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BACHELOR PROGRAM IN ENGLISH LANGUAGE TEACHING

**THE USE OF A MATH APP TO PRACTICE COUNTING SKILLS
THROUGH PROBLEM SOLVING AND CLIL**

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CLIL AND TECHNOLOGY INSIDE MATH LESSONS

3

INDEX

INTRODUCCION.....	9
CHAPTER 1.....	11
Justification	11
Research problem	14
Research question	15
General objective.....	15
Specific objectives	15
CHAPTER 2.....	16
THEORETICAL FRAMEWORK	16
Content and language Integrate Learning (CLIL).....	16
Mathematics, problem solving and counting skills	23
1. Mathematics	23
2. Problem solving.....	27
3. Counting skills	32
4. Educational Technology	36

CLIL AND TECHNOLOGY INSIDE MATH LESSONS

	4
2.2 LITERATURE REVIEW	43
CHAPTER 3	52
Research design	52
Research paradigm.....	52
Qualitative research.....	52
Research approach	53
Action research	53
Setting	55
Participants	55
Data collection instruments	56
Aptitude test	56
Achievement test	57
Semi-structures interviews	58
Ethics.....	59
CHAPTER FOUR.....	59
PEDAGOGICAL INTERVENTION	59

CLIL AND TECHNOLOGY INSIDE MATH LESSONS

	5
1. Task phases	61
2. Pre- task phase.....	61
3. Task- phase	63
4. Post-task phase	66
5. Designing Activities for the task	67
6. Reading Activities	68
7. Listening Activities	69
8. Writing activities	71
CHAPTER FIVE.....	73
DATA ANALYSIS	73
Category 1: USING COUNTING SKILLS IN PROBLEM STATEMENTS	81
Subcategory 1: Prior knowledge	83
Subcategory 2: Working memory	87
Subcategory 3: Additions and Subtractions in problem solving.	91
Category 2: CLIL THROUGH ACTIVITIES IN TBLT	95
Subcategory 1: TBLT and its pedagogical implications	97

CLIL AND TECHNOLOGY INSIDE MATH LESSONS

	6
Subcategory 2: CLIL within math language instructions	101
Category 3: THE BENEFITS OF TECHNOLOGY IN MATH CLASSROOMS.....	104
Subcategory 1: Technology in math lessons	105
Subcategory 2: Student`s perceptions toward using technology	108
CHAPTER 6	111
CONCLUSIONS	111
IMPLICATIONS.....	113
LIMITATIONS	114
REFERENCES	114
ANNEX 1 APTITUDE TEST	121
ANNEX 2 TASK LESSON ONE	121
ANNEX 3 TASK LESSON TWO	122
ANNEX 4 TASK LESSON THREE	122
ANNEX 5 TASK LESSON FOUR	123
ANNEX 6 TASK LESSON FIVE	123
ANNEX 7 SEMI-STRUCTURED INTERVIEW PARTICIPANTS	124

ANNEX 8 SEMI-STRUCTURED INTERVIEW TEACHER 125

ANEXX 9 CONCENT SCHOOL..... 126

TABLE OF GRAPHICS

Graphic 1.Overall score per lesson, initial coding76

TABLE OF FIGURES

Figure 1. Pre-task activity colors and numbers recognition 1 to 1062

Figure 2.Pre-task activity colors and numbers recognition 1 to 10: motivation63

Figure 3.Task activity scramble colors..... 64

Figure 4: Task activity puzzle to develop logic and memory..... 65

Figure 5:Post-task activity elements of the house67

Figure 6: Reading activity for problem solving68

Figure 7: Listening activity clothing and problem solving.71

Figure 8: Writing activity personal information72

Figure 9: Writing activity descriptions of characters72

Figure 10:Semi-structured interview teacher in charge: color coding..... 80

Figure 11: Elements of the house problem solving (p 3)..... 84

Figure 12: Problem solving exercise (p 10).85

Figure 13: Geometry figures: working memory (p 13)..... 87

Figure 14: Symbolic number: working on memory (p 22)..... 89

Figure 15: Symbolic number: working memory with attempts90

Figure 16: Addition problem solving task. (p 17)92

Figure 17: Subtraction problem solving task. (P 26)..... 92

Figure 18:Pre-task CLIL (P 22)..... 97

Figure 19.Task CLIL (P 23)98

Figure 20: Post-Task CLIL (P 23)99

Figure 21: Instructions there is there are102

TABLES

Table 1:Topics per lesson with No. of items. Focused coding77

Table 2.Participants Semi-structured interview79

Table 3: overall marks per students84

Table 4:Semi-structured interview, teacher in charge question 186

Table 5:(Results of the task: Geometry figures for working on memory No 4)88

Table 6: Results of the task: Symbolic number: colors90

Table 7:(Results of the task problem solving: animals and colors. No 4)93

Table 8: Semi-structured interview teacher: Addition and subtraction in problem solving..... 95

Table 9:Semi-structured interview teacher: TBLT and its pedagogical implications100

Table 10: Results of task there is there are102

Table 11:Semi-structured interview, teacher: student’s progress105

Table 12:Semi-structured interview, teacher: Technology inside math classrooms106

Table 13:Semi-structured interview, teacher: Technology motivating107

Table 14: semi-structured interview students: question No 4109

Introduction

According to Baki, (2008), in teaching environments equipped with technology, learning becomes easier, and the learning process quickens; deficiencies are eliminated by means of feedback, individual learning increases, active learning, creativity and equality of opportunity are enabled and consequently students reach the information first hand.

This research project was focused on enhancing counting skills through solving math problems by using the communicative approach “CLIL” as vehicle to the design of the tasks which were based on adding up and subtracting in one number within problem solving exercises done on a math (APP) called “Have fun learning” which was designed for children of 1st grade who belong to a bilingual and private school. For this school is quite important that its students get ready for the standardized exams as the Cambridge test starters, in which students are assessed according to the Common European Framework since early stages

This implies performing in math lessons properly with enough resources to do so, hence in mathematics area, children need to apply the content which is firstly taught in their mother tongue and then, they have to reinforce it in L2, which makes students feel frustrated and even have low scores in both areas.

In order to achieve that purpose it is necessary to use Content Language and Integrated Learning (CLIL) in the design of the tasks, since this approach allows learners to reinforce a second language fostering solving mathematics problems and taking into account mainly the use of simple vocabulary to solve them.

On the other hand, first graders seem to work easier on activities that are centered specifically on the English subject matter because all time they are exposed to it by using the vocabulary through songs, pictures and more dynamic activities. In addition, the purpose of the study was to contribute with other types of exercises that contained animation by using the content learnt.

In this way, as a main objective the project attempted to design a playful math (APP) that contained basic elements such as vocabulary about numbers from 1 to 10, school supplies, family members, rooms and elements of the house, geometry figures, colors clothing and language structures to recognize them that helped learners to solve problems related to subtractions and additions in one number by using CLIL and the educational technology approach.

The starting point in presenting the project was therefore to show a theoretical framework, in which are described the main constructs: a) Content and Language Integrated Learning b) solving problem c) counting skills d) Educational Technology, taking the last one as the way for the implementation and procedures that supported the proposal and were related directly to the use of the math (APP).

Educational Technology has long been recognized as a valuable approach to improve the mathematics achievement of elementary school children (Chang, Yuan, Lee, Chen, & Huang, 2013). According to the National Council of Teachers of Mathematics (2000), "Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning" (p. 11).

In order to analyze the benefits of technology inside math classrooms, this study needs to describe some common factors and cognitive processes which are involved in

students' learning such as representation of a problem, reasoning and arguments, especially in children who are learning a foreign language and have to apply it in the area of mathematics, and its possible effects at the moment of solving math problems to follow instructions in L2 by using technology.

The research design chapter includes the research methodology employed for the study in order to assess the effectiveness of the math APP and whether students enhance counting skills through solving math problem by adding and subtracting in one number. To do this, it is necessary to gather the necessary data and procedures regarding the specific requirements of reporting the study and its process of inquiry which is action research, to end up answering the question proposed at the beginning of the project referring if it is possible to observe positive effects by the use of the math (APP) to enhance counting skills through solving problems by adding and subtracting in English.

Chapter one

Justification

According to (MEN) Ministerio de Educaciòn Nacional, (2010) many elementary school students struggle with acquiring basic math skills .The poor math performance is also reported in math education research every single year in our country for the MEN.

One striking example is that fewer than 10% of students in grades 1-6 are able to solve the math problem $(8+4=? +5)$ correctly.

There is considerable evidence that student's cognitive skills affect their future and personal income so the aggregate these skills also affect future national income (Hanushek

and Woessmann, 2008). In response to this evidence, a growing number of countries regularly test their students in national and international examinations to determine their skills. One of these examinations is the Trends in International Mathematics and Science Study (TIMSS).

According to Foy and Olson (2009), the results TIMSS in 2007 average score in mathematics for the Colombian of 1st to 4th grade population is 355, which is considerably below the low benchmark of acceptable skills. In addition, the distribution of Colombian test scores indicates that 95% of students score below 500 (ICFES, 2010).

In the institution where this study was carry out, this situation seems not to be different, regarding to the students of first grade, the majority of them have to take extra lesson to achieve the proficiency level in this area, therefore, they are facing frustrations with mathematics content which is taught in English. The low scores have been evidenced in the reports of first, second and third term, and are related to difficulties acquiring the basic math skills such as counting skills, solving problem, subtracting and adding up.

Regarding to this study, it is necessary since earlier grades to include different types of tasks giving multiple-choice counting activities to take control of the class by applying suitable stimulus on the computer screen, and using interactive classrooms to reinforce math concepts which have been taught in English, as well as engaging them into a communicative approach. However, it is relevant to clarify that the school has been implementing CLIL (content Language Integrated learning) in all the areas in the curriculum, but students must perform in their mother tongue in math's tests as a way to assess them in 1st grade.

Concerning with the school, children in bilingual contexts can be expected to go through periods in which they mix the two languages and borrow vocabulary across languages (code-switching) to express their ideas, sometimes within the same sentence. Corzo and Robles (2011).

This occurs because particular vocabulary may exist in one language but not in the other, or because the speaker knows the vocabulary in one of the languages but is not familiar for him/her in the other, or words from one language may convey a message that is not easily translated to the other language.

As a result, differences between the distinct settings in which children are learning both, language and content, technology appears to be an excellent tool to enhance counting skills through solving problems in adding and subtracting, and additionally to reinforce vocabulary in L2, and counting skills being the last the main objective of the study.

The mentioned aspects make students become fearful toward mathematics learning in English, and also there is a kind of comfort at the moment of learning math but only by using their mother tongue (MT), associating only the similarities that have in common with English language, leaving away the vocabulary learned in other subjects useful to be reinforced in math problems such as school supplies, personal information, numbers, color, animals, among others.

Therefore, identifying predictors of performance in early grades should be applicable toward the effort of analyzing some dominant issues in predicting math outcomes, such as language process, visual memory, and symbolic knowledge in number identification, number comparison and counting skills. Of these, counting skills appear to

be the most proximal to arithmetic and therefore may be more predictive of math outcomes than other number predictors or domain general skills.

In addition, by using the communicative approach CLIL, which is in charge of being the vehicle to include the English content, allowed to use vocabulary in L2 to be reinforced at the moment of reading and interpreting the statements of the problems and solving them out on the math APP. In this sense, the project pretended that the students first, can get self-confident to solve math problems by using the English language to express the possible results by obtaining motivation, and in some exercises more than one attempt to continue, this given by the APP, as well as listening each statement in English, watching the multiple choice answer and tasks, and receiving a right or a wrong point depending on the answer which had to be marked in each score.

In fact, the mainly purpose of the project was to show another alternative of solving math problems and enhancing counting skills where students become interested by taking the advantage which is, their age, their energy and active attitude toward learning through technology.

The APP contained a colorful animation in which learners enjoyed solving problems and reinforcing English vocabulary, giving another strategy for the math class which is giving following the guides practice, through dynamic activities and making writing exercises in the student's (MT).

Research problem

The problem addressed in this study was to engage children into the use of interactive activities so when they were using technology had another point of view toward math, because they had faced troubles when acquiring the basic arithmetic skills in this

case, adding and subtracting. In addition, this grade had low scores in math during the first, second and third term. That is the reason why they really needed to reinforce the content in both, math and English so that the math APP “have fun learning” might bring to the classroom another alternative to practice specific content by using technology.

Another factor affecting math scores is referring to the time they spend learning English, they are given with a considerable amount of exposure of L2 per week, and also math subject is the second area with the highest importance for the school because they policies establish students must have the enough competences in both areas for the future, so that they can have good results that are required for many new opportunities in different field such as bachelor programs, jobs or simple to take international exams. However, the main point of this study is to involve students into a playful learning environment by taking the benefits of technology in classrooms engaging students to learn through technology manipulation.

Research question

How can the use of a math (APP) contribute to enhance counting skills by adding and subtracting through simple problem solving practice in English?

Objectives

General

To enhance counting skills (adding and subtracting) in one number through problem solving by using the communicative approach “CLIL” and a math APP.

Specific

1. To design a math APP that allows students to solve mathematics problems by adding and subtracting in one number.

2. To analyze the effectiveness of the math APP applying specific content according to the curriculum of the school.
3. To reinforce counting skills and English language by using a technological performance including content learnt.

Chapter two

Theoretical Framework

In order to contextualize this research, it is necessary to explain the theories that have been related and centered in the project. These were relevant and useful to connect different aspects, points of view and theories to support the design of the math APP, which connected two areas English and Math, this implied using the communicative approach which was CLIL, being the first construct presented. Secondly, the construct presented math and shows the relation between counting skills and problem solving so that students had another alternative to enhance counting skills through problem solving by adding up and subtracting in one number by using technology. The final construct was educational technology which served as the mainly base to apply this study.

Content and language Integrate Learning (CLIL)

Graddol, (2005), stated “Content and Language Integrated Learning (CLIL) is a teaching approach in second language acquisition, which includes teaching a foreign language as a model within the whole areas in the curriculum. Curriculum content and language are taught together” (p.86).

CLIL allows students to get a deeper practice of a second language while they are learning the contents of the all areas of the curriculum, thus, the time of exposure for them is higher than when English subject is taught as an isolate subject. However it implies a great deal of new methodologies and strategies to apply those contents into meaningful teaching practices and tasks by giving them the better alternatives to be used inside and outside the classroom.

According to Navés and Muñoz (1999), Content and Language Integrated Learning CLIL is not new. In recent years, however, integrating the teaching of languages with the teaching of academic subject matter has become more and more popular all over the world because it has been adopted in many countries with the purpose of including English in classrooms in order to reach bilingualism.

European Commission's (2005) also reported that CLIL helps to ensure the school objectives in the area of language learning and enables pupils to study a non-language-related subject in a foreign language. Therefore, learning a foreign language implies using current teaching strategies, one of them is by using technology in which a technological language required learners to respond stimulus on the computer to carry out any type of task.

In addition, for Littlewood (2007), there is no discontinuity between content language instruction CLIL and task-based learning and teaching (TBLT). This language teaching approach was used to design the tasks for each of the APP's section. Hence it will be presented more detailed with its stages in the chapter four called "pedagogical

intervention”. However in this first construct is presented what TBLT is and its strong relationship with CLIL.

The first thing to notice in this definition according to Nunan (2002) is that Task-based learning and teaching (TBLT), has become an important element in syllabus design, classroom teaching and learner assessment. Arguing that, “a task is a piece of work undertaken for oneself or for others, freely or for some reward” (p 20). Thus examples of task include painting a fence , dressing a child, filling out a form, buying a pair of shoes, making an early reservation, borrowing a library book or as in this case recognizing room of the house and its elements or solving problems by using vocabulary related to family members.

Having the definitions above, CLIL could be interpreted as a foreign language enrichment measure packaged into content teaching, and TBLT suggests to improve vocabulary, automaticity of learning and performance in “real world” contexts by developing more complex task into problem solving skills depending on the content, to do that, tasks must be designed with a good criteria in order to assess its role and pertinence in second language acquisition

Regarding to statement above, Richards (2005) also includes both task-based and content-based instruction (CBI) as “extensions of the CLIL movement but which take different routes to achieve the goals of communicative language teaching – to develop learners’ communicative competence” (p 27).

Nevertheless, in more detail of these claims the authors Nunan (2002), and Richards (2005), suggest that in selecting or designing a task there is a trade-off between cognitive processing and focus on form, tasks must be realistic, useful for students highlighting the

correct use of language by promoting communicative competences and using content to recreate a new communicative scenario where students can also learn about English for specific purpose through a specific content.

Nunan (2004), sees communicative language teaching as an overarching concept ('a broad, philosophical approach to the language curriculum') of which "task-based language teaching represents a realization ... at the levels of syllabus design and methodology" (p10).

Despite there are other types communicative approaches, it seems that task-based language teaching provides a wide range of opportunities in the design of activities where students can get the level desired in the areas and also, this approach gives step by step a complete development of a content by following the stages proposed at the levels of syllabus design.

In addition, task-based language teaching brings to the classrooms easy steps to be applied in teachers' proposal at the moment of developing activities which have authentic context of language and also giving a chance to create a real life environment for students who tend to use their prior knowledge to connect a successful task by being exposed to language.

Littlewood (2004) also regards TBLT as "a development within the communicative approach" (p 324), in which the crucial feature is that communicative 'tasks' which serve not only as major components of the methodology but also as units around which a course may be organized. Most of the arguments in favor of CLIL come from SLA research and show that CLIL and TBLT:

- Create conditions for naturalistic language learning

- Provide a purpose for language use in the classroom
- Give a positive effect on language learning by putting the emphasis on meaning rather than form.
- Drastically increase the amount of exposure to the target language

Cummins (1984) advocates CLIL and suggests that, successful learning takes place when the task is cognitively simple, besides learners need to have access to spontaneous speech, preferably in an interactive context where they can obtain information on the structure and functioning of the foreign language.

Regarding to this interpretation, a task must also provide a context to arrange the activities that will be done by students, nevertheless, a more difficult cognitively demanding task may reduce the amount of attention and exposure to language, so learners could not have a good understanding from the messages, instructions, even of the task itself, having a task only focused on grammatical development rather than spontaneous speech.

For Krashen (1997), when schools provide children quality education in their primary language, they give them two things: knowledge and literacy. Literacy developed in the primary language transfers to the second language. Once we can read in one language, we can read in general. Cummins (2000) argues that, “the first language must not be abandoned before it is fully developed, whether the second language is introduced simultaneously or successively, early or late, in that process” (p.31).

The success of the connection between knowledge and literacy is related to students’ mother tongue and how it has been developed by focusing on a useful management of a

their first language, from here, another language can be introduced simultaneously by giving them new concepts to increase that knowledge.

Once having the students' level and using the previous knowledge was possible to develop this study, which required working on concepts already learned but in this time doing the tasks in a different way from the guidelines they had worked on. Therefore, through these principles, the instructions were given in English getting these instructions from those that were familiar for learners in the different math and English tasks. However, non-native learners may try to associate those concepts by translating and using their mother tongue.

The authors above, suggest that a second language is most successfully acquired when the conditions are similar to those presented in the first -language acquisition: that is, when the focus of instruction is on meaning rather than on form, when the language input is at or just above the proficiency of the learners and when there is sufficient opportunities to engage them in a meaningful use of that language in a relatively anxiety-free environment.

The researchers take the position that students will learn more when the focus of language instruction is shifted away from teaching the language directly to a situation in which students acquire language naturally, through lively exchanges with other students. The key to these exchanges is content area instruction in English.

To support the ideas above Lasagabaster and Sierra, (2009) stated:

- CLIL is about using a foreign language or a lingua franca, not a second language (L2). That is, the language of instruction is one that students will mainly encounter in the classroom, given that it is not regularly used in the wider society they live in.

- The dominant CLIL language is English, reflecting the fact that a command of English as an additional language is increasingly regarded as a key literacy feature worldwide.
- CLIL also implies that teachers will normally be nonnative speakers of the target language. They are not, in most cases, foreign language experts, but instead content experts, because “classroom content is not so much taken from everyday life or the general content of the target language culture but rather from content subjects, from academic/ scientific disciplines or from the professions”
- This means that CLIL lessons are usually timetabled as content lessons (e.g., biology, mathematics, music, geography, mechanical engineering), while the target language normally continues as a subject in its own right in the shape of foreign language lessons taught by language specialists.
- In CLIL programs typically less than 50% of the curriculum is taught in the target language.
- Furthermore, CLIL is usually implemented once learners have already acquired literacy skills in their first language (L1), which is more often at the secondary than the primary level.

