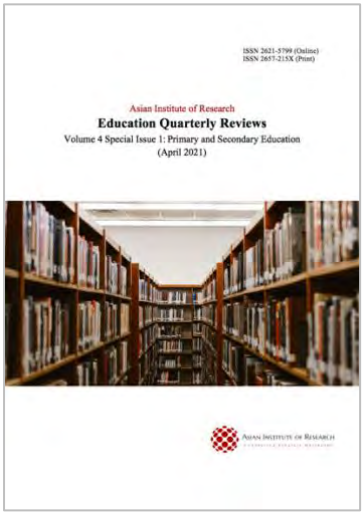

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Review on Montessori Educators' Opinions Concerning the Digital Assessment Tool They Use in Terms of 21st-Century Skills

Fatma Merve Şimşek[1] & Mehmet Nur Tuğluk[2]

[1] Yildiz Technical University, Istanbul, Turkey. ORCID: 0000-0003-4959-0702
[2] Yildiz Technical University, Istanbul, Turkey. ORCID: 0000-0003-2007-5942

Correspondence: Fatma Merve Şimşek, Master's Student, Social Science Institution, Yildiz Technical University, Istanbul, Turkey, E-mail: fmervesmsk@gmail.com

Abstract
This study aimed to examine the opinions of Montessori educators on the digital assessment tool they use in terms of 21st-century teacher skills. The study sample covered 14 Montessori educators working in early childhood classes in public and private preschool educational institutions, located in Barcelona and Istanbul, where the Montessori educational approach is applied. In the study, the experiences of the Montessori educators with the digital assessment tool they use as the assessment tool were examined in terms of the identified 21st-century teacher skills. To this end, the research was designed with a phenomenological approach in the qualitative research method. The data were obtained through the personal information form and structured interview questions prepared for the digital assessment tool used by the Montessori educators. In the analysis of this data, the phenomenological study of Moustakas (1994) was introduced through the steps of the analysis. The perspectives of the Montessori educators concerning digital assessment, their application experiences regarding the digital assessment tool, and their views on their experiences were discussed in terms of utilization of the digital tool applications, as well as to use and evaluate information, their skills regarding collaborative work and communication, and finally their communication skills with the parents, which are among the 21st-century teacher skills. It was concluded that different factors influenced the opinions of the Montessori educators, where there were positive and negative expressions within the scope of these skills regarding the digital assessment tool.

Keywords: Montessori Education, Digitalization, Digital Assessment Tools, 21st-Century Assessment, Early Childhood, Phenomenology

1. Introduction

1.1 Introduce the Problem

Beginning when a child is still in the womb, the vital signs are monitored and recorded, as are the time of birth, average heartbeat per minute, breathing, reflexes, and appearance of the skin (Wortham, 2014). All of these data are obtained with the aim of getting to know the child and create a suitable environment for him/her. The

recognition process, which consists of numerical and medical information in the first years of life, changes and becomes multidimensional as time passes.

Getting to know the child in early childhood is the first step in evaluating them. In terms of the lexical sense, assessment is derived from the meaning of attributing importance to an object (Slentz, 2008). As a concept, the assessment covers all measurements and examinations to answer questions about what children know and what they can do (McAfee and Leong, 1997). Assessment in preschool education is a systematic process in which information is obtained through observations, interviews, portfolios, projects, tests, and other sources that can be used to gain insight into the characteristics of children or programs (Marion, 2015).

On the basis of Carr (2001), this systematic process can be explained as follows:

- There should be an interaction of quality between the teacher and the child.
- The child needs to be encouraged to take responsibility for his own learning.
- The fact that the child reaches a higher level is targeted.
- Positive learning trends need to be ensured.

Making the assessment right is crucial in creating positive learning experiences and academic success. (Neumann et al., 2019) Assessment in preschool education means assessing the child's learning and development holistically.

Assessment in Montessori Education is a continuous process that allows us to see the achievements concerning the child holistically within and as a result of the education process. Similar to monitoring and recording the vital signs of the child, Maria Montessori formed her philosophy by watching the child and getting to know him/her (Kramer, 2017). Therefore, it is very important to be aware of the interests, needs, and individual characteristics of the child; in other words, to know the child in order for the Montessori educator to provide the appropriate environment for the child (Gutek, 2004). Montessori expressed the importance of the development of the child during this period with the concept of the ‘absorbent mind,’ in which the child takes all of the stimuli around him/her into his/her mind through absorption. This period, which covers the period from birth to six years of age, is important in terms of acquiring the skills that will form the basis of his/her life, as well as creating social and academic life experiences that will affect the later periods of his/her life (Poyraz & Dere, 2003).

