Digital Education Using Apps for Today's Children

Hilda Beatriz Ramírez Moreno
Faculty of Accounting and Administration, UABC,
Tijuana, Mexico
ramirezmb@uabc.edu.mx

Margarita Ramírez Ramírez
Faculty of Accounting and Administration, UABC,
Tijuana, Mexico
maguiram@uabc.edu.mx

Esperanza Manrique Rojas
Faculty of Accounting and Administration, UABC,
Tijuana, Mexico
emanrique@uabc.edu.mx

María del consuelo Salgado Soto
Faculty of Accounting and Administration, UABC,
Tijuana, Mexico
csalgado@uabc.edu.mx

Abstract — **The evolution of information technologies and the accelerated growth of mobile devices have changed the world we live in and the educational field is no exception. Every day we see more and more frequently the incorporation of mobile applications to the teaching-learning process by teachers in their classroom; with respect to children, the use of applications in mobile technology was revolutionary, opening a new horizon for them. Considering the aforementioned, we present a fragment of the results of a descriptive, quantitative research that was conducted in the city of Tijuana, B. C., Mexico, to evaluate 3 mobile applications in private primary schools where teachers incorporate information technologies in their teaching process.**

Keywords - Mobile applications, digital education, information technologies.

I. INTRODUCTION

MIND Hub is a company that has developed seven mobile educational applications (iOS Platform on iPads) for basic and special education, for example for autism and dyslexia, to mention a few. [1]. These 7 applications are integrated in a package called EdNinja (Club LIA) which are: Find the letters, Sequences for Autism, Patterns, Soundmatch, Sequences for Kids, Expressions for Autism, Sorthings for Autism, all of which are available in English or Spanish in the App Store. EdNinja offers parents, teachers and elementary and special education schools simple and effective tools to help children reach their full potential [2].

Nowadays there is a variety of applications for all types of school activities, mainly based on basic education, but sometimes both teachers and parents don't have the appropriate knowledge to select the one that best suits the needs of the child or the one that is needed for a school activity.

This research was carried out to evaluate three applications of EdNinja by 8 teachers of primary level of second year in different private schools, to know their perception regarding their use with children.

II. BACKGROUND

The apps revolution in mobile technology opened a new horizon for children and helps them overcome cognitive and motor skills problems while playing with fun applications, following the rules of the game. In this regard, the psychologist Raznoszczyk (2012) mentions the following about regulated games: "…*The games based on regulations allow developing competitiveness, respecting differences, seeking improvement and tolerating frustration*…" [3].

The purpose of the article is to present the results obtained from the evaluation of the mobile applications of EdNinja Soundmatch, Sequences for Kids and Patterns used by teachers of second grade of primary school in private schools in Tijuana, B.C. [4].

A. SOUNDMATCH:

It's a game that starts from a dynamic of auditory and visual stimulation where equal sounds and images must be matched respectively. It has 3 levels of difficulty: only image, only sound, and image and sound. All the sounds presented are non-verbal. Similar to a visual memorama, SoundMatch presents the user with a group of cards that, when turned over, reveal a sound or an image. Once matched, the cards are disabled. When the activity is completed, a congratulations screen will be displayed, from which you can continue playing, return to the menu or repeat the game.

Benefits:

- Auditory discrimination and perception.
- General improvement in the capacity for concentration and attention.
- Improves your child's memory skills.

B. SEQUENCES FOR KIDS:

Sequences for kids is designed to help children improve their communication skills. The objective of the game is to place a set of sequences in the correct order to complete a story.

As a teacher or therapist, you can create unlimited sequences for your classroom or patients using photos taken with the device and their own recorded audio [5].

C. *PATTERNS:*

EdNinja's Patterns is a fun and entertaining application to help children improve their modeling skills that will eventually lead to the early development of mathematical skills.

The objective of the game is that the player compares, relates and selects an image to fill in the blanks at the beginning, middle or end, in which the children will have to analyze the pattern to complete the exercise successfully. [6].

All applications have general information in a Menu with the following options:

- Play
- Home
- Restart Game
- Help (explanation)
- Configuration

They also have a configuration button for the game with three options:

- See progress
- Voice
- Audios

III. BODY

The evaluation of the applications was carried out by 8 pedagogues with previous knowledge of the applications of different private educational centers. The participating students were a group of 12 children belonging to the second grade of primary school, the ages of the children fluctuated between 5 and 7 years. Each child worked for a period of time with each of them.