Concluding, it is important to notice that “content” is the first word in CLIL. This is because curricular content leads language learning, and this achievement is considered necessary and sufficient evidence language objectives have been achieved as well. Therefore, students can most effectively acquire a second language when the task of language leaning becomes meaningful, realistic and useful, so that way the input they receive can provide them entertainment and can be used in other scenarios different from

the classroom. Therefore, the strong relation that exist between CLIL and TLBT served in this study to develop the activities that were included in each of the APP section based on task-based using problem solving and English language.

Mathematics, problem solving and counting skills

1. Mathematics

The design of pedagogic math tasks required specifications about certain theories that are composed into mathematics as a macro-skill, in which exist different major divisions such as arithmetic, algebra, geometry, statistics, problem solving etc., As the study concerns, of this macro- skill were taken counting skills and problem solving for the development of each APP's section and its task which are presented below.

As a starting point and according to Corzo and Robles (2011), “a fundamental concern in mathematics education is understanding the connections between the mathematical concepts themselves and the students who are trying to learn those concepts”. (p15). Even under ordinary conditions, it may be difficult for teachers to fully understand the challenges that their students face when learning math.

As the same way English has been threatened as an isolated area of the syllabus, in Corzo and Robles (2011), words, math learning seems to have a word that connect it “difficulty” Even with the amount of exposure that learners have had in both subjects during the educational field, students still present many problems acquiring the basic math skills to reach the level desired. This means that exist an interesting space to start designing new methodologies and tools to integrate the most difficult areas English and math for

children during their scholar life by using the current tools that are of interest for them, in this case technology.

The authors also suggested that teaching math in a second-language (L2) environment requires teachers to understand both, relevant math concepts and the language itself. Therefore teachers must be aware the explanations, clarifications, and development of math language which need learners to have sufficient competences in the L2 to understand what is being taught.

Math teachers should be also aware of the specific language learners need to think and use through this process, because it implies helping them to notice math content by giving a simple language so that they can communicate the concepts. Moreover, using CLIL as it was presented in the last section, learners often need to hear language models many times before they can produce language accurately taking into a count that math vocabulary needs to be used as mandatory into content because learners must know these words to be able to understand different topics in math?

It is helpful to think of Coyle`s 3C of CLIL for planning math lesson (Coyle, 1999)

1. Content: What is the main topic? E.g. Adding up, subtracting, dividing, etc
2. Communication: What math language will learner communicate during the lesson?
E.g. regarding to the study language of number by using the grammatical structure
how many?
3. Cognition: What thinking skills are demanded of learners? E.g., identifying,
classifying, reasoning or generalizing

The factors above are extremely important for the study at the moment of designing the tasks because the “3C” contribute in great deal to think what steps a math task must follow to create an interactive space in which students can communicate in L2 while they are learning the math basic skills, regarding to the study the correct order and the factors to be include are:

1. The basic content the APP contain is: questions related to personal information, school supplies, rooms of the house, clothing, colors, sequences of numbers, counting, adding up and subtracting into problem solving exercises using verbs to connect the math operations such us, arrive, left, repair, eat etc.
2. Communication: The language which will be used is according to the grammatical structure students have learned during the scholar year which includes:

How many, verbs that indicate whether there is an adding up problem like: arrive, give, buy, etc. Verbs that indicate if there is a subtraction problem like: Eat, it was send to repair, left, what is she/ he wearing? What it is? There is, there are among others.
3. Cognition: The task will contain identifying exercises in which learners have to identify what type of activities they have to do, like, scramble, match write or listening by using their reasoning to do the task.

In addition, another challenge for L2 math lessons is to understand and make use of the linguistic strengths and experiences that students bring to the classroom (prior knowledge).

The activities will be designed into pieces of prior knowledge and interests that allow them to use the target language in specific situations inside and outside the

classroom, as for example to buy in a supermarket or to start simple conversations using classroom language which provide them a communicative, linguistic and effective space to practice in whatever place, because the APP also will be able to give support outside the classroom as a way of an easy practice.

Despite math has its own specialized language, grammatical patterns, and rules to sum up, Corzo and Robles (2011), characterized the following aspects in order to understand mathematical context in which students must:

- Learn many content-specific vocabulary words (for example, adding, subtracting, counting and equal).
- Understand that many common English words have specialized meanings in mathematics (for example, square, triangle, greater than /less than).
- Know that mathematical operations are associated with many different words.

After having followed the math lessons structure a math equivalence is the idea that two sides of an equation represent the same quantity and it is often symbolized by the equal sign (=). Knowledge of mathematical equivalence is a critical prerequisite for understanding higher-level algebra (e.g., Falkner, Levi, & Carpenter, 1999).

Consequently and regarding to the project, associating the words related to geometry figures to count and define whether the amount is greater than or less than, or simple by using visual material representing quantities in any situation with objects, make easier learners 'productions through exploring in solving problem and also allowing learners to interpret and make their own decisions.

However, the contemporary perception of teaching mathematics is much broader, it covers not only pure mathematical issues, but it also instigates such mental and cognitive processes as **problem solving**, development of strategic thinking and information processing. (Novotná, Hofmannová & Petrová, 2001).

2. Problem solving

According to Schoenfeld. (2013), problem solving was defined as trying to achieve some outcome, when there was no known method (for the individual trying to achieve that outcome) to achieve it. In sum, the author points out the following four categories of problem solving activities that are necessary and sufficient for the analysis of the success or failure of someone's problem solving attempt:

- a). the individual's knowledge
- b). the individual's use of problem solving strategies, known as heuristic strategies.
- c). the individual's monitoring and self-regulation (an aspect of metacognition)
- d). the individual's belief systems (about him- or herself, about math, about problem solving) and their origins in the students' mathematical experiences.

It is relevant to include the above aspects because the project uses math in another way rather than computational exercises " $2+8=$ ", from here, the design of problem solving activities will be created by using students' perception toward the world, and toward different situations taken from the real life and, in here, the problem solving tasks will give them the opportunity to think what they would do in a specific situation, and how they can act making a connection among a real situation by using a math solution, and following the

basic math skills such as counting, adding and subtracting depending on the statements and the visual aids the APP provides them.

All kind of attempts to problem solving need to be assessed in Common Core State Standards words (2011), testing – especially high-stakes testing- determines the foci of classroom instruction and it places significant emphasis on what they call mathematical practice, claiming that people who are mathematically proficient are able to:

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision.
- Look for and make use of structure
- Look for and express regularity in repeated reasoning. (p 24).

As a real part of this study, students have to take some of the responsibility for their own score in the APP and students will be encouraged to get the highest score by using the above mathematical proficiency. They must think of alternatives to choose, look up and make use of the grammatical structure to understand the problem.

Therefore, students need to be aware of the goal of the problem by identifying various solutions and attempting to precision, thus, the input that provides the App will give them useful instructions either by listening or reading to language and arguments development, assisting them in working at higher level of thinking.

Some researchers and educators uphold the importance of attempting to solve problems even if the learner doesn't know how to solve them (Chi, 2009). Learners are encouraged to forge ahead and figure them out using what they already know to get started. Other researchers and educators feel that learners should be armed with a sufficient tool set (e.g., instruction on a procedure or a worked example) before productively attempting novel problems (Hiebert & Kirschner 2003,).

The importance of giving a model before starting a math problem allows students to introduce them into the topic avoiding a possible error, thus, making more probably the option to achieve the goal. It means that the strategy used must develop an abstract thinking rather than giving them a confused statement or a difficult task. For this stage, the APP creates visual images to create "mind pictures" of the problem and its potential solution prior to working on the problem.

In addition, problem solving offers potential benefits on developing a certain of empiricism solving situations without the necessity of argument or about how verify them, it also can be fruitful by focusing on how people learn through exploration and self-discovery of their environment without explicit instruction (Piaget, 1973; Schulz & Bonawitz, 2007). It means that through exploration of an unfamiliar topic or problem is thought to support learning by increasing motivation, encouraging broad hypothesis testing, and improving depth of understanding.

The word "exploration" takes a significant place in the present study, because children need to apply their prior knowledge in a different format from the written guides students have used during the scholar year which contain activities for individual and group learning, these are named for specific pages and homework. With the APP students got the

content to be applied in an interactive way by using technology as the resource in order to motivate them to explore and being involve into the same content without pressure.

Through this exploration children will develop a deeper understanding of key mathematical concepts, and learn how to apply those concepts in the context of problem solving by exposing students to limitless options of counting, adding up and subtracting, and connecting them with vocabulary required.

In addition, there is an easy path for children to learn through exploring situations rather than following only instructions without taking the advantage of creative thinking, here, exploring through technology results to be an effective strategy for encouraging them toward solving mathematics problems.

A recent study has found that a quarter of teachers surveyed reported that there is no time for free play in their kindergarten classrooms Miller & Almon, (2009). This sentiment is likely linked to increasing pressure for young children to have a strong foundation in literacy and mathematics in kindergarten and 1st grade.

Consequently, different methodologies to use in the classroom have increased such us technologic resources to do the same work but as a way of solving problem by giving more motivation and also have been replaced with academically focused activities and lessons. For instance, one report from Common Core Standards indicated that for every 30 minutes of the use computers, many kindergartners are engaged easier to do interesting activities and it get more concentrated in solving problem. Miller & Almon, (2009). However, time spent learning basic math skills, and time spent playing a different game can be done simultaneously. Play and games can give young children opportunities to learn and develop basic math skills that will be used during their whole lives.

According to Ramani and Eason (2013), the time children spend playing with peers, toys, and doing exercises in different Apps can be time to learn new skills, practice their existing abilities, and build their interests, especially in mathematics.

Regarding to the study, the APP contained five lesson in which students got the access to the familiar content by developing the different tasks included in the sections by getting the overall score per lesson, these were designed with Task-based communicative approach TBLT that allowed learners to reinforce as well the previous topics and to keep enhancing the math principles by connecting both contents in an interactive way.

The Common Core emphasizes that kindergarten math lessons should focus on two areas: representing, relating, and operating on whole numbers, and describing shapes and space. These areas will lay a strong foundation for 1st through 3rd grade when children perform operations with numbers, discuss place values, problem solving, and reason about geometric shapes. (Ramani and Siegler, 2008).

Therefore, in the APP, there are exercises to contextualize meaning and the same time to operate on whole numbers but in an abstract way, because the traditional way of operating math was changed to a visual interpretation and by reading short statements as well. The study analyzed whether the use of a foreign language “English” truly is the most influential factor affecting math lessons or not, because in previous observations done in the institution was analyzed that children seemed not to have problems with the use of English in math content, it was more likely with the individual interpretations they presented toward a problem.

To sum up, Ramani (2008), Miller and Almon (2009), advocated and, argued that fun activities structured to provide opportunities for exploration and learning. Technology

and solving problem can be used in early childhood classrooms to engage children in interactive activities that can connect to the curriculum and promote learning.

There seemed to be a connection between maths and technology, through them, students could enhance their basic math concepts with a new options on the APP, It helped them with prompts, a different type of communication by using listening, reading and written skills, and attempts to achieve problem solving exercises while they were working on funny activities letting learners use more self-exploration.

3. Counting skills

Among the array of potential number-related factors, Cirino (2011), identified five related latent variables, which included symbolic knowledge such as number identification and number comparison, non-symbolic math knowledge such as estimation of magnitude or magnitude comparison, symbolic labeling for example recognize the symbols of the country, rote counting for example count by 1 forward from 0, and conceptual counting for example in the recognition of the quantities. Of these counting skills appear to be the most proximal to arithmetic and therefore may be more predictive of math outcomes.

All factors, with the exception of non-symbolic comparison, are strongly related to small sums addition as well as the linguistic ability (phonological awareness and rapid automatized naming) and the spatial working memory. In addition, Savage (2007), found that phonological awareness at age 5 predicted math outcomes at age 11 even after controlling for early literacy skills (word reading, decoding, and letter sound knowledge).

For example in this study the phonological awareness is involved in a task where learners have to hear a number and then are asked to move and put it where corresponds,

therefore spatial working on memory is developed by identifying a shape presented in this study by using geometry figures in order to recognize and recall them into an exercise of greater than or less than.

Moreover, conceptual counting is assessed in this case when learners have to use the grammatical structure how many by interpreting statements and connecting objects that enable learners to make a model including counting as a conceptual principle, and finally the symbolic number identification is measured in this study into a task which contains numbers in randomly from 1 to 10 and 10 to 100 in order to put them correct into the correct space.

Cirino's (2011) comments, reflect a different field of measuring preschooler's growth rather than checking their height and weight, there are other areas such as numbers and counting and its development in children who start to identify objects, size, etc, so that they can understand concepts of quantity (for example more and less, bigger, smaller, and also that can add and subtract small numbers of familiar objects or another ability to put written numbers from 1 to 10 in the correct order among others.

Besides, from early stages children need to be aware of some of the basic math skills and concepts they should have, here, the school takes an important place because is better known than at home, students start to apply counting in their lives and also other kind of factors related to math, but is truly in the school that they reinforce and enhance those skills.

However, it has also been suggested that symbolic factors are more predictive of mathematics (Holloway & Ansari, 2009). Further, children with mathematics difficulties (MD) appear to be more impaired on symbolic tasks than non-symbolic tasks (De Smedt

and Gilmore, 2013). Therefore, the present project focuses on symbolic predictor which is counting skills.

A few population in the school which has been observed present difficulties with simple counting, understanding the one-to-one correspondence between number symbols and items/objects, and understanding or noticing variations in size, patterns or shapes. For these children is relevant to work on promoting and giving opportunities to learn, and practice with structured teaching activities to develop skills in those areas, for example through technology, they are exposed to and they can practice where they are succeeding or struggling in procedural counting.

According to (Gersten and Chard 1999), procedural counting is the ability to correctly sequence numbers orally. Counting also allows for the automatic use of math-related information which would permit other cognitive resources to be devoted to more complex tasks, such as problem solving.

With these complex tasks involving problem solving, the App will provide students with several problems, which belong to the current math curriculum and find problems those students had difficulty with during the year. These can be useful as an excellent review, and will help to get students ready for second grade.

Counting can be further partitioned into separate but related components that are procedural versus conceptual. Poor arithmetic skills in children with MD (Mathematics difficulties) are related to an immature understanding of the counting principles and increased procedural counting errors (Geary, 2011).

This in an important aspect to start working from math a numeral awareness to involve students and give them numerical identification (recognizing all 10 numerals from

0 through 9 and knowing each numeral's name) making math learning process more effective and with a good basic math skills. Therefore, early exposure to math and number activities will promote child's comfort with these skills. Also, additional opportunities to practice these skills will increase child's confidence when working with math and number concepts and will lead him to believe he / she is "good at math."

An important domain general factor for math skills is attention. Attentional resources are necessary for children to initiate and direct their processing of information, comprehend, and retrieve information for different tasks (Geary, Hoard, & Hamson, 1999).

This authors suggest children are exposed to processing information since they are acquiring math skills, and also they will already be doing before they reach school-age. Here there are activities or tasks to catch children's attention as saying numbers orally, hearing them to work from memory or understanding of numbers and how counting relates to the real life.

A reduced ability to maintain the focus of attention as rated by teachers (behavioral inattention), is predictive of arithmetic skill (adding and subtracting single digit numbers), algorithmic computation, arithmetic word problems in first graders, and of estimation skill in children in first grade (Seethaler & Fuchs, 2005).

To avoid this, one of the purposes of the study is to promote a different task which students will be concentrated doing the activities by using technology in order to help them with math principles so that they can reinforce on the topics learned. The challenge will be centered on technology because technology is mainly the way the project will be developed.

Along with all the interpretations above, it seems that counting appears to be as mechanical process required to start living into the math area, however, “reciting” means saying the numbers from memory in chronological order, whereas counting involves understanding that each item in the set is counted once and that the last number stated is the amount for the entire set. When children are just reciting, they’re basically repeating what seems like a memorized sentence. When they’re counting, they’re performing a more cognitive activity in which they’re associating a one-to-one correspondence with the object and the number to represent a quantity.

Counting skills took an important place for the project because it gives children strong foundation when they start school, and also because the skills children have when they start kindergarten affect their trajectories through early elementary school; therefore, it’s important that children can work on those skills using many types of resources as for example by integrating educational technology.

4. Educational technology

Educational technology has long been recognized as a valuable approach to improve the mathematics achievement of elementary school children. According to the National Council of Teachers of Mathematics (2000), “Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students’ learning” (p. 11).

Using technology to get students engaged in a math lesson results to be useful to understand in another way different levels of math. Nowadays, teachers can use the tracking tools that allow students to submit work and answers they have worked on. This new changes require modifying, creating and reorganizing the way a new era is learning.

This part is enough relevant for the present study to determine how are the students' perception in front of using a technological tool in a math class.

In the last three decades, various types of computer-assisted math programs have been developed and studied. Recent reviews on educational technology for math learning reported a general positive effect on students' math achievement (Cheung & Slavin, 2013).

Segal (2011) found that children who used math APPs performed better in arithmetic and numerical estimation than children who managed the mouse (computer pointing device). Geist (2012) observed that two-year old toddlers were able to use the computers with little direction from adults.

These authors stated that with the increase of technology, students can take the advantage of these on computers, cellphones, starboards, etc, reinforcing math concept because websites can offer the engagement to lessons and the use of exploration, here technology creates the opportunity to make meaning and work on the learning process

In technology-implemented classes, interactive student involvement in the learning process is fostered, and learning becomes more fun and more attractive for the students (Smaldino, Russell, Heinich & Molenda, 2005).

Wells (2006) stated: "Technology provides an excellent avenue for student motivation, exploration, and instruction" (p. 17); it is also obligatory to consider the teachers who are the actual users of such technology and the groundwork that consists of the necessary aids, training, and equipment (Ashburn & Floden, 2006).

It seems that technology makes students feel excited to learn, and more likely to be interested in, focused on, and interested in the subjects they are studying. In this case subjects as math that might be monotonous for some students, technology enables those

students to learn at their own pace, and they are able to get direct, individualized instruction from the computer becoming them more self-directed in the learning process. It can also give teachers more time to accomplish classroom objectives because they can take more time to help those students who might be struggling with certain lessons.

It has become evident that teaching, learning, and technology work synergistically to provide effective and efficient knowledge transfer because educational technology helps teachers to create learning contexts that were not previously possible with traditional teaching methods (Wiske et al., 2005).

Bitter and Pierson (2005) stated “A recent meta-analysis demonstrated that students using technology had modest but positive gains in learning outcomes over those students who used no technology” (p. 107). Bates and Poole (2003) observed: “...technology does not reduce the need for imaginative, creative thinking about teaching and learning; indeed, it increases the need. Technology opens up a vast range of opportunities for imaginative, creative teaching ...” (p. 178).

Besides, it is believed that when technology is used appropriately in classroom instruction, it has a very positive impact on student achievement or success. Moreover, using technology in education or teaching helps teachers provide immediate feedback to students and motivates active student learning, collaboration, and cooperation. It also helps teachers provide individualized learning opportunities and flexibility for their students.

In this regard Kelly and McAnear (2002) stated: “To live, learn and work successfully in an increasingly complex and information-rich society, students and teachers must use technology effectively. Within a sound educational setting, technology can enable students to become:

- Capable information technology users
- Information seekers, analyzers, and evaluators
- Problem solvers and decision makers
- Creative and effective users of productivity tools
- Communicators, collaborators, publishers, and producers
- Informed, responsible, and contributing citizens. (p. 4).

The benefits mentioned above, prepare students for the future because by learning to use technology in the classroom, both teachers and students will develop skills essential for the 21st century. But more than that, students will learn the critical thinking and workplace skills they will need to be successful in their future because nowadays, education is no longer just about learning and memorizing facts and figures, it is more like appropriate collaborate bringing to the classroom new solving complex problems, developing different forms of communication and leadership skills, and promoting motivation and productivity.

