Company name

Description automatically generated with low confidence

**BUBBLE**

Educational Games For Children

Mohamed Mahmoud El Badri 20194841

Mohab Khalid Mahmoud 20193015

Saif Eldin Ashraf Taha 20191737

Youssab Ayman 20194784

Contents

[Abstract 2](#_Toc114768565)

[1 . Chapter one : Introduction 3](#_Toc114768566)

[**1 . 1 . Background of the project** 3](#_Toc114768567)

[**1 . 2 . problem** 3](#_Toc114768568)

[**1 . 3 . Objectives** 4](#_Toc114768569)

[**1 . 4 . Scope** 4](#_Toc114768570)

[**1 . 5 . Limitations** 4](#_Toc114768571)

[**1.5.1 Minimum device requirement** 4](#_Toc114768572)

[**1.5.2 Framework** 4](#_Toc114768573)

[**1.5.3 Database** 4](#_Toc114768574)

[2 . Chapter two : Literature Review 5](#_Toc114768575)

[2.3. conclusion 9](#_Toc114768576)

[3 . Chapter three : Methods 10](#_Toc114768577)

[4 . Chapter four : Results and Discussion 10](#_Toc114768578)

[5 . Chapter five : Conclusion 10](#_Toc114768579)

[**6 . References** 11](#_Toc114768580)

# Abstract

In the 2022s, it is clear that children now spend most of their days in front of the screen. During screen time, playing games is one of the most important activities of children. However, technology is developing day by day and innovations are quickly becoming a natural part of life. Therefore, children now need to be creative people who produce innovation, rather than just consuming themselves with the digital content offered to them. For this reason, students need to improve their creative thinking skills. Also, they need guidance for producing with technology. As a result, it was determined that there was a statistically significant difference in the creative thinking skill scores of those who designed their own educational game.

# 1 . Chapter one : Introduction

## **1 . 1 . Background of the project**

Today's kids seem to be able to do things much beyond their years, and they start using the Internet at a young age for a range of tasks like playing games, watching movies, looking up information, sharing it with friends, and so on [1], Their brains can now process new information more quickly than they could previously.

Nowadays, practically every child owns a smartphone primarily used for pleasure. Some children also use their smartphones for learning, but why? Mobile devices are helpful for a variety of reasons, including accessibility from anywhere and at any time, personalization, resources that can be used at one's own pace, and simple communication [1]. Additionally, education is delivered in a manner that differs from how it is often done in school.

Gaming is the most popular learning method, and it plays a significant role in every child's life. No matter the age group, games have a powerful driving force that drives players to compete and win, even if it means repeatedly playing the same game. This is the ideal learning environment [2].

Our aim is to create free software that every child can use easily for learning. As a result, we chose to create a mobile educational application for kids.

Our software will be divided into three sections: one for preschoolers, one for elementary schoolers, and one for middle schoolers. Each component will include games tailored to the appropriate age group.

Since there is no educational application that supports our Arabic language, our first priority is to deliver all game content in Arabic for Arab youngsters.

## **1 . 2 . problem**

**Here are a few issues that arise with kids and mobile learning.**

* No kid-friendly smartphone app is accessible in the Arab globe with Arabic language.
* the absence of a platform that would be interested in instructing kids of this age.
* There is no teaching platform for the concept of programming in the Arab world.
* The reward system is not available in applications from other countries.

## **1 . 3 . Objectives**

We'll develop the first mobile educational software for children in the Arab world with the goal of making it simple for any child to use for learning.

Our software will be divided into three sections:

* preschool:

this section will teach the kids the letters, shape of animals and their sound, and concept of math.

* beginning of school:

this section will teach the children the concept of Algorithm, and concept of problem solving.

* midschool:

this section will teach the children the concept of programing, and concept of logic gates.

## **1 . 4 . Scope**

Our application's target users include the following:

* Children between the ages of 5 and 12
* the parents of these kids

## **1 . 5 . Limitations**

The time frame for this study was constrained because it began in October 2022 and ended in Feb 2023. The fact that this study is exclusively done in the Cairo and Giza government presents another challenge.

**1.5.1 Minimum device requirement**

* Platform:
  + Android 4.1 or above,
  + iOS 11 & above
* Memory: 4GB RAM
* Storage: available 100MB

**1.5.2 Framework**

We will create stunning, natively built applications for mobile devices using Google's portable UI toolkit, the flutter framework.

