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I Have a Voice: Examining Augmentative and Alternative Communication Application According to Parent's Opinions*

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Abstract: Augmentative and Alternative Communication Systems (AAC) is an important method for individuals with limited verbal communication (speech) to access communication tools and communicate accordingly. This research examines the application process of the "I Have A Voice" Program, which produces tablet and computer-assisted speech, designed to support the communication skills of individuals with limitations in the verbal communication process, according to the parents' opinions. Within the scope of the research, while describing the application process of the "I Have a Voice" program, it is also aimed to examine the possible problems related to the application and its causes. Another aim of the study is to examine the views of family members about the tablet program and the effect of the Program on family members. In this context, 3 parents who received the tablet program training constitute the research participants. The research was carried out with a case study, one of the qualitative research methods, and the data obtained were analyzed with content analysisAAC supports accessibility and equality so that those with limited verbal communication can independently participate in a social order based on speech. In addition, if these systems are to be utilized effectively, parents must be taught how to use AAC.

Keywords: Augmentative and alternative communication, autism, parent education, speech generating device

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Introduction

Autism spectrum disorder (ASD), a diagnosis of 1 out of every 54 children today (Maenner et al., 2020), manifests itself with limited interests, limited social interaction, and communication skills (American Psychiatric Association [APA], 2013). The heterogeneous structure seen in the communication skills of individuals with ASD creates diversity for the support they need in the communication process. There are individuals with ASD who cannot speak or need support in the process of communicating by speaking despite receiving intensive training from an early age (Ganz, 2015; Kasari et al., 2013; Van der Meer & Rispoli, 2010). Studies have been carried out for years so that the diversity in communication styles of individuals with ASD can be socially accepted and they can live independently (Corr et al., 2015; Dekker, 2020; Fellowes, 2017; Short & Schopler, 1988; Verhoeff, 2013). The main purpose of these studies is to enable individuals with ASD to take part in life independently with their diversity. One of these fields of study is Augmentative and Alternative Communication Systems (AAC). Individuals with ASD can learn to communicate using AAC systems (Bondy & Forst, 1994; Dicarlo & Benaje, 2000; Romski et al., 2010). AAC systems provide an alternative or support to speech for communication (Beukelman & Mirenda, 2013; Tager-Flusberg & Kasari, 2013). Considering the history of AAC dating back to the 1950s, the increased awareness of the access rights of individuals with disabilities contributed to the development of AAC (Zangari et al., 1994). Therefore, Augmentative and Alternative Communication systems try to minimize the participation restrictions in the communication process of individuals who have limitations in verbal communication or who cannot communicate verbally, and which include attempts to support these restrictions in alternative ways (Ganz, 2015).

AAC consists of various techniques and tools such as picture communication boards, drawings, speech-generating devices, gestures and signs that will support the individual's ability to express feelings, thoughts, wishes and needs. AAC is based on evidence-based practices for individuals with ASD (Bondy & Frost, 1994; Mirenda and Brown, 2009; NCAEP, 2020; Sulzer-Azaroff et al., 2009). AAC is examined in two groups as communication systems that are unaided/do not require the use of a vehicle and that require assistance/use of a vehicle (Mirenda, 2003). Systems that do not require the use of tools are defined as the situation in which the individual communicates with non-verbal language such as gestures, facial expressions, hand pointing, sign language, which does not need a tool other than his own body. Systems that require the use of vehicles are considered as low-tech and high-tech systems. Systems that enable the individual to show or select a picture or object to convey one's feelings, wishes and thoughts (e.g. Picture Exchange Communication System [PECS]) are included in low-tech systems (Agius & Vance, 2016). Speech-producing devices and specially made electronic systems are included in high-tech systems. Today, with the development of technology day by day and the facilitating factor coming to the fore, high-tech systems are more preferred. Individuals in need can use these systems in a

period of their life as well as throughout their lives (Buekelman & Mirenda, 2013; Ganz et al., 2017).

Although AAC is known to have positive effects on the communication skills of individuals with ASD (Fried-Oken et al., 1991; Maglione et al., 2012; Mirenda, 2003; Tager-Flusberg & Kasari, 2013; Van der Meer & Rispoli, 2010) more research is needed (Kasari et al., 2014). There are studies on AAC in Turkey, but it is seen that AAC programs that produce speech and research on this subject are limited. The Touch-to-Talk program can be downloaded from Google Play and App Store stores and enables individuals who need verbal communication support to convey what they want to say by touching the symbols representing the word or sentence (Genc-Tosun, 2016). Another program is the program "I Have a Voice". The program "I Have a Voice" will be detailed in the following parts of the research. When we look at the studies, it is seen that the parents are not involved in the process in most studies that look at AAC effectiveness. In Turkey, no study has been found on parental teaching of an AAC program that produces speech. In order for individuals with ASD to take part in life independently, these systems should proliferate and parents should be guided about these systems (Angelo, 2000; Hettiarachchi et al., 2019). In addition, a skill that is in life and used in different environments, such as communication skills, must be supported by experts and the parents of individuals with ASD (Rocha et al., 2007; Sallows & Graupner, 2005). Education of the parents of individuals with ASD is emphasized in the literature (McConachie & Diggle, 2007; Orum-attk et al., 2020). Studies on the education of parents of individuals with ASD show that parents can applied the education given (Barton & Fettig, 2013). Studies on teaching AAC to parents also support this information (Angelo, 2000; Parette & Angelo, 1996). As family theory systems emphasize, families are at an important point for the success of AAC, and the use of AAC by a family member will affect all family members, including the extended family (Angelo, 2000In addition, worldwide home closures have begun due to the COVID-19 pandemic that emerged during the planning phase of the research. Therefore, awareness of the importance of parental education and the need for education of parents increased in this process (Karasel et al., 2020; Thompson & Nygren, 2020; Cahapay, 2020). Successful results in AAC applications refer to the cooperation of family members with experts during this application process and their commitment to the Program used (Huer and Lloyd, 1990).

