

“Interactive Media in English for Math at Kindergarten: Supporting Learning, Language and Literacy with ICT”

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Abstract

Modern society is actively engaged into technology due to educational reasons. Interactive media is considered as an integral part in language learning process to support the efficiency of the study process taking into consideration the needs and achievements of students. Therefore, new trends appear in the education process and technologies have to be successfully integrated by the teachers working in early childhood education institutions. The implementation of information and communication technology (ICT) curriculum at early childhood education is one of the educational sector development efforts to improve and support young learners' learning, language and literacy with ICT. English for Math activities are designed for kindergarten students so that they can experience the learning of Math in English in fun and exciting ways by creating the atmosphere of learning like playing integrated with ICT which will help the very young learners to understand the learning materials. This discussion is aimed at describing English for Math learning with ICT for kindergarten students. Moreover, the description can become one of the basic forms of the development of interactive learning based on students' self-learning. Besides, the arrangement of this study is also aimed to improve young learners' habitual and self-learning.

Keywords: Information and Communication Technology (ICT), English for Math, interactive media, self-learning

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Introduction

Modern technology such as computers and interactive whiteboards give many opportunities for teachers to get new possibilities of integrating visual materials inside the classroom. The development of possibilities that increase every year does not mean that they are not fully exploited in the language classroom, due to a number of reasons such as school facilities or teacher literacy of new technologies. The use of visuals, apart from those included in the textbooks was not an integral part of the everyday lessons implemented by teachers in early childhood education. The use of multimedia visuals, such as slide-presentations or video-based activities was demoted to special occasions, or not even implemented in English classroom practice at all (Ramírez, 2012).

The implementation of information and communication technology curriculum at pre-school level is one of the effort to improve the quality of education in Indonesia. Basically, the curriculum of information and communication technology makes students to be ready with the rapid changes not only in the world work but also another activities (Anwariningsih & Ernawati, 2013). Information and Communication Technology (ICT) subject integrated with other subjects such as Language, Math, and Science is included subjects that require direct practice. It requires teachers to do innovation in creating the learning media that can help young learners' understanding the materials being learned. This opportunity can be integrated with the innovation, invention and creativity in the implementation of English for Math learning for very young learners in Early Childhood Education.

The use of media in teaching is essential to create fun and exciting atmosphere in the classroom practice. The media is also considered as one of the important component of teaching technology in supporting the teaching and learning process (Anwariningsih & Ernawati, 2013). Therefore, Media has a role to unite between oral and symbols so as to convey information and to deepen the understanding of the contents or the real meaning in the teaching process that has function to create playful activities, especially designed for young learners in early childhood education.

Almost all of the ICT study in the school still relies on textbooks and teacher profiles as the source of information. Whereas, there are many pre-school students still learn at the level of speaking and emergent writing. Thus, it becomes the contrary when the students are forced to read a computer learning modules while they are still in the stage of speaking and emergent writing. Because of that, creating or supporting learning process with interactive media that can improve students' self-learning will have the development of students' language and literacy.

Students in pre-school has a comprehension of symbols or pictures to understand the message or information that is more dominant than reading. Thus, it is very important to create learning environment that supports the psychological aspects. Consequently, the learning environment should become a friendly learning, entertaining and motivating to the children. This is the learning background in how to make a media in learning English for Math with ICT to become playful activities so as to arouse children's interest that can make them motivated to have a habit and self-learning

Theory Learning Paradigm

There are some views of learning that is very crucial for teachers to understand and implement in the classroom practice. The first is learning as a natural, social process, or even learning as active and passive processes. The next view of learning emphasizes on the ongoing integrative and contextual process that require teachers to create activities based on model strengths, skills, interests, and culture of students. Besides that, learning also views assessment activity based on the fulfilled tasks, obtaining results, and real problem solving that is done either individually or in groups (Barr & Tagg, 1995; Taras, 2009).

Learning views do help teachers how and what to teach in the classroom practice with fun and exciting atmosphere. Moreover, learning views are able to change the role of teachers and students in the learning process itself. The teachers' role have changed from a transfer of knowledge, the main source of information, the expert in recognizing the material, and the source in finding answer to become a learning facilitator, coach, collaborator, navigator of knowledge and learning partners for their students (Ball & Forzani, 2009). Moreover, the role of teachers who control and instruct all aspects of learning has changed into the role of teachers providing more alternatives and responsibility to each student in the learning process.