**1.5.3 Database**

To avoid any internet issues to provide a better experience, we will use a local database.

# 2 . Chapter two : Literature Review

2 . 1. **introduction**

Smart mobile device usage is increasing rapidly among young children due to the novel characteristics of these devices and the rapid development of apps targeting these age groups.

Many researchers have pointed out that mobile devices are the preferred learning technological tool for young children, due to the advantages of this technology relative to other older ways of learning, These include a user-friendly touchable interface and interactive displays that stimulate multiple sensory systems and provide instant responses to input [4].

Unlike traditional learning ways such as school which demand fine skills and self-study to get the most benefit, which often proves difficult for young children.

We found that the most effective way to learn a child is by gaming because gaming lets children practice what they know, and also what they don't. It allows them to experiment through trial and error, find solutions to problems, work out the best strategies, and build new confidence and skills, specific games will be designed for each age range [5].

This chapter will give a brief on our project and show the games that we choose and the categories we'll be including in the app. It will also go through the rationale behind our choice of this teaching strategy.

**2.2. body**

**2.2.1. why education for children?**

Firstly, before we start this chapter we have to know why education for children is one of the rights that every child should have, and how we are obliged to upgrade the educational process all over the time to fit the new children's minds and also make the educational process it keeps up with the now times.

A good education process for children brings their self-esteem, better career prospects, improved health, and a better understanding of the surrounding world and the people that live in it, it's a significant resource to end the cycle of poverty and to bring brilliant minds to light in order to change and develop people's livelihood in this world in which we live [6].

Receiving education through the traditional method has become a thing of the past nowadays. All countries put children’s education as the priority for them because they know the importance of having a future generation aware and aware of the development in which we live [7], so they are now competing to develop the method of education and make it easier, better, and more developed.

So, we have to adapt to this new era and participate in it and make our own mark.

**2.2.2. The mobile educational apps**

Learning in its wider perspective could be seen as a continuous process of enriching human knowledge, of which focus has now completely shifted to eLearning. Due to mobile phones and the various feature-oriented applications, students can learn at their pace and take their time at understanding things, as everything is just a click away [8].

mobile learning is the fastest-evolving learning technology and has ample opportunities in the global learning technology industry. If the app is designed very well [9], it will definitely fulfill the purpose of learning and discovery.

In accordance with this context, we have aimed to design an educational app named Bubble. The proposed app aims at teaching and self-learning for children in preschool and in school, even any child who does not even have any previous knowledge.

**2.2.3. The important role of using mobile apps in education**

mobile applications have gradually brought about some crucial changes in the education industry, as most individual educators are getting in touch with the app stores, to get mobile apps for imparting knowledge, and this is because the educational apps offer a lot of benefits.

Thus, mobile apps have progressively become the most interactive and constructive way to attract students to study and enhance their productivity.

Therefore, some of the key benefits of adopting mobile educational apps include the following:

**Interactive learning:**

Gone are the days, when the only option for the students to read books, was by visiting the library (the traditional setting). On the other hand, the innovative gadgets of today make it easy for students to practice their lessons in an effective and interactive way. These become readily possible through the use of apps on mobile gadgets and are available for all types of skill levels and aid learning using various teaching methods, such as video tutorials, and even educational games [9].

These apps ensure interactive and effective learning, by transforming boring lessons and helping the students to visualize each and everything.

**Availability:**

Unlike schools, mobile apps are available round the clock. Therefore, learning via apps is not time-bound learning; rather it is relaxed learning. Consequently, time-bound learning is not much effective, as children get distracted very easily and are not able to concentrate continuously for a long time.

Thus, educational apps work the best regarding this issue, as they are always available, and the students can study at their convenience [9].

**Portability:**

Mobile devices could be said to be an important part of our everyday lives since they enable us to access a large variety of ubiquitous services, a reason why most persons will not leave their mobile phones at home while going somewhere [9].

Thus, using apps have become a part of the daily routine, whether one is watching a video on the way to work or playing games at lunch, one’s phone is always with him/her. Therefore, the apps can be the constant companions for the students, that is, with the help of educational apps, learning will not be confined to the classroom alone, as the apps allow pupils to take their learning into their own hands and they can study and test themselves at any point in the day.

