Instructional Technology and Lifelong Learning Vol. 4, Issue 2, 148-175 (2023)

https://dergipark.org.tr/en/pub/itall

ITALL

Research Article

ISSN: 2717-8307

Investigation of Mobile Applications for Children to Support the Acquisitions in the Preschool Education Program

Şuheda Betül Nur ÖZLEVENT *[1], Bengü TÜRKOĞLU [2]

* *Corresponding Author, turkoglubengu@gmail.com*
[1]*Ministry of National Education, Türkiye*
[2]*Necmettin Erbakan University, Türkiye*

Abstract

Nowadays, with the widespread use of mobile devices and the internet, the age range of users has decreased to the preschool period. Games in application stores do not always contain educational content. The content encountered is important for children who spend some of their time playing games on mobile devices. In line with this, the present study aimed to examine the support status of mobile applications for children regarding the acquisitions in the Preschool Curriculum. The sample of the study, in which the document analysis method was employed, consists of 24 mobile applications for children in the Google Play Store. While examining the applications, the data were processed into the Application Review Form created on Google Forms by the researcher, and all the data were analyzed at the end of the review process. According to the study results, it was revealed that the examined mobile applications could support 28 acquisitions out of a total of 63 acquisitions in the Preschool Curriculum and the highest number of supportable acquisitions belonged to the cognitive development domain. It was concluded that mobile applications were insufficient to support the acquisitions in other development domains and mobile applications could be used as an educational tool only for some acquisitions, and suggestions were presented in this direction.

Keywords: Preschool Education Program, Mobile Application, Mobile Device, Acquisition

Citation: Özlevent, Ş. B. N., & Türkoğlu, B. (2023). Investigation of Mobile Applications for Children to Support the Acquisitions in the Preschool Education Program. *Instructional Technology and Lifelong Learning, 4(2)*, 148-175. https://doi.org/10.52911/itall.1385301

Çocuklara Yönelik Mobil Uygulamaların Okul Öncesi Eğitim Programında Yer Alan Kazanımları Destekleme Durumunun İncelenmesi

Özet

Günümüzde mobil cihazlar ve internet kullanımının yaygınlaşmasıyla kullanıcı yaş aralığı okul öncesi döneme kadar inmiştir. Uygulama marketlerinde yer alan oyunlar ise her zaman eğitsel içerikler barındırmamaktadır. Zamanlarının bir kısmını mobil cihazlarda oyun oynayarak geçiren çocuklar için karşılaştıkları içerikler önem arz etmektedir. Bu doğrultuda bu çalışmada, çocuklara yönelik mobil uygulamaların Okul Öncesi Eğitim Programı'nda yer alan kazanımları destekleme durumunun incelenmesi amaçlanmıştır. Bu araştırmada nitel araştırma desenleri arasında yer alan doküman incelemesi kullanılmıştır. Çalışmanın örneklemini Google Play Store'da bulunan çocuklara yönelik 24 adet mobil uygulama oluşturmaktadır. Uygulamalar incelenirken veriler araştırmacılar tarafından Google Formlar üzerinde oluşturulan Uygulama İnceleme Formu'na işlenmiş, inceleme sürecinin sonucunda ise tüm veriler analiz edilmiştir. Araştırmanın sonucuna göre incelenen mobil uygulamaların Okul Öncesi Eğitim Programı'nda yer alan toplam 63 kazanımdan 28 kazanımı destekleyebileceği ve en çok desteklenebilecek kazanımların bilişsel gelişim alanına ait olduğu tespit edilmiştir. Mobil uygulamaların diğer gelişim alanlarındaki kazanımları destekleme durumunda yetersiz kaldığı, mobil uygulamaların ancak bazı kazanımlara yönelik eğitim aracı olarak kullanılabileceği sonucuna ulaşılmış ve bu doğrultuda öneriler sunulmuştur.

Anahtar Kelimeler: Okul Öncesi Eğitim Programı, Mobil Uygulama, Mobil Cihaz, Kazanım

Date of Submission	02.11.2023
Date of Acceptance	20.12.2023
Date of Publication	31.12.2023
Peer-Review	Double anonymized - Two External
Ethical Statement	It is declared that scientific and ethical principles have been followed while carrying out and writing this study and that all the sources used have been properly cited.
Acknowledgements	---
Author(s) Contribution	The authors took part in all phases of the study and contributed equally.
Plagiarism Checks	Yes - Turnitin
Conflicts of Interest	The author(s) has no conflict of interest to declare.
Complaints	ithalljournal@gmail.com
Grant Support	The author(s) acknowledge that they received no external funding in support of this research.
Copyright & License	Authors publishing with the journal retain the copyright to their work licensed under the **CC BY 4.0**.

1. Introduction

Many different definitions have been made about education given its broad scope and dynamic structure. The elements it contains vary based on its underlying philosophy and the expectations toward it can also change (Yavuz, 2018). According to Ertürk (1972), education is the process of intentionally achieving a desired change in an individual's behavior through his/her own experiences. In other words, education is the process of planned changes in an individual's behaviors by practising and experiencing, determined by societal ideals (Gürsel, 2003; cited in Yavuz, 2018). According to Başaran (1994), the aim of education is to individualize one and make him/her productive while fostering cultivation and socialization.