The implementation of learning views in the learning process will also switch the teacher-centered learning to become student-centered learning. Furthermore, the role of students in learning process have changed from a passive receiver of information to be active participants in the learning process. Besides that, the role of the students as learning participants who reexpress knowledge has changed to become learning participants who are able to produce and share knowledge. Further more, the student activities also have changed from learning as an individual activity (solitary) into collaborative learning with other students (Zajac, 2009). It means that learning environment that is centered on teacher has shifted to student-centered.

There are three main kinds of learning modus that can give enlightenment for both teachers and school citizen to reach the maximum learning outcomes (Arsyad, 2006). The first is direct experience (enactive) in which learning is done by doing and it is the role of teachers to provide learning activities where the students are doing what they are learning. The second is experience of pictorial / image (iconic) in which learning is done by studying and understanding the learning objects from image, painting, photo or film that require teachers to provide supporting learning media for the students' learning activities. And the last is experience of abstract (symbolic) in which learning is done by matching the learning object that is studied with a shadow on a mental image or match the experiences associated with learning objects (Passarelli & Kolb, 2011).

In order to make the learning process runs well so there must be interaction between students and teachers. Visual stimulus from the use of interactive media in the process of teaching learning will give learning outcome better for learning activities such as remembering, recollecting, recalling, and also connecting facts and concepts. all these ideas should be supported.

Interactive Media

The term “interactive media” started to be known widely at the end of the 20th century. The definition of interactive media is explained as the integration of digital media including combinations of electronic text, graphics, moving images, and sound, into a structured digital computerized environment that allows people to interact with the data for appropriate purposes (England & Finney, 2011).

There are some basic characteristics of interactive media. Those are: interactivity, communication, free access, divergence, flexibility, attractiveness, multi-formats of information and interactive active participation. Media provides people with assistance when they have the purpose of exchanging information and ideas on particular issues and on particular occasion. The exchange of information can be done by using different channels and methods of interactive media such as written method of communication (blogs, comment, and chat rooms), visual information (short movies, games), graphical information (photos, pictures), audio (music files) and etc (Kuprienė & Žegunienė, 2017).

Media is human, material, or events that lead the situation and conditions in creating students enabling to acquire knowledge, skills or attitudes. If the media carries messages or information which has instructional aims or teaching objective so the media is called a media of learning. Learning media is an instrument in the learning process that can be implemented both inside and outside class to support and help students’ learning experience and improve learning outcomes (Lonka, 2015).

There are some benefits of using media in the learning process, namely: (1) learning will be more interesting so it will cause the learning motivation to the students, (2) learning materials will be easily understood and allows student to control and achieve the learning goals, and (3) teaching methods will be more variative through verbal communication from the teacher’s explanation.

Thus, it is very important to use interactive media combined with the traditional methods to create fun and exciting atmosphere of learning English for Math with ICT for kindergarten students and improve students’ self-learning.

Computer-Based Media

Information technology gives the access of using alternative media as teaching media integrated with the conventional teaching media such as textbooks. This media can be used as a supporting media for the effective education and teaching and also facilitate student learning. The use of media through a systematic design can help teachers teach memorable materials easily with playful activities (Anwaringsih & Ernawati, 2013). Moreover, the use of concrete visuals is able to attract students’ interest to describe the subject material and provide concrete experiences to make the learning process run in fun and exciting ways. The use of visuals from interactive media implementation in classroom practice has also been known to stimulate learning and knowledge processing.

There may be some problems dealing with computer literacy, and mental readiness on both teachers and students but those can be solved by starting the socialization of computer literacy training among teachers who will later on transfer it to their students. The use of computers as a learning media has several advantages, such as to provide a more affective conditions

accommodating students who are slow in accepting the lesson, and stimulate students in doing exercises. The other advantage of using computer as a learning media is that students' learning development can be monitored through the records of students' activity in the forms of exercise files stored in the computer.