Hawkes and Cambre (2001) stated: “Technology presents new opportunities for students and teachers that can be organizational, instructional, individual, procedural, and cultural” (p.1). The authors continued by stating that technology has an impact to learners understand concepts, promotes communication and motivation, and gives experiences by connecting real situations to contextualize them through the use of technology.

They also pointed out the term “cultural” which takes a significant role to the study, because the school has implemented CLIL, and also has comfortable laboratories of technology in which each learner has the access to work individually in one computer, it is so relevant because in our context, despite there is a complete coverage at public school,

there is a lack of modern laboratories in the institutions, and also most of the cases, children have to work in pairs or even computers don't work.

“Math apps” that run on portable tablets offers great affordances for math learning (Segal, 2011). First, it allows learners to work on math problems at their own pace, which can be particularly useful for struggling students who need more time to solve a problem (Baker, Gersten, & Lee, 2002). “Math apps” can also provide immediate feedback to individual learners about their performance, which would otherwise be difficult to achieve during general instruction.

Providing feedback to students in a timely manner is important for learning, especially for students with any math difficulty. However, Hattie and Timperley (2007), found that providing rapid feedback to students about their performance is the most cost-effective approach because it is more time consuming and generates increasing in teacher salary, and class size reduction.

In addition, Brosvic (2006), found that students with math learning disabilities benefited from immediate feedback to their performance, but not from delayed feedback. In sum, the capability of providing immediate feedback to students through math apps on portable devices is promising.

Mathematical computation and problem solving often involves complex rules and procedures, which can be challenging for many students (Barringer, Pohlman, & Robinson, 2010). When working with multiple-digit multiplication, for example, students must remember and follow the correct sequence, and align numbers in space correctly to do the calculation.

One scaffolding strategy to support student learning is breaking down complex procedures into smaller, manageable steps (Vaughn, Wanzek, Murray, & Roberts, 2012). For example, naming an animal and counting it includes repeating sequences of single-digit in subtracting and addition.

The APP called “Having a fun learning” which breaks down with the way of adding and subtracting in one number but now into a problem with smaller steps and allows students to solve the problem step by step.

In this way, the implicit steps to solve adding and subtracting problems are made explicit to students. In each step, if students enter a correct answer, the answer will fly to the right place. Otherwise the answer will stay in the same place, indicating that their answer is wrong. This app allows users to set the added or subtracted to have up to 1 digit and the answer comes to take the number needed to solve the problem.

Having seen that, this project will contribute with an APP by giving a more rounded sight of the mathematics children needs at the moment of solving problems that implies (adding and subtracting) using both, numbers and simple vocabulary and to develop a mathematical reasoning ability for problem solving. Thus, it is relevant to make an overview about the classes environments in which technological devices are being used.

The relationship between technology advance and pedagogy go together, because today it is vital that since first ages, students can investigate and explore in order to find solutions to their doubts, here, technology offers different choices to develop different tasks and activities to articulate the content in specific areas, but also students may find different society issues, however, whether technology is used to get the types of activities planned

with an specific purpose, students will do on computers those activities by taking the best advantages of it, writing, reading and even listening and practicing a foreign language..

In sum, Hubbard Philip (2009), advocate the use of technology settings because it provides:

- Learning efficiency: learners are able to pick up language knowledge or skills faster or with less effort;
- learning effectiveness: learners retain language knowledge or skills longer, make deeper associations and/or learn more of what they need;
- Access: learners can get materials or experience interactions that would otherwise be difficult or impossible to get or do;
- Convenience: learners can study and practice with equal effectiveness across a wider range of times and places;
- Motivation: learners enjoy the language learning process more and thus engage more fully;
- Institutional efficiency: learners require less teacher time or fewer or less expensive resources. (p.2)

To sum up, the use of CLIL, educational technology, and maths for solving problems must be practiced by taking the benefits that offers technology in order to have a better understanding about the impact that have had the use of computers inside the classrooms, by giving the opportunities to interact with the target language, counting and problem solving exercises according to an appropriated use

of the content which is reinforced at the same time enhanced by providing interesting tasks which are on the math APP “have a fun learning” for first graders.

Literature review

The following chapter represents studies that have been developed in the different fields that were mentioned in the previous section, which are, educational technology, CLIL, and math with counting skills and problem solving the main subareas of it. The studies that will be presented later on served as support for the present study in order to provide some procedures that were used for researchers interested in the topics that are included in the development of the whole research.

As starting point will be showed a study related to educational technology which involved the use of a math App for a four grade classroom inside a public elementary school in an urban city in the southwestern in the United States which show the benefits and some suggestions to be included in the math APP “Having a fun learner”.

1. Educational technology

This study called “: *Using Math Apps for Improving Student Learning: An Exploratory Study in an Inclusive Fourth Grade Classroom*”, developed by a doctoral student and a graduated students in the Department of teacher Education at the university of Texas. (Gallegos and Asam 2005), which took place in a fourth grade classroom at a public elementary school in an urban city in the southwestern United States.

This school enrolled about 800 students, among which over 90% were Hispanic, and 68% were eligible for discounted or free lunch. Six students were identified as at-risk students who received additional service in school due to problematic behaviors or inadequate academic progress.

The teacher was a Hispanic male and had five years of teaching experience. Each student was supplied an iPad with the math apps. Prior to this study, the students did not have much experience using iPads in school.

The students used the math Apps, “Splash Math” (StudyPad, 2012), “Motion Math Zoom” (Motion Math, 2012) , and “Long Multiplication” (iDevBooks, 2012) , in four math class sessions over the course of one month, each session lasting about 80- 90 minutes. The students had learned the concepts of decimals and multiplication prior to using the math apps. These apps were used to supplement regular instruction. In each class session, the teacher or the first author spent 5-10 minutes teaching the students how to use the apps. When students were using the apps, the teacher and the first author provided help to students who had problem with the math tasks. The students worked individually on the math apps, but they could talk to their other partners about what they were doing during the sections.

At the beginning of the session, they were told to set the upper number to be two-digit, and the lower number to be one-digit. Once they showed mastery in solving the problems, they were allowed to work on more complicated problems, such as multiplication of five-digit numbers by two-digit numbers.

As a result the students improved their performance in each of the assessments given and designed by the researchers after using the math apps. Paired-sample t-tests showed that the differences between the pre- and post-tests were all statistically significant.

This study found encouraging evidence on using math apps to improve student learning and close the achievement gap between struggling students and typical students. Prior research has shown that struggling learners benefit from computer-enhanced math intervention (Burns, Kanive, & DeGrande, 2012), but little is known about the effectiveness of math apps. This study found that the use of math apps may be an effective practice in providing instructional supports for struggling students within general education classrooms.

First, struggling students have more room for improvement than typical students. Second, the affordances of math apps, such as self-pacing, immediate feedback, and breaking down complex processes into small steps, may be even more beneficial for struggling students. It is not uncommon that in regular math instruction, struggling students are unable to keep up with the pace of general students (Baker, et al., 2002). In summary, there is a potential for using well-designed math apps to help struggling students achieve the Common Core State Standards for Math.

Moreover, this study shows the relationship between students who have faced difficulties with math, and how in the classrooms can be applied other learning methods to teach and reinforce content. Thus educational technology performs as a main factor encouraging students to avoid and prevent low scores by following certain steps at the

moment to bring to the classrooms math apps such as given instruction, time spend working on a math app, and analyzing raised math concepts, which were taken into account in the implementation of the present study.

2. Solving math problems

The study called enhancing young children's arithmetic skills through non-intensive, computerized kindergarten interventions: A randomized controlled study developed by (Praet 2013). In the present investigation researchers report the findings of a randomized controlled trail with two short computerized conditions and a business-as-usual control group.

Researchers aimed to critically examine the effect of non-intensive, individualized but very short (8 sessions of 25 min) computerized interventions (using child-friendly computer games) in kindergarten with a pre-test a post-test, and delayed post-test design “Measures”. Participants were 132 (53% male) full-day kindergartners between the age of 4 and 5 from five schools in the same school district in Zele (Belgium) in 2013.

The general aim of the present study was fourfold. Firstly, they investigated the modifiability of early numeracy in young children. They expected positive outcomes since early numeracy skills have been found to be trainable in other studies (e.g. Baker et al., 2002 and Coddling 2009). However, previous studies were more intensive interventions whereas the present study examined if a shorter intervention (8 sessions in kindergarten) could also be effective.

Counting and number comparison strategy approach is hypothesized as being capable of modifying kindergartens' early numerical skills in the post-test. Researchers hypothesized no such improvement in the control conditions.

Secondly, they use two CAI (Computer Assisted Intervention) groups - a counting and number comparison condition to explore to what extent those approaches differed and if one is more effective than the other as a computerized instruction variant. Researchers were interested in the core components of kindergarten interventions on sustainable learning of mathematics in grade 1.

They explored if both CAI were capable of improving the early numerical skills (wave 2 in kindergarten) and arithmetic achievement (wave 3 in grade 1) in young children.

Thirdly, they investigated the potential of the CAI on kindergartners with below average performance ($>pc$ 25) in early calculation measures. They explored the effect on the delayed posttest and expected that these at risk children would also benefit from the intervention. Finally, they explored to what extent a kindergarten CAI was effective to change the mapping skills of young children. Researchers expected less mapping errors when children reached better arithmetic skills.

The CAI interventions (serious games) took place in nine individual computerized sessions in a separate classroom during 5 weeks, 25 min each time. Multiple treatments were performed at each school. Each session consisted of solving problems in accordance with the instructions given in the program (computer game).

They played computer games for learning to count synchronously and learned to count without mistakes, thus experiencing the cardinality principle. Clicking on a symbol generated a quantity of that symbol with an upper bound of 6. The child was asked to count and register it by tapping the number on the keyboard. Auditory feedback was given. Children were asked: “how many animals are there?” or “how many can bark?” while there were objects, plants and animals on the screen.

The main, practical implication of this study concerns the importance of counting skills in the development of arithmetic skills. The findings of this study inform diagnostic procedures to focus specifically on counting (as symbolic number skill) in kindergarten. Moreover, the study revealed the value of adaptive serious games as a didactic method and look-ahead approach to enhance learning.

They demonstrated that an intensification of teaching in kindergarten, by using adaptive serious games in regular kindergarten classes, can provide children with playful, immediate and continuous feedback, as well as repetitive learning, and can be used as preventive support for low early numerical skills.

These findings might contribute to knowledge of the subject matter, the pedagogical content knowledge and the attitude of teachers and teacher educators towards games and arithmetic. In addition, using these serious games at home might also be a promising way of assisting high-risk children with ‘additional educational needs’. Adaptive games as a core part of the curriculum and preventive support in regular kindergarten classes might

prevent a waste of valuable instruction time and, therefore, also contribute to the realization of inclusive education in elementary school.

The findings also demonstrate that digital technology presented new opportunities for learning and exploring early numerical concepts and sharpened the actual learning process in young children. Even non-intensive and computerized adaptive interventions in pre-school can enhance early numeracy in young children with a delayed effect on arithmetic performances in grade 1. Waiting until first grade to intervene, when arithmetic difficulties become persistent, seems a waste of valuable (instruction) time. However, when looking for key components to see whether counting or comparing is the most effective, there was a slight difference between the outcomes of the two serious games (counting and comparing CAI). They both had an impact on number knowledge, but playing educational counting games also had an impact on mental arithmetic. Thus, the study specifically revealed the value of adaptive computerized counting intervention in kindergarten as a look-ahead approach to enhance arithmetic proficiency, and from this, is taken for the present study the most relevant aspects to be included when designing a screen with visual stimulus for children to enhance early arithmetic skills, but working on more complex exercises due to the grade in which was applied the present study.

The study above includes comparison exercises by using different objects, something similar was taken for the present study. In addition, was really helpful to analyze adaptive games as a core part of the curriculum by using other types of strategies like technology, taking it as support and a starting point for educational needs.

3. CLIL in maths

The study called *Approaches to Scaffolding in Teaching Mathematics in English with Primary School Students in Colombia* developed by Corzo and Robles (2011). This study examines the situation of primary-level mathematics teachers teaching in English this implied apply an ethnographic research, at the Bureche School, a bilingual and private school in Santa Marta, Colombia, who faced frustrations when students had difficulty understanding their English-language mathematics instruction.

This investigation took an ethnographic approach, in that it was based on observation of people in their natural environment (Johnson, 2002). Information was collected through the application of various ethnographic instruments, such as classroom observations and teacher interviews.

The study focused on the question of what is done by the mathematics teacher within a lesson to help students with their abilities in performing a mathematics class that is taught in English as a second language, as well as the particular characteristics of mathematics teaching in early grades at the institution, with the objective of identifying the general characteristics of an L2 mathematics lesson that helped students successfully understand the mathematical content in the L2.

It was found that, in some classroom observations, the teacher sometimes did not always exploit the students presumed background knowledge. However, the teacher generally helped students with meaningful explanations that helped them master the topic of the lesson; particularly valuable was the use of context clues to clarify concepts. Scaffolding was also represented in the support and assistance provided through drawing graphs, mimics, and student interaction in support of information written on the board.

Additionally, the teacher created opportunities for students to express what they learned orally.

The findings were focus on awareness of the students' linguistics strengths and experience, and in this sense it was found that, code switching, or a change of register, could be used as needed by both teacher and students as an aid to understand lesson content. In this way, the teacher would elicit students' knowledge by allowing them to build their own meaning of the lesson: "We can count faster Volándonos un número ...". The teacher would not necessarily praise or criticize what students answered, but rather accepted their ideas, continuing by formulating additional questions based on their initial responses. In other words, through the use of their "mother tongue", ideas were made understandable, and thus helped construct the overall context for the topic under discussion. Even though most of the students had been involved in a second language education setting throughout their primary school experience, their first language of instruction and daily interaction remains Spanish, taking out a second language.

As it has been noted, Content and Language Integrated Learning (CLIL) has gained popularity in recent years throughout the Colombian territory. Nowadays, educators do not talk about teaching in English but teaching through English. Colombian schools have used this approach in order to promote project-based learning. For instance, CLIL gives schools the opportunity to do some cross-curricular work through different technological programs written and designed in English. Schools are engaged in high scale projects that involve more than one content area.

As another alternative, via the use of the target language by playing computer serious games in other areas as it was mentioned before "mathematics", CLIL allowed the

present study to include a foreign language with math content in a Hispanic and private school, and also performed as an enhancer of linguistic proficiency level of students that are being encouraged to enjoy tasks related to solving problem taking into account the benefits of technology.

Chapter 3

Research Design

The following chapter is structured with the specific research methodology employed for the study in order to assess the use of a math APP into the educational technology approach focus on solving math problems, with the purpose to gather the necessary data and procedures regarding the specific requirements of reporting a qualitative research methodology.

Research paradigm

Qualitative

The study implies a qualitative research relying primarily on the collection of qualitative data because with the contribution to an APP is pretended to observe and describe the phenomenon of educational technology in the mathematics in the area of problem solving with all its characteristics. Although there is another research methodology as quantitative research, in this study qualitative research allows researcher to answer the why and how of the human behavior, opinion, and experience that is more difficult to obtain through more quantitatively oriented methods of data collection.

According to Denzin and Lincoln (2005) “Qualitative research is a situated activity that locates the observer in the world.” (p.36). With regard to this perspective, it consists of a set of activities that make interpretations of the word into a real context and its nature in order to describe a phenomenon in terms of the results people bring to them.

Qualitative research involves methods of collecting data using physical context in which behaviors occurs, in this case as a complete observer because the APP needs to be observed while student are using it to get the enough data to analyze whether they are really engaged with the methodology and if it works.

In addition, the qualitative research allows to analyze children’s environments in which is possible analyze a phenomenon as in this case is the performance of a technological tool inside the classrooms with curricular content. Furthermore toward this tool was observed the improvement of the results in the last term “fourth term” showing up a real interest to keep involving content students had learned as a reinforcement for their exams.

Research Approach

Action research

According to Crothers (2008), research is about generating knowledge. Action research creates knowledge based on enquiries conducted within specific and often practical contexts. As articulated earlier, the purpose of action research is to learn through action that then leads personal or professional development. Action research is participatory

in nature, which McTaggart (2000) to describe it as participatory research. The author states that action research involves a spiral of self-reflective cycles of:

- Planning a change.
- Acting and observing the process and consequences of the change.
- Reflecting on these processes and consequences and then replanning.
- Acting and observing.
- Reflecting.
- And so on

In action research, are the educators who conduct the research Mills (2000). It is a disciplined inquiry that allows teachers to examine their own practices, learn from them, and take action to affect positive change within the contexts of their own teaching environments. This type of research can be done individually or collaboratively with other educational stakeholders. It can be conducted in a class, school or district environment (Ferrance, 2000).

Mills (2000) found four common steps, or phases that researchers were advised to follow when conducting action research

- Deciding on an Area of Focus
- Collecting Data
- Evaluating & Interpreting the Data
- Making a Plan of Action

Setting

The institution is a private bilingual school, which is located in the Bosque Popular neighborhood. Students from different social status compose the institution, because all of them have the access through parents who are associated with a Family Compensation Fund. The study is developed in a first grade that is composed by 32 students with the age of 5 and 6.

In this grade students are involved into tasks of solving math problems by adding and subtracting and at the same time the needs of providing the use of non-native languages as a vital part of the bilingual instructions in their curriculum, which has included different methodologies and the communicative approach CLIL to reach bilingualism.

Participants

Twenty-five students who are between five and six years old. The study will be developed to the whole class, taking into account their special needs toward mathematics learning, and also the collaborative attitude of their parents to pilot the APP which will be analyzed into laboratories by using computers for solving mathematics problems in adding and subtracting.

The study will be focused on the content used for 1st graders according to the curriculum. In the classrooms there are twenty five students. The school has one hour of English class daily, there is a single English teacher for each group.

Data collection instruments

The study used three instruments that will be presented during the chapter in order to get the necessary and relevant data to analyse the performance of math APP inside math classrooms according to the objectives and the question proposed at the beginning of the study. The instruments are: Aptitude test, achievement test, semi-structured interviews

Aptitude test

According to Hidden curriculum (2014). Attempt to predict a student's ability to succeed in an intellectual or physical endeavor by, for example, evaluating mathematical ability, language proficiency, abstract reasoning, motor coordination, or musical talent. Aptitude tests are "forward-looking" in that they typically attempt to forecast or predict how well students will do in a future educational or career setting. Aptitude tests are often a source of debate, since many questions they can provide learners' predictive accuracy and value.

This instrument (see annex 1), was applied during the first section in order to analyze student's level in the use of a second language and relevant aspects such as the management of certain skills to include more complex activities in the next tasks. It was developed at the moment to create a common account to start doing the activities. This involved personal information questions as how old are you, what is your favorite color, etc. Students were also asked to create a password as is made in any type of app. See annex 1. In addition the next sections were used to apply specific content in the APP to analyze student's progress in counting silks through solving math problems and possible attitudes that may arise from the use of the math it.

Achievement test

According to Hidden curriculum (2014) achievement test are designed to measure the knowledge and skills students learned in school or to determine the academic progress they have made over a period of time. The tests may also be used to evaluate the effectiveness of a schools and teachers, or identify the appropriate academic placement for a student—i.e., what courses or programs may be deemed most suitable, or what forms of academic support they may need. Achievement tests are “backward-looking” in that they measure how well students have learned what they were expected to learn.

In each part of the APP there are five lessons, lesson 1 was related to reinforce personal information as well as colors, numbers recognition and their symbolic organization (See annex 2). In the next section there was lesson 2 that was related to vocabulary about school supplies using there is there are in order to count objects by providing visual and interactive material, numbers recognition to analyze phonological awareness with yes/ no question. (See annex 3).

In addition, lesson three was related to working memory by identifying geometry figures and connecting counting with greater than and less than (see annex 4). Lesson four was related to rooms of the house vocabulary and problem solving and conceptual counting of umber from 1 to 10 and 10 to 100. (See annex 5). Finally lesson five was related to work on vocabulary related to clothing and problem solving too. (See annex 6).

It is relevant to clarify that from the aspects and characteristics of the achievement tests, were designed the tasks in which learners were assessed in order to analyze the

enhancement and the reinforcements of them by using the technological tool which and contained the different topics student had worked, and each user had a watch to be monitored with the time they spent doing the lesson, in addition, the APP stored the overall scores of each learner showing how successful they were by working individually obtaining English level a math performance.

