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Development of Interactive Media for ICT Learning at Elementary School Based on Student Self Learning

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Abstrak
Penerapan kurikulum Teknologi Informasi dan Komunikasi (TIK) pada tingkat Sekolah Dasar merupakan kemajuan di bidang pendidikan. Mata pelajaran Teknologi Informasi dan Komunikasi (TIK) termasuk mata pelajaran yang membutuhkan praktik langsung untuk memudahkan pemahaman siswa, sehingga guru dituntut untuk menciptakan media pembelajaran yang membantu siswa untuk memahami dari materi pelajaran. Tujuan dari penelitian ini adalah mendeskripsikan pola pembelajaran TIK yang dilakukan pada Sekolah Dasar serta media pembelajaran yang digunakan. Deskripsi tersebut kemudian menjadi salah satu dasar untuk pengembangan model pembelajaran interaktif berbasis kemandirian siswa. Model pembelajaran yang dibangun diharapkan dapat menciptakan kebiasaan dan kemandirian belajar.

Kata kunci*: Teknologi Informasi dan Komunikasi (TIK), Model Pembelajaran, Media Pembelajaran, Media Interaktif, Kemandirian Siswa*

Abstract
The implementation of information and comunication technology (ICT) curriculum at elementary school is the educational sector development. ICT subject is a practical subject which require a direct practice to make easier in the student understanding. Therefore, a teacher is demanded to make a learning media which helps the student to understand the material of study. This research is aimed at describing the model of ICT study in elementary school and using of learning media. Moreover, the description can be become one of the basic from the development of interactive study model base on student self learning. Besides, the arraging of this study model is hoped to make habitual and self learning.

Keywords*: Information and Communication Technology (ICT), Learning Model, Learning Media, Interactive Media, Self-Learning*

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Introduction

The implementation of information and communication technology curriculum at elementary school level is one of the effort to improve the quality of education in Indonesia. Basically, the curriculum of information and communication technology makes student in order to can be involved in the rapid changes not only in the world work but also the another activities that have additional and changes in the variation of the using of technology [1].

Information and Communication Technology (ICT) subject is included subject that require direct practice. It opens the opportunity to each teacher to innovate in creating the media study that can help students understanding. This opportunity will create the innovation, invention and creativity in the science, technology, and arts area.

According to Hazimah HJ. Samin [2] quote from Heinich Pestalozzi opinion which state the use of media in teaching is essential. The media is also considered as one of the important component of teaching technology in supporting the teaching and learning process. Therefore, Media has a role as a unity between oral and symbols to convey information and to clear the understanding of the contents or the real meaning in the teaching process.

Almost all of the ICT study in the school is still rely on textbooks and teacher profiles as the source of information [3] .Whereas, there are many elementary school students, especially in grade 1 and 2 that still learn at the level of reading. Thus, it becomes the contrary when the students are forced to read a computer learning modules while they are still in the stage of reading.

Students in the grade 1 until 3 has a comprehension of symbols / pictures to understand the message / information that more dominant than reading. The study which supports the psychological aspects should also be a concerned. Consequently, the study should become a friendly learning, entertaining and motivating to the children. This is the learning background in how to make a media in studying ICT becomes a friendly study, entertaining and motivating to children so that students can be motivated to have a habit and self learning

Theory

Learning Paradigm

In line with the development of ICT, it has been changed the view of study, they are learning as: (1) a natural process, (2) social process, (3) active and passive processes, (4) the linear or non-linear, (5) the ongoing process integrative and contextual, (6) activities based on model strengths, skills, interests, and culture of students, (7) assessment activity based on the fulfill task, obtaining results, and real problem solving either individually or in groups. Thus, It has changed the role of teacher and student in the study. The teacher's role has changed from: (1) a transmitter of knowledge, the main source of information, the expert in recognizing the material, and the source in finding answer to be a learning facilitator, coach, collaborator, navigator of knowledge and learning partners, (2) control and instruct all aspects of learning to be providing more alternatives and responsibility to each student in the learning process. Meanwhile, the role of student in learning have been changed as follows: (1) a passive receiver of information to be active participants in the learning process, (2) reexpress knowledge to be producing and sharing knowledge, (3) learning as an individual activity (solitary) into collaborative learning with other students. Learning environment centered on teacher has shifted to student-centered.

Learning Process

One of the main component of education is the learning context. Context of study includes various physical and social environment factors which is arranged base on necessity of the educational activity [4]. The learning context is designed for the educational purpose. Context of learning related to teaching and learning strategies. Teaching and learning strategies is the way how to organize potency (the learner, educator) and resources (facilities, costs, and infrastructure) so that a program can be used optimally, or any subject can achieve its goal.