The effectiveness of using computers as a learning media can make students become "active" with the up to date information in which the software is designed interactively according to the level of students' age and capability. In addition to the condition that computer media allows students to develop skills and capabilities, interactive learning media has a stimulus that is conducive and supportive to the development of the student independence, especially in terms of the development of competence, creativity, self-control, consistency, and commitment both to themselves and to others. Moreover, the use of computer as learning media has a significant influence on the students' interest and willingness to learn the atmosphere of competencies (Motteram, 2013).

Interactive media: new opportunities for foreign language learning

There are many researchers that have emphasized lots of beneficial effects of the usage of interactive media, and discussed the basic characteristics of interactive media, interactive media is significantly beneficial for the foreign language teaching/learning process. If interactive media was chosen for the study process, a student would be able to select from variety of learning methods such as educational games, websites, chat rooms, forums, internet games, social networks etc (Kuprienė & Žegunienė, 2017). For younger learners, it is important the assistance and the regular monitoring observation for them when using interactive media as an alternative of improving their language and literacy.

There are some advantages that interactive media can give for the beneficial learning outcome. The first advantage is there will be more convenient and attractive manner of communication among students that could be managed in. The next is that the study process can be organized outside the regular teaching or learning environment. It means that the communication between a teacher and a student would not be limited by time, availability and place. it can be arranged at any time and any where. In addition, interactive media can be a platform used as an educational environment for the exchange of methodological aids, accumulation of multi-format information and links to the scientific sources used for the lessons and independent studies or self-learning. Besides that, specialized websites containing many useful links to the educational websites will give more help for learners to study any foreign language. These educational websites are forums which are used for communication among native and non-native speakers, or communities of teachers-volunteers who are engaged into online teaching (Motteram, 2013).

Language learning is an active process of foreign language skills formation that has to be uninterrupted. The successful and efficient language teaching or learning process will take place if supported with the combination of theory and practice. Because of that, environment of study process plays a vital role, and it is a duty of a teacher to provide students with modern and interactive possibilities to support their positive achievements as their learning outcomes in foreign language learning. The combination of theory and practice can be in the form of the use of course

books that may be partially replaced with innovative methods, such as interactive media that comprises websites of newspapers or magazines, internet clubs, websites of business companies, forums, films etc (Motteram, 2013; Kuprienė & Žegunienė, 2017) .

Interactive media with its specification becomes efficient tool for choosing appropriate level of language learning taking into consideration varieties of learners' grade levels. Respectively, a student is able to select topics and activities, which may fulfill the needs and wishes of his needs. For very young learners, teachers will help the selected topics and activities according to the students' age and level of difficulties. Reviewing possibilities provided by interactive media the teaching/learning process becomes more individualized, the material may be adapted in more flexible manner to meet requirements of various learners. Even for very young learners in early childhood education, there are a lot of interactive media that can be found both online and offline. These interactive media will give the alternative playful activities for young learners who like the design of learning with playing. With interactive media, the entire study process is continuously transformed in order to achieve positive learning outcomes. Furthermore, interactive media may be referred to both as a methodological aid and a platform for submitting students' assignments (Sessoms, 2008).

There is a possibility to create a virtual class, club or blog for students and teachers, where students could upload their visual, written, audio material, presentations, papers, essays etc., and their submitted assignments can be assessed by peers and teachers. (Wilke et.al 2006). This possibility is very suitable to be implemented in classroom practice with adult learners. But for very young learners, a virtual class, club or blog does not fit their age level yet. But if, it is in the form of literacy bag, in which the virtual class, club, or blog is designed with the involvement of the parents, that design will give more ideas on the improvement of supporting students' learning, language, and literacy with ICT (Huang, 2013). Currently the users of the Internet are members of at least two social networks and platforms. The development of new networks is still in process, because various networks are focused on the basic needs of users: communication, entertainment, receiving and managing of information and its administration. The huge group of users is interested in search systems and e-publications. Thus, interactive media is not only effective tools for improving students' literacy through self-learning but also promoting parental involvement in children's literacy learning in the English language.