For the evaluation of the applications, the questionnaire was used as a data collection instrument, designed taking into account the Guide for the Evaluation of Computer Multimedia Programs [7]. The questionnaire was divided into four parts; each section represents an aspect to be evaluated and groups a series of items according to each case.

Following are the 4 sections of the questionnaire:

- Section I) Application Design, 14 items, table 1.
- Section II) Contents, 11 items, table 2.
- Section III) Interaction with the Application, 6 items, table 3.
- Section IV) Communicative Level of the Application, 4 items, table 4.

Table 1. Section I) Application Design

Items
1. The child easily accesses the application.
2. Access to different menus is easy.
3. The menu instructions are easy to interpret for the child.
4. The application instructions can be consulted at any time.
5. The images in the application are large and easy to select.
6. The images allow easy recognition of the functions or processes they represent.
7. The graphic aspects of the screens and the menus are pleasant.
8. Images and animations are presented at the right time.
9. The animations of the application are adequate.
10. The sounds are adequate as well as pleasant.
11. The colors are pleasing to the eyes of the child.
12. The application is motivating.
13. The different levels of navigation are easily identified.
14. The child can leave the application at any time.

Table 2. Section II) Contents

Items
1. The information contained in the application is relevant.
2. The information that the application contains is necessary.
3. The information contained in the application is well organized.
4. The information is transmitted monotonously.
5. The application allows the child to develop skills and abilities according to the objective.
6. The application allows the child to identify everyday actions.
7. The application allows the child to improve visuospatial ability.
8. The application allows the child to improve the rote process.
9. The content is free of cultural, sexist, ethnic or religious anti-values.
10. The help of the application facilitates its use.
11. There are notorious errors or omissions in the information presented in the application.

Table 3. Section III) Interaction with the application

Items
1. It has different levels adaptable to the skills and knowledge of the child.
2. There are ways to check what work the child has done in the application.
3. Captures and holds the child's attention for long enough.
4. The interactivity response offered by the application is not only in passing from one screen to another, but also encourages active participation with the child's decisions.
5. The interactivity with the application reinforces the objective set.
6. There are excessively long moments in which the child does not interact with the application.

Table 4. Section IV) Communicative Level of the Application

Items
1. Children have the sensation of navigating freely through the application.
2. Children can go forward or backward at any time as well as anywhere in the application.
3. The information presents resources that establish emotional ties with the children.
4. There is interest in changing the behavior of children.

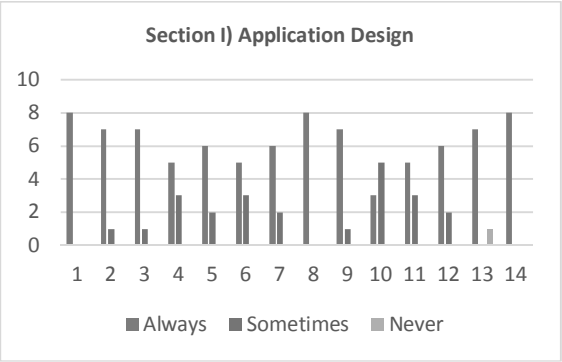
IV. ANALYSIS OF RESULTS

The results of the evaluations are presented below by application.

A. SOUNDMATCH

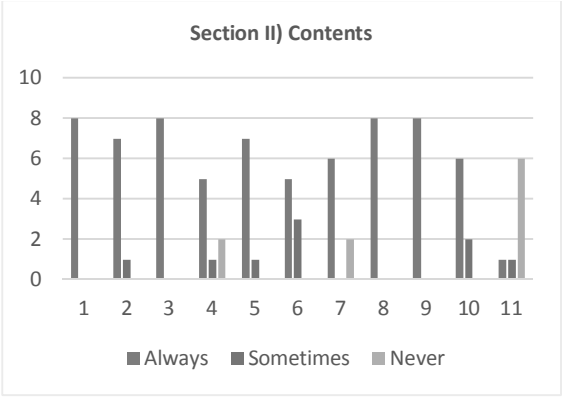
In the first section 100% indicated that the child easily accesses the application, that the images and animations are presented at the right time and that the child can leave the application at any time. Most believe that the sounds are appropriate and pleasant; On the other hand, an evaluator considers that the different levels of navigation are not easily identified as can be seen in chart 1.