Although education continues throughout life, formal education consists of stages limited to certain ages. Preschool education, which covers the 0-6 age range of formal education, aims to support all areas of development, considering individual differences among children, to provide children with a stimulating environment, to instill cultural values, and to prepare them for primary school (Katrancı, 2018). In line with these objectives, in the preschool education program in Turkey, the outcomes that children should reach in various developmental areas are referred to as acquisitions, while their observable forms are referred to as indicators. The preschool education program includes 22 acquisitions in the field of cognitive development, 12 acquisitions in language development, five acquisitions in motor development, 17 acquisitions in social-emotional development, eight acquisitions in self-care skills, each with related indicators (Ministry of National Education [MoNE], 2013).

When planning their education, preschool teachers take into account the developmental levels of their students, select acquisitions, indicators and concepts in the program in accordance with the interests, needs and environment of their students, thus incorporating them in their education plan. The goal is to teach these acquisitions and concepts by using various types of activities in the preschool education program. These activities include Turkish language, art, drama, music, movement, play, science, mathematics, literacy preparation, and field trips (MoNE, 2013).

Preschool teachers integrate technology into their activities, considering the contemporary age, not only when planning their activities but also when implementing them in the classroom environment. Examples of technological tools used by teachers include computer, Internet,

television, projection, smart board, etc. These tools provide advantages to both teachers and students in terms of diversity, convenience, and easy access to data (Can-Yaşar et al., 2012). Technology is an integral part of life, and it is vital to educate individuals who use technology effectively in education, as in every field, and to provide technology integration for achieving this goal (Uslu & Özgün, 2023). However, learning can be increased to higher levels through enriching learning environments with technology and integrating these technologies into education programs (Avcı & Candan, 2023).

In the current state of technology, mobile devices hold a significant position in human life. Mobile devices and the Internet have facilitated communication and accelerated access to information. Likewise, children are introduced to mobile devices at an early age and generally use mobile devices for playing games and watching videos (Kol, 2021). For children, technology can serve as a toy or learning tool (Tüzel İşeri, 2018). However, the unconscious use of mobile devices, starting to use it as early as two years old, and problems with content and timing, there are concerns that technology can cause more harm than benefit to children. In this regard, families find the solution in completely preventing children from using mobile devices and keeping them away from technology. However, this approach is not feasible given the increasing prevalence of technology in daily lives of children. In this consideration, families should be aware of the issue and guide their children, ensuring that they use technology properly and obtain the maximum benefit from it (Budak, 2020).

Today, mobile devices, equipped with features and capacities of a computer, are used as educational tools in higher education with the advantages they offer. Their integration is also expected in other substages of education in the future. Mobile devices are integrated in the education process for various reasons, such as portability, capacity to present diverse content in different ways, and the ability to interact with the content through visual, audible and touchscreen facilities. In the future, they may be favored in terms of allowing students to be engaged in the education process outside the school. Another technological element thought to be important in the future is digital games. Within the scope of digital games, which have become independent of borders as they are in a virtual environment, players can collaboratively solve problems and develop various skills. Digital games can have numerous educational benefits and be used as educational tools. It is argued that this can only happen through educational digital games designed for curricula and educational purposes (Bardakçı, 2018).

Because development and learning are quite rapid and self-control has not yet developed in the preschool period, the type and duration of use of technological devices in children's life in this period is crucial. Digital games, which attracts children's attention and can become a very attractive educational tool for them when used correctly, are also defined as natural teachers (Gölge, 2022). Similarly, parents providing mobile devices to their children while doing housework or traveling believe that their children can benefit from educational mobile applications (Göle, 2023). For mobile applications to serve as natural teachers, they are expected to align with the preschool education program. This shapes the education that preschool children receive in educational institutions. Preschool children who are familiar with and use mobile devices in the preschool period can derive educational benefits if the mobile applications they use for preschool children align with the preschool education program.

In this sense, a question arises regarding whether mobile devices can serve as educational tools, and therefore, whether mobile applications can be utilized as educational tools. For mobile applications to be deemed appropriate for use in preschool education, they should be oriented toward learning acquisitions in the preschool education program. The present study seeks to examine the suitability of mobile applications for acquisitions in the preschool education program.

1.1. Significance of the Research

With the development of technology, access to technological devices is increasing. Today, we can access the desired data on the Internet using smartphones and tablets. According to a study by the Turkish Statistical Institute, the proportion of households with access to the Internet increased by 1.3% in 2021 compared to the previous year and reached 92.0% (Turkish Statistical Institute [TURKSTAT], 2021). Adults' easy access to and continuous interest in the Internet and mobile devices may cause children to access and be interested in them in the same way. In addition, constant flow of visuals, lights, and sounds attract children's attention (Urfa, 2020).

One of the most important factors in preschool education is family. Children experience their first learning experiences with their families. Family support holds a very significant place throughout the education process. The engagement of families in the preschool period can affect children's both academic and social, emotional, and self-development in several ways.

Conversely, the absence of family involvement may lead the child to feel a deficiency in many ways (Ergüden et al., 2020).

In a study conducted with parents, technology addiction emerged as one of the problems they experienced concerning their children. They expressed a desire for receiving parental education as support for educational guidance (Koç et al., 2022). In the study conducted by Durmuş and Övür (2021), 30.2% of the children encountered smartphones at the age of 7-12 months and 18.24% encountered tablets at the age of 25-36 months. In this study, 33.1% of the children spent 0-1 hour a day with smartphones and 20.3% spent 0-1 hour a day with tablets, with 47.3% watching videos on smartphones.