In this study, the application process by parents of a tablet computer-assisted speech producing Program aimed at improving functional communication skills of individuals with ASD is being examined. Considering the place and value of parents in the education of individuals with ASD, in the study, parents were provided with the training of an AAC program called "I Have a Voice", and parents were allowed to support their children's functional communication skills in a natural environment. The process and outcomes of this tablet program used at home by parents trained in the research will be evaluated based on their opinions. No research has been found on the parent education of a speech-producing program in Turkey. Therefore, this research is a study that has not been tried before in Turkey. The main purpose of the research is to

examine the processes and results of the application of this tablet program at home by the families who received the application training of a tablet computer-assisted speech-producing program designed to improve the communication skills of individuals with ASD. Within the framework of this purpose, answers to the following questions were sought:

1. How do the participating children communicate with their parents and what is their educational experience like?

2. How is the parent's application process in the home application of the tablet program?

3. What are the parents' suggestions for the home app?

4. What is the contribution of the home application of the tablet program on parents and their children?

5. What are the parents' opinions about the tablet program's home application?

Method

This study is a case study on the examination of the processes and results of the application of this tablet program at home by the families who received the application training of the "I Have a Voice" program, which produces tablet computer-assisted speech designed to improve the communication skills of individuals with ASD. A case study is a qualitative approach in which the researcher collects long-term and in-depth information about a situation or situations in life and describes that situation (Creswell, 2013). In the case study, an intensive description and analysis of a circumscribed situation is made (Merriam, 1998). Within the scope of the research, the teaching of the first stage of the Android-based "I Have a Voice" application, which is an AAC application, to families with children with ASD and the process of applying the application at home by the families were examined in-depth, and it was thought that designing the research with a case study would be an effective way to answer the research questions. In this context, the process of applying the program at home and the families' experiences about the program formed the focus of the research. Multiple information sources (interview, researcher's diary, visual and/or audio materials) were used while investigating the experiences of the three parents participating in the study about the application processes of the program (Creswell, 2013). According to Merriam (1998), this research is a descriptive case study depending on the purpose of the research. The descriptive case study, on the other hand, is aimed at describing innovative programs and the phenomenon in the field of education (Merriam, 1998). In this case study, which seeks to comprehend the application process for a program at home, a comprehensive description of the program is provided. In this context, the researchers established the aforementioned case study definitions to serve as a guide for data collection and analysis.

Working Group

While determining the participants, the criterion sampling method, one of the purposive sampling methods, was used. There are several predetermined criteria in criterion sampling, and the criteria that will constitute the sample of the research can be determined by the researcher (Yildirim & Simsek, 2018, p. 119). In this context, the participants of the study a) Between the ages of four and nine with a diagnosis of ASD, b) have pre-verbal or limited functional speech, c) consists of parents with children who need an AAC program. An announcement was made on social media while the participants were being determined. Parents who met these criteria and volunteered to participate in the research process were given access to the researcher, and a preliminary interview was conducted with the volunteer parents. Within the framework of the preliminary interviews, it was observed that three parents met the criteria and the consent form was signed. Data size is one of the principles to be considered when deciding on sample size in qualitative research. According to this principle, the smaller the sample size must be, the more extensive and detailed the data (Yildrm & Simsek, 2018, p. 124).It is emphasized that the number of participants should be limited, especially in order to examine the situation determined in the case study in depth (Yildirim & Simsek, 2018, p. 295).

Parent 1

Parent 1 is the 39-year-old father of Child 1. The father is a university graduate. His profession is photography.

Child 1

Child 1, born on 23.01.2017, uses the way of pointing while expressing themselves, taking the parents' hand and leading them to what they want. If the things they want are within their reach, they can get what they want by themselves They can express what they do not want with gestures and facial expressions. In addition, the family emphasized that Child 1 utters words at unexpected moments.

Parent 2

Parent 2 is the mother of Child 2, 43 years old. She is a communications graduate and is currently working as a civil servant.

Child 2

Child 2 with ASD, born on 04.03.2013, uses nearly 20 words. They cannot use the two words together, but their wishes in one word. They express what they do not want with their facial expressions.

Parent 3

Parent 3 is 42 years old. The child is the mother of 3. She is a teacher, but she is not currently working.

Child 3

Child 3, born on 27.08.2012 and had ASD, combines simple syllables such as mama, baba (father). They show what they want by taking the mother to it or bringing it themself; they express what they do not want with gestures and facial expressions. Parent 3 stated that there is no showing by pointing.

Researcher Role

The corresponding author carried out and reported the application in this study. Thanks to the researcher's diary during the research process, the researcher wrote their observations reflectively, their process, feelings, and thoughts about the process. Thus, the researcher maintained an objective stance throughout the research process. The second researcher oversaw the research's application and reporting processes.

Data Collection Tools

Family Recognition Form

The family recognition form was created to understand the development process of the participant parent and the child with ASD in-depth and to get to know the family. Before the process started, a typical day and time were determined with the participating parents, and a meeting was held on the Zoom platform. The form includes questions about demographic information, the child's development and education process, and language and communication skills.

Meeting

The interview is the most used data collection tool in the qualitative research process. In this research, semi-structured and unstructured interviews, which are types of interviews, were conducted (Ozer Ozkan, 2019). Within the research purpose and literature, semi-structured interview forms were developed and presented to the expert as a result of the interviews with the consultant. Necessary arrangements were made with the feedback of four faculty members who are experts in the field of special education, and in addition, it took its final form with the discussions with the consultant. Semi-structured interview questions consist of three stages: before the hourly training, after the hourly training, and at the end of the eight-week practice. The questions were not prepared in advance in the unstructured interviews, and mostly conversational interviews were conducted. On the other hand, these meetings consist of meetings on Zoom, which are held once a week during the application process, starting after hourly training. In the unstructured interviews, the researcher listened to the application process and experiences of the parents during that week. They made suggestions regarding the application process of the parents within the framework of their needs. All interviews were conducted individually with parents. Only parents and researchers

participate in the interviews. All interviews were recorded with the parents' knowledge and consent through the Zoom programme.

The researcher's diary

Researcher diaries have an important place for the research to proceed following the principles of validity and reliability (Corbin & Strauss, 2008; Lawrence & Tar, 2013). The diaries contain the researcher's observations in the process, the preparation process for the research, interviews, planning of parent education, personal evaluations of the process, and discussions with the counselor and their evaluations. The diary consists of a Word document of 20 pages in total.

