants underlined some certain difficulties/disadvantages during the process of producing slow motion animations. The most common problems were determined to be due to the use of mobile phones, voice recording, the

need of materials, taking so many photos. There were also other problems such as writing the story, arranging the storyboard, arranging the speed of the video, using the slowmation applications or software programs and creating the setting.

While some of the participants also stated that they were in need of materials and equipment to use as models and could not get them easily as they had to stay at home because of Covid-19 and that they tried to overcome this difficulty by trying to make use of the materials they had at home, some of the participants stated that all the five steps of producing slowmation was time consuming as they had to decide and arrange many things at the same time.

3. Findings on the use of slowmation by pre-service teachers in their future career

The opinions of the teacher candidates about the use of slowmation by in future career include "contributions of slowmation to the students", "using slowmation in various disciplines", "philosophy" and "economy" sub-themes. In the following table themes, sub-themes, codes and quotations from the interviews are given (Table 3).

Table 3. Themes, sub-themes, codes and quotations on the use of slowmation by pre-service teachers in their future career

3rd Theme: Use of Slowmation by Pre-service Teachers in Their Future Career			
Sub-themes	**Codes**	**f**	**Sample quotations**
Contributions of Slowmation Process to the Students	21st century skills (learning-innovation skills, and information, media and technology skills, social skills)	13	*Think of my students, they are making their own animations. They will use their creativity by writing their own stories. They will search for information. They will use technology. They will solve the problems when they face them. Maybe they will work together (P6).*
	Language skills	9	*The process itself develops the language skills. You write stories and then you read them again and again. Even you ask another person to read it aloud and you listen to your story. Then when the animation is ready the students listen and watch. By this way, my students will develop their language skills (P8).*
	Psychomotor skills	1	*…. their psychomotor skills will also develop as they will draw pictures, use various materials (P11).*
	Attention/interest	1	*I will be able to keep my students' attention and interest in my lessons (P5).*
	Learning by doing	1	*… And at the same time, students will have fun and do a pleasant activity. They will learn better by doing (P12).*
	Collaboration/cooperation	1	*For instance, I can make up the story and narrate it and my students can draw pictures for the story and they can express their thoughts with their drawings. Then, they can do the voice recording, find appropriate music for their study and finally we all together create our own animations (P7).*
	Enriching the teaching-learning environment	1	*In order to increase the readiness of my students on the topic to be dealt with, I can make an animation and use it at the beginning or in order to reinforce my students learning, I can use it at the end of a theme (P14).*
Using Slowmation in Various Discipline	Science teaching	2	*For my students, I can use this method during the listening and viewing phase in Turkish lessons. I can use it not only in Turkish lessons but also in science while I will be teaching abstract concepts or scientific rules or theories, laws and in social studies lessons, as well (P8).*

	Life studies	2	*We used it (slowmation) for listening skills in Turkish lessons. But I think that we can use it very effectively in science and life studies lessons as slowmation is effective while showing our students the changes in a process (P14).*
	Social studies	2	*When we become teachers, we can use slowmation in most of the courses like social studies. It will be good for my students (P13).*
	Value education	2	*As I answered in the previous question, we can especially use it (slowmation) to teach abstract concepts, especially the issues of morality and virtue can be taught effectively with the animations my students and I will make together (P7).*
Philosophy of Education	Constructivism	1	*Slowmation is effective in teaching process and especially it can serve the principles of constructivism, which is our educational philosophy (P12).*
Economy	Time/Space/Cost	1	*I think that one of the most important contributions of slowmation will be to help us to save time and space. Namely, I can have my students watch animations and help them to visualize the events in the animations and doing this will not cost me much (P5).*

Depending on the pre-service teachers' answers to the question of how they can make use of slowmation in their future career and in their classrooms, it was found out that except only one participant, all the other participants wanted to use slowmation method in their classes in the future. They believe that slowmation by either teachers or students will create a better classroom setting in which students will be able to make their animations and will develop their writing skills, drawing, listening and speaking skills. Besides, 13 of the participants think that during slowmation process, their students will use their creativity while writing their story and arranging the scenes, look for information from various sources and evaluate and use that information, use technology tools and create their own media products and solve problems. Therefore, the participants believe that slowmation can contribute to 21st century skills (Partnership for 21st century learning, P21, 2015) like critical, creative and analytic thinking skills, problem solving skills, technology and information literacy skills, social skills. They believe that they can arrange group works in their classrooms and students can work cooperatively and collaboratively while they will be able to learn by experiencing and doing. Also, they are of the opinion that using new methods like slowmation in their classes will enrich the teaching-learning setting.