The influence of parents is very important in children's interactions with mobile devices. Parents provide their children with the opportunity to engage with applications by installing applications designed for children from application markets on their devices. However, improperly selected applications and misuse can lead to addiction in children. There are children who cannot meet even their basic daily needs without mobile devices. Because children are more vulnerable at their age and lack sufficient usage skills, the Internet poses various risks for them. These risks can range from encountering inappropriate content to exposing personal information. Thus, parents with Internet literacy can provide effective guidance to their children on safe Internet practices. This support includes protecting children from various risks and guiding them on proper Internet use (Kopuz et al., 2022). It is very risky for children to spend time with mobile devices with Internet connections without parental supervision. Therefore, regarding the use of mobile devices, particularly for preschool children, the applications and content used, the time spent and the purposes of use are crucial. With these limitations imposed on children, we can talk about benefit rather than harm (Kol, 2021). Parents typically do not have restrictive attitudes toward mobile devices, and even those who do may permit their usage in certain circumstances. Children whose parents are generally inadequate in supervision can use mobile devices to access both content and applications without supervision, often without their parents' knowledge (Cengiz Saltuk & Erciyes, 2020). With the provision of education through digital media during the COVID period, parents do not have the necessary knowledge and skills to guide their children correctly and need guidance to access the right resources and methods (Cao et al., 2022). Some parents find digital technology frightening for their children, while others introduce it to them at an earlier age than they

should. However, parents should be aware of the possible dangers in the digital world, protect their children from these dangers, raise awareness of their children against them. They should further ensure that their children can access and benefit from the right and safe content without any problems, just as they protect and guide them in the real world (Kurtoğlu Erden & Uslupehlivan, 2021). Today, the number of mobile applications that appeal to children, offered to them as toys by their parents, is increasing daily. Various mobile applications produced at this point generally aim to attract children's attention and entertain them. Some applications have the purpose of providing educational content. In this respect, there are some criteria that mobile applications, which are inevitably used in the education process, must meet to be considered educational. Examples of these criteria include the appropriateness of the child's developmental characteristics as well as the presence of hardware features that can be used, the presence of explanatory and directive instructions for the application, the opportunity to make mistakes, the difficulty level being adjustable according to children, the use of interesting vivid colors and visuals that facilitate understanding, the examination of the app's advertisements, etc. (Topuz & Kaptan, 2017).

A study examined the information exchange of preschool teachers about the use of mobile applications in education on an online platform. It found that teachers wanted to include applications in the educational process for different educational purposes. A preschool teacher emphasized that it is not impossible for a competent preschool teacher to turn mobile devices, which act as a babysitter, into educational tools. Any object unrelated to education can be turned into a usable tool in education with the necessary adjustments made by the teacher (Marklund & Dunkels, 2016).

In light of this information, when determined that mobile applications for children are compatible with and support the acquisitions in the preschool education program, this can benefit three groups. Children who spend a lot of time with mobile devices and are exposed to content and applications that may not be age-appropriate can have fun and learn by using applications that are appropriate for their development and support the learning acquisitions in their education. Preschool teachers seeking to engage families in education and care about children using more appropriate applications on mobile devices can recommend families to use these applications with their children as an alternative. In addition, the teacher can make use of the applications in the classroom, even if limited, and turn them into educational tools.

1.2. Aim of the Research

In this study, we aimed to examine the extent to which mobile applications for children support learning acquisitions in the preschool education program. Within this framework, we sought answers to the following questions:

1. *To what extent do mobile applications for children support the acquisitions in the preschool education program?*
2. *Which acquisitions from the preschool education program supported by mobile applications for children are most supported by the applications?*
3. *Can mobile applications for children be a training tool for preschool teachers and a support training tool for families based on their ability to support the acquisitions in the preschool education program?*

2. Method

This section provides information about the research model, population and sample, data collection tools, data collection, and data analysis.

2.1. Research Model

This study employed document analysis, one of the qualitative research designs, to determine the extent to which 24 applications suitable for ages 5 and younger among the applications under the title of "education" in the "children" category of the Google Play Store, meet the acquisitions based on the developmental areas in the preschool education program. Document analysis is a qualitative research method used to examine, evaluate, and interpret the content of written documents in detail and to systematically generate understanding and make sense of the subject (Corbin & Strauss, 2008; Wach & Ward, 2013; Yıldırım & Şimşek, 2016). In this context, the children's applications in the Google Play Store were examined within the framework of the acquisitions in the preschool education program, evaluating the suitability of the applications to the acquisitions. Because the research involves the evaluation of the applications in the Google Play Store by experts based on the application review form, Ethics Committee permission was not necessary.

2.2. Population and Sample of the Study

The population of the study consists of all applications in the Google Play Store. As a sample in the study, 24 applications that were randomly selected from the applications under the title of "education" in the "children" category in the Google Play Store, which are suitable for ages 5 and younger, and the applications that are close to this category from the applications found by searching with the keywords "preschool" and "preschool games" were examined. Applications that did not have educational content and were difficult to understand were not included in the study.

2.3. Data Collection Tools

To facilitate data recording and analysis, the researchers created an application review form on Google Forms with the guidance of an expert. The data related to the implementation were recorded on this form. The form included eight sections. The first section covered the application name, the recommended age group, the purpose of the application, the platform the application was located on, whether there were in-app purchases, the existence of advertisements in the application, the ratings it received from users, download statistics, and whether it was in the teacher-approved category. The other five sections of the form consisted of acquisitions based on the development areas outlined in the preschool education program. These development areas included cognitive development, language development, social and emotional development, motor development, and self-care skills. The seventh section of the application included the categorization made by Google Play about the application. It encompassed the age range for which the app was suitable, indicated which area it was educational in, if in the educational category, subheadings in the fun and interesting category, subheadings in the specially designed for children category, subheadings in the creativity and imagination category, positive messages it contained, and the labels it had in Google Play labeling. The final part of the form included a summary of user comments about the app and the researchers' comments. Additionally, there was an item stating that the application could support the identified acquisitions when used under the guidance of an adult speaking English.