In generalization, a basic feature of interactive media is interactivity that brings so many advantages to education rhythm, because media may be developed by everybody and the content of information depends on the objects, in this case learners, who are involved in the process of information share and exchange. Students, adult learners or young learners, are extremely active users of interactive media. They acknowledge provided possibilities and know how to get benefit of interactive media usage. The virtual environment is an alternative way of literacy learning that is attractive in educational perspective. Therefore teachers have to be ready to integrate interactive media into study process to create playful activities especially for young learners, because this innovative method stimulates study process that makes it efficient and modernized (Kuprienė & Žegunienė, 2017; Wyse & Jones, 2008; Winograd, 2015).

English for Math Learning for Young Learners

While technology, business and politics interact with other countries becomes a norm, language and culture are key to every successful individual in the new global community. Effective and high-quality education includes cultural and linguistic learning for all students. Research shows that all students will benefit from being bilingual and biliterate in their own language and other languages (Acevedo, et.al., 2012). In this case bilingual educational programs are central to making that vision a reality (Rodriguez, et.al., 2002).

Bilingual learning for early childhood will work well if the learning activities packaged for early childhood can help develop cultural pride and identity in the new language they are learning in the mother tongue. It is crucial that teachers have the ability to assemble all learning activities carefully, step by step, to build the previous child's knowledge and develop skills and concepts that are integrated into learning materials one of which is mathematics (Soderman, Wescott, & Jie, 2007).

Young learners begin to develop a mathematical understanding through experiences with various types of real objects provided in learning centers as well as practical situations (such as beams, pegs, buttons, cooking utensils, etc.). Provision of learning activities that are able to maximize critical and creative thinking skills can be facilitated through creative math learning for early childhood that can create a cognitive condition and a solid attitude in thinking to solve the problems faced (Clement 2001). To make this happen it will be important for educators to maximize strategic efforts in education with respect to the coaching and cultivation of noble, gradual and sustainable cultural literacy (Wyse & Jones, 2008; Segal, 2015; Winograd, 2015).

The principle and standard of early childhood mathematics learning according to NCTM or National Council of Teachers of Mathematics (1991) is that instructional programs from pre-school to grade 2 should enable all students to understand the meaning of the operation and how the operation is interconnected. Furthermore, expectations for pre-school classes through grade 2 should understand the various meanings of addition and subtraction of integers and the relationships between the two operations, understand the effects of adding integers, and understand situations requiring multiplication and division as grouping objects evenly.

While the purpose of counting for early childhood according to Department of Education and Culture (2000), the first is for children to think logically and systematically at early age, through observation of concrete objects, pictures or figures around the child's environment. Furthermore, early childhood will have the accuracy, concentration, abstraction and high appreciation and have an understanding of the concept of space and time so as to estimate the possible sequence of an event that occurred in the vicinity. And the last is that young children are expected to have creativity and imagination in creating something spontaneously as a form of their literacy development.

Thus, the use of interactive media integrated in English for Math for young learners will give other alternative for creating fun and exciting learning atmosphere, besides improving and also supporting students' language and literacy with ICT.

The Importance of Interactive Media in English for Math Learning

Most of the language teachers seem to agree that the use of visuals can enhance language teaching. As they help teachers to bring the real world into the classroom and to link words and their meanings, they make learning more meaningful and more exciting. Visual aids can also improve students' comprehension of content to overcome learning difficulties (Halwani, 2017). According to Gibbs and Colston (2006), visual literacy is the key to obtain information, construct knowledge and build successful educational outcomes due to the increase of the number of images in the world. It is important to point that students bring to the classroom their own background, that nowadays is associated with images provided by mass media, videogames etc.

Interactive media is one of helpful tools in the language classroom that can help teachers to clarify, establish, correlate and coordinate accurate concepts, interpretations and appreciations, and enable them to make learning more concrete, effective, interesting, inspirational, meaningful and vivid to young learners (Zazkis & Liljedahl, 2009). It means that interactive media material or anything use to help the students see an immediate meaning in the language may benefit the students and the teacher by clarifying the message, if the visuals enhance or supplement the language point. These advantages suggest that visuals in interactive media can help make a task or situation more authentic (Canning-Wilson, 1998).