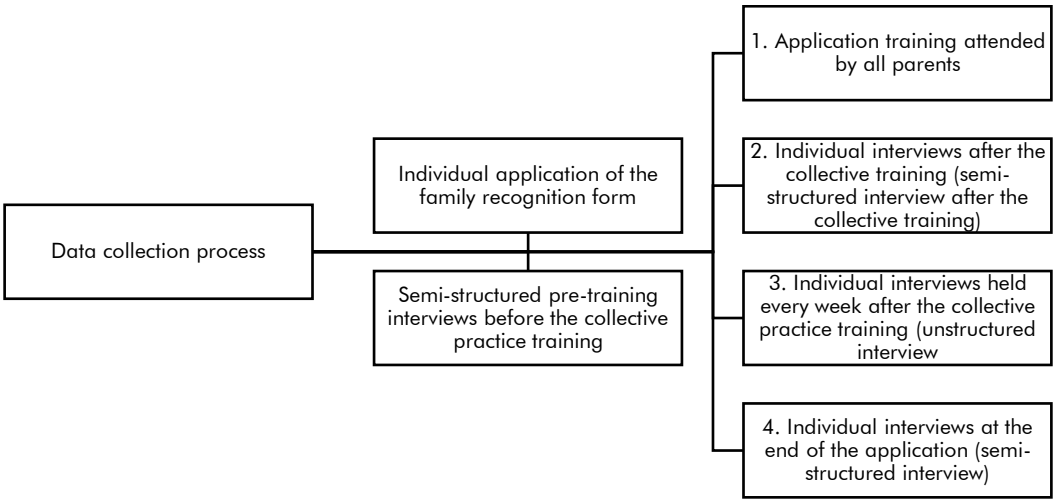
Data Collection

After the family recognition forms were applied individually via Zoom, semi-structured interviews were conducted before the collective application training, which will be held primarily in the data collection process. These interviews were held individually with each parent via Zoom. In these interviews, there are questions to reveal how the child communicates, what the parents expect from the application, and what they understand when it comes to communication and Augmentative and Alternative Communication system. After the interviews before the collective application training, collective training was given to the parents via Zoom. During the planning process for the collective education, preliminary interviews with the parents were done, and the researcher's diary was used to put together a presentation based on what she had seen. For example, it was observed that parents had concerns about whether the program to be applied was scientific or not, and the definition and scientific data on AAC were shared (Researcher's Diary, p.4). This training took 60 minutes with question-answer. At only the first stage of the data collection process (application training, in which all parents participated), were the parents present together; at all other stages, the researcher conducted individual interviews with each parent. Figure 1 illustrates the procedure for data collection.

On the next day of the collective training, the families were met individually over the Zoom platform for post-training interviews. Open-ended questions in the semi-structured interview were asked to the parents in the interviews after the collective education. These questions are about evaluating the training given by the researcher, learning their expectations from the "I Have a Voice" application, which they will start to apply, and learning their thoughts about the user interface. The recording of the collective training was shared with each family, and it was possible to watch it again. Word documents containing the program's training booklet and the reinforcement determination table were also shared with the families. One-by-one appointments were made with the parents to evaluate the educational process they would apply at home every weekend, and the application process at home was started. Table 1., Table 2., and Table 3. containing the individual interviews of the parents, are presented in the next section.

Figure 1.

Data Collection Process



Tables of individual interviews conducted each week to follow up the application process are given in the following section. Since the application process of each parent is individual, the number of interviews with each parent is different. The criterion that allows parents to stop monitoring their applications is that parents do not have any questions about the application, they learn the practice and begin to apply it fluently. This criterion was realized within the framework of unstructured interviews held every week. The content of these weekly meetings was discussed in the follow-up meetings where only the researcher and consultant participated. Information including the monitoring meetings is presented in Table 4.

Table 1.

Meeting with Parent 1

Data Type	Date	Duration	Participant	Data Content	Data Collection Tool
First/preliminary meeting with Parent 1	23.11.20	53 min.	Father	Recognition form and pre-training semi-structured questions	Family recognition form, Semi-structured interview, Researcher diary, Audio recording
Second meeting with Parent 1	06.12.20	19 min. 23 sec.	Father	Revisiting the training highlighting key points + post-training semi-structured questions	Semi-structured interview, Researcher diary, Audio recording
Third meeting with Parent 1	13.12.20	23 min. 10 sec.	Father	Parent's first week's education evaluation meeting + Q&A	Unstructured interview, Researcher diary, Audio recording
Fourth meeting with Parent 1	20.12.20	26 min. 27 sec.	Father	Parent's second week's education evaluation meeting + Q&A	Unstructured interview, Researcher diary, Audio recording
Fifth meeting with Parent 1	03.01.21	54 min. 25 sec.	Father	Third and fourth-week training evaluation + Final interview	Unstructured interview, Researcher diary, Audio recording, Semi-structured interview

Table 2.

Meeting with Parent 2

Data Type	Date	Duration	Participant	Data Content	Data Collection Tool
First/preliminary meeting with Parent 2	25.11.20	49 min. 12 sec.	Mother	Recognition form and pre-training semi-structured questions	Family recognition form, Semi-structured interview, Researcher diary, Audio recording
Second meeting with Parent 2	06.12.20	37 min. 49 sec.	Mother	Revisiting the training highlighting key points + post-training semi-structured questions	Semi-structured interview, Researcher diary, Audio recording
Third meeting with Parent 2	12.12.20	22 min. 21 sec.	Mother	Parent's first week's education evaluation meeting + Q&A	Unstructured interview, Researcher diary, Audio recording
Fourth meeting with Parent 2	19.12.20	37 min. 20 sec.	Mother	Parent's second week's education evaluation meeting + Q&A	Unstructured interview, Researcher diary, Audio recording
Fifth meeting with Parent 2	02.01.21	12 min. 32 sec.	Mother	Third and fourth-week evaluation	Unstructured interview, Researcher diary, Audio recording
Sixth meeting with Parent 2	02.01.21	14 min. 59 sec.	Mother	Fifth-week evaluation	Unstructured interview, Researcher diary, Audio recording
Seventh meeting with Parent 2	23.01.21	9 min. 39 sec.	Mother	Sixth and seventh-week evaluation	Unstructured interview, Researcher diary, Audio recording
Eighth meeting with Parent 2	31.01.21	14 min 48 sec.	Mother	Eighth-week evaluation	Unstructured interview, Researcher diary, Audio recording
Ninth meeting with Parent 2	6.02.21	18 min. 11 sec.	Mother	Last Meeting	Semi-structured interview, Researcher diary, Audio recording

Table 3.

Meeting with Parent 3

Data Type	Date	Duration	Participant	Data Content	Data Collection Tool
First/preliminary meeting with Parent 3	30.11.20	42 min.	Mother	Recognition form and pre-training semi-structured questions	Family recognition form, Semi-structured interview, Researcher diary, Audio recording
Second meeting with Parent 3	06.12.20	10 min. 15 sec.	Mother	Revisiting the training highlighting key points + post-training semi-structured questions	Semi-structured interview, Researcher diary, Audio recording
Third meeting with Parent 3	13.12.20	12 min. 10 sec.	Mother	Parent's first week's education evaluation meeting + Q&A	Unstructured interview, Researcher diary, Audio recording

Fourth meeting with Parent 3	19.12.20	10 min.	Mother	Parent's second week's education evaluation meeting + Q&A	Unstructured interview, Researcher diary, Audio recording
Fifth meeting with Parent 3	26.12.20	8 min. 25 sec.	Mother	Third and fourth-week evaluation	Unstructured interview, Researcher diary, Audio recording
Sixth meeting with Parent 3	02.01.21	14 min. 59 sec.	Mother	Fifth-week evaluation	Unstructured interview, Researcher diary, Audio recording
Seventh meeting with Parent 3	09.01.21	13 min. 22 sec.	Mother	Sixth and seventh-week evaluation	Unstructured interview, Researcher diary, Audio recording
Eighth meeting with Parent 3	16.01.21	6 min.	Mother	Eighth-week evaluation	Unstructured interview, Researcher diary, Audio recording
Ninth meeting with Parent 3	23.01.21	9 min. 19 sec.	Mother	Ninth-week evaluation	Unstructured interview, Researcher diary, Audio recording
Tenth meeting with Parent 3	31.01.21	4 min. 46 sec.	Mother	Tenth-week evaluation	Unstructured interview, Researcher diary, Audio recording
Eleventh meeting with Parent 3	06.02.21	20 min. 37 sec.	Mother	Last Meeting	Semi-structured interview, Researcher diary, Audio recording

Table 4.