Semi-structured interviews

Semi-structured interviewing, according to Bernard (2009), is best used when you will not get more than one chance to interview someone and when you will be sending several interviewers out into the field to collect data.

The semi-structured interview guide provides a clear set of instructions for interviewers and can provide reliable, comparable qualitative data. Semi-structured interviews are often preceded by observation, informal and unstructured interviewing in order to allow the researchers to develop a keen understanding of the topic of interest necessary for developing relevant and meaningful semi-structured questions.

Many researchers like to use semi-structured interviews because questions can be prepared ahead of time. This allows the interviewer to be prepared and appear competent during the interview. Semi-structured interviews also allow informants the freedom to express their views in their own terms.

Two semi- interviews were applied to both, the teacher in charge during the implementation and participants. These semi-interviews were taken from the last section to get enough data for the study, (See annex 7) and (see annex 8). In the following chapter

there are descriptions of the interviews with more detail to analyze, perceptions, opinions, and experiences toward the use of the math APP.

Ethics

The present study will involve human participants and investigate some aspects related to include a different way of learning, and practices in the use of the math APP with the purpose of contributing to students from a private and bilingual school in order to solve math problems with content in L2 within educational technology. To do this was necessary to ask for permission with a consent previously designed for the institution according to its policies. (See annex 9).

The consideration of these issues is necessary for the purpose of ensuring the privacy as well as the security of the participants. These issues will be identified in advance so as prevent future problems that could be evidenced during the research process. Among the significant issues that will be considered included are: consent, confidentiality and data protection.

Chapter 4

Pedagogical Intervention

This chapter will map out the pedagogical implementation plan based on Task-based language teaching (TBLT) defined as the way to create condition for naturalistic language learning which provides a purpose for language use in the classroom. (Nunan, 2004). Taking this communicative approach, a series of activities were designed in order to

include the enhancement of counting skills through problem solving by using English as a foreign language, this was the way to achieve the target language of the activities in which participants used the math APP to reinforce previous topics that covered English area and Math.

The activities were designed by following the cycle of Task-Based language teaching which involves the pre-task, the task and post-task phases, each one bringing up to the lesson a complete input of language.

In the theoretical framework it was mentioned a short explanation about the design of the tasks which are included in the APP, nevertheless, is relevant to clarify and specify what a task is, its components, phases, and the way those tasks are organized in a syllabus, those terms helped to support and direct the design of pedagogic task for certain language skills that were used in the mat APP.

According to Nunan (2002), “a task is a piece of work undertaken for oneself or for others, freely or for some reward” (p.2). Thus examples of task include painting a fence, dressing a child, filling out a form, buying a pair of shoes, making an early reservation, borrowing a library book etc. The definition above conceives the task as a single activity which requires a mental process where students accomplish a goal from the development of an activity that is being used for adapting a real situation.

This approach was an excellent space to involve learners in activities for practicing and designing pieces of work related to the first grade content knowledge and interests that allowed them to use the target language in diverse ways. It implied looking for attaining a

communicative and abstract reasoning goal when students focused their attention on the meaning of a message rather than the pressure of results of a task done in guide practice as always they had taken. Thus the structures were only the means and not the aim of the task.

Task phases

The nature of the task is related to three phases, which allow learners to follow certain steps during the task. Three phases are recognized as: a) the pre-task stage, b) the task stage and c) post-task, which contain series of communication problems to solve with assessments in terms of outcome.

Pre-task phase: For Lee (2000), the pre-task stage involves a “preparation” for the task. This pre-task is carried out between the teacher and the whole class, here the teacher introduces and helps students to understand the theme, and the objectives of the task.

Furthermore, Lee describes the importance of ‘framing’ the task to be performed and suggests that one way of doing this is to provide an advance organizer of what the students will be required to do and the nature of the outcome they will arrive at.

In addition, Dornyei (2001), emphasizes the importance of presenting a task in a way that motivates learners. Like Lee, he sees value in explaining the purpose and utility of the task. This may be especially important for learners from traditional classrooms; they may need to be convinced of the value of a more ‘experiential’ approach. Moreover, Dornyei also suggests that task preparation should involve strategies for whetting students’ appetites to perform the task (e. g. by asking them to guess what the task will involve) and for helping them to perform the task.

The author above besides mentioned these alternatives that can be tackled procedurally in one of four ways; (1) supporting learners in performing a task similar to the task they will perform in the during-task phase of the lesson, (2) asking students to observe a model of how to perform the task, (3) engaging learners in non-task activities designed to prepare them to perform the task or (4) strategic planning of the main task performance. (p.138).

Following the principles above, these are real examples included in the design and implementation of the study in which is observed such sequences of activities and procedures that were include the pre-task phase in order to introduce learners into topics with an easy exercise, and procedures were applied to introduce learners to the topic for the task.

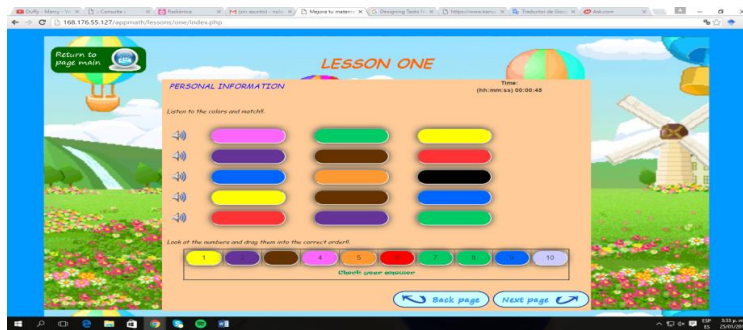


Figure 1. Pre-task activity colors and numbers recognition 1 to 10

In this pre-task activity, students were asked to recognize colors by listening and also to get familiar with a listening exercise without any marks in order to make this phase something funny and interesting, while they were hearing they just needed to identify the correct color by matching the correct answer, it was also an introduction of a sequence of

number from one to 10 to familiarize students working on numbers. While they were answering a Mickey Mouse is showed to motivate students to keep trying.



Figure 2. Pre-task activity colors and numbers recognition 1 to 10: motivation

Task- phase: In this phase, students were familiarized with the topic and some grammar and vocabulary of the task. Here, the time takes an important role in the performance of the task in which there are various options relating to how the task is to be undertaken taking prior to the actual performance of the task, and thus planned for the teacher. Discussions in this latter category are discussed below.

There are three task performance options. The first of these options concerns whether to require the students to perform the task under time pressure. The teacher can select to allow students to complete the task in their own time or can set a time limit. In addition, Lee (2000), strongly recommends that teachers set strict time limits. This option is important because it can influence the nature of the language learner's production.

Others authors as Yuan and Ellis (2002), found that giving students an unlimited time to perform a narrative task resulted in language that was both more complex and more accurate in comparison to a control group that was asked to perform the same task under

time pressure. The students used the time at their disposal to monitor and reformulate their utterances.

The second task performance option involves deciding whether to allow the students access to the input data while they perform a task. According to Sangarung, J. (2001), in some tasks access to the input data is built into the design of a task (e. g. In spot the difference, describe and draw, or many information in gap tasks). However, in other tasks it is optional. For example, in a story retelling/recall task the students can be permitted to keep the pictures/text or asked to put them on one side as they narrate the story. This can influence the complexity of the task, as tasks that are supported by pictures and texts are easier than tasks that are not.

This is an example of a piece of a task taken from the APP, to illustrate this phase, learners were introduced with the topic of colors in the pre-task phase with a funny activity but now the time was controlled and the task is more complex, marks started to add up for individual score to analyze the data in the next chapter. It is a scramble exercise to analyze how internalized is the topic by using the writing skill.

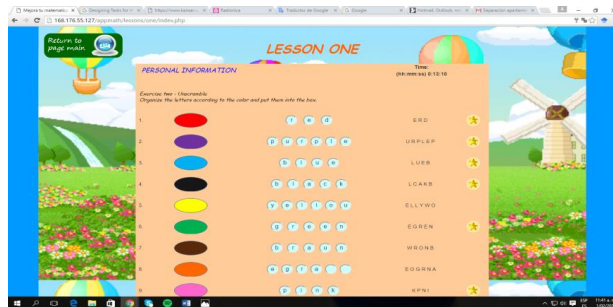


Figure 3. Task activity scramble colors

Learners were given with a start in order to encourage and assess the task, there was a chronometer to measure. In addition they had to read the instruction and recognize common exercise that helped them to reinforce vocabulary colors.

The third task performance option consists of introducing some surprise element into the task. Lynch, T. and Maclean, J. (2001) stated that students can complete a decision-making task that required them to decide what to do in whatever situation. This type of task may work on effects of fluency, complexity or accuracy of the learner language. It is recommended as requirement to cope with a surprise which serves as an extension of the time learners spend on a task and this increase the amount of knowledge.



Figure 4: Task activity puzzle to develop logic and memory

Post-task phase: In this phase learners are prepared to practice what they have learned during the task. Bygate (2001) provides a definition and purpose for this phase.

According to Bygate (2001), the post-task phase also affords a number of options to get pedagogic goals such as to provide an opportunity for a repeat performance of the task, to encourage reflection on how the task was performance, and to encourage attention to

form, in particular to those forms that proved problematic to the learners when they performed the task.

The author also shows that there is a case for asking students to repeat the task with the intention of improving production in a number of ways. Therefore, students can enhance the basic language skills while they are doing interesting activities, these skills may be the use of prepositions, articles, fluency etc, that seem to be difficult for them. The author also suggests that through the task students can work individually or in small groups in order to make a reflection on how was the task performed with the idea to internalize the topic and not with the idea of examine the performance to get low scores.

In addition, Ellis (2001), recommends asking students to present a report on how they did the task and on what decided or discovered. It is considered the natural conclusion of the task cycle, in which the teacher's role is always trying to encourage the students to keep learning in a natural way with a normal situation without under pressure.

This author also suggests "focusing on forms" that refers to once the task is completed, students can be invited to focus on forms, working on fluency but also on accuracy because focusing on forms constitutes a valuable option during the task that is quite compatible with a primary focus on message content.

To illustrate this phase, was taken a task applied for learners from the school where the APP was used in order to repeat or reinforce topics learned during the different terms. This exercise is about "Elements of the house". Here students were prepared with different tasks before doing this, these tasks were mentioned above, pre-, and task. The idea of this exercise was to analyze how learners had performed in the last tasks by dragging in the correct place each element.

Results showed that applying the complete cycle, learners really improved their language skills, in this case vocabulary and also in the design of the post-task the researcher could analyze whether the planning of the task was successful by using an interesting and interactive tool and a correct use of the content.

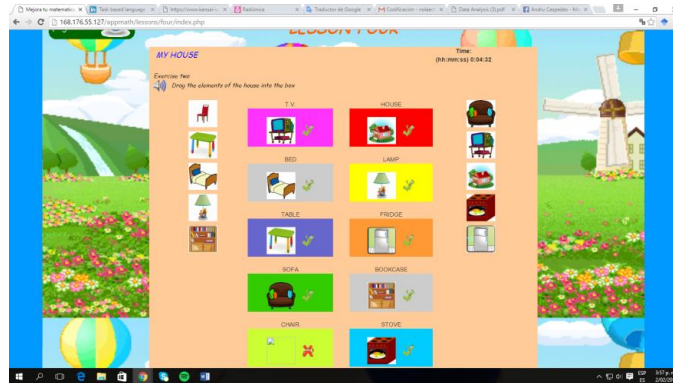


Figure 5: Post-task activity elements of the house

Designing Activities for the Tasks

In this section is showed the material for each one of the tasks' lessons and how they were designed. This activities were mainly obtained from the school' content in order to reinforce the topics by using a different way or format of doing interactive and colorful tasks, in which learners could play at the same time learn.

Reading activities

To design the activities for these skills, it was necessary to follow some principles in order to become the activities interactive and interesting for learners. According to National Reading Panel (2000), "reading is a complex, interactive, developmental process that requires readers to use print-processing skills, prior knowledge and experiences, and a variety of comprehension strategies to make meaning of texts" (p.5).

This definition is related directly to meaning and decoding skills, it means that readers need to work on word recognition, vocabulary knowledge, fluency and comprehension to develop the capacity to find those abilities into a text in order to increase this skill. The author highlights some aspects such as prior knowledge and experiences which are of quite importance for the present study, because through this, was taken the content and the vocabulary used by learner to perform in the APP by forming an overview of statements and problems with different levels of interaction by analyzing, including and interpreting and evaluating what they read based on previous reading experiences and prior knowledge.

In the APP there were activities in which learners had to read statements for problem solving by using vocabulary learned in previous classes activating prior knowledge, taking into account that the APP allows to monitor their understanding by recognizing when the answer is wrong and whether the reading text is not making sense to solve the problem.

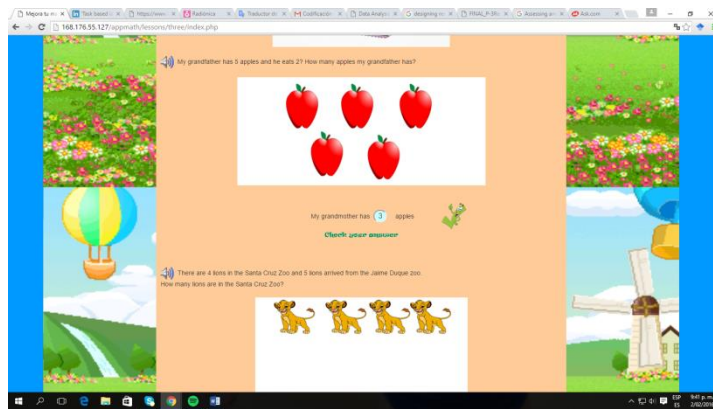


Figure 6: Reading activity for problem solving

Listening activities

As the same as in the previous skill “reading” in the design of listening activities were considered some aspects to become this interactive, interesting and successful for learners. Nunan (2001) argued that listening is a six-staged process, consisting of Hearing, Attending, Understanding, Remembering, Evaluating and Responding. These stages occur in sequence and rapid succession. Nunan (2001) also argued that the first one is hearing and has to do with the response caused by sound waves stimulating the sensory receptors of the ear; hearing is the perception of sound, not necessarily paying attention, you must hear to listen, but you need not listen to hear.

For this, we have an attention stage. It refers to a selection that our brain focuses on. The brain receives a stimuli and permits to select some inputs. The third stage is Understanding, which consists of analyzing the meaning of what we have heard and understanding symbols we have seen and heard. We must analyze the stimuli we have perceived. Symbolic stimuli are not only words, they can be sounds like applause or even sights, like a blue uniform that have symbolic meanings as well. To do this, we have to stay in the right context and understand the intended meaning.

The meaning attached to these symbols is a function of our past associations and of the context in which the symbols occur for successful interpersonal communication: the listener must understand the intended meaning and the context assumed by the sender.

After following with the next stage, it is necessary to make a remark: as it was mentioned previously and illustrating to (Nunan 2001), the background knowledge is important and people have to take into account several points: general factual information,

local factual information, socio-cultural knowledge and knowledge of context. With these factors, the information will be correctly received.

According to (Nunan 2001), the next step, is “remembering”, it is an important listening process because it means that an individual phonological awareness comes to learners minds, in addition, it allows to receive and interpret the message and this has also added it to the mind’s storage bank, which means that the information will be remembered in our mind. But just as our attention is selective, our memory as well, what is remembered may be quite different from what was originally heard or seen.

In the penultimate stage, there is “evaluating”, here the listener evaluates the message that has been received. It is at this point when active listeners weigh evidence, sort fact from opinion and determine the presence or absence of bias or prejudice in a message. The effective listener makes sure that he or she does not begin this activity too soon, as beginning this stage of the process before a message is completed results in no longer hearing and attending to the incoming message and, as a result, the listening process ceases.

Finally, we have “responding”, a stage in which, according to the response, the speaker checks if the message has been received correctly. This stage requires that the receiver complete the process through verbal or non-verbal feedback, because the speaker has no other way to determine if a message has been received. Therefore, it is sometimes complicated as we do not have the opportunity to go back and check comprehension (Nunan, 2001) p.23.

In the following activity, learners were asked to recognize vocabulary related to clothing by a listening activity. Learners read a statement on a related topic which is

fashion, clothing and colors, classifying the items and making problem solving task.

Vocabulary: socks, trousers, dress, jacket, skirt, shirt.

The purpose of this activity was to reinforce clothing vocabulary and enhancing the use of real language used for problem solving, the information was gathered in the overall score given in the amount of wrong and correct answers. Here the stimulus of the activity was to integrate the stages stated above in order to understand what they had heard.



Figure 7: Listening activity clothing and problem solving.

Writing activities

In the study was presented a type of writing activity to apply an “aptitude test” where learners had to make a register, which is most of the time required in whatever technological program or account; besides they got in contact with the grammatical structure of common personal questions which is the linguistic component of the task; so students could develop it by using their own identity by a writing activity taking into account that writing is one of the most difficult skills to develop. In addition, learners had to recognize correctly what are the steps they have to follow in order to create an account having an idea what the APP is going to be about, and the possible challenges they had to face as well as practicing topics in English.

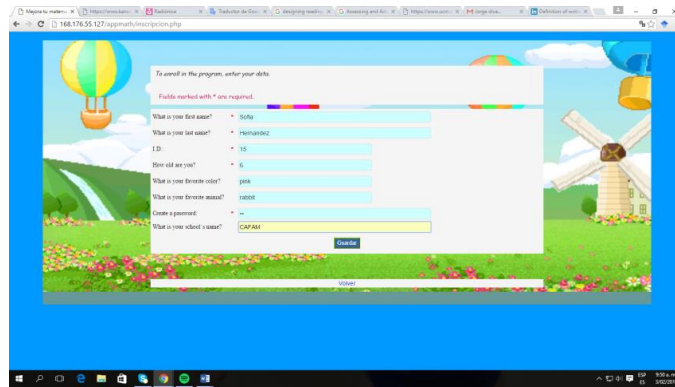


Figure 8: Writing activity personal information

One of the most important authors, which is Nunan, (2001), defines “writing as a physical and mental act” (p 98). It is about discovering ideas, thinking about how to communicate and develop them into statements and paragraphs that will be comprehensible to a reader. The author also argued that writers must select the most advantageous medium for their writing.

This statement refers to writing as a process but also as a product, here the writer creates, plans and writes different drafts in order to make their writing skills the best, revises, edits and publishes his or her final work expressing his ideas and developing communication.

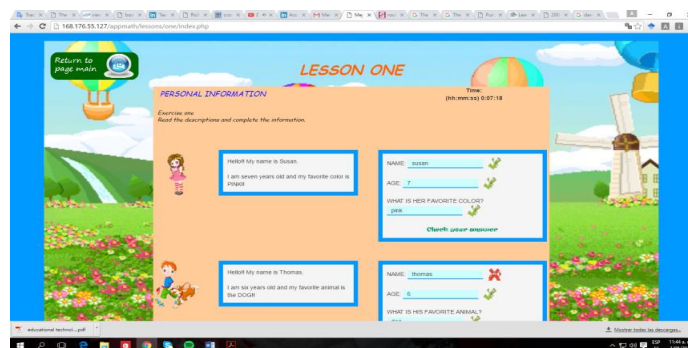


Figure 9: Writing activity descriptions of characters

In the design of the activity which corresponds to figure 8, each candidate was required to write and discover the information that was implicit in short descriptions by using a correct spelling, punctuation, grammar and expression, the data to be taken from such work was stored up in the APP' score.

The activity makes reference to a writing task in which students had to comprehend what was asked for using writing as the target of the task, they had to write on a specific gap, this implied the use of the correct vocabulary related to colors, animals, sports numbers to describe age and its correct spelling, it was used personal information statements which were learned at the beginning of the first term. In addition, it was taking into account that the tasks must motivate and encourage learners to achieve its goals.

Chapter 5

Data analysis

The previous chapters made reference to the use of the math APP called “Have fun learning” for first graders to reinforce and enhance math skills through problem solving in the foreign language learning process “English”. The following chapter reflects the results of the data analysis collected through six sessions in a bilingual and private school in Bogota, in order to explain and show how the use of technology serves as a vehicle to work on Math and English areas by developing skills such as counting skills and problem solving through the use of a technological tool.