2.4. Data Collection Process

Following the literature review, mobile applications were installed on a mobile device. Prior to examining the application, sections 1 and 7 of the application review form were filled in

considering the page of the respective mobile application on Google Play. Then, each mobile application was examined starting from step 1, examining each step or category. While examining the application, the acquisitions in the preschool education program were considered and the compliance of the applications with these acquisitions was analyzed. Subsequently, the data were entered into the implementation review form as necessary. Then, the final section of the application review form was filled in as per the reviews and user comments and this process was renewed for each application. In addition, notes were taken to briefly summarize the ways in which the applications supported the identified acquisitions.

Each mobile application is produced by different application developers for different purposes. While some developers aim to create a truly useful and educational application for children, others can be more concerned with materialistic concerns. It is not possible to know these purposes. Therefore, the applications were selected relying on the purposes stated by the developers. During the research, a form was created to analyze the data of the applications. In line with the data and labeling in Google Play, new sections were created by adding them to the form. In addition, after noticing the "teacher approved" labeling in certain applications in the children category by Google Play, an inquiry was conducted to ascertain the certain features for receiving these labels. In addition, a new section was added to the form for this category, aiming to determine the effect of this labeling on the applications' ability to support the acquisitions. It also aimed to examine more applications, but since the acquisitions in the preschool education program are comprehensive and the applications generally consist of many phases, the research was limited to 24 applications. During the research, most of the applications were in English and did not include Turkish language support. After determining that these applications could support the acquisitions if they had Turkish language support, the item "*This application can only support the stated acquisitions under the guidance of an adult who speaks English*" was added to the form.

2.5. Data Analysis

Following the examination of 24 mobile applications, the data in the responses section of the application review form created in Google Forms were analyzed. For open-ended items, the prominent answers were taken as a basis, and for optional items, the analysis was performed

by examining the graphs automatically generated by Google Forms. The analysis was conducted according to the items in the application review form.

3. Result

This section presents the findings that derived from the analysis of the data obtained from the implementation review forms.

3.1. Names of the Examined Applications

Table 1 shows the names of the 24 mobile applications for children whose compliance with the acquisitions in the preschool education program was evaluated.

Table 1.

Application Names

Application Name
TRT Aegean and Gaga
Miffy's World - Bunny Adventures
Preschool Educational Game
Montessori Preschool Games
Masha and the Bear Educational Game
Brain Games for 4-6 Year Olds: Kids Brain Teasers
Coloring Book for Children
Pinkfong Numbers Zoo
KidloLand-Children's Songs and Games
Educational games for 2-5 years - kids games
Kids Preschool Basics
Kids UP - Montessori Online
Baby Panda's Emergency Tips
Preschool Games
Baby Shark Car Town
Funny Food 2
Kid-E-Cats. Educational Games
Busy Shapes & Colors - Learn Colors and Shapes
Sago Mini Camping
Sago Mini Space
MarcoPolo Ocean
Kidzooly-Kids Preschool Learning Games & Toddler Rhymes
Sago Mini Super Juice Maker
Dino Tim

3.2. Appropriate Age Group for Applications

Table 2 shows that 18 of the 24 applications were suitable for ages 2 and above, four were suitable for ages 4 and above, and two did not specify the appropriate age. Of the applications examined, 75% were suitable for ages 2 and above.

Table 2.

Appropriate Age Group for Applications

2+ Age	4+ Age	Unspecified
18	4	2

3.3. Purpose of the Applications

Table 3 shows that 17 of the 24 applications included activities such as puzzles, painting, matching, recognizing numbers, colors, patterns, and shapes. The purpose of the applications was to perform these activities. The remaining seven applications were found to have different themes and purposes. Although 70.83% of the analyzed applications were not similar, they had similar purposes. The visuals, sounds, types of activities and games, and actions expected to be performed were similar. However, 29.17% of the applications were designed for different purposes additional to or different from the purposes of other applications. These included finding different objects from pictures that would eventually form the picture of a story, discovering and experiencing different things in a campground with animals and objects, preparing and serving fruit juices using interesting materials in different ways, accompanying a tiny rabbit for a day, exploring in a submarine and creating your own submarine, providing first aid intervention to children injured in several ways, and exploring with a dog in space.

Table 3.

Purpose of the Applications

Completing Activities such as Puzzle, Coloring, Matching	Objectives for Different Themes
17	7

3.4. Platforms of the Examined Applications

Table 4 shows that 20 of the 24 applications are available in both the Android and IOS application markets, and four are only available in the Android application market. The vast majority of the analyzed applications (83.33%) were created to be compatible with both the Android and IOS operating systems.

Table 4.

Platforms of the Examined Applications

Android + IOS	Android
20	4

3.5. Availability of Advertisements in the Examined Applications

Table 5 shows that nine of the 24 applications contained advertisements, while 15 did not. Of the analyzed applications, 37.50% contained advertisements, while 62.50% did not.

Table 5.