Meetings

Data Type	Date	Duration	Participant	Data Content	Data Collection Tool
Monitoring Meeting	16.06.20	60 min.	Researcher and consultant	Research proposal, title, etc.	Diary
Monitoring Meeting	14.10.20	60 min.	Researcher and consultant	Interview questions, literature titles, forms to be prepared, participant characteristics	Diary
	28.10.20		Preparing questions and sending them to expert opinion		
Monitoring Meeting	21.11.20	60 min.	Researcher and consultant	Planning the data collection process	Diary
Collective online parenting practice training	05.12.20	60 min.	Parents	Usage process and presentation of the program	Zoom recording
Monitoring Meeting	06.12.20	30 min.	Researcher and consultant	Evaluating the training and the second interviews to be held before starting the interviews	Diary
Monitoring Meeting	10.01.20	40 min.	Researcher and consultant	Evaluation of the interviews	Diary
Monitoring Meeting	15.02.20	60 min.	Researcher and consultant	Evaluation of the interviews	Diary
Monitoring Meeting	15.03.20	60 min.	Researcher and consultant	Evaluation of the interviews	Diary
Monitoring Meeting	05.04.20	60 min.	Researcher and consultant	Data Analysis	Diary

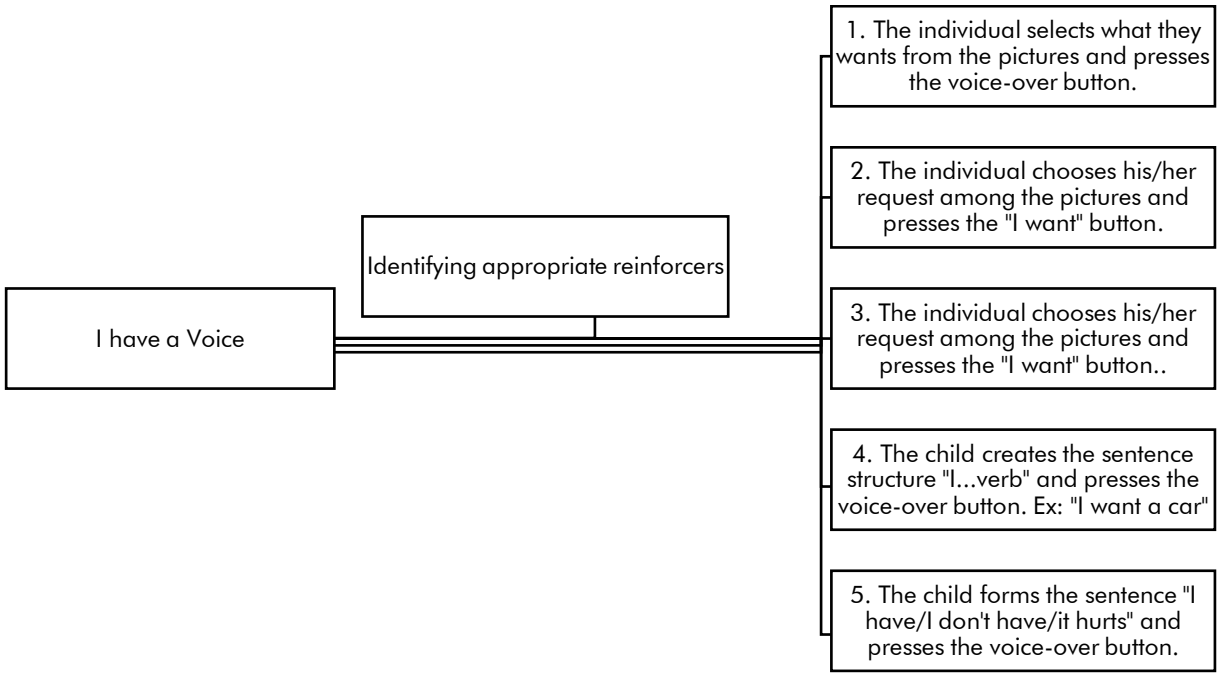
After the transcripts of the interviews were created, the researcher read the data set several times and worked on the codes and themes repeatedly during the code and theme creation process. The resulting themes were associated with the research questions. The analyses were combined in a common analysis table due to separate coding done by the researcher and the consultant. The joint analysis table created, and the data were conveyed to the opinion of an expert who completed their doctorate on qualitative studies in the field of special education. Within the context of the expert's comments on the relationship between the code, the theme, and the data, the analysis table was revised and finalized in collaboration with the consultant.

I Have a Voice

The "I Have a Voice" application, which targets individuals who show symptoms of ASD and have communication problems and individuals who show different development, was developed in 2014 by a team led by Ertan Gorgu, PhD. A system of Augmentative and Alternative Communication that allows individuals who cannot speak or need assistance with verbal communication to express themselves. The content of the program consists of 500 pictures that make a sound when touched. The user of the program can add additional pictures and sounds of pictures to the program. Pictures are the pictures that the user of the program sees and uses daily. Water, chocolate, car, teddy bear, and park pictures can be given as examples of these pictures.

Figure 2.

I Have a Voice Program Stages



The teaching process of the program progresses with gradually increasing pictures and consists of 5 stages. Before starting the program, it is necessary to determine the effective reinforcer. For this, a table is presented to the parents. Parents were taught the 1st stage in this study, and the teaching process for this stage was followed, because the 1st stage is the foundation of these 5 stages and parents who are able to apply the 1st stage can easily move on to the others. The objectives of the program's five phases are outlined below.

1st Stage Purpose: The individual selects what one wants from the pictures and presses the voice-over button.

Data Analysis

The data were analyzed with content analysis, one qualitative data analysis approach. In content analysis, data is subjected to deep processing as a technique for analyzing text content. Content analysis aims to reach the concepts in the data beyond describing the data as it is. The researcher presents these meanings and concepts to the reader through a systematic classification process (Cansoy & Turkoglu, 2019). Essentially, the process consists of identifying the data that forms a meaningful whole and presenting the data in a detailed and understandable manner within the context of concepts and themes (category). During data analysis;

1. Transcribed were the audio recordings made during the interviews.
2. The obtained data were read multiple times and coded according to common themes, thereby forming a whole.
3. The code table was created for the coded data, and the data was then cut and inserted into it.
4. The codes compiled in the code table were examined, commonalities were identified, and research themes were determined.
5. The data was organized by establishing a relationship between code and theme.