In order to collect data the study used 3 different instruments, aptitude test, achievement test, and semi-structured interviews, the aptitude test was specifically developed at the beginning of the implementation in order to make a register in the APP to create an user account which allowed to analyse student's interests and use of language to introduce them in next tasks.

The first instrument was certainly important in order to analyse students' writing skills by using personal information as the main topic for this test and also to present the tool, this with the intention to involve learners into a cyber space inside the classroom, having the relevance that arise from the connection of the project that implied technology, problem solving tasks by using TBLT, counting skills and (CLIL) as the communicative approach. These instruments allowed the study to gather information related to the interaction directly with technology and maths, giving a view about how learners performed by using specific vocabulary and language patterns required to participate in the study.

The second instrument were the achievement tests used to gather information related to the student's proficiency required to measure how much learners had learned, but also to make a diagnostic about weaknesses and strengths in some students who had difficulties acquiring math skills during the development of the curriculum. This instrument also helped analysing the student's development on listening, reading and writing skills by setting the criteria of the school as guidelines to evaluate the effectiveness of the educational system within the integration of both areas.

The final instrument semi-structured interviews, were applied at the end of the sessions in order to cover a list of questions, that included students' and teacher's perceptions through technology, problem solving, and counting skills in English, followed in a particular order, first, were interviewed the participants and finally the teacher in charge to supervise the performance of the study. In fit to the content and the approach selected into the curriculum development, were analysed with this last instrument.

Those became a main focus for findings of the study for this specific population; the categories are divided into specific subcategories that contributed the study to achieve the objectives and consequently give an answer to the research question:

How can the use of a math APP contribute to practice and enhance counting skills through problem solving practice in English?

All the data found was organized by using Coding and memoing strategies, notes and observations toward the APP in order to create categories and subcategories that emerged from the data analysis, these will be presented during this chapter, these were taken from the most relevant information collected and was classified from an initial coding, focused coding and memoing. When the data was collected new information emerged from the activities proposed and developed as cyclical process during the research study in order to refine the information.

Bailey (2006) defines coding as the “process of organizing a large amount of data into smaller segments that, when needed, can be retrieved easily.” She distinguishes coding analysis from thematic analysis in that themes do not emerge from the data. She asserts that

the themes appear at the interpretation of the researcher and the associated research questions. She describes two types of coding: initial coding and focused coding.

Initial Coding

- Initial coding is also known as open coding.
- During initial coding, the researcher reads and codes the data.
- Only, the data that is relevant to the study purpose and research questions are coded.
- An iterative process

Having the aspects mentioned above, in the study the initial coding was made by taken from the APP the overall score per lesson in order to collect the relevant data from each of the tasks “achievement test”, see table 1, and to generalize the performance of all the participants using the technological tool. In addition, the initial coding was also made from the semi-structured interviews applied at the end of the sections by reading and making an overview of the participants and teacher’s answers in order to include this instrument in the initial coding, and start analyzing given from the instruments.



Graphic 1. Overall score per lesson, initial coding

Focused Coding

Focus coding is also known as axial coding. Typically, it occurs after the initial or open coding. It involves grouping coded text into larger segments which encompasses the smaller segments. It is an iterative process

The focus coding was made by identifying the relationships among the overall scores of the achievement tests and the topics included in each task to analyze the performance in each of the topics in order to assess and conclude weaknesses and strengths students presented on them.

No. Lesson	Topics	Items per lesson
Lesson one	Personal information: Names , sports, age, favorite colors numbers recognition from 1 to 10	28
Lesson two	School supplies “there is there are” , numbers recognition, has/have	23
Lesson three	Geometry figures, number recognition, family members	13
Lesson four	Room of the house, element of the house, numbers recognition from 10 to 100	53
Lesson five	Clothing, colors	18

Table 1.:Topics per lesson with No. of items. Focused coding

After reading the answers given in the semi-structured interviews for the participants and the teacher in charge, were coded the relevant information to build the categories that emerged from larger segments which encompasses the smaller segments through the use of the APP. These were classified by giving and specific code to later on begin to find the connections with the objectives and to know whether the study really

achieved the aims based on the research question. Only six participants were selected to participate in the semi-structured interview.

QUESTION	STUDENT	Student one	Student two	Student three	Student four	Student five
	GENDER	Female	Male	Male	Male	Male
	AGE	Six years old	Six years old	Six years old	Six years old	Six years old
		Samples of participants answers				
1. ¿Cuál lección de LA APLICACIÓN DIVIERTETE APRENDIENDO te gusto más?		Me gustó mucho la de los colores y la de la ropa con el muñequito	La de los números del gusano y la de contar	La del gusano y el muñeco	Me gustó mucho la de los lugares de la casa	La donde estaba el gusanito porque me gustan los números (activities of solving problema)
2. ¿Cuál lección de LA APLICACIÓN DIVIERTETE APRENDIENDO te pareció más difícil?		La de los lugares de la casa y las cosas del colegio. (Problem solving)	La primera y la segunda (personal information and colors).	La del gusano y contar, me gustaron pero estaba un poquito difíciles.	La más difícil me pareció cuando uno tenía que colocar los números (problem solving)	La más difícil me pareció la de los lugares de la casa
3. ¿ En cuál de los siguientes temas sientes que debes reforzar mas <ul style="list-style-type: none"> • Personal information • Colors • How many / how much • School supplies • Sequences of numbers from 1 to 10 • Rooms of the house • Clothing 		How many Rooms of your house	Clothing Personal information	Colors Rooms of the house	Sequences of numbers from 1 to 10	Los lugares de la casa, en los exámenes me fue más o menos pero en el juego me fue un poquito mejor por que gane globitos y estrellas y me salieron muñequitos.

4	¿Crees que puedes mejorar en los temas usando LA APLICACIÓN DIVIERTE APRENDIENDO? ¿Por qué?	Si, por que es más fácil y es más divertido, además hay que ganar y acumular muchos muñecos, globitos y estrellas.	Sí, porque me gustó mucho el juego y me gustan los computadores para hacer tareas y practicar, me fue bien en el juego y gane muchos puntos.	Si, por que los temas son divertidos y gane muchos chulitos y globos aprendiendo lo que se me había olvidado.	Si, por que me pareció muy bonito el juego y más fácil hacer las clases	Si. Porque no son como los exámenes y se puede jugar con las cosas que uno está aprendiendo
5	¿Cada cuánto utilizas el computador? ¿Para qué lo usas?	Lo utilizo casi todos los días en mi casa y aquí en el colegio, y lo utilizo para ver hacer tareas que la teacher deja o para ver videos y jugar	Yo utilizo el computador para hacer tareas, imprimir, ver videos y juegos. Y lo utilizo todos los días, pero mis papas están conmigo.	Yo uso el computador pocos días, pero yo sí sé que sirven para hacer tareas y muchas cosas como jugar.	Lo utilizo a veces cuando llego a mi casa y me pongo a estudiar un rato	Yo lo utilizo como 3 veces por semana en mi casa y aquí en la sala de informática
6	¿Para qué sirven los computadores?	Los computadores sirven para hacer tareas, ver videos, jugar, para hacer muchas cosas y son muy chéveres.	Sirven para muchas cosas, para hacer tareas, ver videos, jugar e imprimir imágenes y cosas.	Los computadores sirven para que uno aprenda y use cosas para que se saquen buenas notas	Los computadores sirven para escribir, para aprender	Los computadores sirven para aprender y para estudiar

Table 2. Participants Semi-structured interview

It was also used color coding in order to analyze the possible categories that emerged from the second third instrument. The following sample shows the process done in this axial coding.

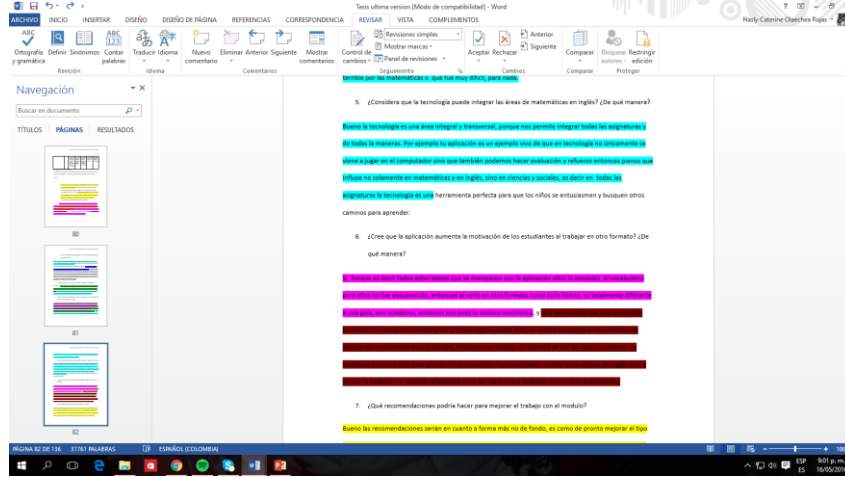
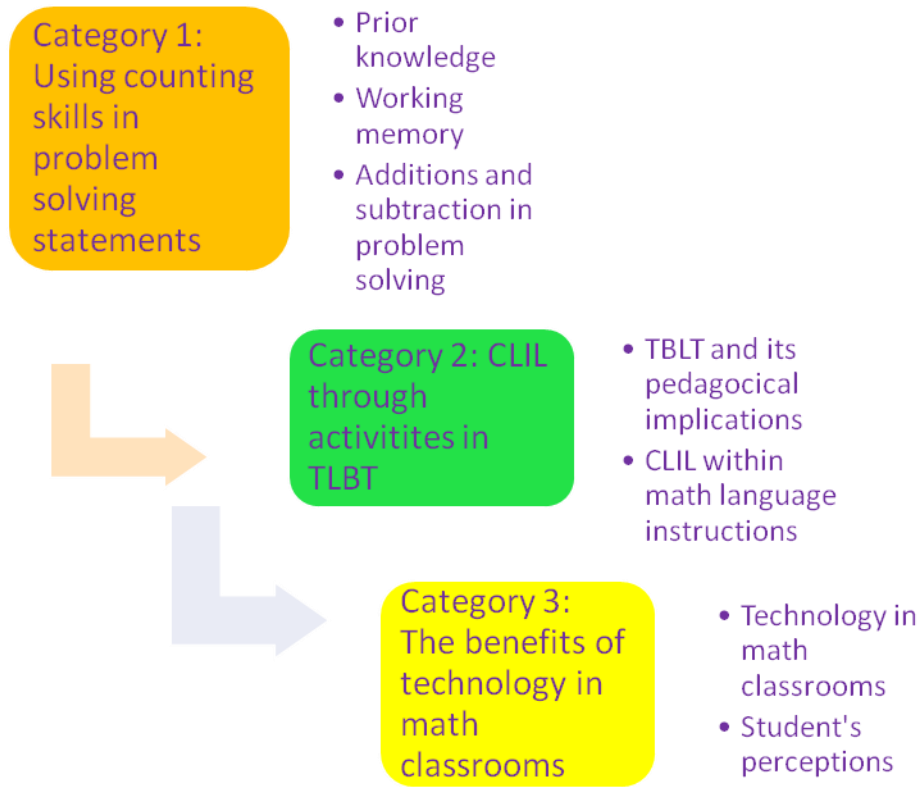


Figure 10: Semi-structured interview teacher in charge: color coding

Memoing

Writing notes to oneself regarding the coding, including reflections on the data notes could include attempts to operationalize definitions, questions, posing hypotheses, and answers revealed in the data. Facilitates coding at a higher conceptual data from this process was used for subsequent analysis an iterative process.

After reviewing all the data collected, were found 3 main categories each one with subcategories to evidence the findings, subcategories respectively that reflect the performance and different issues at the moment of using the APP, in which participants found a set of activities that included different language skills to work on and individual goals to achieve by using individual’s decision making mechanism.



Category 1: USING COUNTING SKILLS IN PROBLEM SOLVING STATEMENTS.

This first category reflects how problem solving and counting skills gradually emerged during the use of the APP, whose content was designed including problem solving statements which required the management of specific vocabulary learned in previous lessons to comprehend and associate reason abstractly and quantitatively, this category involves problem solving along with counting skills to enhance and reinforce high enough the student’s performance in both, the math and English areas which usually are integrated during every lesson.

It was found that using problem solving and counting skills worked on an interactive tool, can have positive outcomes for reinforcing and enhancing previous topics

that children tend to forget, the way this outcomes are received are crucial in the learning process due to the strategies used, especially in the comprehension of the problems. This process required levels of understanding and comprehension to achieve the outcome when a child is central in the interpretations of individual believes or knowledge to solve problems. Through the use of the APP students had the opportunity to use the individual's monitoring and self-regulation as Schoenfeld (2013) argued.

The exercises applied in the tests implied know the vocabulary and making sense of the problem to persevere in solving it to do this work, the technology class was taken to use the APP during 45 minutes per section. In addition, students were working on activities that contained listening, reading and writing activities where learners had to work on the reinforcement and the enhancement of the targets of each task.

As Common Core State Standards words (2011) stated, the comprehension of the instructions took an importance place at the moment of making emphasis on the math practice because through them, learners could model with the different counting tasks and tried to attend to precision by using an approximate tool which was clear instead of confusing them when were reading or listening the statements to achieve the goals for the tasks.

Of this main category, are taken three subcategories that explain specific points when talking about counting skills' practice through problem solving exercises by using a technological tool to enhance and reinforce student's performance in math and English areas, these components of math, gave some principles that clarify how the use of technology serves as facilitator to enrich learning math process by increasing the

motivation toward doing additions, subtractions or simple interpreting what learners have to do in specific situations. National Council of Teachers of Mathematics (2000).

Subcategory 1: Student's prior knowledge

On this subcategory learners were involved on using previous knowledge acquired during the four terms; those required a deep understanding to satisfy their own scores in different exercises in the APP.

A learning process was necessary for students to solve the problems using counting skills, this subcategory was essential during the whole sections because through the practice of vocabulary learned in English, the study could introduce language within problems that implied associating mathematical operations as additions and subtractions in one number as well as recognizing, greater than, less than with geometry figures, colors, and vocabulary related to family members, school supplies, rooms of the house and clothing, this process implied sharing directly with technology as vehicle to work on the different topics mentioned above.

First was introduce the following drag task, (see figure 9), in order to analyze student's prior knowledge toward the use of vocabulary related to elements of the house. It was pretended to introduce learners into the vocabulary they will be working on but solving math problems. (See figure 11).

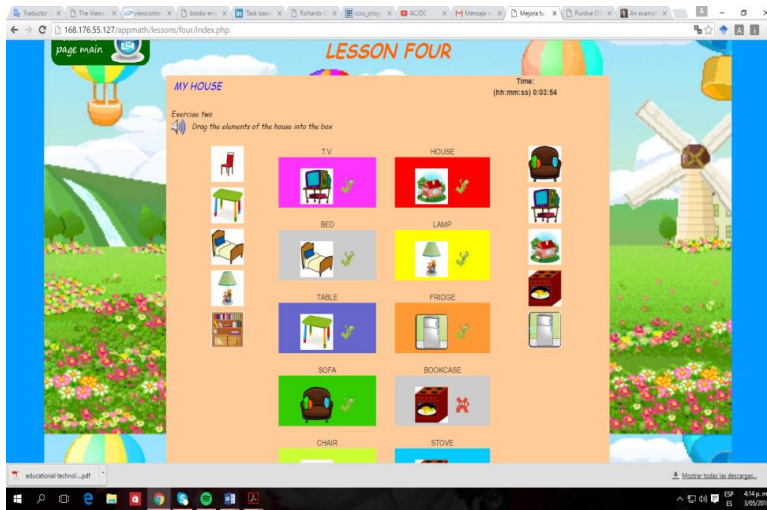


Figure 11: Elements of the house problem solving (p 3)

In the task above students demonstrated that they managed the vocabulary related to elements of the house, because despite they did not get marks above 9, most of them achieved the task. In addition, this finding allowed to work on more complex task as is showed in (figure 12).

Student	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Score lesson four	0,69	0,74	0,71	0,77	0,80	0,74	0,69	0,77	0,80	0,63	0,74	0,71	0,69	0,80	0,77	0,74
Student	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Score lesson four	0,80	0,77	0,77	0,69	0,71	0,74	0,71	0,83	0,77	0,69	0,69	0,74	0,69	0,74	0,89	0,69
Average																
0,741																

Table 3: overall marks per students

Note: The scores are reported as number of items correct with a possible maximum score of 1.

This evidence indicated that working on problem solving statements, continue being difficult to comprehend and assimilated for children, even weather they know the

vocabulary to associate the situations because the score is significantly low having only 4 participants with marks above of 8.

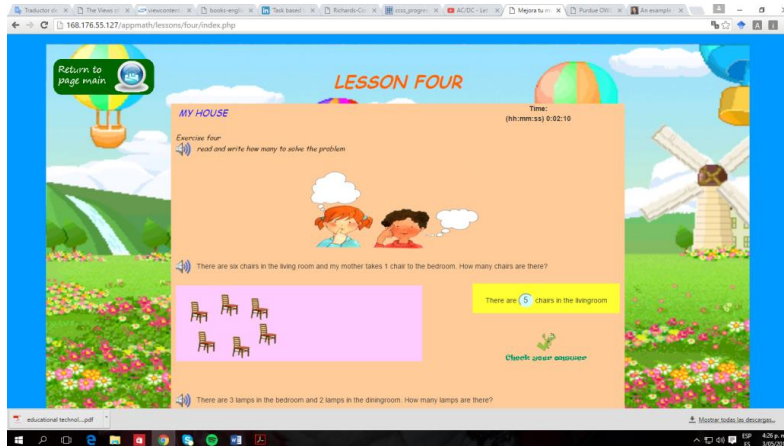


Figure 12: Problem solving exercise (p 10).

In the tasks illustrated above, the finding demonstrated the student's prior knowledge had an important impact in the effectiveness of the intervention of the study because they were initially familiar with the target language during the last terms included in the curriculum.

The study found that prior knowledge allowed learners to check the reasonable of their answers found through other means and also it helped them to develop a better understanding of place value, math operations, and general numbers sense. As the National Research Council stated (2001) "The curriculum should provide opportunities for students to develop and use techniques for mental arithmetic and estimation as a means of promoting deeper number sense" (p. 415).

The following excerpt for this subcategory showed how students performed in activities that implied counting or associate items according to previous knowledge by recognizing familiar content, and also to identify wheatear students had forgotten the topics

that had learned at the beginning of the scholar year. The extract is taken from semi-structures interview applied for the math teacher in charge.

Question 1: ¿Cómo cree que las lecciones contribuyen para poder reforzar los temas vistos en clase?
Las lecciones en este momento nos están contribuyendo a que no sola mente nos sirven para reforzar, sino también para evaluar y para darnos cuenta en qué nivel van los niños , lo bonito de esto, es que hemos podido ver desde principio de año todos los temas y los hemos podido reforzar y ver cómo van, entonces pesaríamos que lo de primer periodo ya se les ha olvidado, pero no, por medio de la aplicación podemos ver que el resultado fue excelente y vimos que tienen buen manejo de los temas y eso nos ayuda mucho.

Table 4: Semi-structured interview, teacher in charge question 1

It is noticed that the teacher advocated the use of familiar content in order to reinforce students' prior knowledge by assessing them and analyzing how learners performed in each task in the APP. It was found that learners had the enough competences to face different math exercises by using their English level to cope with problem solving as it was used in the different sections of the technological tool. In addition, prior knowledge served as strategy in which learners were asked to re-solve problem solving tasks with the content worked for them by using different strategies provided for the school, such us guides practices, construction material and dynamic activities developed inside the classroom.

This reflected that by using a different strategy in this case an interactive tool, students could solve the problems as a practice instead of only as assessment, improving from the prior knowledge the math performance by using the reinforcement as a simple strategy as working on technological platforms because these are easier to get access and can be used in everywhere.

Subcategory 2: Working memory

The component of working on memory allows students to temporarily hold and manipulate information about geometry shapes; this implies that learners in math subject have to do activities that involve visual working memory, including the relationships that have math concepts and their connection around of their environment.