Moreover, interactive media can improve students' motivation and maintain students' attention by adding variety and making the lesson more interesting (Bradshaw, 2003). Persuasion of interactive media tend to be accomplished in children through imagery, and that those images and visuals speak directly to us in the same way experience does: holistically and emotionally. Young students have little knowledge of the living world and developing conceptions. Therefore they need more visual information to represent their thoughts (Arif & Hashim, 2009).

Interactive learning media ICT tries to accommodate the information obtained at the stage of observation, namely:

1. The material presented in Interactive media includes early childhood education school curriculum that is identification form, function, and how to use the computer for very young learners, recognizing and using application of image processing, also the information in using a computer properly.
2. This media combines voice, video and images to make the students get easy in understanding.
3. Learning media is interactive so students can communicate and have interaction with the objects individually or in pairs in this media to support their learning process.
4. Visual appearance also supports students' learning and improves their ability in emergent writing skill.

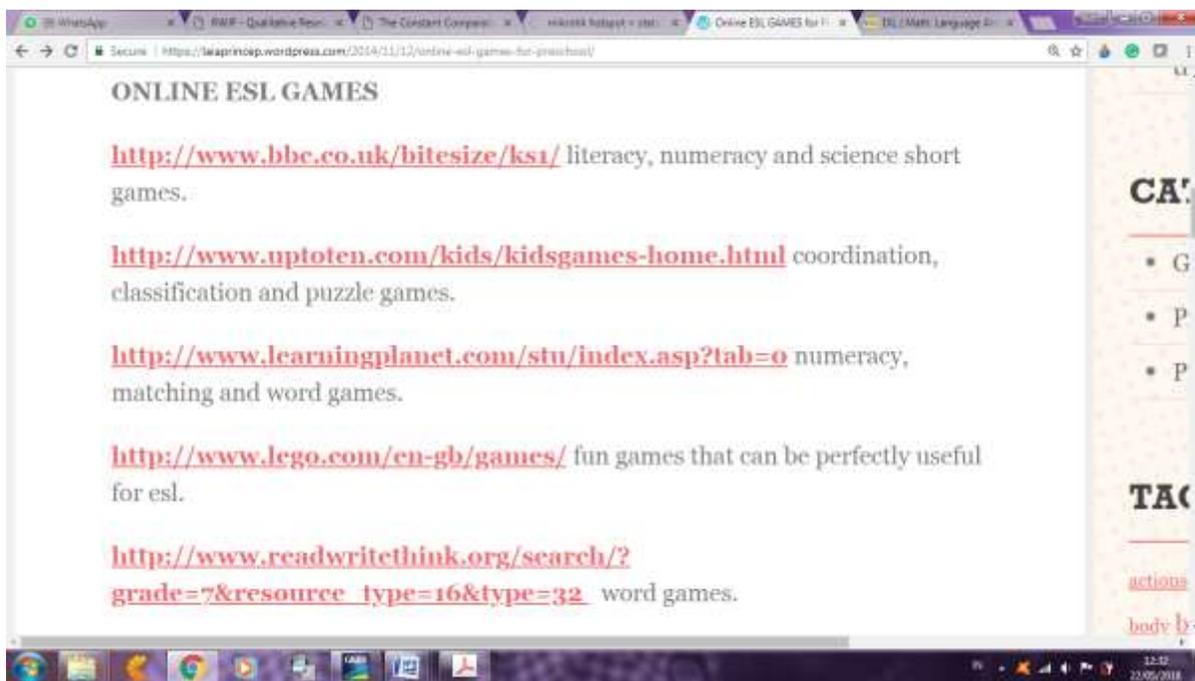


Figure 1 Suggested Online ESL Games for Young Learners

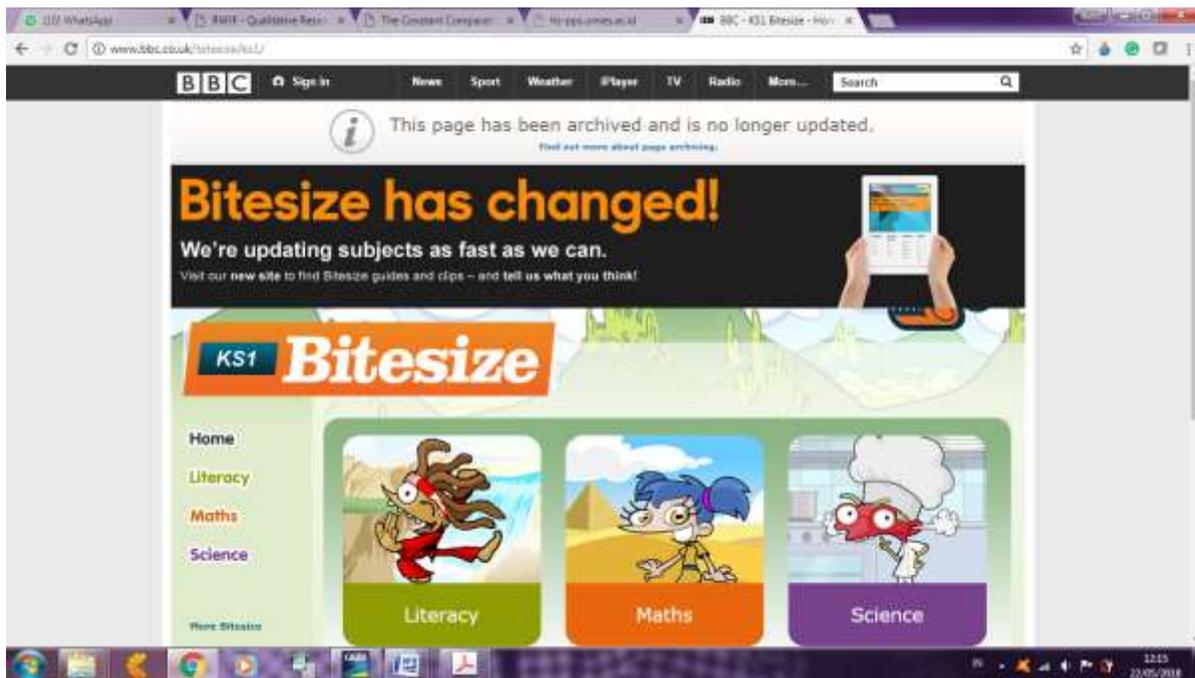


Figure 2 BCC ESL Game Online for Young Learners

Figure 1 gives the alternative of ESL game online for young learners that can be used by students to improve their learning, language, and literacy with ITC. The role of the teachers here is to give the recommended ESL game online that is appropriate for young learners. Figure 2 is BCC ESL Game online for young learners that give three options of game learning activities, namely:

Literacy, Maths, and Science. These ESL game online will also work best on improving students' learning, language, and literacy with ICT if supported with parental involvement besides students' self-learning. The involvement of parents will apply effective literacy strategies in which parents will encourage children utilize some extension activities, including asking critical questions, emergent writing activities, and word games.

In addition to ESL game online, there are also alternative of using ESL game offline such as "Tux Math of Command" ESL game online. In Figure 3, it shows the option of the game whether it would like to be played alone or played with friends and many other options that are easy to follow. And If the student chooses to play alone, Figure 4 gives information about the kinds of games that can be played alone. If one of the icon is clicked, so there will be some options of the numeracy skills that can be learned and played by the student as mentioned in Figure 5. And the example of the game offline that is played by students is on figure 6. It is addition: sums to 10. The student who plays it just heats the keyboard to answer the item on the screen and heat the 'enter' button to get the confirmation of the answer given in the form of shooting. Tux of Math Command is very fun and exciting for young learners. They will be happy to do it as self-learning or with friends or the companion of the parents. If they get companion so they can get more practices of interaction not only with the object of the media but also with partners (friends or parents) so that they will get more opportunities to improve their communication skills and social skills.