The research questions were associated with the themes. Throughout the analysis process, the researcher constantly reviewed the research questions and the conceptual framework of the research. During the code and theme creation process, they read the data set several times and worked on the resulting codes and themes repeatedly. The resulting themes were associated with the research questions. The analyses were combined in a common analysis table due to separate coding by the researchers. The common analysis table created, and the data were conveyed to the opinion of an expert who completed their doctorate on qualitative studies in the field of special education. The researchers revised the analysis table within the framework of the expert's feedback on the connection between the code, the theme, and the data and took its final form.

Credibility and Ethics

To ensure the validity and reliability of the research, the applications carried out within the framework of the literature (Arastaman et al., 2018; Erlandson et al., 1993; Merriam, 1988; Miles & Huberman, 1994; Yildirim & Simsek, 2018) are as follows:

1. Interviews were held with the participants every week throughout the research. Thus, the credibility of the research data was supported by establishing long-term interaction with the participants.

2.The reproducibility and transferability of the research were bolstered by the inclusion of rich and detailed descriptions during the research writing process.3. Triangulation was done by using various data sources in the research. The experiences of different people on the same subject are discussed.

4. Data collection tools were examined by experts working in the field, and they were finalized and used in line with their feedback.

5. To ensure the reliability of the application, it waa evaluated the application process of the researcher within the framework of the Application Reliability Form, by following the weekly interviews and the training given by an expert researcher who wrote a Master's Thesis on the application of "I Have a Voice".

6. During the data analysis process, researchers agreed on the coding made separately, and both validity and reliability were supported by sending data to an expert for external auditing.

7. The corresponding author kept a diary of each research stage. Thus, precautions were taken to prevent the research process from being affected by their feelings and thoughts. The diary shared with the second author.

8. At certain stages of the research, the researchers held follow-up meetings and discussed the application process.

9. Data are stored in a computer environment by researchers.

10. For research ethics, verbal and written information was given to the participants and a consent form was signed. In addition, an ethics committee certificate was obtained from the ethics committee of Istanbul Medeniyet University (No: 2020/01-04).

Results

The findings related to the themes and sub-themes that emerged as a result of the analysis of the data collected in line with the purpose of the research are presented in the following section. In order to provide the reader with a fluent and understandable data presentation, the findings will be in an appropriate order.

Table 5.

Theme and Sub-Themes

Theme	Sub Theme
Regarding the child	a) The way of communicating b) Educational experience
Application of the tablet program	a) Easy aspects of the process b) Difficult aspects of the process
Parents' suggestions on the application	a) For users b) For those who develop the program
Contributions of the tablet program	a) Contributions to the parents b) Contributions to the child
Parent's feelings and thoughts	a) Before Application b) After Application c) Expectations from the Tablet Program

Findings Regarding the First Research Question

1. How are the Participants Children's Communication Styles with their parents and Educational Experiences?

1.1. Child-Related Information

Common points were seen in the information given by the parents about their children in the semi-structured interviews.

As a result of data analysis, the information given by parents about their children is divided into two sub-themes: communication style and educational experience. The findings regarding the information about the children are summarized in Table 6.

Table 6.

Findings Concerning Child-Related Information

Information about the child	Parent 1	Parent 2	Parent 3
How to Communicate			
By holding the parent's hand	■	■	■
By pointing	■	■	
In tears		■	■
By gesture	■		■
Bringing what they want	■	■	■
With the words they put out	■	■	
Edication Experience			
Sports training		■	■
Special education	■	■	■
Nursery	■		
Occupational therapy	■	■	
Speech language therapy	■		■
Previous experience with technology	■	■	■
AAC experience			

a) The Way of Communication

Data on how parents communicate with their children and children's environment were collected in the research. The data was collected from the pre-interview sessions held after the determination of the participating parents. Examples of expressions describing the way the participant children communicate are given below:

> They tell what they want by crying. I say show what you want, yet, they do not show it. They take it away or pick it up. (...) If they do not want to, they put their hand. If they want something, they take me to it or pick it up and bring it to me. They do not show. They do not eat until I tell them to, they just bring it to me' (P3, pre-interview)

Examining Table 2, which describes the collected data, reveals that the participant children use crying, pointing, taking the parent's hand, expressing with gestures and mimics, bringing what they want and expressing it in words, as well as bringing what they want and expressing it in words, when expressing their demands or situations they do not want.When the data regarding the research process are examined, it was seen that the researcher put the condition that the participant children should have no or very limited verbal communication skills in the process of finding participant parents (Researcher's Diary, p.2). The purpose of the research and the audience that AAC addressed constituted the necessity of this condition.

b) Educational Experience

In the data analysis process, the partnerships in the educational processes of the participating children formed a sub-theme as an educational experience in the theme of information about the child.

The data are collected from the pre-interview sessions held after the participating parents were determined. Children's educational experiences in the past and present converge on common points. Examples of information gathered from the participating parents on this subject are as follows:

> Special education has been going for 1.5 years. Received occupational therapy for 4 months. (...) They are going to kindergarten now. Full time. There is a lot of progress in socialization. They go to speech therapy for 1 hour once a week. (P1, pre-interview)

> They go to OCEM for mild autism class. They go to the rehabilitation center once a week. I used to send them to the gym while I was working. They received speech-language therapy for 1.5 years at the age of 4. But there was no progress (P3, pre-interview)

Considering Table 2, which describes the findings of the educational experiences sub-theme, it was seen that special education, sports education, occupational therapy and speech-language therapy are seen as common education branches by the parents. In addition, sample sentences about the education and/or knowledge of parents on AAC are as follows:

> So, wordless? Programs that are outside of normal speech. This came to my mind. (...) I did not receive such training, but it can be with signs other than speech. There is no other... I can't think of anything else. (P3, pre-training interview)

In the interview after the "I Have a Voice" training conducted by the researcher after the preliminary interview, it was observed that the parents referred to their previous experiences with technology. The sample finding that includes these views is as follows:

> I mean, for example, I downloaded other programs and they didn't show much interest in them. So they adopted it a little more. I didn't expect them to show that sugar because when you put it in front of them, they show them all at same time. On the smartphone, for example, they were showing them all together at once in other programs. They pressed on whatever they wanted in this one. (P3, post-training interview)

Findings Regarding the Second Research Question

2. How is the Parent's Application Process in the Home Application of the Tablet Program?

2.1. Application of Tablet Program

In the data analysis process, it was seen that the parents' home application processes started after the "I Have a Voice" training given by the researcher (Researcher's Diary, p. 5). During the application of the tablet program with the parents at home, the researcher conducted unstructured interviews with the parents once a week. In the data analysis, the codes found from these interviews were united under the theme of Application of Tablet Program. The Application of the Tablet Program was analyzed with two sub-themes as a) easy aspects of the process b) difficult aspects of the process. The findings regarding the application of the tablet program are summarized in Table 7.

Table 7.