Learning and Learning Mode

Learning is a complex process and is occurred long live in which this process is occurred because of the interaction of someone with his/her environment. One of the sign that a person has studied is there is a behavior changing in her/his self that may be caused by the changing in the level of knowledge, skill or attitude [5].

There are three main levels of learning modus [5], namely: (a) direct experience (enactive) in which learning is done by doing, (b) experience of pictorial / image (iconic) in which learning is done by studying and understanding the learning objects from image, painting, photo or film, (c) 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.

In order to the learning process runs well so there must be interaction between student and teacher. Visual stimulus produces learning result that better for tasks such as remembering, recollecting, recalling, and also connecting facts and concepts.

Learning Media

The word “media” comes from the Latin medius meaning 'middle', 'intermediate' or 'introduction'. Arsyad [5] quoted Gerlach & Ely defines the media is human, material, or events that make conditions in creating student enables to acquire knowledge, skills or attitudes. If the media carries messages or information which has instructional aimed or teaching objective so the media is called a media of learning.

Learning media is an instrument in the learning process both inside and outside class. Sudjana & Rivai [6] suggests there are some benefits of learning media in the learning process, namely: (1) learning will be more interesting so it will cause the learning motivation to the students, (2) material study will be easily to understood and allows students to control and achieve the learning goals, and (3) teaching methods will be more variative through verbal communication from the teacher explanation. Student is more doing activities in learning not only listening to the teacher description but also doing other activities such as observing, performing, demonstrating, acting, and others.

In The Selection Of Learning Media, Heinich In Arsyad [5] Proposed The Use Of Effective Planning Model Which Is Known As Assure (Analyze Learner Characteristics, State Objectives, Select Or Modify Media, Utilize, Require Learner Response, And Evaluate), Namely:

(a) analyzing the general characteristics of the target group or subject that follows learning.

(s) formulating learning objectives that is behavior and abilities expected by the subject after attending lessons. Capabilities include knowledge, skills and attitudes.

(s) selecting, modifying, or designing and developing appropriate material and media. In the selection of media, it should be able to raise student interest and to provide opportunities for students in participating.

(u) preparing all the things that support the implementation of media in teaching so it becomes effectively because of the enough preparation.

(r) asking student responses regarding the effectiveness of the teaching process after using learning media.

(e) evaluating the learning process to determine the level of student achievement on the learning objectives, the effectiveness of media, approaches, and teachers.

Seeks and Glasgow in Arsyad [5] divides types of media based on technological developments into 2 forms:

1. Traditional media
    a. operated visual quietly, eg projection opaque, overheads, slides, filmstrips.
    b. unprojected visual eg, image, posters, photo, charts, graphs, etc.
    c. Audio, eg tape, disk recording, etc.
    d. Print, eg textbooks, modules, handouts, etc.
    e. Games, eg, puzzles, simulation, board games.
    f. Realia, for example maps, dolls, and the specimen.
2. Modern Media Technology
    a. Media based telecommunications, including teleconferencing and distance learning.
    b. Media based Microprocessor**, eg** computer-assisted instruction**, computer games,** intelligent **t**utoring systems**,** hypermedia**, interactive** video, video compact disc**.**

Computer-Based Media

Information technology enables the use of alternative media as the media of teaching beside the conventional teaching media likes textbooks. This media can be used as a supporting media for the effective of education and teaching and also facilitate easily learning for students. The use of media through a systematic design can help teachers teach easily and memorable after the objective design of teaching and learning is known. The use of the media more refers to the using technology. The use of concrete visuals is able to attract students interest because they can describe the subject material and provide concrete experiences to make the learning process easily. The use of visuals have also been known to stimulate learning and knowledge processing [7].

According suntoro ahmad et al [8] it is time to popularize computers in education. By increasingly sophisticated world of microelectronics technology, the role of computers may not be

ignored. Of course, the computer is not always having no problems when it is accepted by society. Problems such as unfamiliar with the computer (computer illiterate), mental readiness and also the price that still quite relative expensive is need to be solved. Despite the advantages that can be obtained by using the computer is also quite a lot. For example, it can include an abundant source of information with a database facility (data base), an electronic library, a library of questions and prediction, helping delivery / understanding materials, helping in exercising case and understanding the material (drill and practice, tutorial), simulation of natural laws, assisting in the processing and analysis of data / information and also assisting in the derivative mathematical formula [8] .

The use of computers as a learning media has several advantages, there are: (1) provide a more affective condition so it can accommodate students who are slow in accepting the lesson, (2) stimulate students in doing exercises, (3) the absolute student control of learning so that the level of learning speed of the student can be matched to the level of control, and (4) development of students can be monitored by looking at the records of student activity through exercise files which is stored in the computer.