Availability of Ads in Examined Applications

There are Ads in the App	No Ads in the App
9	15

3.6. In-App Purchase Status in the Examined Applications

Table 6 shows that 21 of the 24 applications had in-app purchases, while three did not. The vast majority of the analyzed applications (87.50%) had in-app purchases.

Table 6.

In-App Purchase Status in Examined Applications

In-App Purchases Available	No In-App Purchases
21	3

3.7. The Number of Stars (Ratings) Received by Users in the Examined Applications

Table 7 shows that five of the 24 applications received three stars and 19 received four stars from the users in the application markets. The majority of the analyzed applications, 79.17%, received four stars.

Table 7.

The Number of Stars (Rating) Received by Users

3 Stars	4 Stars
5	19

3.8. The Number of Downloaded Examined Applications by Users

Table 8 shows that one of the 24 applications was downloaded between 5,000 and 10,000 times, one was downloaded between 10,000 and 50,000 times, two were downloaded between 50,000 and 100,000 times, five were downloaded between 100,000 and 500,000 times, one was downloaded between 500,000 and 1,000,000 times, and 14 were downloaded more than 1,000,000 times. The majority of the analyzed applications, i.e., a total of 58.33% were downloaded more than 1,000,000 times.

Table 8.

Number of Downloads by Users

5000-10000	10.000-50.000	50.000-100.000	100.000-500.000	500.000-1.000.000	>1.000.000
1	1	2	5	1	14

3.9. The Status of the Examined Applications Included in the Teacher Approved Category

Table 9 shows that 17 of the 24 applications were found in the Teacher Approved category created by the Google Play Store, while the rest were not. The vast majority of the analyzed applications, i.e., a total of 70.83% were teacher-approved applications.

Table 9.

Inclusion in the Teacher Approved Category

Teacher Approved	Not Teacher Approved
17	7

3.10. The Status of Supporting Cognitive Development Acquisitions by the Examined Applications

Table 10 indicates how many of the 24 applications can support the cognitive development acquisitions in the preschool education program. Accordingly, all applications can support acquisition one. The 2nd, 3rd, 4th, 5th, 6th, 8th, 12th, and 15th acquisitions can be supported by 10 or more applications. The 7th, 9th, 10th, 14th, 16th, 17th, 18th, and 20th acquisitions can be supported by at least one and at most nine applications. The 11th, 13th, 19th and 21st acquisitions cannot be supported by any application.

> *"In the game, blue, yellow and red chameleons are matched with food of the same color."* **(Educational games for ages 2-5 – Children's games) - 1st, 5th, 6th, and 8th acquisitions**
>
> *"In the game, the two groups of fireflies are counted and the correct number is marked after finding out their total number."* **(KidloLand-Children's Songs and Games) - 4th and 16th acquisitions**
>
> *"When an apple is dragged to the campfire, it turns into a pie. By remembering this information and using it in new situations, the child can try dragging different foods to the fire."* **(Sago Mini Camping) - 3rd acquisition**

"In the game, different geometric shapes and spaces suitable for these shapes are matched." **(Brain Games for 4-6 Year Olds: Kids Brain Teasers) – 5th, 6th, 8th and 12th acquisitions**

"In the game, creatures and tools are disassembled down to the smallest part and then reassembled to form a wholeness." **(MarcoPolo Ocean) - 15th acquisition**

"The lost tooth of the dinosaur is replaced by finding the correct color in accordance with the pattern. Then, it is brushed and whitened." **(KidloLand-Children's Songs and Games) – 1st, 5th, 8th and 14th acquisitions**

Table 10.

The Status of Supporting Cognitive Development Acquisitions by the Examined Applications

Acquisition	Number of Applications that can Support the Acquisition
Acquisition 1. S/he pays attention to the object/situation/event.	24
Acquisition 2. S/he makes predictions about the object/situation/event.	11
Acquisition 3. S/he recalls what they perceive.	10
Acquisition 4. S/he counts objects.	10
Acquisition 5. S/he observes objects or entities.	19
Acquisition 6. S/he matches objects or entities according to their properties.	18
Acquisition 7. S/he groups objects or entities according to their properties.	9
Acquisition 8. S/he compares the properties of objects or entities.	13
Acquisition 9. S/he sorts objects or entities according to their properties.	4
Acquisition 10. S/he applies the instructions related to location in space.	1
Acquisition 11. S/he measures objects.	0
Acquisition 12. S/he recognizes geometric shapes.	11
Acquisition 13. S/he recognizes symbols used in daily life.	0
Acquisition 14. S/he creates patterns with objects.	7
Acquisition 15. S/he understands the part-whole relationship.	11
Acquisition 16. S/he performs simple addition and subtraction operations using objects.	1
Acquisition 17. S/he establishes a cause-effect relationship.	1
Acquisition 18. S/he explains the concepts related to time.	1
Acquisition 19. S/he produces solutions to problem situations.	0

Acquisition 20. S/he prepares graphics with objects/symbols.	1
Acquisition 21. S/he recognizes Atatürk and explains his importance for Turkish society.	0

3.11. The Status of Supporting Language Development Acquisitions by the Examined Applications

Table 11 indicates how many of the 24 applications can support the language development acquisitions in the preschool education program. Accordingly, only the 1st, 6th and 7th acquisitions can be supported by at least one application and the other 9 acquisitions cannot be supported by any application.