Findings Regarding the Application of the Tablet Program

Application of Tablet Program	Parent 1	Parent 2	Parent 3
Easy aspects of the process			
The utility of the program	■	■	■
Audio and visual output of the program	■	■	■
Combining the program with the teaching material	■	■	■
Individualization of the program	■	■	■
Feedbacks	■	■	■
Difficult aspects of the process			
Infrequent use of the program	■	■	■
Program freezing		■	
Difficulty using the program on the phone		■	■
Families do not make the application systematically	■	■	■

The findings regarding the Application of Tablet Program theme that emerged in the data analysis are given in Table 7. The application of the tablet program and the analysis of the interviews in which parents shared their experiences during the application process were described as having both easy and challenging aspects, based on the interviews conducted throughout the research.

Easy Aspects of the Process

In the data analysis, it was seen that the parents mentioned some functional features in the use of the program while applying for the tablet program. These features are sub-themed under the application process as the easy aspects of the process. Findings regarding the sub-theme are presented in Table 7. Example parent sentences are as follows:

> Regarding education, here is everything they do daily. As a verb. Here are the things; brush teeth, wash hands, take a bath, and do things they like to do. (…) We're lucky to have this system that makes some noise right now because they need to be talked to all the time. They need to hear voices all the time. (P1, interview at the end of the application)

> You know, the teachers say that in our children, visual memory is in the foreground There is a visual there; they hear the sound. (P2, the interview at the end of the application)

> ''But they probably paid attention because it was what they loved. (…) I noticed that they also listen to the sound. They didn't press the volume button, but I always pressed it. (P3, post-training interview)

> Meeting once a week at least brings a sense of responsibility. You've been a great help too. I am glad that I met you and this program. (…) I think your ideas were good. For example, the ideas you give about actions. For example, I was doing it with food, only, then I added the actions. Your guidance was good. When we've met each week, you had different suggestions. It worked for me. I couldn't think of them at the time. (…) It also accelerated the use of the program. (P3, Interview at the end of the application)

> I couldn't do much in the first training, but in the second video, it became clear in my mind after you explained it to me in the interview. I was confused a bit at first." (P2, Interview at the end of the application)

> Your guidance and suggestions in previous conversations have been good for us. (…) It was very good to be guided on what we were doing right and what we were doing wrong. Your guidance is also very valuable for us. (P1, the meeting at the end of 8 weeks)

As presented in Table 7, it is seen that the parents' opinions on the easy aspects of the process are that the process was useful, combined with the teaching material, could be individualized, audio and visual output, and researcher feedback. In addition to the easy aspects of the process stated by the parents, the difficult aspects of the process were also seen in the findings. These findings are presented in the next section.

a) Difficult Aspects of the Process

In the data analysis, opinions stating the difficult aspects of the application process of the tablet program have been found. The findings of these views are presented in Table 7. Sample parent comments are as follows:

> But it is very difficult to open from the smartphone. To choose. Since we do not have tablets, those boxes are small or difficult to choose. (…) In a normal setting, it is very difficult to find and choose what they want right away.'' (P3, first week of application) and ''I can make them practice only 5-10 minutes in a day, they do not look at the phone, if I play a song they like, they listen to it once or twice then throw the phone away. (…) The tablet is turned off, so they might be forgetting. I am not keeping the tablet in the middle since they might throw the tablet away. (P3, fifth week of application)

> They are constantly moving so we were unable to open it and show it right away. We were unable to put in a Schedule. Otherwise, it is a very good program. (P2, the seventh week of the application)

As presented in Table 7, the parents' opinions about the difficult aspects of the process include freezing of the program, infrequent use, difficulty in using it on the phone, and the families' inability to perform the application systematically. It has been observed that the parents offered some suggestions within the framework of their experiences regarding the process. These findings are presented in the next section.

Findings Regarding the Third Research Question

3. What are the parents' suggestions for home application?

3.1. Suggestions

The findings regarding the suggestions made by the parents are presented in Table 8. As a result of the analysis, the parents' suggestions were divided into sub-themes as a) Suggestions for the users, b) Suggestions for the developers of the program.

Table 8.

Parents' suggestions on application

Recommendations for users	
Making the program accessible to the child	
Spend more time	
Recommendations for program developers	
More realistic visuals	
A better tone of voice	
Faster operation	
Integration of the training manual into the program	

a) Recommendations for Users

The opinions of Parent 2, including suggestions for users, are presented below.

> The tablet should be turned on and used for this purpose only. By this way, there will be no password on the smartphone and it will be accessible by the child. (…) We need to speed them up a little about using the program actively, in our way. (P2, the seventh week of the application)

The only finding of the suggestions for users sub-theme is seen as the suggestion made by Parent 2. Parent 2 expressed the opinion that the tablet should be accessible to the child and that more time should be allocated to the program by the parents.

b) Recommendations for Program Developers

A sample opinion containing the suggestions for the developers of the tablet program is presented below.

> You know, when we started our education, you told me as the 1st stage, the 2nd stage. It was descriptive and clear. Maybe if everything was categorized in the program. For example, things needed to be taught in one stage, okay, what were the goals in the second stage? Maybe it would be more helpful if these steps were included in the program. (…) The visuals in the program could have been better and a little more realistic. (P1, Interview at the end of the application)

The parents' suggestions for those who developed the tablet program are as following; more realistic visuals, faster operation of the program, a better tone of voice, and the presence of the training guide in the program. In the data analysis, Contributions of Tablet Program theme was found and findings regarding this theme was presented in the next section.

Findings Regarding the Fourth Research Question

4. What is the Contribution of the Home Application of the Tablet Program on Parents and Their Children?

4.1. Contributions Of the Tablet Program

In the semi-structured interview at the end of the application, the parents talked about how they thought the tablet program helped. This was seen in the data analysis. These views are themed as the Contributions of The Tablet Program. The coding of the views expressed by the parents formed two sub-themes under this theme: a) Contributions to the parents, b) Contributions to the child. The findings regarding the contributions of the tablet program are given in Table 9.

Table 9.

Findings on the Contribution of the Tablet Program

Contributions of the Tablet Program	Parent 1	Parent 2	Parent 3
Contribution to the Parent			
Change in the way a parent talks to their child	■		
Formation of the idea of an alternative communication tool		■	■
Facilitating parent-child communication			■
Contribution to the Child			
Learning how to form sentences	■		
Learning Concepts	■		
Alternative communication		■	■
Showing what they want			■
Recognizing objects			■

a) Contributions to parents

The sample sentences in which the contribution of the tablet program to the parents are stated as follows:

> I also learned to distinguish. For example, they were crying before, but it was difficult for me to find what it was for. It is much easier for me when I say show what you want and then they show what they want. In other words, it made my communication with them easier. (P3, Interview at the end of the application)

> I think this method will be good even if they can not talk. There is a possibility in my mind. (…) At least I know that there is such an alternative. So, at least that's how I can communicate with my child. In other words, such an alternative and such a shape came to my mind. (P2, Interview at the end of the application)