Apart from the findings which focus on including primary school students in the process of making their own animations, two participants pointed out that slowmation can be used effectively in science teaching, life studies and social studies as well as Turkish language teaching.

4. The findings on the opinions of pre-service teachers on slowmation experiences via distance education due to Covid-19

The opinions of the teacher candidates about their experience via distance education due to Covid-19 include "effects of Covid-19 on the mood of the students" and "effects of Covid-19 on teaching and learning" sub-themes. In the following table themes, sub-themes, codes and quotations from the interviews are given (Table 4).

The last question on the interview was on pre-service teachers' experiences via distance education due to Covid-19. The analysis of the data reveal that the participants began to answer the question by mentioning the loss of their motivation, becoming bored and worried due to the effects of Covid-19. However, despite this negative mood, most of the participants stated that they were trying to do individual studies to develop themselves by making use of the Internet, attending educational forums,

keeping in touch with their friends and teachers. They also stated that they were trying to follow online lectures or if they could not, they watched the recorded lectures offline. Besides, the participants mentioned about their preference on the delivery of instruction. While some of them preferred face-to-face education, some were of the opinion that face-to-face and distance education can be combined, which means that they would prefer blended learning.

Table 4. Themes, sub-themes, codes and quotations on the pre-service teachers' experiences via distance education due to Covid-19

4th Theme: The Pre-service Teachers' Experiences via Distance Education due to Covid-19			
Sub-theme	**Codes**	**f**	**Sample quotations**
Effects of Covid-19 on the Mood of the Pre-service Teachers	Worry	8	*As everybody, I am also very worried about what is going on all over the world and in my country. The disease has affected every part of our lives. As a student, I am worried about my education (P10).*
	Boredom	3	*I am very bored of staying at home and not being able to go out and to my university especially. I do miss my friends, my teachers, my class, everything outside (P7).*
	Loss of motivation	3	*We are worried about what happens to people all over the world because of the disease and also are worried about our own health and our families' health. On the other hand, we are struggling to continue our education and we wonder when our school will reopen. Sometimes, I feel like losing my motivation for studying and doing my assignments and tasks (P5).*
The Effects of Covid-19 on Teaching and Learning	Face-to-face education	9	*The online lessons on Zoom, your comments, our friends' sharing their comments on Whatsapp and Edmodo were all very helpful. Despite we did it on the virtual world, it was like real because we could make contact with you and my friends most of the time. But of course, I would prefer to see you in our class and have our lessons in the classroom together. Face-to-face is always the best (P1).*
	Blended learning	5	*During this Covid 19 period, I recognized that distance education can also be used in our education with face-to-face education. Even, it will be very helpful and advantageous in terms of time, money, place. We can have the theoretical parts of our lessons on distance education and in the class, we can do practices. This will save time, money and energy for us. And also, it will develop our technology skills (P9).* *We tried to follow our lessons online and offline. For some lessons I can say that distance education was good but for some I cannot say so. I think we can mix face-to-face and distance education and get a new education system (P12).*
	Individual studies	6	*We must face the reality of the disease and also we must always keep our duties as students and candidate teachers in mind. We have a lot of spare time these days, so I am trying to turn this situation into an advantage. I visit education web sides. I attend online lessons on Zoom and whenever I want, I can revisit our distance education system and watch the records of the lessons (P7).*

DISCUSSION, CONCLUSION & RECOMMENDATIONS

Covid-19 pandemic disease has suddenly changed the nature of teaching and learning processes all over the world. Taking the changing nature of teaching and learning processes into consideration, this study aimed to examine the opinions of pre-service teachers' slowmation experiences. The results of the study were gathered under four themes, the advantages of slowmation experiences, disadvantages

and difficulties of slowmation, the use of slowmation by pre-service teachers in their future career and the effects of Covid-19 and distance education on pre-service teachers' experiences.