> *"An animal sound is played, asking which animal it is."* **(Kids UP - Montessori Online) – 1st acquisition**
>
> *"In the game, the names of various sea creatures and tools are mentioned with their details using their visuals."* **(MarcoPolo Ocean) – 6th and 7th acquisitions**

Table 11.

The Status of Supporting Language Development Acquisitions by the Examined Applications

Acquisition	**Number of Applications that can Support the Acquisition**
Acquisition 1. S/he distinguishes sounds.	3
Acquisition 2. S/he uses her/his voice appropriately.	0
Acquisition 3. S/he constructs sentences according to syntax rules.	0
Acquisition 4. S/he uses grammar structures while speaking.	0
Acquisition 5. S/he uses language for communication purposes.	0
Acquisition 6. S/he develops vocabulary knowledge.	1
Acquisition 7. S/he understands the meaning of what he/she listens/watches.	2
Acquisition 8. S/he expresses what s/he listens/watches in various ways.	0
Acquisition 9. S/he demonstrates phonological awareness.	0
Acquisition 10. S/he reads visual materials.	0
Acquisition 11. S/he demonstrates reading awareness.	0
Acquisition 12. S/he demonstrates writing awareness.	0

3.12. The Status of Supporting Social and Emotional Development Acquisitions by the Examined Applications

Table 12 indicates how many of the 24 applications can support the social and emotional development acquisitions in the preschool education program. Accordingly, only the 3rd and 4th acquisitions can be supported by an application and 15 acquisitions cannot be supported by any application.

> *"The child can design his/her own monster image using the options offered during the game."* **(KidloLand-Children's Songs and Games) - 3rd acquisition**
>
> *"The child can express the reasons for the reactions of the animals drinking the prepared juices."* **(Sago Mini Super Juice Maker) - 4th acquisition**

Table 12.

The Status of Supporting Social and Emotional Development Acquisitions by the Examined Applications

Acquisition	**Number of Applications that can Support the Acquisition**
Acquisition 1. S/he introduces her/his own characteristics.	0
Acquisition 2. S/he introduces the characteristics of her/his family.	0
Acquisition 3. S/he expresses herself/himself in creative ways.	1
Acquisition 4. S/he explains the feelings of others about an event or situation.	1
Acquisition 5. S/he shows positive/negative feelings about an event or situation in appropriate ways.	0
Acquisition 6. S/he protects her/his own and others' rights.	0
Acquisition 7. S/he motivates herself/himself to accomplish a job or task.	0
Acquisition 8. S/he shows respect for differences.	0
Acquisition 9. S/he explains different cultural characteristics.	0
Acquisition 10. S/he fulfills her/his responsibilities.	0
Acquisition 11. S/he takes responsibility in activities related to Atatürk.	0
Acquisition 12. S/he complies with the rules in different environments.	0
Acquisition 13. S/he protects aesthetic values.	0
Acquisition 14. S/he recognizes the value of works of art.	0
Acquisition 15. S/he has self-confidence.	0
Acquisition 16. S/he explains that individuals have different roles and duties in social life.	0
Acquisition 17. S/he solves problems with others.	0

3.13. The Status of Supporting Motor Development Acquisitions by the Examined Applications

Table 13 indicates how many of the 24 applications can support the motor development acquisitions in the preschool education program. Accordingly, only the 2nd acquisition can be supported by an application and the remaining 4 acquisitions cannot be supported by any application.

> *"In the exercise section, various balance movements that children can do are provided with visuals and timings." (Preschool Games) - 2nd acquisition*

Table 13.

The Status of Supporting Motor Development Acquisitions by the Examined Applications

Acquisition	Number of Applications that can Support the Acquisition
Acquisition 1. S/he makes displacement movements.	0
Acquisition 2. S/he makes balance movements.	1
Acquisition 3. S/he performs movements that require object control.	0
Acquisition 4. S/he performs movements that require the use of small muscles.	0
Acquisition 5. S/he moves with music and rhythm.	0

3.14. The Status of Supporting Self-Care Skills Acquisitions by the Examined Applications

Table 14 indicates how many of the 24 applications can support the self-care skills acquisitions in the preschool education program. Accordingly, the 1st, 2nd, 3rd, 7th and 8th acquisitions can be supported by at least one application, while the remaining 3 acquisitions cannot be supported by any application.

> *"The character in the game is awakened by the child, showing self-care skills such as brushing teeth, bathing, and dressing."* **(Miffy's World - Bunny Adventures) - 1st, 2nd and 3rd acquisitions**

> *"The game shows different reasons for children's injuries and treatment methods. The child gives first aid to the injured children in the game."* **(Baby Panda's Emergency Tips) - 7th and 8th acquisitions**

Table 14.

The Status of Supporting Self-Care Skills Acquisitions by the Examined Applications

Acquisition	Number of Applications that can Support the Acquisition
Acquisition 1. S/he applies the rules of cleanliness related to her/his body.	1
Acquisition 2. S/he is able to do things related to dressing.	1
Acquisition 3. S/he makes necessary arrangements in living spaces.	2
Acquisition 4. S/he has an adequate and balanced diet.	0
Acquisition 5. S/he explains the importance of resting.	0
Acquisition 6. S/he uses the necessary tools and materials for daily life skills.	0
Acquisition 7. S/he protects herself/himself from dangers and accidents.	1
Acquisition 1. S/he takes precautions related to her/his health.	1