According to Montessori (2015), children have sensitive periods during the pre-school period. Montessori stated that these sensitive periods are critical time zones for development to take place, and it is essential to provide the necessary stimulation. The role of the adult for in the education of the child during this period is to guide their desire to learn and understand this environment in which the child absorbs like a sponge in its nature. This guidance creates an educational environment appropriate for the child with individualized education, which is a characteristic feature of the Montessori approach (Isaacs, 2007). Therefore, a Montessori educator is a good observer above all (Durakoğlu, 2010).

Observation, which plays a leading role in assessing the progress of the child and planning for the next steps, allows the ability of Montessori educators to be reflective in interpreting the observed behavior of the child. Moreover, these observations serve as a record-keeping and assessment tool and provide information on the planning and modification of the environment (Isaacs, 2010). The data obtained for each child through observation is recorded in many ways. Some are recorded with tools such as observation reports, time records, daily work plans, expert checklists, critical indicators, etc. (Korkmaz, 2013).

In the 21st-century, technology has created an area of utilization in the field of education by its introduction into human life and its day-to-day development (Taşgın, 2019). In this sense, technology that enables recording, analyzing, and sharing of data obtained through observation in a digital environment emerges as an assessment tool in early childhood education, as well.

Wortham (2014) referred to the digital assessment tools, which he called "the technology-based assessment," as the adaptation of on-paper assessments, such as reading or math checklists, or in connection with a particular curriculum to computer software. Feld and Bergan (2002) referred to it as the electronic management of learning and stated that it makes recording, analysis, and reporting of the learning data of a child possible, and it can then be used to document learning outcomes and plan for subsequent learning goals and activities. Through electronic learning management, parents, teachers, and administrators have access to information on curriculum planning based on the learning and assessment of the child (Feld and Bergan, 2002; Wortham, 2014).

In the 21st century, the use of technology to address the complexities of class assessment can provide a medium (Heritage, 2018).

In the UK, it is known as a computer-based system (computer-based assessment) and is divided into two systems, namely private and state-developed. E-Profile is an example of a computer-based system designed by the government to help classroom teachers record profile assessments for the English curriculum. This system allows teachers and managers to monitor the success of Early Learning Goals and acts as a medium for reporting the information in charts and reports. This system, called the E-Profile system, also allows for reporting by the parents (Featherstone, 2013).

In Turkey, it has been decided that the digital assessment system will be included within the scope of the 2023 Education Vision published by the Ministry of National Education in 2018. Within the scope of the 2023 Education Vision, the decisions regarding the digital assessment system are as follows:
Measurement and assessment area
Objective 1. Measurement and assessment methods will be activated to improve the quality of education
Article 6: An E-Portfolio, which was designed for the assessment and improvement of all areas of the development of children, will be created based on the protection of the data of the child in a way that will start from early childhood education and continue in the upper levels of education.
Article 7: Special training for parents will be designed for the digital measurement and assessment applications.
Objective 2. The social, cultural, and sportive activities of the child will be monitored
Article 3: The social, sportive, and cultural activities of all children will be compiled in the E-Portfolio. Every child should have the option to be the best of what he/she can be, feel that he/she has it at every moment of their educational life, and has enough opportunities to move forward on the path he/she has chosen in order to reveal his/her full potential. The responsibility of a good assessment system is to support all stakeholders, who are responsible for making sense of the abilities of the child and increasing them, to make accurate and meaningful decisions on this journey.

The objectives and articles covered by the 2023 Education Vision set forth by the Ministry of National Education showed that a digital assessment system had been introduced to monitor, assess, develop and steer children (MEB, 2018). Thus, it was understood that the issue of assessing, monitoring, and supporting the individual characteristics of each child, which gains importance in the 21st-century, is being carried out.
Some of the digital (online, electronic) record-keeping tools used to keep records in Montessori education are as follows:

- Montessori Records Express is a program that allows teachers to monitor and follow-up progress, plan, save, and report studies. They can copy and paste work from other schools that use the software, or prepare studies specific to their class. There is also a portal for parents in the system.
- This software, the Montessori Compass, which also offers a free 14-day trial, is available on all devices. It provides the opportunity to record attendance, classroom observations, and course ideas and plans. Moreover, the features of printing weekly work plans on the system, overseeing classroom progress at a glance, and communicating with parents are available, as well.
- The Montessori Workspace is a system that allows the teacher to monitor progress, record social observations, and create customized reports and lists (https://carrotsareorange.com/transparent-classroom/).

Within the scope of the study, two digital assessment tools were examined via the opinions of Montessori educators. Transparent Classroom is the digital assessment tool used at the Montessori school in Barcelona, and Sap Fiori is the digital assessment tool used at the Montessori school in Istanbul. The historical process and content of these digital assessment tools are given below.