> Actually, I have changed the way I talk. I am trying to apply what I do on the tablet to the normal times. When they started hearing the verbs, they started to want them because we were saying " What this? A phone". There were no verbs such as "I want". What that? An apple. They can keep objects in their mind. Do you want to take a bath? Do you want to sleep? Let's not go to bed. I started to talk like this. (P1, Interview at the end of the application)

Findings on the contribution of the tablet program to the parents, as indicated in Table 9 showed that the parent's way of speaking with their child changed, the idea of an alternative communication tool was formed, and it facilitated the communication between the parent and their child. In the data analysis, it was also seen that the tablet program contributed to the child. These findings are presented in the next section.

b) Contribution to the Child

Example sentences in which the contribution of the tablet program to the child are as follows:

For example, when I say show what you want, they wouldn't show without the program. But when there was a picture on the tablet, they started to show it with the picture. In

other words, children show what they want better when there is a picture. They do not want to show the real objects. So, at least it helped them to recognize objects." (P3, Interview at the end of the application)

> For example, some animals are afraid of their voices. They covered their ears when they saw the first horse picture. I told them then they pressed. So they also learn the things they fear. (…) In fact, it is nice for them to learn these concepts and speak. (…) But also soup. I want. Here, I want to sleep. They are learning how to express it. (P1, Interview at the end of the application)

Findings regarding the contributions of the tablet program to the child are summarized in Table 9. These contributions are learning how to construct sentences, learning concepts, showing what one wants, and recognizing objects. The findings are discussed in the next section.

Findings Regarding the Fifth Research Question

5. What are the Parents' Views on the Home Application of the Tablet Program?

5.1. Parent's Feelings and Thoughts

During the data analysis, it was observed that the parents expressed some feelings and thoughts. Under the theme of parental feelings and thoughts, the codes that came out of the semi-structured interviews and the sub-themes that formed when the codes were put together.

Table 10.

Findings Regarding Parent Feelings and Thoughts

Before Application	Parent 1	Parent 2	Parent 3
Concern about child's dependence to the program	■		
Concern about the child becoming lazy	■		■
Concern about not being interested in the child	■		■
After Application	■		■
Supporting the conversation	■	■	■
Self-expression tool			■
Expectations from Tablet Program			
The expectation for the child to start talking	■	■	■
Expectation of the child to express themselves easily		■	■
The expectation of reduction in tantrums		■	
The expectation of increased concentration		■	
Forward Planning	■	■	■

The feelings and thoughts that the parents shared with the researcher during the interviews were divided into sub-themes: a) Before the application, b) After the application, c) Expectations from the tablet program. The findings regarding the parents' feelings and thoughts are summarized in Table 10.

a) Before Application

It was observed that parents 1 and 3 had similar feelings and thoughts at the beginning of the application about the tablet program. The findings regarding these feelings and thoughts are given in Table 3. Example sentences are as follows:

> Even if they can not speak, at least they can express themselves without speaking. But does this lead the child to take the easy way out? (P3, Pre-training interview)

> I want to ask something. Now, this tablet is very nice, but can they get that feeling in the future? When I want something, the tablet speaks for me. Would this make them lazy? (E1, interview in the first week of the application)

As presented in Table 3, the feelings and thoughts of the parents about the tablet program at the beginning are; the worry about the child becoming lazy, the child's dependence on the program, and the worry that the child will not find the tablet program interesting enough.

b) After Application

During the data analysis, it was discovered that the parents' feelings and thoughts about the tablet program after the application were distinct from their feelings and thoughts before the application. The findings regarding these differing opinions are depicted in Table 3. Example thoughts are as follows:

> They do not talk and, I thought if they would be lazy to talk, but as I saw how the program worked, I do not think like that anymore. I think the program was made to accelerate the child's ability to express themselves. (P3, Interview at the end of the application)

> Program's ability to make sounds created a situation that could guide us as well... I read somewhere that when children hear a sound 300 times, they can make that sound. Can I say a word to them 300 times? With this system, I can say it via tablet, it helps and is going help in the future. Because they want to repeat. It does not bother me to repeat the voices here. I get annoyed when they do anything else repetitive. But, it is good for me that they repeat the voice they hear here. (E1, Interview at the end of the application)

> Even if they can't talk, I think this method will be good. There is a possibility in my mind. (...) At least I know that I have such an alternative. So, at least that's how I can communicate with my child. In other words, such an alternative came to my mind. (P2, Interview at the end of the application)

Another sub-theme of the parents' feelings and thoughts about the tablet program is "Expectations from the Tablet Program". In the following section, the findings of this sub-theme are presented.

c) Expectations from the Tablet Program

During the data analysis, it was discovered that parents discussed their expectations for the program as well as their feelings and thoughts regarding the tablet program.

Results regarding these opinions were shown in Table 3. Example sentences of parent's thoughts are as follows:

> I expect them to speak, of course. I do not understand why they do not talk, I hope that it will be helpful. (P2, post-training interview)

> I think it will be easier for them to express themselves. (...) If the child starts at an early age, tantrums will decrease. More so, their concentration will also increase. I think that they would perform better in class. I think that they will express themselves easier. Maybe they will come and show me the tablet by themselves when they improve their tablet use. (P3, end-of-application interview)

As presented in Table 3, the parents' expectations from the program are that their child speaks easily, expresses themselves easily, decreases tantrums, and increases concentration. In addition, in the data analysis, it was seen that the parents started to plan for the future with the tablet program. Parents' statements on this issue are presented below.

> I will put this tablet in their bag and tell it to the life coach there. You know, because they work one-on-one, there will be more opportunities. In such environments, I know that they might want food and water, it can be challenging. So the tablet can be very useful for us. (P2, second week of the application)

The theme of "Application of the Tablet Program" will follow this section in which the findings on the parents' feelings and thoughts are presented. In the following section, findings on the third theme are presented.

Conclusion and Discussion

This study was conducted with parents who received application training for the tablet program "I Have A Voice," which generates computer-assisted speech to improve the communication skills of those with ASD.Aim of this study was to examine the application process and results of the tablet program at home according to the opinions of the parents. Four themes were found in the study: information about the child, the feelings and thoughts of the parents, the application of the tablet program and the contributions of the tablet program. Themes and sub-themes found according to results are presented in the findings.

Within the scope of the first research question, it was observed that the participant children used ways such as crying, pointing, bringing what they wanted, expressing themselves with a single word, and using gestures in communication with their environment. This finding supports the findings in the literature regarding the heterogeneous structure of communication skills of individuals with ASD and the fact that individuals with difficulties in verbal communication attempt to communicate using non-verbal language (e.g., crying, pointing, gesturing, etc). (Hart and Banda, 2010; Kjelgaard and Tager-Flusberg, 2001; Rea et al., 2018).In addition, participant parents reported that their children received various trainings such as special education,

occupational therapy, language and speech therapy after they were diagnosed, but the participating families stated that they did not benefit from these trainings and that their children's verbal communication skills did not develop.These findings support studies that emphasize that some individuals with ASD cannot develop speaking skills despite receiving intensive education (Chin & Bernard-Opitz, 2000; Norrelgen et al., 2014).

