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Review of Mobile Application Studies in Special Education: A Systematic Domain Scan

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Abstract: The general purpose of this research is to conduct systematic field writing screening to determine the use of mobile application studies in special education. The research was conducted in the spring of 2019-2020. The universe of research is the articles in the field of technology and special education in the field of mobile application. The sample of the study consists of 26 articles published in the Google Academic database in the field of mobile applications in private education between 2015 and 2020. First of all, journals with articles were identified by researchers as part of the use of special education technology and mobile applications and articles were examined. More qualitative and mixed research methods have been preferred as data collection tools in the researched research. It is thought that the results will shed light on future studies.

Keywords: *Special Education; Technology Usage; Special Education and Technology; Mobile Application.*

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1. Introduction

The digitalization process has affected the cheapening of technology, rapid information production, dissemination and consumption. It may be appropriate to use technological tools that will provide the same developmental results instead of the materials used in classical course processing processes (Börekci, 2010). The ease of use of mobile devices increases the ability to interact with mobile applications installed on devices (Doğan, 2018). As teaching material, such devices used to support teaching enrich the teaching process (Sibel et al., 2008). Mobile devices are used as a supplementary material in education. It is now easy to learn to use mobile devices before children learn to meet many basic life needs (Çoklar et al., 2018). The facilities provided by the software that can be used in education provide constructive changes in the teaching phase (Baltalı & Uzun, 2016). As mentioned in educational technology, it covers many tools but mobile devices have significantly replaced all of them. Although these devices are not designed for education, their use for educational purposes has increased day by day (Ezin, 2019). Technology has brought change to the teaching paths of educators and the learning paths of children (Kalçık, 2017).

These devices, which have become part of our lives day by day, have become our personal assistants. Technological tools used correctly during teaching play an important role in ensuring permanent learning in the student by supporting the full realization of learning (Kurtoğlu, 2019). Mobile devices, which are now used as tools in education, facilitate learning with their visual and auditory elements (Bicen et al. 2022; Karaşahinoğlu, 2018). In addition, it stands out as a supporting tool in education with its features such as instant access to information, visual, audio, photo, video, data storage. In mobile-assisted teaching; With the effective, fast, repeatable interactive structure of mobile applications, user self-learning takes place (Ekici, 2018). With the mobile applications prepared for education, children can go back and forth between information at their own learning speed or continue from where they left off when education is interrupted. Kearney (2012) takes a pedagogical view of mobile learning; they emphasized authenticity, collaboration and personalization features. Personalization, M-learning activities have been customized with a tool. The digital environment is to have control over the speed and time of learning and learning content. Mobile learning can be personalized in two different ways, both at the vehicle and event level (Şen, 2018).

In the preference of mobile applications, attention should be paid to the development levels and disability groups of children (Karaşahinoğlu, 2018). Children with special educational needs use tablet devices and more educational applications and digital book applications because they enable them to learn by having fun (Yılmaz & Tortop, 2017). Mobile applications are software that works on smartphones, tablets, computers with a certain purpose that includes multiple features (Bicen et al., 2021; Kuyucu, 2017). With the spread of technology and its inclusion in education, there is a need to produce software that is compatible with these devices and supports education (Çağıltay & Polat, 2018; Oznacar et al., 2020). The use of mobile devices is increasing day by day, especially in special education and children with special needs (Şenyürek et al., 2017). The contents of mobile applications need to be combined with special training programs. When mobile technology products are included as support materials in educational environments, it should be ensured that the child is effective in mobile applied studies (Topuz & Kaptan, 2017).

The fact that many positive aspects of children with special education needs have been revealed by the studies has increased the interest in the mobile application. However, it is noteworthy that there are limited numbers of studies that can reveal the studies in this field and describe what the general trend is. In this study, it is aimed to reveal the results obtained by examining the studies on mobile application in special education from various angles. In line with the aim of the study, articles related to mobile application in special education were examined under various categories. It is thought that the obtained data are important in terms of revealing the trend towards mobile application in special education and the outputs about mobile application in special education.