Transparent Classroom

This assessment tool is software that allows the recording of observations concerning children in Montessori classrooms in a digital environment and making various assessments of the development of the child as a result of the possibilities enabled by technology. Originally developed in 2012, solely for the purpose of keeping records for Montessori educators, this tool later began to allow sharing with parents. The tool was created by a team of eight people, including an Association Montessori International-certified Montessori educator. Even though Transparent Classroom is a software that was developed in Seattle, it has users in many regions of the world. There is also a website where the contents of the tool and all information about the tool can be accessed. Transparent Classroom provides Montessori educators with a wide range of use detailed under headings including record keeping, child profile, meeting reports, and optional features.

SAP (System Analysis and Program Development) Fiori

This system was created in 2019 through the preparation of the interface in SAP Fiori software for the purpose of recording observations and sharing information with the parent for the parents and educators of a special educational institution. This tool is also used in all steps of the educational institution and teacher-related personal service procedures. Under this heading, a digital assessment tool section of the SAP Fiori tool designed for the Montessori method will be explained. The tool was designed by the information technology department of the educational institution in cooperation with Montessori educators. It was created with the combination of the information about the title and subheadings of Montessori studies of educators and software information of the information technology unit.

The SAP Fiori digital assessment tool consists of the observation records for the Montessori studies, and the teacher and parent notes regarding the observations on the profile page of the child, branch lessons, photo and document upload, guidance, and absence tabs.

In addition to the use of digitalization for assessment in education in the 21st century, other skills have also emerged. Although these skills have common traits, the skills created by different institutions and organizations are shown in Table 1.

P21-Partnership For 21st Century Skills	NCREL En Gauge-North Central Regional Educational Laboratory	ATCS -Assessment, And Teaching Of 21st Century Skills	NETS/ISTE- National Educational Technology Standards	EU-European Union	OECD-Organization For Economic Cooperation And Development
Learning and Innovation Skills Creativity and Regeneration, Critical Thinking and Problem-Solving Communication and Collaboration	**Creative Thinking** Adaptation, overcoming complexity and self-management Curiosity, risk-taking and creativity	**Ways of Thinking** Creative and Innovative Critical thinking, problem-solving and decision-making, -Metacognitive awareness	**Creativity and Innovation** Creative thinking, structuring information and turning it into the product, and use of technology in the process	**Learning to Learn** **Communication** Communicating in the native language Communicating in the foreign language	**Interaction with heterogeneous groups** Building good relationships with others Working as a team in collaboration Managing and resolving complex events
Life and Career Skills Flexibility and Adapta**tion skill** Initiative and Self-Management Social and Intercultural Skills Leadership and Responsibility	**Effective Communication** Working in cooperation as a team, Personal, social and citizenship responsibility, Interaction	**Working Paths** Communication Collaboration	**Critical thinking, problem-solving, and decision-making**	**Cultural awareness, Social and citizenship adequacy, Entrepreneurial sensitivity**	**Ability to act independently** To move in the great scheme of things To create and carry out life plans and personal projects; Defend and assert rights, interests and needs
		Living in the World Global and local citizenship Life and career Personal and social responsibility (Cultural Awareness)	Communication and Collaboration Students use of digital media and mediums to communicate and collaborate	**Digital proficiency**	
		High Productivity Effective use of Planning and Management Tools Production capability and high quality products	Digital Citizenship Understanding cultural and social issues through technology		Use of technology tools Use of language, symbol and text Use of information Use of technology
		Working Tools Information literacy, Information, Communication Technology Literacy	**Technological Applications and Concepts** Understanding the meaning, systems and applications of technology		
		Digital Age Literacy Basic, scientific, economic and technology Visual information literacy Multicultural literacy and global awareness	**Research and Information Fluency** Use digital tool applications to obtain, use, and evaluate information		

Voogt, Jockey, Natelia, Pareja Roblin. 2010. 21st-century skills. Discussion Paper. Zoetermeer: The Netherlands: Kennisnet. c. p.23 3:2000.

2. Method

This research was developed using qualitative research methods to interpret the experience of Montessori educators regarding the digital assessment tools they use by considering their opinions. Qualitative research is a method in which literature does not provide sufficient information about the phenomenon being studied, so it is a way to attain detailed data about the phenomenon from participants (Creswell and Poth, 2018). One of the patterns of qualitative research, the phenomenological study, is an approach that closely examines how an individual interprets his/her experiences (Cilesiz, 2011; Lodico et al., 2010). In this study, it was aimed to uncover and interpret the experiences, perspectives, and attitudes of the Montessori educators towards digital assessment tools that are considered as phenomena.