3.15. Age Appropriateness and Different Category Labelings for Teacher-Approved Applications

Table 15 indicates that eight of the 17 teacher-approved applications are suitable for ages up to five years and nine applications are suitable for age groups of 6-8 years. Among the 12 teacher-approved applications evaluated in the education category, six applications were labeled as mathematics, five applications were labeled as arts, and four applications were labeled as language arts. Therefore, these three labels were most frequently given in the education category. Music, emotional literacy, and science labels were assigned to only one app, while the social sciences label was not assigned to any app. Sixteen out of the 17 teacher-approved applications evaluated in the fun and interesting category received the popular topic label. Therefore, almost all of the teacher-approved applications have popular topics. In this category, 13 applications received the label "lots of things to do", 10 applications received the label "tasks", eight applications received the label "surprises", five applications received the label "characters" and two applications received the label "humor". Of the 17 applications evaluated in the category of specially designed for children, all of them received the labels words and sounds, ease of use, art and animation. Among the 17 teacher-approved applications evaluated in the creativity and imagination category, nine applications received the critical thinking label, eight applications received the role-playing game label, eight applications received the intriguing label, seven applications received the creativity label, six applications received the

imagination label, five applications received the innovative label, and no app received the beautiful story label. Among the 12 teacher-approved applications evaluated in the positive messages category, 10 applications received the label "love of learning", which was the most common label given in this category. Two applications received the environment label, and only one app was given the labels of diversity, friendship, family, empathy and emotions. Healthy nutrition and physical health labels were not given to any of the applications.

Table 15.

Age Appropriateness and Different Category Labelings for Teacher-Approved Applications

Suitable Age	**Number of Applications (17 Applications)**
Up to 5 years old	8
6-8 years old	9
Education Category Tags	**Number of Applications (12 Applications)**
Art	5
Mathematics	6
Social Sciences	0
Language Arts	4
Music	1
Emotional Literacy	1
Science	1
Fun and Interesting Category Tags	**Number of Applications (17 Applications)**
Popular topic	16
So many things to do	13
Surprises	8
Humor	2
Characters	5
Tasks	10
Tags in the category Specially Designed for Children	**Number of Applications (17 Applications)**
Words and sounds	17
Ease of use	17
Art and animation	17
Creativity and Imagination Category Tags	**Number of Applications (17 Applications)**
Critical Thinking	9
Innovative	5
Imagination	6
Role Playing Game	8
Curiosity Arousing	8
Creativity	7
Good Story	0
Positive Messages Category Tags	**Number of Applications (12 Applications)**
Diversity	1
Physical Health	0
Environment	2
Love of Learning	10
Healthy Nutrition	0
Friendship	1
Family	1
Empathy	1
Emotions	1

4. Discussion and Conclusion

This study examined the status of mobile applications for children in supporting acquisitions in the preschool education program. In this regard, using the document analysis method, 24 applications were randomly selected from the educational applications for preschool children from the Google Play Store and examined based on the acquisitions in the preschool education program. The data were recorded in the application review form and the data obtained were analyzed in line with the purpose of the research.

Considering the question *"To what extent do mobile applications for children support the acquisitions in the preschool education program?"* and the findings from the study, the applications examined could support 28 acquisitions (44.44%) out of 63 acquisitions in the preschool education program, while 35 acquisitions (55.56%) could not support in any way. When analyzed according to developmental areas, 17 out of 21 acquisitions belonging to cognitive development, three out of 12 acquisitions belonging to language development, two out of 17 acquisitions belonging to social and emotional development, one out of 5 acquisitions belonging to motor development, and five out of eight acquisitions belonging to self-care skills could be supported. Twenty-one of the applications had in-app purchases. Although this does not affect the users much in some applications, in other applications, the free part is very limited, and the application forces the user to purchase paid items. In this case, more reasonable price arrangements can be made for educational applications for children or teachers and parents can be allowed to try paid items for free before purchasing them. In addition, users would not be misled by indicating in the app descriptions how many paid items are in the app. However, the menu section with in-app purchased items and settings is usually accessed with encryption that can be decrypted by an adult. This is a security method to prevent children from making accidental purchases. Advertisements were detected in nine applications. The absence of advertisements in most applications for children is a positive aspect. This is because the advertisements that usually appear in applications are not filtered through a certain filter. In user comments on nine applications with advertisements, there are negative comments such as the advertisements being too many and the application being difficult to use due to the frequency of advertisements. The research findings suggested that more acquisitions could be supported from the cognitive development area and self-care skills according to the number of acquisitions within themselves. The development areas in which the fewest acquisitions could

be supported were social and emotional development, motor development, and language development. Since cognitive development is the first thing that comes to mind in regard to developmental areas, or cognitive development is generally seen as equivalent to all development, cognitive development gains can be supported more. Social and emotional development and language development can be less supportable because they require the child to have an interlocutor and motor development can be considered less supportable because they require physical activity.