In the APP there was a space to work on identification and on the ability to remember for immediate recall the characteristics of geometry figures as, triangles, cubes, prisms, spheres, and rectangles in order to formalize and generalize mathematical material to detect what is of chief importance, to operate with numerals and other symbols, and to handle sequential, properly segmented and logical reasoning related to the need for proof, substantiation and deduction. (Wieczerkowski et al., 2000).

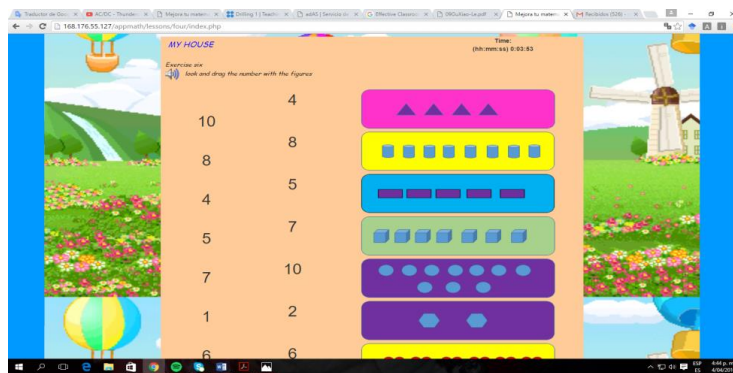


Figure 13: Geometry figures: working memory (p 13)

The task showed above, was used in order to introduce learners to work on memory by using numbers and with different shapes, and also to get student involved and engaged in non-symbolic math knowledge such as estimation of magnitude or magnitude comparison math exercises. (Cirino et al., 2011). Student were asked to recognize and compare small amounts of geometry figures by comparing greater than or less than pointing

with the mouse to the correct answer in the APP, this activity was very useful to have student practicing and reinforcing geometry figures shapes working on visual memory.

It was found through this task that students performed quite well on working memory by identifying the sketchpad for the storage of visual-spatial information over a short period this played an important role in the generation and manipulation of mental images. From here, it was possible to analyse from the use of math material cognitive mechanism as the preservation of information, while students were simultaneously processing other type of information that came from other tasks they could recognize the geometry shapes by using a phonological input recalling the relevant info to do the task.

Student	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Score lesson four	0,78	0,83	0,78	0,65	0,74	0,87	0,96	0,83	0,91	0,74	0,78	0,70	0,83	0,78	0,78	0,83

Student	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Score lesson four	0,78	0,91	0,83	0,91	1,00	0,96	0,83	0,96	0,78	0,91	0,96	0,91	0,87	1,00	0,83	0,91

Average
0,834

Table 5:(Results of the task: Geometry figures for working on memory No 4)

Note: The scores are reported as number of items correct with a possible maximum score of 1.

The results also showed that learner also had good counting skill for the recognition of numbers from 1 to 10, in which they could recognize easily the numbers to connect with the amounts of items “geometry shapes, most of them got marks above 8 getting closer to 9, so this indicate that the task was completely achieved for this subcategory. In addition, this finding allowed to continue working on symbolic number comparison. See (figure 14).

The figure below was another exercise related to working on visual memory, where students were given with an interactive exercise in which they had to circle the number in red color in order to identify specific numbers while they were recognizing some colors at the same time by listening and reading the instruction.



Figure 14: Symbolic number: working on memory (p 22)

Symbolic number was identified in the recognition of numbers with colours by analysing the ability to represent and understand written numbers as a part of children's cognitive development in which there is the prerequisite for the learning of basic arithmetic skills, in this case adding and subtracting. Zhou and Wang (2004).

Most learners began to listen and select without any hesitation. Even for those children who claimed that they did not know what number chose, the APP provided as many attempts as they needed in order to reinforce and keep practicing on working memory as is showed in figure 15.

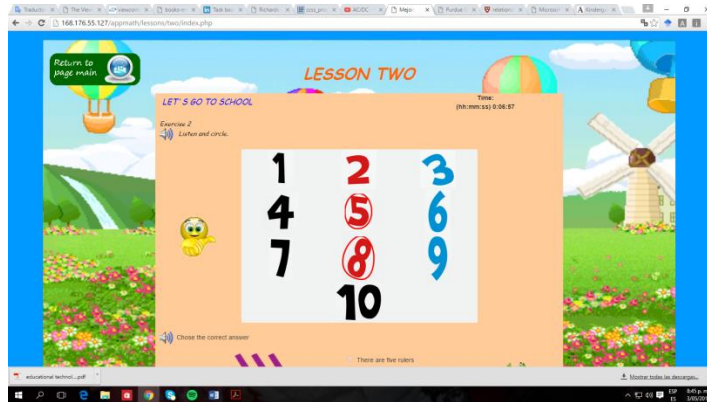


Figure 15: Symbolic number: working memory with attempts

It was found that pre-schoolers represented and understand the written numbers by having the input of listening numbers in the second language “English”. This finding demonstrated that they could interpret the task from a short term memory to a long term memory reproducing it in a sequential fashion because they knew the sound of the those number previously, the score was significant getting closer to 9 which represent a high score.

Student	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Score lesson ONE	0,640	0,960	0,960	0,680	0,960	0,960	1	0,960	1,000	0,680	0,920	0,800	0,880	1	0,760	0,800

Student	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Score lesson ONE	0,880	0,920	0,800	0,880	0,920	0,760	0,880	0,960	1	0,960	1	1	1	1	0,840	0,960

Average
0,897

Table 6: Results of the task: Symbolic number: colors

Note: The scores are reported as number of items correct with a possible maximum score of 1.

Swanson (2003), named the distinctions from working memory (WM) to short-term memory (STM) which are, in WM the author mentions (the phonological loop), which

means that through hearing an input, learners process a resource of limited capacity which involved the preservation of any information while STM involved situations where small amounts of material are held passively.

Through the task minimal resources from long term memory were activated to interpret the task, in the figure is showed three digits in red colour, here students recognized and reproduced it making from a phonological input a complete reproduction of that phonological coding and rehearsal.

Subcategory 3: Additions and subtractions in problem solving

The design of pedagogic math tasks required specifications about certain theories that are composed into mathematics as a macro-skill, in which exist different major divisions such as arithmetic in which are, multiplications, divisions, additions, subtractions, algebra, geometry, statistics, problem solving etc., As the study concerned, of this macro-skill were taken from the arithmetic: additions, subtractions and problem solving in the development of each APP's sections which were designed using TBLT as communicative approach.

The additions and subtractions were applied into problem solving exercises in which students had to recognize certain types of verbs that indicate wheatear they have to add up or subtract explaining the total amount of objects when they were put together or to know how many objects were left in the group after taking away a certain amount of objects from that group. In addition these groups were represented with movements in order to help learners to recognize the most difficult verbs. (See figure 16 and 17).



Figure 16: Addition problem solving task. (p 17)

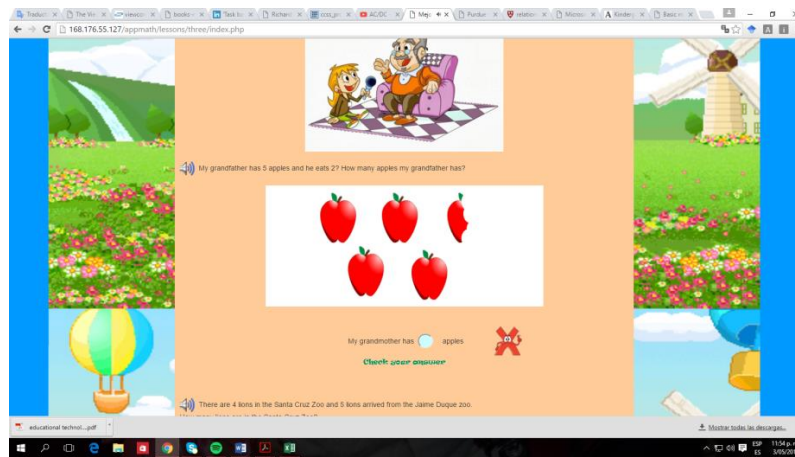


Figure 17: Subtraction problem solving task. (P 26)

From those products made by learners in figures 16 and 17, it could be analyzed the individual's belief systems about mathematics and problem solving come from of the origins in the students' mathematical experiences, (Schoenfeld et.al 2013). In addition there is relevant to clarify that from these student's products student had to use reason abstractly at the moment to interpret the movements which indicate a subtraction with the verb "eat" by making a quantitatively judgment about a symbolic object representation.

It was analyzed that students got a low performance on identifying additions and subtractions in problems solving because the scores were below of 8.

Student	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Score lesson four	0,69	0,74	0,71	0,77	0,80	0,74	0,69	0,77	0,80	0,63	0,74	0,71	0,69	0,80	0,77	0,74

Student	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Score lesson four	0,80	0,77	0,77	0,69	0,71	0,74	0,71	0,83	0,77	0,69	0,69	0,74	0,69	0,74	0,89	0,69

Average
0,741

Table 7:(Results of the task problem solving: animals and colors. No 4)

Note: The scores are reported as number of items correct with a possible maximum score of 1

However, the scores task above involved problem solving exercises with additions and subtractions the scores show that despite learners could not get high marks none failed, it means that though a different input student have a lower risk of fail in problem solving.

Something to notice is that the through visual group representation, learners found easier solve additions and subtractions instead of representation on number without any type of stimulus, this implies using for first graders creative and interactive material in order to foster math learning process.

In addition, by using maths apps it was analyzed that student can continue practicing to overcome the weakness and to become good at performing in problem solving with simple arithmetic operations. Moreover, it implies reinforcing and practicing to develop a math thinking since early ages because problem solving appear to facilitate the learning process toward maths by increasing the management of basic math skills.

Furthermore, it was demonstrated that according to the school content, the use of counting with how many, there is and there are into problem solving exercises with additions and subtractions, it was completely understood by students, but at the moment of working in problem solving with verbs like arrive, left, eat, or passive voice structure as was sent to repair, student struggled with the reason abstractly and quantitatively that appear to be the most difficult issue when learners are facing math in problem solving as (Schoenfeld, et al. 2013) argued.

To conclude, through these findings it is relevant to highlight the use of technology to do the tasks, because it served as a vehicle to enhance and practice complex problem solving exercises through self-exploration because due to the expansion of technological devices, learners seemed to be quite enough interested on doing whatever type of math exercise on the computer without refusing to do it, they did not focus whether the APP contained math exercises related to counting or problem solving they just wanted to participate and start to click and explore by themselves.

To illustrate this final conclusion was taken a teacher's answer from a semi-structure interview in which it is appreciated that for the participants doing the problem solving exercises resulted so easy without realizing that in some way they were assessed.

Question No 4: ¿Cuál fue la percepción de los estudiantes al encontrar en la aplicación no solo temas de inglés sino también problemas matemáticas en inglés

Bueno ellos como estaban tan encantados con la aplicación, no se dieron ni cuenta que habían problemas de suma y resta en inglés, igual me gusto que así hubieran este tipo de situación en donde ellos tenían que interpretar un problema matemático que les implicaba contar y analizar que debían hacer, nunca se cambió el lenguaje y continuo siendo en inglés, entonces nos sirve hacer los dos refuerzos en las dos áreas, cuando yo los vi, me dio un poco de temor hacia si iban a crear algún tipo de resistencia o se les iba a complicar un poco la interpretación, pero no, ellos lo hicieron muy bien y al referente no me han dicho nada de que fue terrible por las matemáticas o que fue muy difícil, para nada.

Table 8: Semi-structured interview teacher: Addition and subtraction in problem solving

Category 2: CLIL THROUGH ACTIVITIES USING TBLT

Through this main category, Content Language Integrated learning CLIL, the study could include the use of a foreign language in the design of problem solving exercises into other types of activities. CLIL also allowed students to get a deeper practice of a second language while they were reinforcing math and English subjects' contents, thus, through tasks which were designed based on TBLT, the exposure to language was higher in both, while the sections were implemented.

From this starting point, TBLT task-based language teaching, brought to the sections easy steps to be applied in the researcher's proposal at the moment of developing activities with authentic contexts of language and also gave a chance to create a cyber space environment for students who had to prove their prior knowledge, counting skills, abstract thinking and problem solving abilities with arithmetic operations which were mentioned before to recognize the theme of the task and its objectives just by using the math APP,

thus they were connected with a successful task into its different phases to promote a great deal amount of exposure to language.

During the research, different exercises based on TBLT guided to provide the practices and opportunities to reinforce and enhance the math performance by using counting skills, and problem solving in the foreign language “English”, this showed different results in the students’ performance toward these abilities including a second language as vehicle to do the test through the tasks.

The general results were based on the achievement test or better named “tasks” for the study, and semi-structured interviews, during the following subcategories will be explained how through the design of activities in English “CLIL” by using TLBT promoted the reinforcement and enhancement of math performance by connecting language as the base to communicate and do the different tasks given for the APP. It was English used as the language instruction where students mainly encountered vocabulary learned in the last four terms so that the implementation of the this technological tools served as reinforcement taking the general content of first grade to work on form academic/scientific disciplines. Lasagabaster and Sierra, (2009).

Subcategory 1: TBLT and its pedagogical implications

Learning a foreign language implies using activities that represent contributions to the syllabus design, classroom teaching and learner assessment. Thus, Task- based Language Teaching TBLT is an extension of the CLIL, which provides different stages to

achieve the communicative goals and to develop learners’ communicative competences. (Littlewood, et al., 2004).

Even though the participants had got a strong input and amount of exposure to language, they needed to reinforce and improve some vocabulary patterns in order to take the final exams. Whereby through the use of the APP, learners had the opportunity to work on the math and English’s contents to reinforce and enhance those concepts or language patterns where students presented weaknesses.

Taken the benefits of TBLT, it was necessary to include the complete cycle of task based on the design of the activities, which required a pre-task phase, a task phase and a post-task phase, in order to connect the English content to start working on the math area. This approach allowed to identify Student’s English level, interests, prior knowledge and the achievement of the tasks.



Figure 18:Pre-task CLIL (P 22)

Each task was designed taking into account the relevance that has the introduction of the topic to engaged learners, the excerpt above was an exercise to illustrate and involve them into counting and problem solving for later exercises with the intention to prepare them to perform the task as is showed in figure 18. In addition, it is noticed that (Dornyei et, al.2001), emphasizes the importance of presenting a task in a way that motivates learners. Through student’s answers was found that the use of the correct cycle of TLBT allows teachers, researches etc., create a complete context of language only whether a model is provided as is showed in figure 18, whereby tasks can be integrated to any subject or topic within a specific purpose.

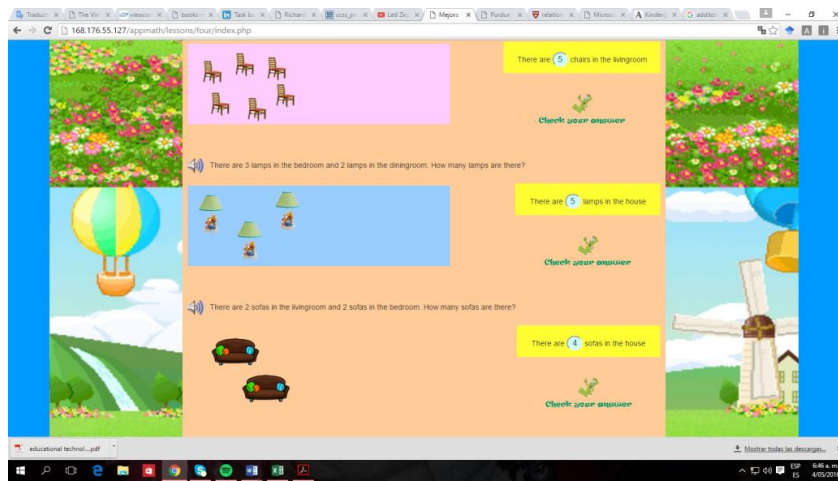


Figure 19.Task CLIL (P 23)

From this excerpt, it is illustrated the use of the previous vocabulary introduced in pre-task phase to now do the task, this phase implied a complete plan in order to get a sequence and coherence in the activities. As (Lee, et al. 2000) argued, on the learner’s part they reflected the language learning inputs they had had, it served as an import influence to succeed the task and also was analyzed that a common assumption of task-based teaching regarding to its implications is the texts, the discursive practices and any language practices

inside or outside of the classroom are constructed by and through a task resemble those found in non-pedagogic discourse. From these interpretation it is relevant also to include the use of technology which is not claimed as a pedagogical discourse, but through this sample is analyzed that the use of technology by taking the cycles of TBLT is an excellent strategy to include academic content to reinforce and enhance learner productions in any subject.

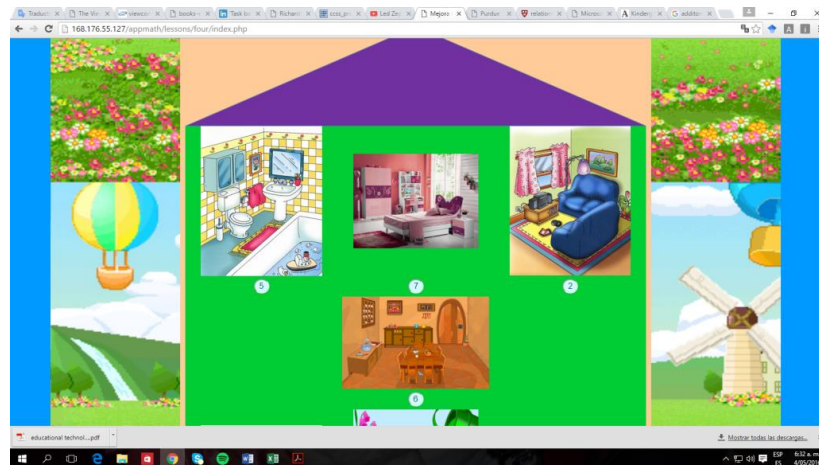


Figure 20: Post-Task CLIL (P 23)

From this excerpt it was necessary to analyze the post task phase as the final production of each section and also to not analyze only the effectiveness of the APP did, it was also relevant to know about how much useful were all the tasks into the participants, it was found that students understood and recognize the task' role in each of the sections, this allowed the study to be focus on the effectiveness of the communicative approach TBLT in the activities, and whether they had been achievement the aims. Students felt comfortable doing activities without feeling that they were difficult or confused for them. Here we can evaluate the tasks in order to analyze if they got the purpose in each phase of the TBLT.

This excerpt support the conclusion above but now reported by the math teacher in charge during the implementation of the math APP in all the sections where it is showed the task’s success through the use of a technological tool.

Question No 4: ¿Considera que las lecciones cumplen con los objetivos propuestos en las actividades?
Yo pienso que sí, es evidente que hubo una planeación con base en contenidos reales y conocidos para las niños, entonces claro que cumple con los propósitos, además la aplicación es muy colorida y eso les gusta mucho, entonces hace que ellos se interesen y que estén muy atentos a lo que tiene que hacer y quieren continuar sin manifestar cansancio o que quieren salir a descanso como en una clase normal.

Table 9: Semi-structured interview teacher: TBLT and its pedagogical implications

From these answers it was confirmed that students really got engaged with the tasks in the APP, and these achieved the main purpose of the research, which was bring to the classroom understandable exercises using the implications of TBLT in order to reinforce, support and activate previous knowledge to enhance math and English learning process. In addition, learners found in the APP an easy way to practice by exploring and having other type of motivation making feel them that they work was significant in the pedagogical field. This finding also shows that the activities were designed without making assumptions, otherwise students might get confused with both areas, so through the use of TBLT, content could be provided meaningful tasks creating conditions for naturalistic language learning and also providing a purpose for language use in the classroom. (Nunan, et, al. 2004).

Subcategory 2: Using CLIL within language instructions for maths

On this second subcategory of the following finding, it was discovered that the language instruction for math subject should take place as simple process without having learners struggling for comprehend the ideas or what they have to do. During the instructions given by the APP was noticed that the math's content and exercises that implied counting, numbers recognition, problem solving with additions and subtraction provided in English language were understood in an easy way.

The APP provided movements to make easier the instructions in order to help student to communicate the math language inside English vocabulary and language patters such us as how many, there is there, greater that less than are needed to associate the math operations, items recovered animation doing work easier to interpret; however, during this part, it will be discussed the enhancement of counting skills during the tests, and the reinforcement of vocabulary related to English of first graders, by the incrementing motivation toward self-exploring in math.