1.1. Purpose of the Study

In line with the aim of the study, the following problems were answered:

1. Which disability groups are the most applied in the studies examined?

2. What are the research methods used in the studies examined?

3. What are the mobile applications used in the studies examined?

4. What are the issues addressed in the studies examined?

2. Method

In this study, 26 articles related to mobile application studies in special education were examined, which were reached by systematic

literature screening in line with the determined criteria. Descriptive content analysis method was used to explain the obtained data and to reach the necessary relationships. In the descriptive content analysis method, the researches conducted on a specific subject are discussed and the trends and results of these researches are evaluated in a descriptive and systematic manner (Göktaş et al., 2012).

2.1. Collection of Data

The articles aimed to be reached in line with the objectives of the research were obtained from the Google Academic database by conducting a systematic literature review covering the years 2010-2020. However, considering the years when the interest in the use of mobile applications in special education began to increase, the literature review was limited between 2015-2020. The inclusion of the studies reached in the research was carried out within the scope of some criteria. These:

1. Contain the keywords "Mobile Application in Special Education" or "Technology in Special Education",

2. To be scanned in the Google Scholar database,

3. The research area is education or educational research,

4. The date range should be between 2015-2020,

5. The publication language should be Turkish,

6. The type of publication is an article,

7. Have open access,

8. Lack of scan work **.**

In the screening process carried out using only keywords ("Mobile Application in Special Education" or "Technology in Special Education"), 32 articles were reached in the Google Scholar database. After the studies were examined in detail, it was decided that 26 articles from the Google Scholar database, which were suitable for the purpose of the research and did not have a screening study, were suitable for the study.

2.2. Analysis of Data

A total of 26 articles that were accessed as a result of the literature review and found appropriate to be included in the scope of the research were analyzed by taking into account the screening and selection criteria determined in accordance with the purpose of searching for answers to the research problems. The characteristics of the disability group of each article, the research method, the mobile applications used, the subject area of the special education and the topics covered are examined in detail. Frequency (f), percentage (%), etc. values for the results are presented in tables. The

distribution of the articles examined within the scope of this study according to publication years is seen in Table 1.

Table 1 - Distribution of the Articles Examined within the Scope of the Research by Years

Database	2015	2016	2017	2018	2019	2020	Sum
Google Scholar	9	4	4	4	4	1	26
Sum							26

Source: Authors' own conception

As can be seen in Table 1, a total of 26 articles, including 9 articles from 2015, 4 articles from 2016, 4 articles from 2017, 4 articles from 2018, 4 articles from 2019 and 1 article from 2020, are included in this study.

3. Findings

The findings for each sub-problem determined in line with the purpose of this research are presented under the relevant subheading in this section. In this context, the findings obtained in relation to each sub-problem and the interpretations related to these findings are included.

3.1. Findings for the First Sub-Problem

The first research problem of this study was determined as "Which are the most applied disability groups in the studies examined?" In the studies examined, the most applied disability groups are; are grouped as hearing and visual impairment. The frequency and percentage values for these study groups are presented in Table 2.

Table 2 - Most Applied Obstacle Groups

Workgroup	Frequency	Percent
Hearing Impairment	7	%27
Visually Impaired	5	%19,2
Gifted	2	%7,7
Mind Lapse	3	%11,5
Autism Spectrum Disorder	2	%7,7
Body Disability	3	%11,5
Learning Disabilities	2	%7,7
Reading Difficulties	2	%7,7
Sum	**26**	**%100**

Source: Authors' own conception

As seen in Table 2; While the most application and working disabled group was the hearing impaired, the visually impaired was the disabled group with the most mobile application work.