2.1. Determining the Study Group

The study group consisted of Montessori educators who provide Montessori education, use a digital assessment tool as a means of assessment. and work at two schools that have official private school status in the cities of Barcelona and Istanbul. Of the 14 participants, 3 used the digital assessment tool called Transparent Classroom at the Montessori school in Barcelona, whereas 11 used the SAP Fiori digital assessment tool at the Montessori school in Istanbul. The phenomenological study consisted of the experiences of the participants with the specified phenomenon. It was very important that all of the participants had experience with the phenomenon being studied. Criteria sampling required that all of the individuals examined should represent those who have experienced the phenomenon (Creswell and Poth, 2018). For this reason, the criterion sampling method, which is one of the purposive sampling methods, was selected in determining the study group. The research had criteria for the inclusion of participants in the study group, which were determined during the preparation stage of the study, and was set forth as follows: The participants in the study group should have received Montessori educator training from an officially trained institution, and use a digital assessment tool designed for Montessori education as the assessment tool in educational institutions designed with the full Montessori method in early childhood category. Moreover, the concept of ‘experience acquired’ in phenomenological research was very important. This study covered the experiences acquired by the participants between 2 months and 2.5 years of phenomena usage; in other words, the digital assessment tool. Purposive sampling, which allows the sample to best represent all of the diversity indexes, provides maximum diversity in qualitative research with different people and environments in a selected sample (Maxwell, 2013). In the study, the experience durations of the participants enabled the provision of maximum diversity. The entirety of the experiences of the participants with the digital assessment tool was discussed.

2.2. Analysis of data

There are many approaches to analyzing data acquired through the phenomenological approach (Merriam, 2009; Moustakas, 1994). The data obtained within the scope of this study was analyzed by following the steps developed by Moustakas (1994). The Moustakas phenomenological data analysis procedure was followed in the analysis of data collected from educators through the phenomenological interview.

Interviews with educators were recorded on video and transcription was performed by the researcher within a maximum of 3 days. The punctuation and spelling that the participants gave were ignored while transcription was being performed, and put on paper in a computer environment. After the recording was transcribed, the recording was listened to several times to check for errors. This was to ensure the accuracy and uniformity of the coding and themes from the transcriptions, which were attempted to be made without errors. Moreover, accuracy and uniformity were achieved through review analysis.

2.3. Validity and reliability studies

Van Manen (2014) stated that the validity of a phenomenological study should be sought in the evaluation of the robustness of the authenticity and interpretation of the meaning shown in the study. Therefore, one of the characteristics of qualitative research is that it does not have any concerns regarding generalizability.

Therefore, the validity of the research is the focused effort of understanding that can be associated and explained with the problem of the research in interviews and analyses conducted throughout the study. In order to ensure the reliability of the research in this explanation and interpretation process, the first thing the researcher must do is implement the epoché process. In other words, the researcher excludes his/her own experiences from the research. For this purpose, the researcher put his/her own experiences on a paper and then examined the experiences of the participants. Thus, during the data analysis, he/she tried to increase the characteristics of the research as reliable and unbiased by keeping the experience that he/she had put on paper separate from those of the participants (Yüksel and Yıldırım, 2015).

Moreover, strategies for the validity studies were also introduced to ensure validity of the research by bringing together insight from qualitative research history that defined strategies such as the length of time that the researcher has spent in the field of research, rich definitions, and closeness with participants in the study, and recommended that at least two of these should be followed in the study. The strategies used to ensure validity in the study are given below (Creswell and Poth, 2018).

Peer review, detailed and wide descriptions, external auditing, length of time in the field of research, and observation were among the strategies used to ensure validity. The interview questions used to collect data were created by taking expert opinion and conducting a pilot scheme, and external auditors were included in the research process. The themes generated as a result of the data collected from the study group were also reviewed by another Montessori educator. As a result of the peer review, the themes were finalized by looking at the harmony and disharmony between the themes. Without making any changes to the transcription and analysis of the opinions of the educators, it was attempted to express the findings in rich definitions and explanatory detail.
Reliability in qualitative research is the consistency of the study by non-researcher individuals. In this sense, the use of an online interview program while collecting data was a factor in the reliability of the work in terms of recording the entire interview and then making transcripts of these records. The fact that the interviews were transcribed as they were, including pauses during speech, intonations, and sound drops, had a strengthening effect on their reliability, as well. (Creswell and Poth, 2018).

3. Results

When the data were analyzed, it is found that while talking about their experiences regarding the digital assessment tools, the Montessori educators associated them with ease of use, sharing with parents, and Montessori studies. It was also observed in the interviews that the Montessori educators included statements about their own observation styles and observation recording methods. Although these statements did not give information directly about the digital assessment tool, they were examined as a separate theme, as it was important for the educators to be able to understand their feelings and attitudes toward the digital assessment tools through a holistic approach. As a result, the data obtained revealed four main themes, which comprised: ease of use, sharing with parents, Montessori studies, and non-digital assessment tools. Within the scope of the study, among these themes, the themes of necessity of usage, communication with the parents, and communication and cooperation among Montessori educators were selected. The selected themes are shown in Figure 1.