Figure 3. Tux of Math Command Game offline for young Learners



Figure 4. Tux of Math Command Game offline for young Learners

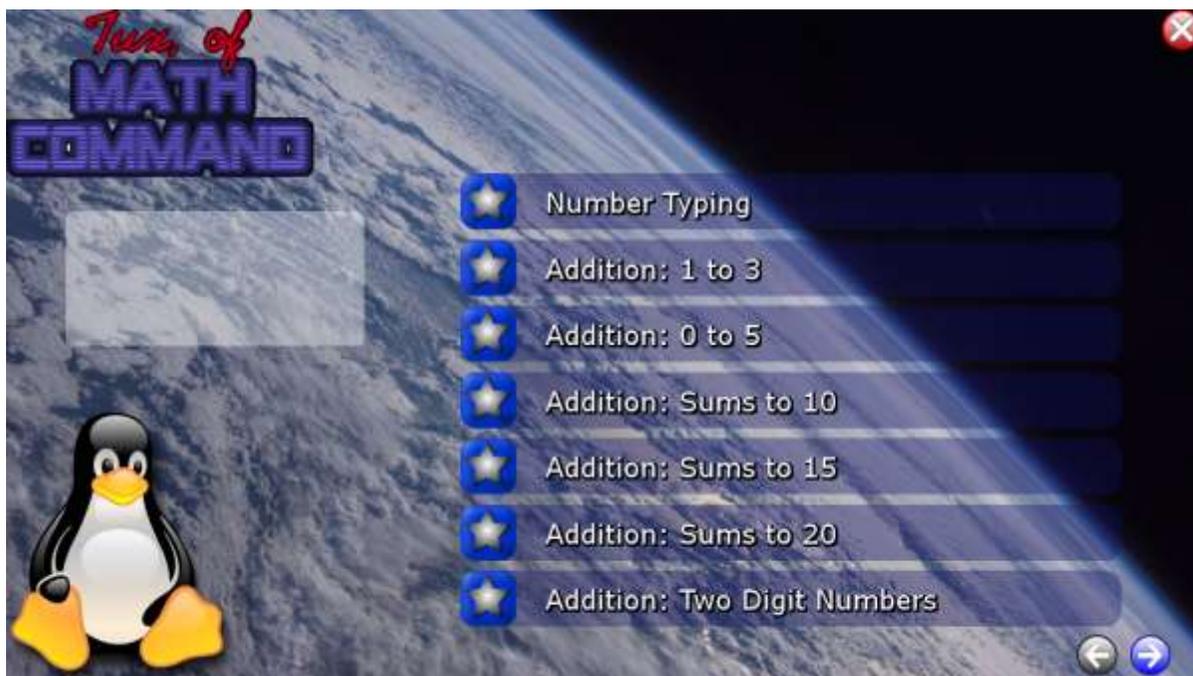


Figure 5. Tux of Math Command Game offline for young Learners



Figure 6. Tux of Math Command Game offline for young Learners

New learning paradigm emphasizes independent learning and putting teachers as facilitators. English for Math integrated with ICT lessons are in need of independent exercises of students, even though they still rely heavily on the teacher as a place to ask. Besides that, teachers are still many do not have a handbook. Teachers rely more self-taught capabilities when providing ICT material. This Interactive Media is expected to help students learn English for Math with ICT independently. Media attempted prepared to accommodate students' literacy and supports the concept of learning that is fun and exciting so that students will feel comfortable, happy, and excited when learning.

Conclusions

Interactive media can be characterized by mentioning the basic characteristics such as interactivity, communication, free access, divergence, flexibility, attractiveness, multi-formats of information and interactive participation, availability to share and exchange multi-content and multi-format information in order to communicate efficiently, to create communities, to comment on published information and to express own personality. Almost each person of contemporary society can become an active user of interactive media. Updated information, various educational activities, different information sources provide users (teachers and students) with evidence that integration of interactive media supports efficiency of foreign language learning and teaching (Kuprienė & Žegunienė, 2017).

Educational games have been mentioned as possibility to deepen foreign language skills in more innovative manner. Thus the study process may be more attractive and students could achieve positive learning outcomes if traditional methods will be combined with modern (communicative, situational/natural context-oriented methods, community language learning methods, innovative technologies, and interactive activities).

There is a benefit of giving bilingual learning to kindergarten students as it will develop students' skills in cognitive thinking, mathematical concepts, logic, problem-solving materials, and decision-makers as evidence of literacy development. Because bilingual mathematical learning is appropriate to be applied in Kindergarten through constructivism approach, thus the results of this implementation improve not only student development in Mathematics skills but also communication skills but also communication skills. Thus, interactive media is an alternative of combining the traditional method with the modern one so as to create fun and exciting learning for very young learners so that they will be also interested to improve their self-learning.

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