3.2. Findings for the Second Sub-Problem

The second research problem of this study is "What are the research methods used in the studies examined? is determined as follows: Research methods used in the studies examined; quantitative, qualitative and mixed. The frequency and percentage values of these research methods are presented in Table 3.

Table 3 - Distribution of Research Methods Used

Research Method	Frequency	Percent
Quantitative	3	%11,5
Qualitative	16	%61,5
Hash	7	%27
Sum	**26**	**%100**

Source: Authors' own conception

As can be seen in Table 3, the most commonly used research method in the studies examined is the qualitative research method, while the least used method is the quantitative research method. In the studies examined, it was concluded that they received opinions in only 3 quantitative studies.

3.3. Findings for the Third Sub-Problem

The third research problem of this study was determined as "What are the mobile applications used in the studies examined?". Mobile applications used in the studies examined; content and content are grouped under themes. The frequency values for these technologies are presented in Table 4.

Table 4 - Distribution of Technologies Used to Prepare and Deliver Content

Theme	Mobile Application Used
Content	Let's Meet the Sentences
	Let's Learn the Symbols
	E-Government Application
	Sentence Editing Application

Serving Content	Forensic Science Teaching My World Sapling Application Point Determination Technique Story Map Mobile App Reading Comprehension Mobile App Concept Teaching Mobile Application Navigation App Barrier-Free World Mobile App Barrier-Free Smart Transportation Application My Eye App I'm Learning Math Passion Flower Application PDA App moBraille Educational Mobile App Powered by Hand-Graspable Interactive Objects Blind Museum Tourer App Blind RouteVision App Proloquo2Go App MAHREC Application Literacy (Hearing Impairment) Resolving Charts and Symbols Diagnosing and Solving the Problem Reading Comprehension Social Skills Teaching (Autism) Mathematics Teaching Concept Training Problem Solving Skills Location-Direction Training Social Life Skills Development of Number Counting Skills Literacy (Visually Impaired)

Source: Authors' own conception

As can be seen in Table 4, the content in the mobile applications used in the examined studies and the themes of presenting the content are specified in detail.

3.4. Findings for the Fourth Sub-Problem

The fourth and final research problem of this study was determined as "What are the topics addressed in the studies examined?". The frequency and percentage values of the variables examined in the studies carried out on the basis of mobile applications in special education are presented in Table 5.

Table 5 - Issues Addressed in the Studies on Mobile Application in Special Education

Variables	Frequency	Percent
Literacy Skills	6	%23,1
Development of Number Counting	5	%19,2
Skills	2	%7,7
Concept Training		
Problem-solving skills	3	%11,5
Location-Direction Training	3	%11,5
Social Life Skills	2	%7,7
Resolving Charts and Symbols	1	%3,9
Mathematics Teaching	4	%15,4
Sum	**26**	**%100**

Source: Authors' own conception

As can be seen in Table 5, the use of mobile applications in special education was mostly in the field of literacy. In addition, place-direction applications for the visually impaired have been one of the most studied topics in recent years. To the conclusion that the use of mobile applications by students with special education needs is mostly used under the heading of academic skills; studies aimed at improving literacy and counting skills have been reached due to the popularity.

4. Conclusion and evaluation

In this research, systematic field writing screening was carried out to determine the use of mobile application studies in special education. In the studies examined; The development of mobile applications, which have been

on the agenda in recent days to facilitate the lives of individuals with special education needs, supports fun and remarkable learning. As a result of the researches in individuals with special education needs, various mobile applications have been designed that support attention and easy use thanks to today's technology due to the fact that attention disorder is very effective. In order to increase the social development of children or individuals with special educational needs in applications; It is aimed to facilitate learning through the use of technology. In this way, it is planned to increase the permanence of learning by listening to the social development desired by the student and supporting it with the added visuals. Therefore, when the studies are examined in general, it is concluded that more academic studies are carried out. However, it has been seen that there are fewer studies to improve daily social skills. Carrying out studies in this field will make the lives of individuals with special education needs a little easier.

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