In terms of the advantages of slowmation experience, this study shows that slowmation has an impact on skill development of the pre-service teachers. Analysis of the data highlights the fact that all the participants believed slowmation could develop learning and innovation skills, information, media and technology skills (Partnership for 21st century learning, P21, 2015) and creative writing skills. Methods, like slowmation, claymation, digital storytelling, require individuals to use multimedia tools together with other technological tools. All these methods follow some certain phases which are interconnected and interrelated to each other and at each phase animation-maker or storytellers need to put some certain skills into action. Depending on the responses of the pre-service teachers, it can be said that they focused on learning and innovation skills and information, media and technology skills. The surprising result is that life and career skills were not mentioned by any of the pre-service teachers. This result can be said to imply that the experience led the pre-service teachers to focus on ways of thinking by focusing on creativity, problem solving, critical thinking. Another implication is that the pre-service teachers' searching for information on various information resources, learning to use applications and/or software programs by which they could created media products are all factors to contribute information, media and technology skills. There are studies in the literature the results of which support the result obtained in this study. The studies show that each step performed during animation or digital story process requires and develops individuals' 21st century skills such as creativity (Atalay, 2015; Ciğerci, 2020; Yüksel, Robin & McNeil, 2011), creative thinking (Koçoğlu & Köymen, 2003), critical thinking and problem solving (Foley, 2013), technology skills (Ciğerci, 2020; Doğan, 2007; Karakoyun, 2014; Robin, 2008) and creative writing (Robin, 2006). Another result of the study in terms of the advantages of slowmation is that slowmation could enhance teaching-learning environment by creating an amusing and pleasant setting, leading to permanent learning, achieving the objectives of a lesson and creating positive effect on relationships between students and teachers. It could be said that slow motion animations could be used to increase the readiness of primary school students on the topic to be dealt with or used at the end of the theme to reinforce students learning. Likewise, Hoban, Ferry, Konza and Vialle (2007); Keast, Cooper, Berry, Loughran, and Hoban (2009) and Hoban and Nielsen (2010) think that the slowmation can be used at the end of a topic for assessment purposes and teachers can check what students have learned about the topic. They also emphasize that slowmation is an effective tool to teach abstract concepts and make learning meaningful and permanent.

In the second place, despite the advantages of slowmation, it was found out in this study that there were some disadvantages or difficulties that the pre-service teachers experienced during the process of creating animations. It can be concluded from the study that the difficulties stemmed from slowmation making process itself and lack of equipment and materials. It can be alleged that methods like animation and digital storytelling may require individuals to follow the steps carefully from wiring the story or text to sharing their products. Therefore, the pre-service teachers in this study might have found slowmation process challenging and demanding as some well-developed skills like using technology effectively are necessary. Besides, as all the participants mentioned, they did not have digital still cameras and tripods and other necessary materials like models, which are necessary during the process, so they had to use their mobile phones to produce slowmations. Though all participants had mentioned that this experience contributed to some of the 21st century skills like technology, media, creativity skills, the low quality of the slowmations produced by the pre-service teachers has a contradiction with their thoughts. The difficulties they stated and their final products imply that the pre-service teachers did not demonstrate enough performance in the 3rd, 4th and 5th steps of 5R technique in creating slowmations (Hoban & Nielsen, 2010). A similar result was also found by Atalay, Anagün and Kumtepe (2016) in their studies concluding that pre-service teachers were not good at forming models, photographing the models and creating the animation. However, it should be noted that the pre-service teachers were provided with two sessions and workshops lasting about six hours at the beginning of the semester, during which the theoretical framework of slowmation and

sample slowmation making process were presented. However, Keast, Cooper, Berry, Laura and Hoban (2009) found out in their study that "slowmation worked best when the teachers had a series of lessons in which to complete the task and when the lessons were structured in a particular way (first lesson for storyboarding, second and third for taking photos and the final lesson for presentations). On the other hand, the pre-service teachers followed the steps of slowmation process and produced their slowmations with limited equipment and materials under the condition of lockdowns due to Covid-19. Therefore, it can be said that the circumstances due to lockdowns and Covid-19 might have made it difficult for the pre-service teachers to demonstrate their skills effectively and producing high-quality slowmations.