To start, the circumstances that refer to this subcategory will be the ones where the main aim was English language to communicate math content which is mandatory to succeed the courser by practicing the instructions that student had to carry on L2 in order to achieve the tasks. One of them was taken during the development of lesson 2 , clarifying that in all sections they took an important place, here students started using there is and there are to count items related to school supplies in the APP, following instructions in which they had to identify whether they have to count in plural or singular.

In the extract below, students were asked to count by using the structure and there is there are, in which they got an easy comprehension form the instructions which were given using listening and reading as the vehicle to drill those instructions. Students demonstrated that by listening the instruction in English they seemed to understand better what they had to do instead of reading the instruction even if they are short. See table 10.

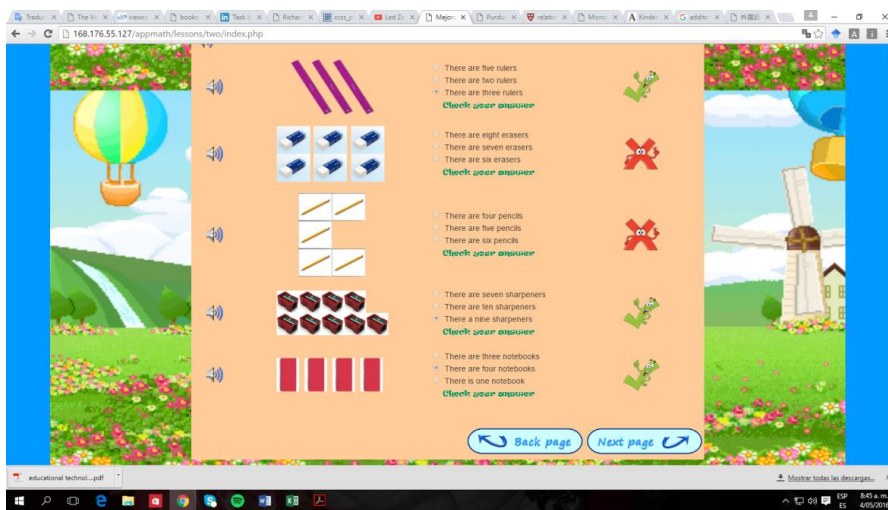


Figure 21: Instructions there is there are

Student	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Score lesson two	0,78	0,83	0,78	0,65	0,74	0,87	0,96	0,83	0,91	0,74	0,78	0,70	0,83	0,78	0,78	0,83

Student	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Score lesson two	0,78	0,91	0,83	0,91	1,00	0,96	0,83	0,96	0,78	0,91	0,96	0,91	0,87	1,00	0,83	0,91

Average
0,834

Table 10: Results of task there is there are

Note: The scores are reported as number of items correct with a possible maximum score of 1.

It was analyzed that learners had the enough listening ability to identify the language pattern there is and there, and it allowed them to associate counting in the task. This occurred because the school has a great amount of exposure to work on the basic language skills by integrating the all the time, writing, reading, speaking and listening during the classes, that is the reason way the school have been working with the communicative approach CLIL in the areas of the curriculum to reach bilingualism. In addition, the strategies teachers use are strongly based on the development of this skill “listening” so this indicated that math area is not an exception to include a foreign language in the learning process.

According to National Center for Educational Achievement (2009), was found that through the use of math instructions in the classrooms by giving them using the basic language skills in this case “listening” demonstrated that despite math is understood as the most complex area of the curriculum for children, the way and the time learners are expose to carry out language instructions could be a plus or a motivation to do not give up following any task students have to face.

This also demonstrated that teaching math must be a funny process in order to prove the hypothesis and math principles where young learners are being involved. It is relevant to mention that in math as in the rest of areas, it is always going to be important the word “content” to communicate more fully in the task. Regarding to this study this content was worked from the beginning of the year.

Category 3: THE BENEFITS OF TECHNOLOGY IN TEACHING AND LEARNING.

Using technology to get students engaged in a math lesson resulted to be quite useful to understand in another way different levels of math. This part was relevant for the research to determine how was the students' performance toward using a technological tool in a math class. The theories argued for different authors in the previous chapters were confirmed, the increase of technology made students take advantages in learning process, making it meaningful through self-exploring different levels or stations in the APP.

In this category, it will be showed some different results of carrying out pedagogical activities by using technology as vehicle to apply an APP designed in order to support the learning process for a bilingual and private school located in Bogota, activities which the principle of practicing the institution content was involved.

During the research, the use of technology was the support to include, reinforce and enhance activities which allowed the study proof that through the use of it, students did not reduce the need for imaginative, creative thinking about teaching and learning, Kelly and McAnear (2002); indeed, it increased the need of children to keep working and exploring through it. As it was stated on previous categories, each category has subcategories; in this case this one has two subcategories that are presented after this part.

Subcategory 1: Technology inside math classrooms

At this part of the work, the different results presented in this first subcategory were focused on the benefits of technology at the moment to create opportunities to math learning process in the classrooms .During the sections that were carried out into

pedagogical activities applied. In addition, it will be shown students’ and teachers engagement and commitment which helped to identify the advantages of using technology inside the classrooms for a better learning process of a foreign language into an specific subject “maths”.

The following excerpt showed how technology and its benefits performed in a math class by using interactive activities to reinforce and enhance math and English content.

Question No 2: ¿Se ha percibido un progreso al usar la aplicación? ¿De qué tipo?
Si, pudimos observar que después de usar la aplicación llegaban a clase más enfocados en las actividades y también les hacíamos preguntas sobre los temas relacionados como en a manera de lluvia de ideas y las respuestas fueron muy satisfactorias, se puede también apreciar un progreso en cuanto al interés de asistir a la sala de tecnología, ahora me preguntan si vamos a estudiar con los juegos, también se ven más motivados a seguir trabajando con los programas que veníamos aprendiendo.

Table 11: Semi-structured interview, teacher: student’s progress

Topics were fostered and learning became funnier and more attractive for students (Smaldino, Russell, Heinich & Molenda, 2005). During all sections students got interested in continue exploring and playing without realized they faced academic exercises that implied taking test to be assessed and to analyze student’s performance in both areas.

Through this teacher’s report, was found that students could be really engaged to the use of the technological tool, it gave them the idea of taking math as a game, providing in an abstract way the enrichment of math learning inside classrooms in which technology served as avenue for students motivation exploration and instructions.

Technology also showed that within an educational setting can enable students to become problem solvers and decision makers and to be creative and effective users of

productivity tools Kelly and McAnear (2002). In addition, technology can be used in different areas in the curriculum to act as supporter of learning process, giving resources to work on activities related to reinforcement and also to can serve as support for teacher’s work. It also demonstrated that technology presents new opportunities to students and teachers that can be organizational, instructional, individual, and procedural, because students had the space to work on their own which was particularly useful for struggling students who need more time to solve a problem.

This is another extract from the teacher’s answers about how technology is essential when teaching and learning math. (National Council of Teachers of mathematics et, al. 2000).

<p>Question No 6: ¿Considera que la tecnología puede integrar las áreas de matemáticas en inglés? ¿De qué manera?</p> <p>Bueno la tecnología es una área integral y transversal, porque nos permite integrar todas las asignaturas y de todas la maneras. Por ejemplo tu aplicación es un ejemplo vivo de que en tecnología no únicamente se viene a jugar en el computador sino que también podemos hacer evaluación y refuerzo entonces pienso que influye no solamente en matemáticas y en inglés, sino en ciencias y sociales, es decir en todas las asignaturas la tecnología es una herramienta perfecta para que los niños se entusiasmen y busquen otros caminos para aprender.</p>

Table 12: Semi-structured interview, teacher: Technology inside math classrooms

According to Hubbard (et, al 2009), This finding pointed out that technology really advocated it uses in educational settings because it provides a) learning efficiency: learners are able to pick up language knowledge or skills faster or with less effort; b) learning effectiveness: learners retain language knowledge or skills longer, make deeper associations and/or learn more of what they need; c) Access: learners can get materials or

experience interactions that would otherwise be difficult or impossible to get or do; d) Convenience: learners can study and practice with equal effectiveness across a wider range of times and places; e) Motivation: learners enjoy the language learning process more and thus engage more fully; f) Institutional efficiency: learners require less teacher time or fewer or less expensive resources.

The excerpt below also supported and advocated the successful performance of the math APP inside a math class in a private school which has been working on getting more interesting strategies in order to provide their students plenty of resources to reinforce and enhance it academic content.

<p>Question No 7: Cree que la aplicación aumenta la motivación de los estudiantes al trabajar en otro formato? ¿De qué manera?</p>
<p>Si. Porque es decir todos estos temas que se manejaron con la aplicación ellos lo conocían, el vocabulario para ellos no fue desconocido, entonces al verlo en otro formato como tú lo llamas, es totalmente diferente a una guía, aun cuaderno, entonces eso pues lo motivo muchísimo, y si lo vemos más aún que lo estaban haciendo con todos sus compañeros. si tenían alguna duda, ellos se estaba ayudando e intercambiando saberes de una manera muy ordenada, entonces ese cambio de formato de ver las cosas no solo en un cuaderno o en una hoja hizo que los niños estuvieran muy motivados no solo hacia el área de inglés sino a contar, a ordenar y a resolver problemas pero de una manera divertida sin sentirse presionados.</p>

Table 13: Semi-structured interview, teacher: Technology motivating

It was found according to (Wiske et al., 2005), that in education is no longer just about learning and memorizing facts and figures, it is more like to use an appropriate what collaborate ways to bring to the classroom new solving complex problems, develop different forms of communication and leadership skills, and promote motivation and productivity. It was evident that teaching, learning, and technology work synergistically to provide effective and efficient knowledge transfer because educational technology helps

teachers to create learning contexts that were not previously possible with traditional teaching methods.

Subcategory 2: Students’ perception toward using technology

In general, young learners present different attitudes and perceptions toward different things, there is attitudes with component of cognition, which refers to ideas, beliefs, and perceptual responses about thing that have to face. Technology presents clues for the curriculum development which need to work on students’ interests and its consequences that may arise from the use of an accurate material to be included inside the classroom.

In the development of the APP it was given items to judges from a population to indicate the favorableness toward the object in this case the “APP” disregarding their attitude toward the topics. Each item was created in order to analyze and determine categories from unfavorable to favorable levels of disagreements to know about deviation about judges.

It was designed 21 items so that students had the opportunity to work on developing different activities in order to evaluate which was the one like most and which one do not provide the high level of satisfaction.

¿Crees que puedes mejorar en los temas usando LA APLICACIÓN DIVIERTE APRENDIENDO? ¿Por qué?		
Participants	Gender and Age	Answer
Student 1	Female six years old	Si, por que es más fácil y es más divertido, además hay que ganar y acumular muchos muñecos, globitos y estrellas.

Student 2	Male seven years old	Sí, porque me gustó mucho el juego y me gustan los computadores para hacer tareas y practicar, me fue bien en el juego y gane muchos puntos.
Student 3	Male six years old	Si, por que los temas son divertidos y gane muchos chulitos y globos aprendiendo lo que se me había olvidado.
Student 4	Male six years old	Si, por que me pareció muy bonito el juego y más fácil hacer las clases
Student 5	Female six years old	Si. Porque se puede jugar con las cosas que uno está aprendiendo.
Student 6	Male seven years old	Mucho, porque sirve para reforzar los temas en los que estamos mal.

Table 14: semi-structured interview students: question No 4

From these answers is analyzed that all students’ answers were positive toward the technological tool, in addition, it could be mentioned that motivation behind students’ beliefs about technology, are involved in their daily setting educational field, and at the moment of facing pedagogical activities, it attains desired students’ learning perspectives, attitudes and outcomes. (Bitter and Pierson et, al 2005) stated: “A recent meta-analysis demonstrated that students using technology had modest but positive gains in learning outcomes over those students who used no technology” p 46.

From this perception the study found that through technology, students with math learning disabilities, benefited from breaking down complex procedures into smaller, manageable steps, this also demonstrated that first, the majority of students’ perception

toward the items are related to the enhancement and reinforcement of math skills, feeling that they received all the time stimulus and motivation from the technology.

It is noticed that student's perceptions are clear enough related to motivation, they enjoyed the language learning process without complaining about maths, it must be mention the access that brings to classes technology, because learners can get materials or experiences through interactions that allow learning process be more effective, faster and with a wide range of attempts and time to practice in any place, Hubbard (2009).

Chapter six

Conclusions

This study found encouraging evidence on using a math "APP" to reinforce and enhance a bilingual and private school' content and learning process. Prior research has shown that learners benefit from computer-enhanced math intervention (Burns, Kanive, & DeGrande, 2012). This study found that the use of math APP is an effective practice in providing instructional support for student within general education classrooms. First, next first graders student will have the opportunity to continue working and practicing in the APP to reinforce the curriculum content.

Second, the benefits of the math APP such us self-pacing and braking down complex process into small steps, may be even more beneficial for young learners. It is not uncommon that in regular math instruction, struggling students are unable to keep up with the pace of general students (Baker, et al., 2002). In summary, there is a potential

opportunity for using well-designed math apps to help students achieve the goals proposed during the scholar year.

In addition, the student learning records provided by the math APP were valuable because they allowed the teacher to track student progress, understand students' weak areas, and plan instruction accordingly. In the aptitude test, achievement test and semi-structure, showed student learning as a result of using the APP, the learning records revealed the process of how the learning happened.

All of students in this study attempted to practice the problem sets to achieve their individual goals .Also, the finding that the students solved an average of 140 exercises during only five sections, suggests that math apps may allow students to solve faster more exercises than using paper and pencil giving the change to practice as many times as possible.

In addition, the use of a foreign language “English “through the communicative approach CLIL, allowed to include not only objectives toward supporting math process, it was also pretended to include language as a vehicle to integrate both, giving the opportunity to the participants to be involved in their learning process by working on the contents and language structures they need to manage according to the school's syllabus design.

Although this study found that the use of the math APP was generally engaging to students and easy to use, there are factors to improve in its design. For example “Having fun Learning” math APP, could be improved by allowing users to customize the settings, and also by creating more levels for topics with different level of difficulties. So students

do not have to start from the lesson one in order to unlock next levels, this was also created to evaluate how fast learner can solve several exercises without get bored.

The APP could be improved also by providing individual and aggregated progress reports to teachers. It should be noted that due to short the study duration, findings in this study may not be generalized to a larger population. More studies should be conducted to identify effective math apps, particularly for Hispanic learners inside the classroom, which could be involved in the communication approach Content Language Integrated Learning CLIL.

IMPLICATIONS

To go further and deep in this research, it is relevance to highlight that the final product was designed according to students and school needs. Besides the context in which the study was applied is considered as a realistic educational setting where students are involved into the communicative approach CLIL in all the areas in the curriculum. This serves as an avenue to include new methodologies inside the classroom in order to encourage and promote the use of interactive new tools to support learning process in any subject.

Moreover, it is recommend to include not only Task-based Language Teaching TBLT, it can be combined with others teaching approaches such as Content Based Learning teaching. CBLT, in order to cover English from whatever academic purpose because both allow making a complete process inside the classroom by using school' contents to involve students in the use of a foreign language.

Researchers who want to go beyond in this study using technology, must be aware that through technology student's interests and goals can be recognized as a valuable approach to improve mathematics.

Concerning the contribution of this research to the school, it can make use of the APP for first graders to reinforce the topics before taking exams through interactive tasks which encourage them to get better scores by including the content they had worked on. It is a challenge for the institution to continue working through the use of CLIL approach to assure student's performance using a foreign language. This study helped the school's curriculum to include new methodologies inside the classroom using technology to promote the interaction among one of the most current educational tools to enhance learning math process.

LIMITATIONS

After making all the interpretation of the present study, there was identified a cultural limitation to use technology in classrooms. Upgrading equipment is often costly and schools may not have the manpower to handle the equipment because a public school was asked for developing the study but unfortunately in the technology room there was not enough equipment with the amount of computers for students work by themselves. Furthermore schools that are not worked with technology cannot offer the same academic benefits. Without a classroom where students can work with technological gadgets, they may not be in accordance with other countries that have been using technology to foster learning process.

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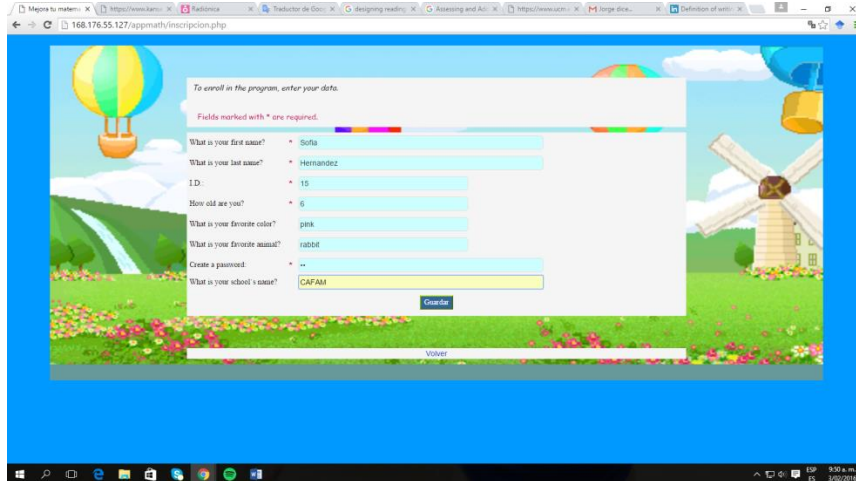
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ANNEXS

ANNEX 1: APTITUDE TEST

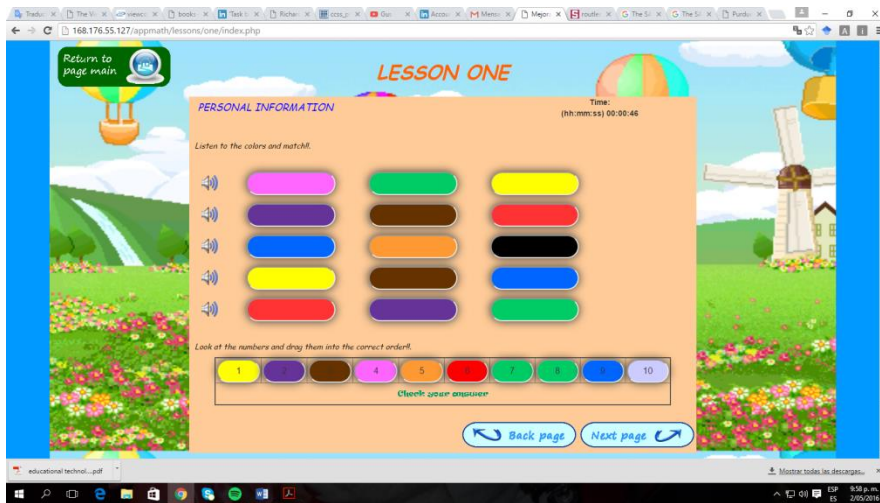
(Developed by user number 2)



ANNEX 2: ACHIEVEMENT TEST LESSON ONE

(Colors and numbers recognition)

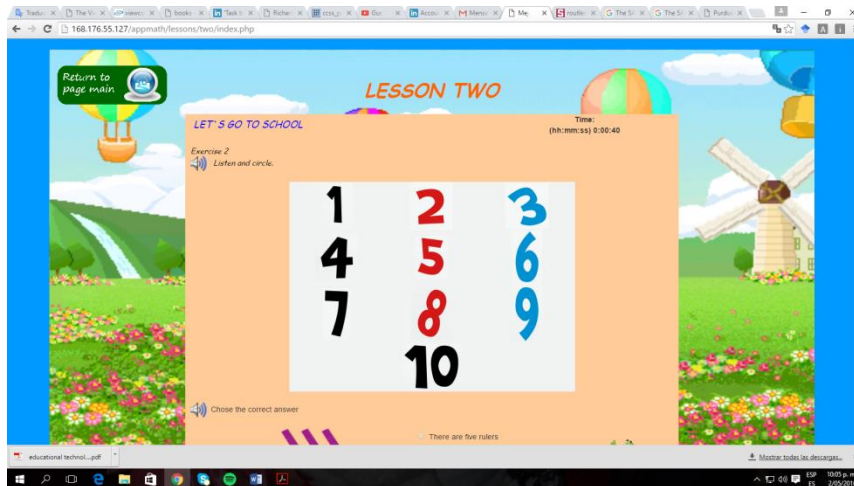
Developed by user number 5



ANNEX 3: ACHIEVEMENT TEST LESSON TWO

(School supplies with there is there are and numbers recognition)