**2.2.4. Design and its effects on the mobile educational apps**

There are many people living in our country. Most individuals in today's economic and technical progress own cellphones. In my nation, smartphone development has increased since around 2010. With the help of 3G and 4G networks, there are more than 900 million smartphone users worldwide, and the penetration rate of the Internet is close to 70%. About 99% of these 900 million netizens use their mobile phones to access the internet, which essentially means that every household in our nation owns a smartphone. As a result, there are always more smartphone applications available, with education apps serving as an example. The key issue at hand right now is how to satisfy entirely various sorts of netizens through interface design what we called in (UI/UX) [10].

Designing for UI and UX is closely tied to the academic field of Human-Computer Interaction (HCI). For HCI research, practice, and teaching, user interface design is essential. Don Norman I initially coined the phrase "user experience" (UX) [14], which aims to address the human experience from an emotional, affective, experiential, hedonic, and artistic perspective. The UX research and design processes respond, focusing on well-established work environments in the public and private spheres and elevating the user's element of emotion and experience. Based on this, the designers can cope with a complex, networked world of information and computer-mediated interactions and grasp the dynamics of socio-behavioral settings of HCI [13].

Interfaces (UI/UX) are the means through which consumers and digital products communicate. The layer of the UX that is visible is referred to as the UI. The user is encouraged to "share" her personal information with the service provider through the UI. The most important factors when discussing user interface and privacy are clearly telling users about the kind and volume of data that is gathered when they use the service [11].

The user requirements for educational APPs are more complex, and the APP interface must enable users to feel the exquisite product experience in terms of vision; otherwise, users won't have a favorable initial impression of the APP. The user's desire for engagement is quite strong in addition to their visual requirements. Users prefer to actively participate in learning and do not want to passively consume app content. User experience and emotional needs can only be met in this way [10] .

Due to the relative range of educational aims and the dispersed nature of user wants, the education APP interface must be explicit about both its product goals and user needs. The effectiveness of educational APP products can only be ascertained when they are used by younger, older, mature, and adult populations. The user's demands are obviously to increase their professional level or learn material for fundamental education [10].

The design goals define which features are necessary for the interface interaction design of educational APPs. The interface interaction design components must incorporate video material if the APP is built around the teaching style of live and recorded viewpoint. [10] The APP, however, is primarily built around a question bank, therefore the interface interaction design components should concentrate on the exercises and aid users in improving their learning outcomes through interactive design features like the in-depth justifications of incorrect questions.

The user experience significantly influences whether a user is likely to use a product again, and this influence is favorably connected with learning results; User willingness is significantly impacted by user-friendliness and entertainment; the User experience is greatly influenced by the way that content is presented, the interaction manner, and the design of the interface. We can easily understand how numerous aspects interact when we organize their connection into a map. The learning results are strongly influenced by user experience and user willingness, and user experience enhancement can also lead to greater user willingness. According to research, the user experience design of ICH craft education applications has a strong emphasis on appearance and interaction, in contrast to other types of apps. The aesthetics of color and graphics, which are frequently valued, are not that significant. The major strategies to stimulate user interest in using educational applications again include designs that are fun and helpful to the user. The desire of users to use craft education applications may also be increased by improving the user experience. [12] Enhancements in these areas can be employed in practical design to raise learning effectiveness and interest

**2.2.5. Why the games?**

A special type of computer software that is both entertaining and instructive is called educational games. In addition to efficiently promoting student learning and problem-solving skills development, it may deftly blend knowledge with games, create authentic problem situations for learners, and drive learning motivation [5].

Several advantages of educational games that led us to pick this way of learning include:

* Increases A Child’s Memory Capacity:

Games often revolve around the utilization of memorization, children have to remember aspects in order to solve the game,

* Helps With Fast Strategic Thinking & Problem-Solving:

Most games require children to think quickly. Moreover, they have to utilize their logic in order to think three steps ahead in order to solve problems and complete levels. This is great because it is something that helps children in later life as they develop their logic, their accuracy, and their ability to think on their feet and outside of the box.

* Skill-Building:

A lot of games contain new skills that child didn't know before. For example, learn the concepts of programming, and how to make software like games, Also learn the concepts of electric circuits.