Another result of the study obtained in the third theme of the study (see Table 3) is that the pre-service teachers seemed eager to use slowmation method in their future career. They stated that they would have their students produce slowmations or they, as future teachers, could produce their own slowmations and use them in their lessons. However, it was found out from almost all the pre-service teachers' expressions that they preferred to include their students in slowmation process instead of making their own slowmations and using them in their future career. On the other hand, the pre-service opinions that slowmation can develop primary schools students' learning and innovation skills, information, media and technology skills, social skills, language skills, psychomotor skills, grasp the attention and interest of these students, enrich teaching and learning setting and bring about collaboration and cooperation among the students are parallel with the findings of the studies by Atalay and Belet Boyacı (2019), Ciğerci and Gültekin (2017), Fleer (2013), Ochesner (2010), whose studies included children in primary or middle schools. Likewise, Hoban and Nielsen (2010) state that students learning can be enhanced through group works to create their own animations, while Hoban, Ferry, Konza and Vialle (2007) state that slowmation can provide a facilitating effect on the classroom method by ensuring that the students are intertwined with technology. Another result obtained from the findings in the third theme is that though slowmation have been included mostly in studies in science teaching (Atalay, 2015; Hoban, 2005; Hoban & Ferry, 2006; Hoban, Ferry, Konza & Vialle, 2007; Hoban, Macdonald & Ferry, 2009; Hoban and Nielsen, 2010; Pak, 2020; Uzun, 2015; Uzuner, 2018), it can be used in other courses or disciplines like language teaching course as in this study, life studies, social studies, value education and other ones and further researches can be made on the use and effects of slowmation in other courses. Besides this result, depending on the statement by one pre-service teacher, it can be said that slowamtion process may serve well the philosophy of constructivism. Likewise, Hoban, Nielsen and Carceller (2010) in their studies on student-generated animations used the term "constructionism", which is based on an integration of constructivist views of learning and social views of learning and stated that designing and making animations require students to make research, design and construct a model which is a representation of their knowledge.

One of the most remarkable results of the study is that Covid-19 pandemic disease has affected the mood or psychology of the pre-service teachers leading them to be worried and loss their motivation and get bored due to lockdowns, which can be said to be indispensable effects of Covid-19 together with many other negative impacts. According to studies on the effect of Covid-19 (Cao, Fang, Hou, Han, Xu, Dong and Zheng, 2020; Liu, Liu, Zhong, 2020; Pragholapati, 2020), the mental health of students is affected in a negative way in case of a public health emergency and quarantine life is accompanied by psychological consequences as well as social and economic ones. The increase in anxiety, depression, worry, fear, tension is among the most common results of Covid-19 and these conditions may lead to acute stress disorder, post-traumatic stress disorder, depression and even suicide. Despite all these undesired effects of Covid-19, it is found out in the study that the pre-service in this study have met distance education for the first time in their life as they stated and that some of the participants mentioned about blended learning. They did not use the term "blended" learning as most probably they did not know the term (see the sample quotation of P12 in Table 4) and instead defined it as "the combination of face to face and distance education". Though there were some pre-service teachers who favored blended learning, most of them believed that face-to-face education was better. Depending on statements of the pre-service teachers preferring blended learning could be said

to have been influenced by the certain factors affecting blended learning satisfaction as listed by various researchers. For instance, Bolliger (2004) point out three *factors instructor, technology* and *interaction*, while Naaj, Nachouki and Ankit (2012) define six factors: instructor, technology, interaction, instruction, class management and learning management system. Since the decision on the closure of schools by Ministry of National Education and Higher Education Council in Turkey was taken, the students have been going on their education via distance education and thus, they have been experiencing those factors listed above as they have been following their lesson either online or offline, making contact with the instructors through Zoom, Edmodo, WhatsApp, e-mails and/or learning management system of the university. Finally, one of the satisfying results of the study is that during the lockdowns, the pre-service teachers have made individual studies to develop themselves by making use of the Internet, attending educational forums, keeping in touch with their friends and teachers. These studies can be said that the pre-service teachers have been trying to take the responsibility of their own learning and to become autonomous learners.

Considering the above discussion points and the importance of slowmations in teaching and learning setting, some suggestions for future can be put forward. This study was limited to 15 pre-service teachers in primary education department. Future studies can be made with more pre-service teachers in primary education department as well as other departments. This study had to be conducted via distance education due to Covid-19. Further studies on slowmation with quantitative or mixed methods can be conducted with pre-service teachers via face-to-face education and the studies can also include in-service teachers. The slowmations prepared by pre-service and in-service teachers can be applied in classroom environments in schools and the eff+ects of slowmations in various courses like social studies, life studies, Turkish language teaching can be analyzed. Apart from the slowmation to be prepared by pre-service and in-service teachers, students at primary, secondary, high and university students can be given workshops on slowmation can be arranged and studies can be conducted with primary school students.

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APPENDIX

In this part, there are images of the pre-service teachers' experiences and scenes from their slow motion animations on WhatsApp and Edmodo.