Suntoro ahmad et al [8] also recognize the effectiveness of the use of computers as a learning media and state that computer media can make students become "active" play with information. The software can also be made interactive too. Besides, computer media allows students to develop base on their condition and background capabilities. Student who are capable in learning at high speed does not need to his/her colleagues who need more time to understand the subject matter.

Interactive learning media has a stimulus that is conducive to the development of the child independence, especially in terms of the development of competence, creativity, self-control, consistency, and commitment both to themselves and to others. Ali, m [9] states the use of computer as learning media has a significant influence on the attractiveness of students to learn the teaching of competencies .

Interactive Media

Interactive comes from the word interaction. According to Indonesian Dictionary [10] interaction means reciprocal action. Interactive in this study intended to the use of media can be controlled released by the users. Nugroho [11] quote Rob Philips states that the interactive meaning is a learning process where students can control to the learning environtment. The definition of learning environment here is a learning environment that uses computer as learning media. Interactive meaning does not refer to computer hardware system used, but it refers to how students respond to the stimulus which is displayed by the screen.

According Schweir and Misanchuk [11], there are three levels of interaction based on the quality of learning interactions, as shown in Table 1.

Table 1. Interaction Taksonomy

Level	**Function**	**Transaction**
Reaktive	confirmation	*Space Bar / Return Key*
Proaktive	*Pacing*	*Touch Screen Target*
Mutual	Navigation	*Touch Screen Ray Trace*
	Inquire	*Mouse Click*
	Elaboration	*Mouse Drag*
		Barcode
		Keyboard-Key Response
		Keyboard_Construction
		Voice Input
		Virtual Reality Interface

source : adapted from Schmeir and Misanchuk (Sunaryo Soenarto in Nugroho 2008)

Independence

According to Indonesian General Dictionary [10], the word be autonomus menas the condition of stand alone, without rely on others. Meanwhile, according to Steinberg (quoted by Fleming [12]) independence is defined as the ability of an individual to behave, feel, and make decisions based on their own desire. Based on the definition above, the writer can conclude that basically, self learning is the tendency of children to carry out learning activities released from external control, with the awareness that learning is their duty and responsibility [13].

Dr. S. C. Utami Munandar [14] says that: "The characteristics of students self learning is the perseverance, diligence, tenacity, liveliness, initiative, discipline, obedience, grooming, independence, and freedom."

Research Method

The development of ICT learning media in elementary school uses the approach included in Research and Development (R & D). It is a research program which followed up with program development. Interactive learning model is developed based on student independence through systematic stage by applying direct observation/interview, development, experimentation and evaluation from the research methods.

The Object of this study was 20 elementary schools in the District of Terrace, Boyolali. While,the population was all students in grades 1 until 3 in all objects of research.

The observations stage was done by direct observation aimed in collecting data as early information that will be used as input in the development stage. In this stage, the data collection included students basic skills of reading and writing processes and the introduction of computer, competence and educational qualifications of teacher who teachs ICT subjects, and also the presence of ICT infrastructure to support the implementation of ICT lessons. The data collection was carried out using a questionnaire. At this stage, the interview method was also conducted to obtain additional information that supports the main data.

While, the stages of design and development of media used a model of software development through the stages shown in Figure 1. Evaluation stage aimed to evaluate the features and display from the interactive media. The results of this evaluation bacame the basis for redesign of the learning model. This stage involved several teachers, students, and lecturers.

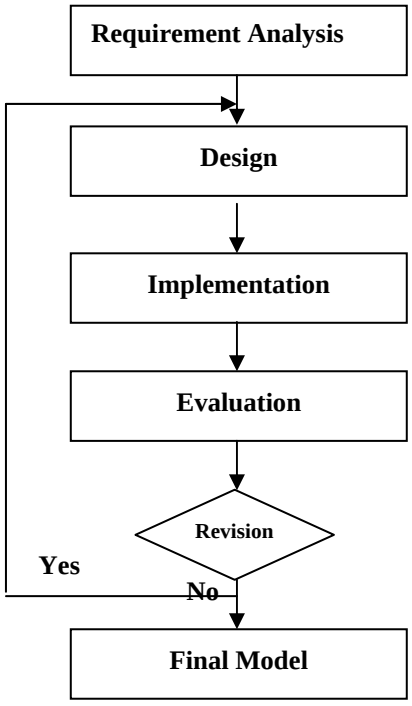

Figure 1**.** Stage of Model development

Result of Observation

The research used twenty elementary school (SD) as the object of study.Beside, the research also taken students in grade 1 until 3 from each elementary school as objects. The observations result shows that only 50% from elementary school in the district Terrace of Boyolali has introduced ICT subjects even it is in form of extra-curricular. The limitation of infrastructure and the lack of teachers who have computer competence become the reason why the implemantation ICT subjects has not been implemented.