**2.2.6. Using reward system**

## 2.3. conclusion

# 3 . Chapter three : Methods

# 4 . Chapter four : Results and Discussion

# 5 . Chapter five : Conclusion

# **6 . References**

Citation: Mlumun, Yugh Sandra, et al. "Intellectual Impact of Mobile Educational Games on Secondary School Education in Nigeria: Case Study of Government Girls' College Makurdi." *American Journal of Information Science and Technology* 5.3 (2021): 48-59.

Intro

Narzikulovich, N. N. . (2022). Development of Physical Qualities of Preschool Children by Means of Mobile Games. International Journal of Discoveries and Innovations in Applied Sciences, 2(2), 45–48.

intro

Citation: Yu, Z., Gao, M., & Wang, L. (2021). The effect of educational games on learning outcomes, student motivation, engagement and satisfaction. *Journal of Educational Computing Research*, *59*(3), 522-546.‏

Game define

Papadakis, S., Alexandraki, F. & Zaranis, N. Mobile device use among preschool-aged children in Greece. *Educ Inf Technol* **27**, 2717–2750 (2022). <https://doi.org/10.1007/s10639-021-10718-6>

Lit

Battistin, T., Dalla Pozza, N., Trentin, S. *et al.* Co-designed mini-games for children with visual impairment: a pilot study on their usability. *Multimed Tools Appl* (2022). https://doi.org/10.1007/s11042-022-13665-7

Lit

Bulut, D., Samur, Y. & Cömert, Z. The effect of educational game design process on students’ creativity. *Smart Learn. Environ.* **9**, 8 (2022).

Abs

Shufang Tan, Wendan Huang, Junjie Shang, Research Status and Trends of the Gamification Design for Visually Impaired People in Virtual Reality, HCI in Games, 10.1007/978-3-031-05637-6\_41, (637-651), (2022).

Why game

Gillett-Swan, J., Thelander, N. (2021). Child Rights Knowledge and Children’s Education Rights. In: Gillett-Swan, J., Thelander, N. (eds) Children’s Rights from International Educational Perspectives. Transdisciplinary Perspectives in Educational Research, vol 2. Springer, Cham.

[6] why education

Zheng, Y. (2021). New Ideas for College Physical Education Development Under the Background of “Internet+ Education”. In: Xu, Z., Parizi, R.M., Loyola-González, O., Zhang, X. (eds) Cyber Security Intelligence and Analytics. CSIA 2021. Advances in Intelligent Systems and Computing, vol 1343. Springer, Cham.

[7]

Al Abdullatif, Ahlam & Gameil, Azza. (2020). Exploring Students' Knowledge and Practice of Digital Citizenship in Higher Education. International Journal of Emerging Technologies in Learning (iJET). 15. 122-142. 10.3991/ijet.v15i19.15611.

[8]

Mkpojiogu, Emmanuel & Hussain, Azham & Onah, Monday. (2021). Security Issues in the Use of Mobile Educational Apps: A Review. International Journal of Interactive Mobile Technologies (iJIM). 15. 124-137. 10.3991/ijim.v15i06.20631.

[9]

10 - Du, Y. (2021). Interactive Design Principles of Educational APP Interface. In: Sugumaran, V., Xu, Z., Zhou, H. (eds) Application of Intelligent Systems in Multi-modal Information Analytics. MMIA 2021. Advances in Intelligent Systems and Computing, vol 1385. Springer, Cham.

11 - Parrilli, D.M., Hernández-Ramírez, R. (2022). Building a Privacy Oriented UI and UX Design: An Introduction to Its Foundations and Potential Developments. In: Martins, N., Brandão, D. (eds) Advances in Design and Digital Communication II. DIGICOM 2021. Springer Series in Design and Innovation , vol 19. Springer, Cham.

12 - Cao, H., Guo, J. (2020). Research on the User Experience of Educational App in the Context of “Intangible Cultural Heritage”. In: Ahram, T., Falcão, C. (eds) Advances in Usability, User Experience, Wearable and Assistive Technology. AHFE 2020. Advances in Intelligent Systems and Computing, vol 1217. Springer, Cham.

13 – Chang, WL., Lu, WH. (2021). Building Common Ground: Applying Mutual Learning in the UI/UX Education. In: Kurosu, M. (eds) Human-Computer Interaction. Theory, Methods and Tools. HCII 2021. Lecture Notes in Computer Science(), vol 12762. Springer, Cham.

14 - Nielsen, J.: A 100-year view of user experience (by Jakob Nielsen). Accessed 11 Feb 2021