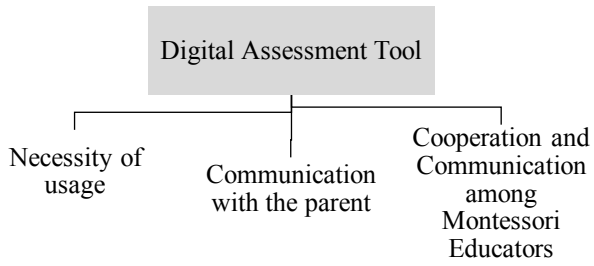

Figure 1: Selected Themes

3.1. Views of the Montessori Instructors on the Necessity of Digital Tools for Using and Assessing Information

The findings regarding research and information flow, the need to use the digital assessment tool by Montessori educators for their ability to use digital tool applications in order to make use of and evaluate information, as determined by the International Society for Technology in Education (NETS/ISTE), are shown in Table 1. Moreover, the opinions taken were classified as positive and negative statements towards the digital assessment tool being used.

Table 1: Opinions Regarding the Necessity of Use

Opinions on the Necessity of Use	**Participants' statements**
	Positive statements "It makes it easier for the teacher to be online and digital, so that other partners and parents can be informed of the observation data entered about the children." K3 "In fact, I think the palest ink is stronger than the sharpest memory. We also write on paper, but the storage of these data of the child online will be very useful to the other teachers of the child in the next few years." K4 "I think it is necessary because we live in a digital age, and in this age, everything is actually recorded there, and if we think about why we use it, the most accurate data is the data recorded digitally. I think it makes sense to use it for transferring information to the next teacher." K7 "It is a good thing on behalf of the institution that the information about the child is kept in a neat and tidy manner, and that they have data on hand." K10 "It is effective if we consider it as transferring the observation forms to the digital field. I find it more functional to use technology actively and fill out forms on the phone than buy and write on printed paper." K11 "A user-friendly platform where I can save data and share information with my assistant, and share photos and comments in terms of sharing information concerning family, and create graphics." K13 **Negative statements** "As a teacher, it does not encourage me to assess because it is very difficult to use, there are so many tabs. It is supposed to be fast, but it is slower than normal." K1 "I think that it is good and healthy for educators to have a folder where they can keep their own notes instead of keeping it in digital form in terms of teacher observations,

Continuation of Table 2: Opinions Regarding the Necessity of Use

Opinions on the Necessity of Use	Participants' statements
	"So I do not think it is very necessary, I do not think we get much efficiency. "There are three options, namely "presented," "working on it" and "specialized"; and they cannot fully express the child." K6 "It is a very useful application, but without it, we can take notes and prepare reports of the process." K8 "At the same time, it is compelling for us as we do not do a desk job, and we do not always have a phone at our disposal." K9 "I think it is not necessary. I do not find the Fiori system very useful. The problems faced by the teacher during entries." K12 "You can also write it on paper, but the digital assessment tool saves time to file reports for families, which is very useful in this sense, but I do not think it is exactly necessary, we can do it another way." K14

When Table 1 is examined, it is understood from their expressions that the Montessori educators had both positive and negative opinions regarding the necessity of the digital assessment tool they use. Among the Montessori participants, K3, K4, K5, K7, K10, K11, and K13 said that a digital assessment tool is necessary in terms of data sharing, data access, and practicality, whereas K1, K2, K6, K8, K9, K12, and K14 said that a digital assessment tool is not necessary for Montessori education due to its usage difficulty and inefficiency.

3.2. Findings on the Effect of Digital Assessment Tools on Montessori Educators' Communication with Parent

The findings concerning the views of the Montessori educators on the "communication with the parent" feature of the digital assessment tools used are shown in Table 2.

Table 3: Opinions on The Feature of Communication with the Parent

Opinions on Communication	Participants' statements
	Positive statements "We had monthly newsletters, and we could upload the food list. We can upload information such as newsletters, meal lists, announcements, organizational events that affect the entire class." K1 "Our general target was to share with our parents the information about children, the things they do and their photos." K3 "After all, we are living in a society of technology, and we need to inform the families. Rather than sending photos on WhatsApp, the SAP Fiori system is a much more formal platform for us." K5 "It is more of a tool for schools to keep data, to share with parents about what is been done with their child, and share newsletters, meal menus, and to keep parents informed," K5 "I am first working with the child in class; and when I am working, I have a notebook in my pocket. I take note as "this child is studying this subject" In fact, when I enter the study data into the system, I write a comment about the child for the parent." K6