Related to students knowledge about computer. Almost all of students have already known the computer entity. However, most of the students do not know the another forms of computer peripherals and their functions.

The reading and writing ability from elementary students is good. However, this ability is limited in short sentences. In addition, elementary students as the object of research is still difficult to read the small / tight writing

Moreover, because of the unmaximum capacity of reading and writing a long sentences, elementary students more quickly catch the commands in the form of sound. This informations will be used as the basis for design of interactive media.

Interactive Media Desain

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

1. The material presented in Interactive media includes elementary school curriculum in grades 1 until 3 that is identification form, function, and how to use the computer, 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 student more easily in understanding.
3. Learning media is interactive so students can control this media in supporting their learning process.
4. Visual appearance also consider students ability in reading and writing skill.

Interactive media learning interface consists of the "Mengenal" (Figure 2) which contains pictures of computer equipment and their functions, the "Belajar Menggambar" (Figure 3) which contains interactive video from the using of paint image processing applications, the " Film Belajarku "(Figure 4) which contains the movie on how to operate computers and another informations related to the operation of the computer, and the" Help "menu.

Figure 2. Menu of the Computer Introduction

Figure 3. Menu of the Drawing Learning

Figure 4. Menu of the My Learning Film

Conclusions

New learning paradigm emphasizes independent learning and putting teachers as facilitators. ICT lessons are in need of independent exercises of students. However, in grade 1-3 elementary schools 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 student's grades 1-3 to learn ICT independently. Media attempted prepared to accommodate students' literacy and supports the concept of learning fun so that students feel comfortable when learning.

References

[1] Pusat Kurikulum Badan Penelitian dan Pengembangan. (2003). *Kompetensi Dasar Mata Pelajaran Teknologi Informasi dan Komunikasi SD & MI*. Jakarta : Departemen Pendidikan Nasional

[2] Samin, Hazimah HJ. *Kajian Peranan Media Dalam Pengajaran dan Pembelajaran*. http://planet.time.net.my/ sepang / mysic/ ckhazimah / pengenalan4. html. Diakses pada 10 Maret 2006

[3] Sri Huning A (2007). Penggaruh Penggunaan Tutorial Interaktif dan Kamus TIK Terhadap Hasil Belajar Siswa Kelas 2 SD Yang Mempunyai Tingkat Intelejensia dan Frekuensi Latihan Yang Berbeda (Studi Kasus SDN Paulan Colomadu Karanganyar)

[4] Muhadjir, Noeng. (2003). *Ilmu Pendidikan dan Perubahan Sosial : Teori Pendidikan Pelaku Sosial Kreatif*. edisi V. Yogyakarta : Rake Sarasin

[5] Azhar Arsyad. (2006). *Media Pembelajaran*. Jakarta : Rajawali Press

[6] Sudjana & Rifai. (1992). *Media Pengajaran*. Bandung : Penerbit C.V. Sinar Baru Bandung.

[7] Maizurah (2000)

[8] Ahmad suntoro dkk .(2000). *Komputer untuk Pendidikan*. www.ilmukomputer.com. Diakses pada 3 April 2007

[9] Ali M (2005). *Pengembangan Bahan Pembelajaran Berbantuan Komputer Untuk Memfasilitasi Belajar Mandiri Dalam Mata Diklat Penerapan Konsep Dasar Listrik dan Elektronika di SMK*. Laporan Penelitian Research Grant PHK A2 Jurusan Pendidikan Teknik Elektro FT UNY.

[10] Pusat Bahasa Depdiknas. (2007). *Kamus Besar Bahasa Indonesia edisi III*. Jakarta: Balai Pustaka

[11] Nugroho, S (2008). *Pengembangan Media Pembelajaran Interaktif Mata Diklat Dasar Listrik dan Elektronika di SMK*. Laporan Proyek Akhir, Jurusan Pendidikan Teknik Elektro FT UNY.

[12] Fleming, M. 2005. Adolescent Autonomy: Desire, Achievement and Disobeying Parents between Early and Late Adolescence. Australian Journal of Education and Developmental Psychology. Vol.5. 1-16

[13] Anymous. *Kemandirian dalam Belajar*. www.perkuliahan.com. Diakses pada 25 September 2012

[14] S. C. Utami Munandar, *Pemanduan Anak Berbakat,* Rajawali, Jakarta, 1982