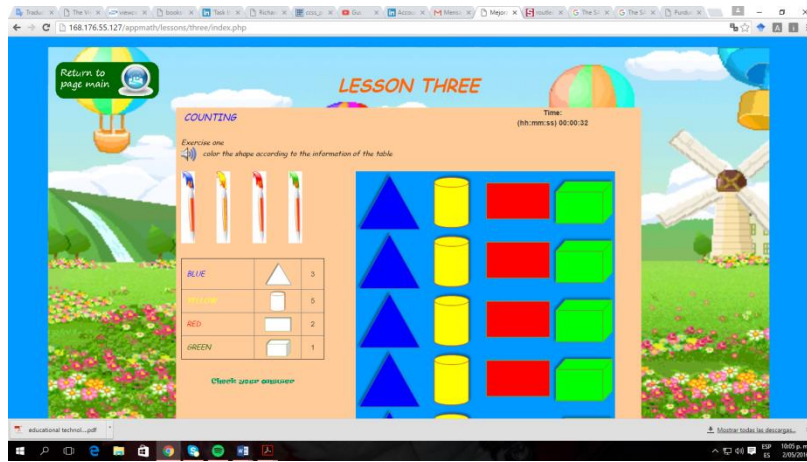
Develop by user 19



ANNEX 4: ACHIEVEMENT TEST LESSON THREE

(Working memory with geometry shapes)

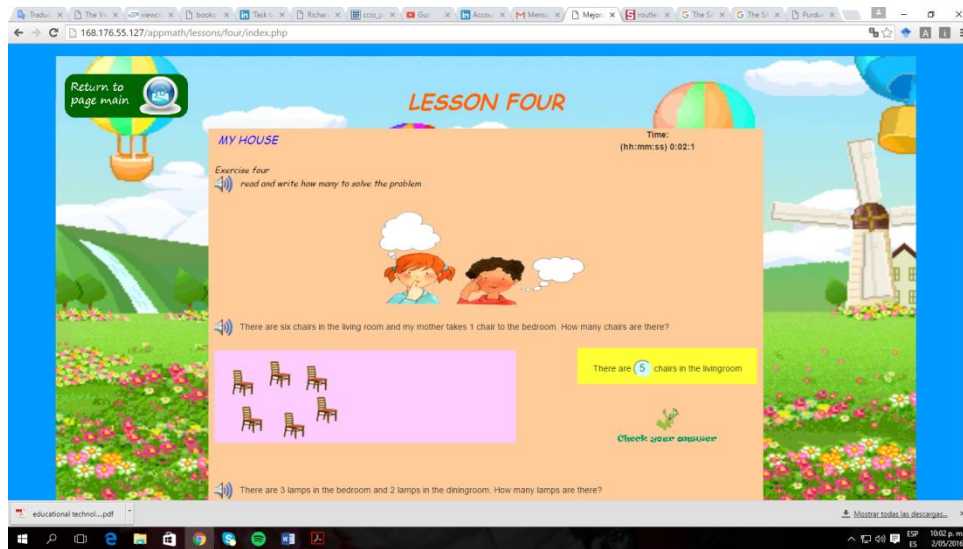
Developed by user 15



ANNEX 5: ACHIEVEMENT TEST LESSON FOUR

(Rooms of the house with problem solving)

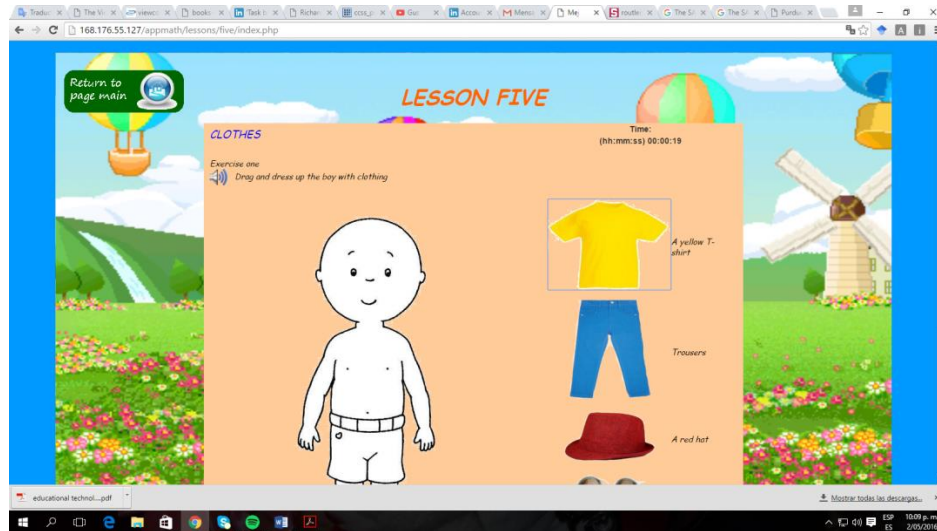
Developed by user 4



ANNEX 6: ACHIEVEMENT TEST LESSON FIVE

(Clothing and problem solving)

Developed by user 22



ANNEX 7: SEMI-STRUCTURED INTEVIEW FOR PARTICIPANTS

PREGUNTAS ENTREVISTA ÚLTIMA SESION DIA 29 DE OCTUBRE 2015

PARA ESTUDIANTES

1. ¿Cuál lección de LA APLICACIÓN DIVIERTETE APRENDIENDO te gusto más?
2. ¿Cuál lección de LA APLICACIÓN DIVIERTETE APRENDIENDO te pareció más difícil?
3. ¿ En cuál de los siguientes temas sientes que debes reforzar mas
 - Personal information
 - Colors
 - How many / how much
 - School supplies
 - Sequences of numbers from 1 to 10
 - Rooms of your house
 - Clothing
4. ¿Crees que puedes mejorar en los temas usando LA APLICACIÓN DIVIERTE APRENDIENDO?

5. ¿Cada cuánto utilizas el computador? ¿Para qué lo usas?
6. ¿Para qué sirven los computadores?

**ANNEX 8: SEMI-STRUCTURED INTEVIEW FOR THE TEACHER IN
CHARGE**

1. ¿Cómo cree que las lecciones contribuyen para reforzar los temas vistos en clase?
2. ¿Se ha percibido un progreso al usar la aplicación? ¿de qué tipo?
3. ¿Qué tipo de comentarios positivos / negativos han manifestado los estudiantes después del uso de la aplicación?
4. ¿Considera que las lecciones cumplen con los objetivos propuestos en las actividades?
5. ¿Cuál fue la percepción de los estudiantes al encontrar en la aplicación no solo temas de inglés sino también problemas matemáticas en inglés?
6. ¿Considera que la tecnología puede integrar las áreas de matemáticas en inglés? De qué manera?
7. ¿Cree que la aplicación aumenta la motivación de los estudiantes al trabajar en otro formato? ¿De qué manera?
8. ¿Qué recomendaciones podría hacer para mejorar el trabajo con el modulo?

ANNEX 9: CONSENT



Bogotá, D.C. Agosto 26 de 2015

Directora

G.

Dirección Educación Básica primaria

C

Respetados señores:

La Corporación Universitaria Minuto de Dios, en primer lugar quiere dar un reconocimiento a su institución por su alto grado de compromiso con la educación de vanguardia innovadora y de calidad. Líder en procesos de enseñanza y aprendizaje en los niveles de educación pre-escolar, básica y media.

Por tal motivo, el Programa de Licenciatura en Idioma Extranjero Inglés de UNIMINUTO, en su búsqueda del mejoramiento continuo, desea establecer vínculos de aprendizaje con su prestigiosa institución, con el objeto que nuestros estudiantes a través de ideas innovadoras involucren procesos de investigación en el aula a partir de vivencias propias en el desempeño de su gestión docente.

Para tal efecto desea presentar a la estudiante NASLY KATHERINE OLAECHEA ROJAS, identificada con cédula de ciudadanía N° 52.980.362, quien está realizando su tesis de grado para optar al título de Licenciada en Idioma Extranjero Inglés.

El objetivo principal de su trabajo de grado es contribuir con una aplicación matemática en la cual los estudiantes de primaria van a mejorar las habilidades para resolver problemas de suma y resta en inglés en operaciones de un dígito.

Es importante aclarar que la información recolectada será confidencial y se usará únicamente con propósitos investigativos y estrictamente académicos, se necesitarán aproximadamente 6 sesiones en los grados primero, segundo o tercero, para que los estudiantes participen en el uso de la aplicación, la cual se realizará a partir de la tercera semana de septiembre.

Cordialmente,

Catalina de los Angeles Lalle



Transcripts Students

The questions were given after using the APP and complete all the lessons, most of the student wanted to participate but only five were chosen. They had to raise their hand to participate



Student one: female six years old

1. ¿Cuál lección de LA APLICACIÓN DIVIERTETE APRENDIENDO te gusto más?
Respuesta: Me gustó mucho la de los colores y la de la ropa con el muñequito
2. ¿Cuál lección de LA APLICACIÓN DIVIERTETE APRENDIENDO te pareció más difícil?
Respuesta: La de los lugares de la casa y las cosas del colegio.
3. ¿En cuál de los siguientes temas sientes que debes reforzar más?
 - Personal information
 - Colors
 - How many
 - School supplies
 - Sequences of numbers from 1 to 10
 - Rooms of your house
 - Clothing
4. ¿Crees que puedes mejorar en los temas usando LA APLICACIÓN DIVIERTE APRENDIENDO? ¿Por qué?

Respuesta: Si, por que es más fácil y es más divertido, además hay que ganar y acumular muchos muñecos, globitos y estrellas.

5. ¿Cada cuánto utilizas el computador? ¿Para qué lo usas?

Respuesta: Lo utilizo casi todos los días en mi casa y aquí en el colegio, y lo utilizo para ver hacer tareas que la teacher deja o para ver videos y jugar

6. ¿Para qué sirven los computadores?

Respuesta: Los computadores sirven para hacer tareas, ver videos, jugar, para hacer muchas cosas y son muy chéveres.

Student two: Male seven years old

1. La de los números del gusano y la de contar
2. La primera y la segunda (personal information and colors).
3. Clothing and Personal information
4. Sí, porque me gustó mucho el juego y me gustan los computadores para hacer tareas y practicar, me fue bien en el juego y gane muchos puntos.
5. Yo utilizo el computador para hacer tareas, imprimir, ver videos y juegos. Y lo utilizo todos los días, pero mis papas están conmigo.
6. Sirven para muchas cosas, para hacer tareas, ver videos, jugar e imprimir imágenes y cosas.

Student three: male six years old

1. La del gusano y el muñeco
2. La del gusano y contar, me gustaron pero estaba un poquito difíciles.
3. Los lugares de la casa y los colores
4. Si, por que los temas son divertidos y gane muchos chulitos y globos aprendiendo lo que se me había olvidado.
5. Yo uso el computador pocos días, pero yo si sé que sirven para hacer tareas y muchas cosas como jugar.
6. Los computadores sirven para que uno aprenda y use cosas para que se saquen buenas notas

Student four: male six years old

1. Me gustó mucho la de los lugares de la casa
2. La más difícil me pareció cuando uno tenía que colocar los números (solving problem)
3. Los números
4. Si, por que me pareció muy bonito el juego y más fácil hacer las clases

5. Lo utilizo a veces cuando llego a mi casa y me pongo a estudiar un rato
6. Los computadores sirven para escribir, para aprender

Student five: female six years old

1. La donde estaba el gusanito porque me gustan los números (activities of solving problema)
2. La más difícil me pareció la de los lugares de la casa
3. Los lugares de la casa, en los exámenes me fue más o menos pero en el juego me fue un poquito mejor por que gane globitos y estrellas y me salieron muñequitos.
4. Si. Porque no son como los exámenes y se puede es jugar con las cosas que uno está aprendiendo
5. Yo lo utilizo como 3 veces por semana en mi casa y aquí en la sala de informática
6. Los computadores sirven para aprender y para estudiar

Student six: male seven years old

1. Todas las lecciones me gustaron
2. Todas estaban fáciles, de pronto la que estaba un poquito difícil fue la de los números (problem solving) y el how many
3. Tal vez tengo que reforzar un poco en las situaciones donde hay números
4. Mucho, porque sirve para reforzar los temas en los que estamos mal y fue muy bueno
5. Yo lo utilizo todos los días porque me gusta estudiar en él y repasar
6. Los computadores sirven para muchas cosas buenas, para reforzar temas como en este juego, para repasar lectura y escritura, para leer para muchas cosas de estudio.

Students seven: males six years old

1. Todas las lecciones me parecieron fáciles
2. Ninguna me pareció difícil en todas me fue muy bien y gane todo
3. En ningún tema porque me fue muy bien, no tuve casi ni un chulito mal
4. Si. Porque por que por medio de los computadores se puede aprender, leer y hacer otras interpretaciones de las cosas, se puede jugar y divertir
5. Yo lo utilizo cada semana en mi casa, aquí en clase también
6. Los computadores sirven para aprender y para leer cosas que te gusten

Student eight male: male seven years old

1. La de las ropa y las cosas del colegio como el eraser, el sharpener y eso, las cosas de la casa
2. Me pareció difícil la del how many, la del gusanito, las que tenían números
3. Tengo que practicar más los números
4. Si. Porque es chévere y se puede uno divertir mientras estamos aprendiendo
5. Yo lo utilizo todos los viernes y el día de clase aquí en el colegio
6. Sirven para informarnos de las cosas que pasan, para poder escribir en Word y pegar imágenes.

Student nine male: six years old

1. Me gustaron todas
2. Mas fácil objetos de la casa
3. Difícil la de la ropa
4. Para aprender nuevas cosas y reforzar otras
5. Yo lo utilizo todos los fines de semana y mi mami está conmigo porque dice que hay paginas donde no puedo entrar
6. Sirven para hacer tareas, estudiar, ver videos y chatear.

Transcript teacher

1. ¿Cómo cree que las lecciones contribuyen para reforzar los temas vistos en clase?

Respuesta:

Las lecciones en este momento nos está contribuyendo a que no sola mente nos sirve para reforzar sino también para evaluar y para darnos cuenta en qué nivel van los niños lo bonito de esto, es que hemos podido ver desde principio de año todos los temas y los hemos podido reforzar y ver cómo van, entonces pesaríamos que lo de primer periodo ya se les ha olvidado, pero no, por medio de la aplicación podemos ver que el resultado fue excelente y vimos que tienen buen manejo de los temas y eso nos ayuda mucho.

2. ¿Se ha percibido un progreso al usar la aplicación? ¿de qué tipo?

Si, pudimos observar que después de usar la aplicación llegaban a clase más enfocados en las actividades y también les hacíamos preguntas sobre los temas relacionados como en a manera de lluvia de ideas y las respuestas fueron muy satisfactorias, se puede también apreciar un progreso en cuanto al interés de asistir a la sala de tecnología, ahora me preguntan si vamos a estudiar con los juegos, también se ven más motivados a seguir trabajando con los programas que veníamos aprendiendo.

3. ¿Qué tipo de comentarios positivos / negativos han manifestado los estudiantes después del uso de la aplicación?

Respuesta:

Bueno comentarios la verdad todos positivos, les gusto ver q era como un juego porque ellos nunca lo vieron a manera de una evaluación o como refuerzo,

De pronto por temas o por el tiempo que tenemos en cada unidad los niños no pudieron terminar todas las lecciones de una vez, nosotros entendemos como docentes que el majeo debió ser así porque en una sesión no podíamos aplicar todo, pero a ellos si se les despertó como una inquietud de que querían saber inmediatamente cual había sido su resultado total para saber que tan buenos eran en los contenidos, porque en los descansos me preguntan profe quien gano, en general todos los comentarios de los chicos han sido excelentes, ellos estuvieron felices con la prueba y en los descansos me preguntan mucho sobre la aplicación.

4. ¿Considera que las lecciones cumplen con los objetivos propuestos en las actividades?

Respuesta

Yo pienso que sí, es evidente que hubo una planeación con base en contenidos reales y conocidos para las niños, entonces claro que cumple con los propósitos, además la aplicación es muy colorida y eso les gusta mucho, entonces hace que ellos se interesen y que estén muy atentos a lo que tiene que hacer y quieren continuar sin manifestar cansancio o que quieren salir a descanso como en una clase normal.

5. ¿Cuál fue la percepción de los estudiantes al encontrar en la aplicación no solo temas de inglés sino también problemas matemáticas en inglés?

Respuesta

Bueno ellos como estaban tan encantados con la aplicación, no se dieron ni cuenta que habían problemas de suma y resta en inglés, igual me gusto que así hubieran este tipo de situación en donde ellos tenían que interpretar un problema matemático que les implicaba contar y analizar que debían hacer, nunca se cambió el lenguaje y continuo siendo en inglés, entonces nos sirve hacer los dos refuerzos en las dos áreas, cuando yo los vi, me dio un poco de temor hacia si iban a crear algún tipo de resistencia o se les iba a complicar un poco la interpretación, pero no, ellos lo hicieron muy bien y al referente no me han dicho nada de que fue terrible por las matemáticas o que fue muy difícil, para nada.

6. ¿Considera que la tecnología puede integrar las áreas de matemáticas en inglés? De qué manera?

Respuesta:

Bueno la tecnología es una área integral y transversal, porque nos permite integrar todas las asignaturas y de todas la maneras. Por ejemplo tu aplicación es un ejemplo vivo de que en tecnología no únicamente se viene a jugar en el computador sino que también podemos hacer evaluación y refuerzo entonces pienso que influye no solamente en matemáticas y en inglés, sino en ciencias y sociales, es decir en todas las asignaturas la tecnología es una herramienta perfecta para que los niños se entusiasmen y busquen otros caminos para aprender.

7. Cree que la aplicación aumenta la motivación de los estudiantes al trabajar en otro formato? ¿De qué manera?

Si. Porque es decir todos estos temas que se manejaron con la aplicación ellos lo conocían, el vocabulario para ellos no fue desconocido, entonces al verlo en otro formato como tú lo llamas, es totalmente diferente a una guía, aun cuaderno, entonces eso pues lo motivo muchísimo, y si lo vemos mas aun que lo estaban haciendo con todos sus compañeros, si tenían alguna duda, ellos se estaba ayudando e intercambiando saberes de una manera muy ordenada, entonces ese cambio de formato de ver las cosas no solo en un cuaderno o en una hoja hizo que los niños estuvieran muy motivados no solo hacia el área de inglés sino a contar, a ordenar y a resolver problemas pero de una manera divertida sin sentirse presionados.

8. ¿Qué recomendaciones podría hacer para mejorar el trabajo con el modulo?

Bueno las recomendaciones serian en cuanto a forma más no de fondo, es como de pronto mejorar el tipo de letra en los ejercicios de mayor que o menor que a una letra un poco más grande y antes del cuadro no en la parte de abajo cosa que los niños vean las opciones de respuesta en la parte

superior y no en la parte inferior ya que este tipo de formato se maneja para estudiantes de cursos un poco más avanzados.

Otra cosa sería que la aplicación no viniera en línea si no que se pudiera instalar en los equipos pues esto en caso de que uno tenga preparada la actividad y no haya internet o se bloquee, porque trabajar en línea es un poco más complicado que tenerla instalada, sería únicamente eso, porque la aplicación me parece colorida muy acorde para la edad de los niños, es de fácil manejo, fue muy entendible para ellos a pesar que estaba en inglés, como vuelvo y te repito que tenía un poco de temor que se fueran a confundir por que no habíamos trabajado en este formato usando nuestros temas, pero el resultado fue totalmente satisfactorio tanto para ellos como para mí, te felicito, manejaste muy bien el contenido, el diseño es atractivo para el usuario, realmente es muy interesante porque sé que aprendieron, reforzaron y algo muy positivo es que pudieron ver que por medio del computador se puede aprender, reforzar y no solo jugar juegos que solo ejercitan lado izquierdo, derecho arriba y abajo.