Continuation of Table 4: Opinions on The Feature of Communication with the Parent

Opinions on Communication	Participants' statements
	"When we have an appointment with a parent or when we organize a meeting, we can enter records of the conversations there. This makes it easier to get a robust report." K7 "Sharing photos with parents, checking presentations made to children, and being able to receive reports for parent meetings." K8 "We usually enter our observations into the system on Fridays. It is spontaneous, and the parents can access the system with their passwords. There is no supervision by the administrators. but some of the parents are very interested, they are logging in at least once a week as they check the studies in which their child participates." K9 "There are the notes of the teacher and the notes of the parent parts. We put a full stop there because we cannot record it without writing something down." K10 "You can write a statement there if you want, but this statement is visible to other teachers, and the parent can see it, as well." K11 "We can share some of the information entered into the system with parents, and use it as a means of communication." K13 "We send emails every second Friday. We send all of the studies and presentations, but parents can access the system at any time they desire. The main goal is to share with parents what has been done concerning their children, and share the level and the studies that the child participates in, and be able to create reports and establish a network between family and the class." K14 **Negative statements** "Most parents cannot use it because they find it difficult to use, or they do not look at the tables we entered. They just look at the photos and use the download feature for the photos." K1 "The parents do not like this system, and they have expressed that the operator side is challenging, and that they cannot access the data very easily. I think that the turnout is very low, and I can tell you that it is one-third." K2 "Parents think it is a system mostly used in many business systems as they do not know much about the system; so, they have demanded from us that we send these issues and the photos over WhatsApp. They are not very interested in the written stuff. I wrote there "pressure tubes," but not many people searched to see what pressure tubes are. We had a parent who googled for it specifically. There are only a few parents, and most of them do not use it; we use it." K4 "The parents do not check, we can tell from the bulletins. When we mentioned the bulletin we uploaded monthly, they said they did not look at it." K5 "Make it "working on it" as the parent will see it, but the parents are waiting for us to report back. They see the name, they see there that the child is working on it, but what is it? It is not efficient in that sense. Parents do not often take a look at it. There were only two parents and one was a computer engineer. They had previously used this system for other purposes, so that parent was very interested. We thought maybe we should send it through WhatsApp now, but even if we continue to load it and steer the parents to it, they are not very interested." K6 "We already use this system to share our observations with parents, but we also get feedback that it is quite complicated and that they do not enter the system For example, "student is studying engraved numbers." Aside from this field, there are also comment fields for teachers and parents, but I do not use it." K12 "It is a good tool but I do not think it is very reliable. I do not think it is necessary for the family to see what is been done all day. I think it is too much. It cannot replace a one-on-one meeting with the family." K14

When Table 2 is examined, it is understood from the statements that the Montessori educators had both positive and negative expressions regarding the feature of digital assessment tools being used to communicate with the parents. Among the participants, while K1 mentioned that the ability to share information, such as newsletters and meal lists, with parents through one-way communication channels was a positive feature of the digital assessment tool, K3, K5, K6, K7, K8, K9, K13, and K14 expressed that informing parents about their children's studies in school in parental communication was a positive effect of digital appraisal tools. In the table, it is understood that K1 and K5 had both positive and negative opinions of their digital assessment tool in terms of communication with the parent.

3.3. Findings on the Effect of Digital Assessment Tools on the Ability of Montessori Educators to Work in Collaboration and Communicate with Each Other

The findings on the digital assessment tools obtained in the study concerning the effect of digital assessment tools on the ability of the Montessori educators to work in cooperation and communicate with each other are shown in Table 3.

Table 5: Findings Regarding the Ability of the Montessori Instructors to Work in Collaboration and Communicate with Each Other

Opinions on Communication and Collaboration	**Participants' statements**
Communication	Positive statements "There is a field on this checklist where only teachers can see the way the children work academically. Considering the moments when he/she cannot share with the other which child is doing which study during the day, both teachers can see what the other teacher enters there, which level the child is at, and instead of taking the time to communicate with each other, we are able to obtain this information there." K2 "There are cases where it facilitates communication with each other, but there are also cases where it is necessary to communicate it privately. In one case... I did not come to school for a few days, I did not know what was done. So, if we are stuck about what was done with this child, which level we are at, and if it is something we cannot observe, then yes, it can be checked there. For example, "we have studied it with this student, but we can also do this and that as well," and "he/she seems to need support on this." But since they saw the same screen through the system as me, let us say that I worked on engraved numbers with a student, I say that this kid needs to study again 3 to 6 times. And when I enter the explanation, my other colleagues can see the explanation. So, he/she can see the details of my work by reading my views." K7 "Teachers can write notes there for each other because we keep entering our notes about the student, which is efficient for other teachers to enter; we do not have to take notes. Then we can forget." We can see the child's studies there, as well; and then we can see the last study of the child while planning what he/she should learn, and plan the next study accordingly." K9 "Let us say daily life, grace, kindness... I click the other study that have been opened under it, and if I have a teacher's note, I enter my note." K10 "We can see which teacher made which presentation. Yes, there are sometimes overlooked issues when you write in the notebook, but when you look at the system, we can see which teacher is doing a presentation for which child. You can write a statement there if you want, but this statement is visible to other teachers; and the parent can see it, as well." K11