Considering the second question, *"Which acquisitions from the preschool education program supported by mobile applications for children are most supported by the applications?"* and the findings, the applications examined could support the cognitive development area mostly. All applications supported only the first acquisition belonging to the cognitive development area. Following this, 19 applications supported the fifth acquisition in the cognitive development area, 18 applications supported the sixth acquisition, 13 applications supported the eighth acquisition, and 11 applications supported the second, 12th and 15th acquisitions. In addition, the number of applications that can support the gains was 10 and below. When analyzed in terms of the number of applications that could support the gains, the least supportable development areas were the social and emotional development area, motor development area, and language development area. When examining the status of the hand-in-hand-to-preschool education books provided free of charge by the Ministry of National Education to children in preschool education in terms of supporting the learning acquisitions in the preschool education program, the learning acquisitions in the field of cognitive development were supported the most. However, the learning acquisitions in the field of social and emotional development were included only once. Similarly, acquisitions in the field of language development were also very few (Zelyurt & Osmanoğlu, 2022). In the study analyzing three different cartoons on TRT Children's Channel based on developmental areas, there were more acquisitions in the field of cognitive development. In the field of social and emotional development and language development, the same acquisitions were included in general and more acquisitions should be included in the field of motor development and self-care skills (Cengiz et al., 2020). Regarding the support status of TRT Children's Songs for the acquisitions in the preschool education program, it supported the acquisitions of all areas, particularly the acquisitions in the field of

language development. Therefore, by including different songs in mobile applications, unsupported developmental areas can be supported (Musuloğlu & Sezgin, 2024).

The third question *"Can mobile applications for children be a training tool for preschool teachers and can they be presented to families as a support training tool based on their ability to support the acquisitions in the preschool education program?"* has indicated that not every application can be a training tool based on the findings of the research. However, some applications can be used in line with a specific developmental area and a purpose for acquisitions. However, teachers should examine and select these applications not by labeling but by experiencing them themselves. Mobile applications are also used as educational tools worldwide (Can-Yaşar et al., 012; Kokkalia et al., 2016; Neumann & Neumann, 2017; Tarasuik et al., 2018). However, there are a limited number of applications that generally support acquisitions in the preschool education program. In fact, the number of applications that support acquisitions according to the grades of the world and universe subject area in science teaching showed that more applications supported fifth grade acquisitions, while no application was found to support eighth grade acquisitions (Özcan, 2020). In this regard, it is possible to use more applications as educational tools if application software developers produce applications considering educational programs and acquisitions. Based on the findings of the study, the applications generally support the cognitive development area. The reason for this may be that cognitive development usually comes to mind regarding the preschool period and mostly cognitive activities are preferred in terms of education. However, studies show that there may also be applications that support different developmental areas. It is possible to support expressive language skills by focusing on music and singing in the application (Altun, 2019), to support language and concept development by using augmented reality-enriched materials (Yıldırım, 2019), to support early literacy and phonological awareness skills (Arnold et al., 2021), and thus to support language development through mobile applications. It is also possible to increase receptive and expressive language development with scaffold-like applications. In addition, different educational models can guide application producers (Vatalaro et al., 2018). Although the social and emotional development area was determined as the least supportable area and there are few studies investigating the effect of applications on social communication skills (Griffith et al., 2019), several studies show that mobile applications can be used as tools in subjects, such as providing art education to children through applications (Kelekçi Olgun, 2017)

and raising their awareness about anger management (Nicolaidou et al., 2022). Other studies have shown that applications can support gains in language development and motor development rather than cognitive development (Herodotou & Mangafa, 2022) (Bebell & Pedulla, 2019). In addition, mobile applications can be a functional educational tool in different areas for children, such as the approach to fruits and vegetables and their effect on their liking (Vepsäläinen et al., 2022). They can also be a functional educational tool in science knowledge and executive function skills (Griffith et al., 2019). The applications can also support concepts when produced for the purpose (Demir, 2007). In addition, these applications can further be used as a tool to support education for children of families living in a low socioeconomic environment (Arnold et al., 2021; Vatalaro et al., 2018). Families with preschool children may also feel inadequate in terms of mobile applications and may need guidance on which applications can be educational and useful (Scott, 2022). There is an argument that in the future, teachers will become a guide on certain issues, such as accessing information and data in the right way, choosing the right source and eliminating inappropriate ones, rather than being a mere source of information. In this regard, teachers should be able to guide children and families correctly for mobile applications on mobile devices (Bardakçı, 2018).

It is possible to turn mobile devices into a useful tool for children within a certain period of time with applications selected considering issues such as children's curiosity about technology, their interest in technology, and having fun in the use of technology. There are many issues to be considered in the preparation and evaluation of mobile applications prepared for children. The scope of these considerations increases, particularly if it has an educational purpose. However, these issues are not taken into consideration by software developers. In general, when considering software developed for commercial purposes without any expert support, there is a trend of similarity among these software programs, and unfortunately, the benefit to children is not considered. In the evaluation of software, it is crucial to consider the suitability of the software for the development of the child, the suitability of the elements used for the child's age and developmental characteristics, whether the use, instructions and layout of the applications are intended for children, whether there is an age level specified for the application, the suitability of the characters in the game and the suitability for the child's health, whether there are negative elements, advertisements and subliminal messages, the suitability

for their culture, originality, and the suitability of the evaluation, stages, way of playing and duration of the game for the child (Kol, 2021).

This study was conducted to investigate whether mobile applications support acquisitions in the Turkish preschool education program. According to the results, the applications did not support the acquisitions at the expected level. Examination of the applications that did support the acquisitions within the framework of developmental areas showed that the majority of them focused on one developmental area. In the literature, there are studies investigating the effects of applications in diverse developmental areas, as well as studies on the use of mobile applications as a support education tool for children from families with low socioeconomic status. In this context, some applications can be used by teachers both as educational tools and shared with families in terms of supporting certain acquisitions. In the application software, producers can produce applications that are more functional and more original in terms of education and have different purposes considering the acquisitions in the preschool education program. Producers can create diverse applications that can nourish developmental areas not supported much. Future researchers can investigate into the effects of the applications on children's acquisition of certain acquisitions in practice.

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