Chart 1. Section I) Application Design



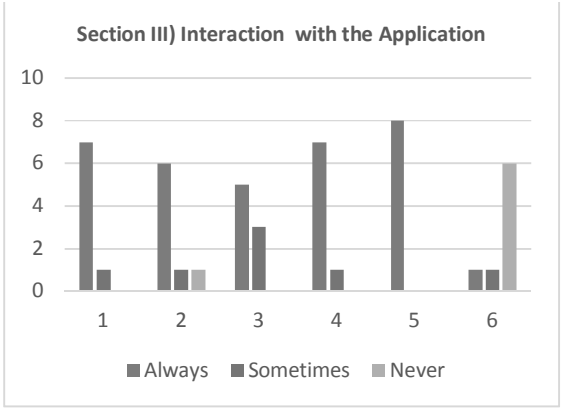
In the second section, 100% of the evaluators consider that the information contained in the application is relevant and organized. The application allows the child to improve the rote process and the content is free of cultural, sexist, ethnic or religious anti-values. The majority believes that there are no errors or omissions in the information presented. Half of the evaluators think that the application always allows the child to identify everyday actions and the other half says that sometimes, chart 2.

Chart 2. Section II) Contents



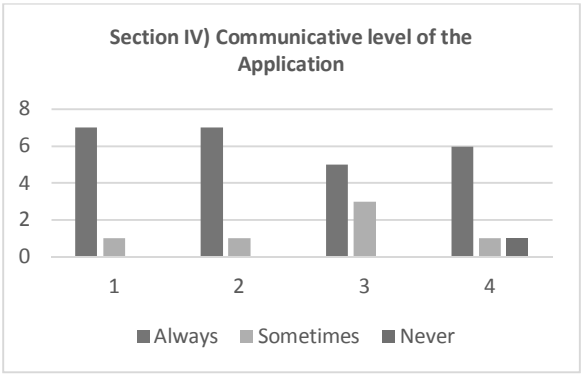
In the third section, most believe that interactivity with the application reinforces the stated objective. Some claim that it has different levels adaptable to the skills and knowledge of the child, if there are ways to establish what work the child has done in the application and that the response of interactivity offered does not stop at switching from one screen to another but rather encourages active participation with the child's decisions. Finally, most of the evaluators found that there are never excessively long moments in which the child does not interact with all the elements, chart 3.

Chart 3. Section III) Interaction with the Application



In the Communicative Level section of the application most say that children have the sensation of navigating freely and that they can go forward or backward at any time as well as to any screen. More than 50% think that the information presents resources that establish affective ties with children and that interest is observed to change their behavior, chart 4.

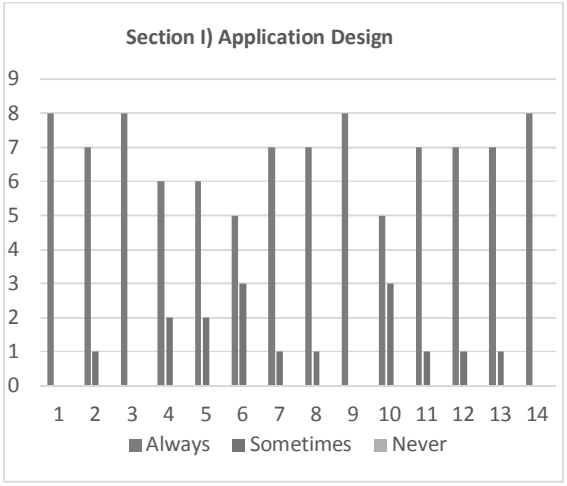
Chart 4. Section IV) Communicative Level of the Application



B. SEQUENCES FOR KIDS

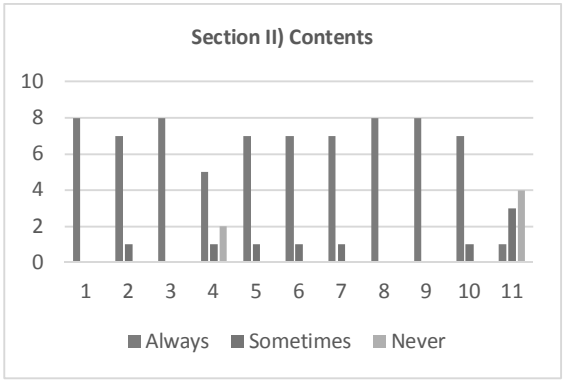
In the first section, 100% thought that the child always has easy access to the application, that access to the different menus and instructions for its interpretation are easy to understand. Most commented that only sometimes images and animations are presented at the right time, chart 5.