Continuation of Table 6: Findings Regarding the Ability of the Montessori Instructors to Work in Collaboration and Communicate with Each Other

Opinions on Communication and Collaboration	Participants' statements
Communication	"My colleague and I can enter all of our observations. First, we take notes in our notebook, then we enter them into the system. I see it quite positively in that sense. During the day, we are able to take a break at different times, and it is impossible for us to meet and exchange information. We can see what has been done through the Transparent Classroom, daily. We have a weekly meeting, of course." K13 Negative statements "It had no effect on communication." K1 "But SAP had no influence on the transfer of the information by the teachers." K5 "We did not need to open and look at it anyway; we open our observations book and look in order to move on from level where the student was." K6 "Every week there are children with whom the teacher worked. We group the children there per educator, but we do not use it so much for communication. In the later period, the teacher looks at the observation book when he/she wants to see it." K12 "I do not really need it very much. Because it is more important that I observe the children directly. It is better to have a meeting together." K14
Collaboration	**Positive statements** "One week it can be one teacher, and another week it can be a different teacher." K1 "We usually enter them into the system at the end of the week on a Friday, sharing what we have worked on with the kids throughout the week with other teachers. In order to collaborate with each other, we group the children per educator, and share the data entered using this application." K3 "We enter the Montessori observations with the collaboration of 3 or 2 teachers. We just enter the information we want to enter by collaborating." K5 "If we think about the number of students. Three teachers last year, two teachers this year. If we can share it and enter it into the system, it makes it easier for us. Anyway, it can be seen which presentations are entered. I have not had problems at this point; it even makes our job easier when it comes to photo entry. For example, we have 24 students and from there we upload photos of 7 students per teacher." K7 "When there are 3 people in the classroom and the number of children in the classroom is high, let us say that the number of students is 24, it makes 8 children per 3 teachers. Whoever we are working with that month to share our workload, we say that "I do all the work related to the child that month," and we do the division of labor and try to make our job easier." K10

When Table 3 is examined, it is understood from the statements that the Montessori educators had both positive and negative expressions regarding the digital assessment tools they use with respect to communication and cooperation with the other educators working in the same class. While Montessori educators K2, K7, K11, and K13 emphasized that each educator can see the study presented by the other in the digital assessment tool in terms of informing each other about the presentations they made, K9, K10, K11 expressed that, through the digital assessment tool, they can inform each other about the condition of the child in the study process. K1 and K5 stated that the digital assessment tool had no effect in terms of communication between the Montessori educators, whereas K6 expressed that they use their own observation book instead of the digital appraisal tool in that sense, and K14 stated that the Montessori educators should meet face-to-face instead of using the digital assessment tool in this sense.

When Table 3 is examined for the effect of the digital assessment tool on the cooperation between the Montessori educators, it is understood that the statements were positive. According to the table, concerning the digital assessment tool for collaboration between the Montessori educators, K1, K3, K7, K10 stated that they collaborate for making presentations to the children and entering observation data into the digital assessment tool.

4. Discussion

In this section, the relation between the 21st-century skills and the related themes obtained from the views of the Montessori educators about the digital assessment tool were examined. The first skill considered as a 21st-century skill was the use of a digital assessment tool as a means of using and evaluating knowledge. While communication skills were discussed in terms of communication between the Montessori educators, and between the Montessori educators and the parents, collaboration skills were discussed in terms of cooperation of the Montessori educators with each other.