Within the scope of the second research question, the parents stated that the weekly interview accelerated the application process, that they did not break with the tablet program and that it was efficient to get feedback on whether they were doing the application right or wrong. These parents' statements support the results of the research conducted by Kaiser et al. (1995), which emphasizes the importance of providing practical guidance with feedback and intervention techniques to parents. Parents' different learning styles and times show that they may need continuous support during the application process (Researcher's Diary p.7). Continued interviews supported the provision of feedback on the needs of parents. Therefore, the need for parents' feedback in the current findings supports studies that emphasize that parents should participate in the education process and be guided by feedback in the process (Light et al., 2019; Starble et al., 2005).

Parents reported that during the application process the following made their process easier; program to have audio output in addition to the visuals, program to be useful, program to be individualized, program to include things that the child likes and program to be used as teaching material. It is seen that these features are among the advantages of speech generating devices in research on AAC (Blischak et al., 2003; Mirenda, 2003; Trottier et al., 2011; Van der Meer & Rispoli, 2010). The ability to customize the "I Have A Voice" application according to the wishes of the children helped parents to individualize the program according to their children's wishes. It also supports the research findings that emphasize that the adaptations made by the parents within the needs of their children, such as language and communication skills, are essential not only by experts but also by parents (Rocha et al., 2007; Sallows & Graupner, 2005). It is a fact that families have more comprehensive knowledge and insight about their children.

In addition to the conveniences, the parents' difficult aspects of the process are as follows; infrequent use of the program, freezing of the program, difficult to use on smartphones, and inability to apply the application systematically by the parents. In the literature on the factors affecting the use of AAC, it is seen that there are factors such as the cost of the device, access to the device, deterioration of the device, the device's inability to work independently, and difficulty in using the device (Phillips & Zhoa, 1993). Therefore, the factors that make the use of AAC devices difficult should be taken into account.

Within the scope of third research question, the participating parent suggested that more time should be spent on the program and that the program should be in an accessible place for the child. It is known that the commitment and support of parents to the device increases the efficiency of AAC applications (Huer and Lloyd, 1990;

Parette and Angelo, 1996). In addition, the parents made suggestions for the developers of the program. Studies showed that devices should be adjusted according to the needs of AAC users and parents. Ease of use and functional use of the device is seen as an important factor for users not to leave the device (Parette et al., 2000).

Snell et al. (2010) examined the studies on communication interventions and it was found that the most of the studies were conducted in a structured environment. In addition, in the studies, it was found that natural partners (parents, primary caregivers, etc.) were not preferred as communication partners in studies, instead researchers took place as communication partners. However, AAC applications aim to be a part of the flow of the individual's life. Therefore, in order to be a part of the flow of life, applications should be supported within the framework of the suggestions given by parents regarding AAC applications.

Within the scope of the fourth research question, according to results, it was seen that parents benefitted from the AAC device. Parent 1 stated that they changed the way they talked to their child and learned to look at their child's way of speaking from a different perspective. Parent 2 stated that even if their child cannot speak, they have learned that they have an alternative. Parent 3, on the other hand, stated that their communication with their child became easier and they experienced that there are different ways of learning. In addition, parents reported that their children also benefited from the AAC device. Parent 1 stated that their child started learning the necessary sentence formation elements. Parent 2 stated that it would be beneficial to know that there is an alternative communication. Parent 3 stated that their child started showing their wishes and learning the concepts. These findings support studies showing that parents and children benefit from AAC devices differently (Huer and Lloyd, 1990; Parette and Angelo, 1996). In addition, the contribution of AAC to children with ASD supports previous research on AAC (Tincani et al., 2020; Zangari et al., 1994).

In the current findings within the scope of the fifth research question, two of the parents who participated in the study had concerns at the beginning of the application that the tablet program would cause dependence and laziness in speaking. It is also seen in the literature that some parents do not want their children to use AAC as a communication tool (Mirenda, 2003). Looking at the historical process of AAC use, the use of AAC as a last resort for people who cannot improve speech (Tincani et al., 2020; Zangari et al., 1994) can be seen as the basis for these thoughts that parents had. Contrary to these findings, in some studies, it was seen that parents' expectations from AAC applications are to increase their child's independence and make improvements in their social life (Parette & Angelo, 1996). In the present findings, it was seen that the two parents' views on the tablet program changed at the end of the application and they benefited from the tablet program within the framework of their children's individual needs. Parents did not initially say that they would prefer an alternative way of communication instead of verbal communication at the beginning, all three parents stated that they could see the tablet program as an alternative communication device in the future at the end of the study. In addition, at the end of the study, all parents stated that the tablet program would be beneficial for their children and that they

would continue to apply it. In a study conducted to examine the effect of AAC on the family, it was concluded that the participants emphasized that there was a more promising future as a result of using AAC devices and they had positive attitudes towards the devices (Angelo, 2000). The results obtained from our study are similar to the future plans made by parents about the program. According to the results, it has been observed that parents had different expectations and plans for using the tablet program. Parents 1 and 2 stated that the tablet program would aid speech since it provides visual and auditory support, while parent 3 stated that their child could use the tablet program to express themselves. Also, parent 3 stated that their child's tantrums would decrease, and concentration would increase. These differences support the research that reveals that each family has unique expectations from education and the intervention process (Parette et al., 2000).

Limitations and Recommendations

As in any research, this study also has some limitations. The research results are limited to the participants of this research, although there is no concern in the nature of qualitative research to generalize the results. In addition, although detailed questions were asked about the parents' applications in the weekly interviews with the parents, the inability to observe the teaching process of the parents at home due to the COVID-19 pandemic can be considered a limitation.

In this research, it was seen that the android-based speech generating program was successful in teaching parents. Therefore, it can be recommended that teachers working with individuals with ASD who need AAC include information on these programs' use in their parental education.

Programs similar to I Have A Voice can be developed.

In the study, it was seen that parents were able to shape the program according to the needs of their children. AAC practitioners can be recommended to create AAC programs that will be inclusive and accessible in line with the needs of parents and children.

For AAC dissemination, a committee can be formed within the MEB regarding AAC.

Courses on AAC can be added to undergraduate and graduate curriculum.

The number of studies examining ACC parent education and application training can be increased.

This research was conducted with 3 parents. It can be suggested that a similar studies can be done with different sample groups. In addition, the effectiveness of the speech-generating program in teaching different communication areas (mutual conversation, etc.) can also be looked at. In this study, the learning level of the child was not examined. In future studies, the child's learning level can also be looked at.

In this study, going home could not observe the parent application process. Therefore, future studies can be conducted in which the application process is observed one-to-one at home.

This research was designed as a case study. Similar studies can be carried out with other methods. In addition, in this study, no application was made for the child to use the speech-generating program independently. Applications for this purpose can also be added to future studies.

Research can be conducted on improving AAC use in social and educational settings.

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