Chart 5. Section I) Application Design



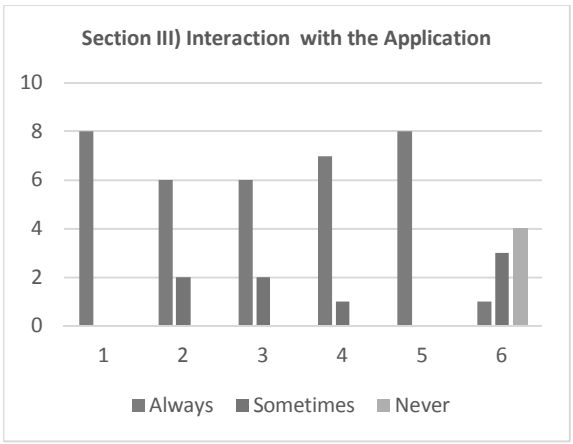
In the second section, 100% of the evaluators consider that the information contained in the application is relevant and well organized. The application allows the child to improve the rote process and the content is free of cultural, sexist, ethnic or religious anti-values. The majority thinks that only sometimes there are errors or notorious omissions in the information of the application, chart 6.

Chart 6. Sectión II) Contents



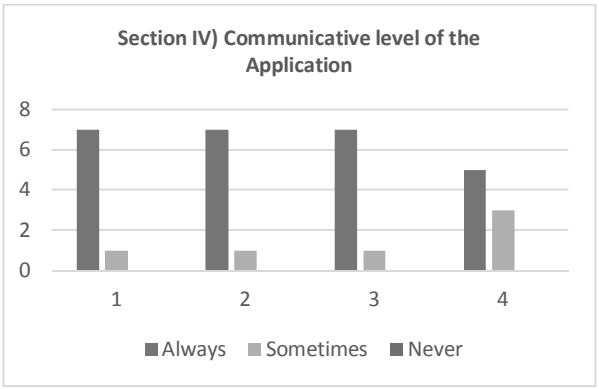
In the third section, 100% of the evaluators believe that the application has different levels adaptable to the child's abilities and knowledge, and the interactivity with the application reinforces the stated objective. The majority found that there are always ways to establish what work the child has done in the application and that the interactivity response that it offers does not stop at changing from one application to another, but it encourages active participation with the child's decisions. chart 7.

Chart 7. Section III) Interaction with the Application



In the Communicative Level section of the application most say that children have the sensation of navigating freely and that they can go forward or backward at any time as well as to any screen. More than 50% think that the information presents resources that establish affective ties with children and that interest is observed to change their behavior, chart 4.

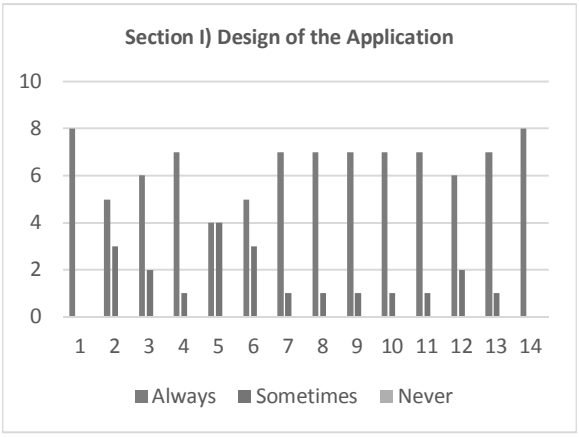
Chart 8. Section IV) Communicative Level of the Application