Within the scope of using a digital assessment tool as a means of using and evaluating information, which is one of the 21st-century skills, it was observed that the Montessori educators fulfilled this skill in practice, However, the analysis regarding the experiences of the Montessori educators with the Transparent Classroom and SAP Fiori digital assessment tools showed that the Montessori educators had positive and negative views on the necessity of utilizing the digital assessment tool. The fact that Lacina (2012) mentioned in his study that there are many benefits of online systems, as well as negative sides, supported the views of the Montessori educators. It can be said that the concept of 'digital" in the digital age was effective in the fact that the Montessori educators believed that a digital assessment tool was necessary. The concept of digital has been used to mean that the observation data obtained from children can be accessed and shared in another environment at any time, and they also stated that this opportunity as the result of technology should be used in education and assessment. Other educators expressed a negative opinion of the need for the use of the digital assessment tool for the assessment. Negative insights were negatively expressed in terms of the efficiency and usefulness of the digital assessment tool used. It was understood that the digital assessment tool was compared to the paper-based assessment. Some of the Montessori educators who use the SAP Fiori system said that the usage of the SAP Fiori digital assessment tool was necessary if its usage was facilitated, and some believed that it was sufficient to conduct the assessment on paper for this reason. Neuman et al. (2019) stated in their research on technology and assessment in preschool that it is difficult to make technology-based education assessment a part of good education practices, but it can be overcome by the joint efforts of a number of stakeholders, and that it is important to choose well the technological tool to be used. This was in line with the views of the Montessori educators that the tool was easy to use concerning their views on the necessity of using the digital assessment tool.

Another 21st-century skill examined was communication skills, which became more prominent with the development of technology, as mentioned earlier. As a result of this research, the Montessori educators highlighted the feature of the digital assessment tools to communicate with the parent. The Montessori educators had both positive and negative statements regarding the digital assessment tool. They expressed a positive attitude towards the digital assessment tool in terms of sharing the status of the children in the classroom and ensuring that the parents could see them. In fact, they used digital assessment tools in the sense that the parent could see how their child was doing. It was also understood that two-way and one-way communication were used with the parents. Montessori educators using the SAP Fiori digital assessment tool can share a photo, monthly bulletin, and monthly meal lists utilizing one-way communication. Moreover, the studies and study reviews of the children are communicated to the parents via the digital assessment tool. Montessori educators using Transparent Classroom said that in addition to parents entering the system at any time and seeing information about their child, they send information to the parents concerning the studies that their child takes part in every two weeks on Friday through the e-mail system of the digital assessment tool. This indicated that Montessori educators using Transparent Classroom utilized the digital assessment tool instead of their own personal communication channels in their communication with the parents. The study conducted by Migliorino and Maiden (2004) supported the fact that using an online record-keeping site has many positive aspects, such as

allowing parents to instantly access up-to-date information about their children from anywhere. Cases such as parents having problems using the system, and not understanding what the study involved had meant, etc., had a negative impact on parental communication. In his study examining the Montessori Compass tool, which was used as another digital assessment tool in Montessori education, Seril (2015) expressed that the Montessori Compass tool was used in communicating with the parent, followed by e-mail, and finally, phone. Moreover, the parents stated that they had difficulty in understanding the reports and entering the system. This fact coincided with the findings of this study, where parents preferred face-to-face communication due to problems such as finding the system complex and losing the password to enter the system, according to the feedback of the Montessori educators.

Collaboration and communication skills in the areas of study, which all institutions and organizations refer to as a common skill among 21st-century skills, become more important in terms of the relationship between educators, since there are multiple teachers in Montessori classes (data on the number of educators over the number of children has already been given). It was understood that the Montessori educators use their collaborative skills to record the observations of the children in the system through digital assessment tools, whereas different factors were effective in their communication between each other; therefore, it changes from one person to another. Neuman, et al. (2019), in their research on assessment and technology in early childhood education, stated that technology has many benefits for assessment. Thus, in the 21st-century, it is understood that in addition to the effect of digital assessment tools on communication and cooperation between Montessori educators, cooperation and communication skills have an important role in its adoption and the increase of efficiency.

5. Conclusions and Recommendations:

it was determined that the Montessori educators utilize a digital assessment tool as a tool to use and evaluate information which is among the 21st-century skills, but their perspectives on their usage vary positive to negative. It was seen that they use the digital assessment tool to communicate with the parents, and the effectiveness of this communication is affected by many issues. It was also observed that the Montessori educators had different perspectives and practices in terms of the effect of digital assessment tools on communication and collaboration with others. Some of the participants found it very useful in terms of communication with each other, while others stated that they did not feel the need to use the tool. Although the importance of the content of the digital assessment tool was emphasized in the study, it was understood that the perspectives of the Montessori educators influence their views on their experiences.

It is foreseen that the use of digital assessment tool technology will increase in Turkey and around the world as it integrates more and more into our lives. Therefore, more studies will be needed to increase the use of digital assessment tools and the quality of their content. In this sense, the recommendations for future studies are as follows:

- The use of digital assessment and similar tools can be researched in schools that provide preschool education under the Ministry of National Education in Turkey.
- The sample of the research can be enlarged, and the experiences of teachers regarding digital assessment tools can be revealed.
- The study can be conducted with Montessori educators in different countries using the same digital assessment tools.
- A study on Montessori educators, who use many different digital valuation tools, that compare different features of the digital assessment tool, can be conducted.
- A study can be conducted using digital assessment tools utilized in different education programs.

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