C. PATTERNS

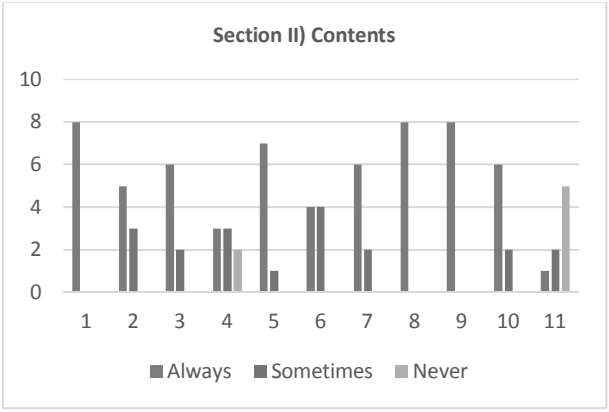
In the first section 100% think that the child always has easy access to the application and can leave it at any time. Most commented that always the images and animations are presented at the right time and the sounds are appropriate and pleasant, also commented that the colors are nice to the child's eyes, chart 9.

Chart 9. Section I) Application Design



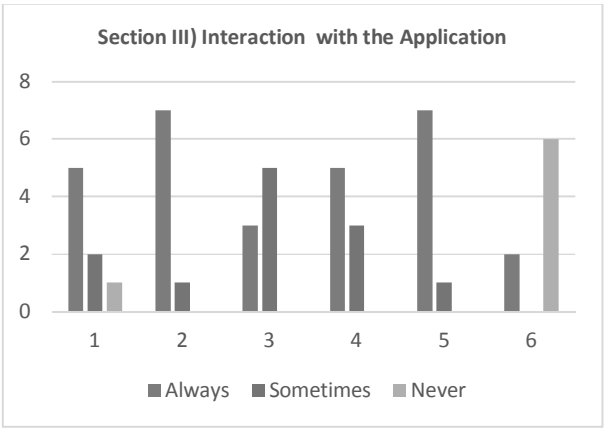
In the second section, 100% of the evaluators consider that the information contained in the application is always relevant, allows the child to improve the rote process and the content is free of cultural, sexist, ethnic or religious anti-values. Most believe that only sometimes the application allows the child to identify everyday actions, chart 10.

Chart 10. Section II) Contents



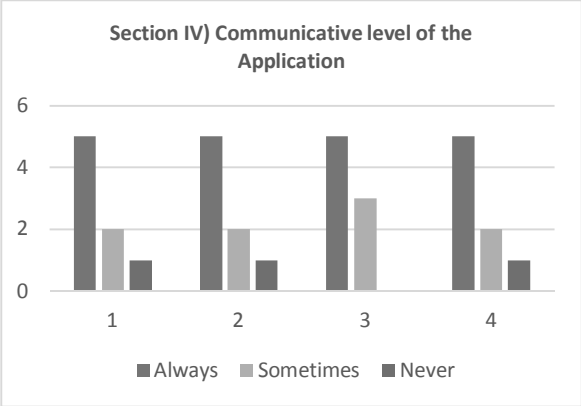
In the third section the majority thinks that the application always reinforces the objective with interactivity. Some claim that the application always has different levels adaptable to the skills and knowledge of the child, that if there are ways to check what work the child has done in the application. Finally, most of the evaluators found that there are never excessively long moments in which the child does not interact with all the elements, chart 11.

Chart 11. Section III) Interaction with the Application



In the fourth section half of the evaluators consider that children always have the sensation of navigating freely and that they can go forward or backward at any time as well as to any screen, chart 12.

Chart 12. Section IV) Communicative Level



V. CONCLUSIONS

Information technologies today are not a luxury, but a necessity to be knowledgeable in the globalized world in which we live. Society is constantly changing; the use of mobile technology is increasing for accessing the internet, shopping and academic purposes.

Speaking of children today, is talking about electronic devices, tablets, iPads, cell phones, and thousands of applications at their disposal. In the early childhood education few parents take advantage of these resources to use educational applications for their benefit.

In primary education, we still have a lot to do, there are few government schools that have computer equipment, however in private schools most have computer systems but only the minority attends these types of schools. It is not enough to have the technological tools is a whole (programs, equipment, applications) to obtain the adequate use in the classes.

We conclude that Soundmatch, Sequences for Kids and Patterns are applications with a simple design where the child can easily access the options presented by showing sounds, animations and colors appropriate for their age. Regarding the content, it is considered that the presented information is adequate and pertinent. The interactivity that is presented is adequate to achieve the objective of each of them.

In general, the use of mobile applications in the classroom can be an additional tool that supports the construction of knowledge, encourage the creativity of the child and improve the rote process as long as it is used correctly and with supervision of the teachers.

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