

Improving primary education in rural areas education essay



**ASSIGN
BUSTER**

There is no doubt that the need of improving the quality of primary schools particularly in rural areas is very urgent for government. One of the most promising solution is through utilization of Information and Communication Technologies (ICTs). In this paper we present our effort and work in improving the quality of primary school teachers and the students' learning process so that improves the quality of primary education. This work is part of our research project undertaken in Keerom Regency, Papua Province that is funded by Directorate General for Highly Education – Ministry of National Education.

Keywords: rural digital learning, primary school, teacher's quality, students' learning process

INTRODUCTION

The problem of national education quality has gained much attention recently. A major weakness in rural primary schools is the lack of qualified teachers needed to deliver the lessons in a classroom, primarily in Math and Sciences. Field observations show that most primary school teachers have non-Math and Science background and they deliver these subjects in conventional ways. The result, students misunderstand many abstract concepts of Math and Sciences [1].

The need of improving the quality of education for primary schools is urgently required, particularly for those in rural areas. In our recent studies, one of the most effective approaches to address this issue is by utilizing Information and Communication Technologies (ICTs). Studies in [5] reveal that ICT is a key weapon in the war against world proverty in number critial

areas including education, healthcare, government, trade, and small business support. Further, Teresa states that ICT-based solutions that work in develop countries cannot simply be transplanted to developing country environments. The solutions must be based on an understanding of local needs and conditions.

Through funding grant from Directorate General for Highly Education – Ministry of National Education, ITB Research Center on Information and Communication Technology conducts a research program to improve the quality of primary school teachers and improve the students' learning process so that improves the quality of primary education, particularly for those in rural areas in Indonesia. In this paper, we report our effort and work on progress in designing and implementing ICT-based environment and learning process for primary schools in Keerom-Papua.

In the next section, we provide the overview of related work. In section 3, we describe our work on designing and implementing ICT-based environment and learning process for primary schools in Keerom-Papua. Section 4 presents the challenges of deploying a digital learning system in rural area. Section 5 describes the conclusion of the research.

RELATED WORK

Our prior work in Research Center on Information and Communication Technology – Bandung Institute of Technology suggest that ICTs plays important role as an alternative for delivering learning programs in primary schools such as through virtual class application. We hope that these programs can address some issues in rural areas including the disparity of

high quality teacher distribution and the existence of many hard-to-reach geographical locations.

Recent studies reveal that the use of ICTs will offer some benefit in improving the quality of primary education. ICT can broaden information access needed by teachers and students as foundation for developing knowledge-based community of teachers and students, ICT can improve the efficiency of learning process as well as improve the teachers and students skills, and ICT can maintain continuing and long life learning.

Further, the use of ICTs for improving the teachers's quality and learning process is summarized as follows [1]:

ICT for Teachers: developing teacher community network, learning resource repositories, and teaching best practices repositories.

ICT for Class: creating virtual class that will help teacher delivering the lesson.

ICT for Laboratory: consisting of virtual laboratory and sstructured computer lab.

ICT for Students: creating a condusive enviroentment for students self-learning.

ICT for Community: allowing the learning process to be delivered and conducted from anywhere and anytime (e. g. particularly from homes).

Both of concepts of ICT for Teachers and ICT for Class have been implemented in a pilot project that was funded by ITB research grant [1]. The project involves two primary schools in Subang (representing rural primary school whose teachers have little knowledge about using computer), two primary school in Bandung (representing urban school whose teachers are computer literate) and one primary school in Cianjur (representing a sub-urban school with modest knowledge of computer usage). Learn from our own experiences, we bring that model to be implemented in Keerom-Papua.

IMPLEMENTATION

In this paper, we present our work last year in designing and implementing ICT-based environment and learning process for primary schools in Keerom-Papua. Actually, the system deployment consists of two main activities: i) deployment of digital learning infrastructure that is connecting all PC-based terminals and network devices through TCP/IP protocols and ii) deployment of digital learning programs that is providing several ICT-based learning applications and processes such as web-based teachers collaboration (ICT for Teachers) and virtual classroom (ICT for Class).

WiFi-based Infrastructure

The pilot project in Keerom-Papua involves three primary schools, as participants are SD Inpres I Arso 2, SD Inpres Arso 6, and SD Inpres Arso 7 and one secondary school as center of the community is SMAN Arso. Kantor Dinas Keerom is prepared for the future deployment. Table 1 shows the GPS-based survey from some locations.

Table 1. The GPS-based survey

Location

Latitude

Longitude

Altitude

Kantor Dinas Keerom

S

2. 91

E

140. 77

69, 1 m

SD Inpres 1 Arso 2

S

2. 91

E

140. 75

57. 3 m

SMAN 1 Keerom

S

2. 87

E

140. 74

43. 1 m

SD Inpres Arso 6

S

2. 83

E

140. 74

44. 1 m

SD Inpres Arso 7

S

2. 77

E

140. 76

35. 0 m

The deployment of digital learning infrastructure in Keeom-Papua is based on WiFi technology using star network topology [6]. The topology is one of the most common computer network topologies that are chosen because of the ability to isolate individual nodes in the maintenance and troubleshooting process. In that network, SMAN Arso acts as core node that is connected to SD Inpres I Arso 2, SD Inpres Arso 6, and SD Inpres Arso 7 directly using WiFi link as shown in Fig. 1.

Figure 1. The mapping of some locations that will be

networked in Keerom-Papua [Y]

Considering several benefits, SMAN 1 Arso is chosen as a core network (see Fig. 2). SMAN 1 Arso lies in the middle of three primary school offering simplicity to implement star network with the school as the center of the network. This school has Internet connection to Jardiknas network provided by Ministry of National Education that will also provide Internet access for the participants. This school also has a computer teacher that is potentially grabbed as technical support for the sustainability operation of the digital learning infrastructure.

Figure 2. The WiFi-based digital learning network using

star topology in Keerom-Papua [3]

The infrastructure is consisting of PC-based terminals and some network devices. In SMAN 1 Arso, we locate some devices such as a PC-based router, a digital learning server, a wireless access point, an IP Phone, and outdoor

WiFi devices. In each primary school, we locate a virtual class box, a <https://assignbuster.com/improving-primary-education-in-rural-areas-education-essay/>

notebook, a wireless access point, an IP Phone, and WiFi devices. All of these devices are used to provide some digital learning services including web-based teachers' collaboration and virtual classroom.

Digital Learning Program

From the five approaches of improving the quality of primary education, we have been implementing ICT for Teachers and ICT for Class. We will elaborate each of these scenarios in the following section.

The concept of ICT for Teachers relates to the use of ICT for providing electronic services to teachers and experts. It requires an Internet-based networking of teachers and experts so that allowing them to interact with each other, to share learning resources and also teaching best practices [1]. This concept is being implemented in a pilot project undertaken in Keerom-Papua involving three primary schools (SD Inpres I Arso 2, SD Inpres Arso 6, and SD Inpres Arso 7) and one secondary school (SMAN 1 Arso) [7]. The participating schools are provided with PC/Laptop and software application as well as access to the Internet. With this infrastructure, a set of learning program are setup for teachers from participating schools. Similar to our pilot project in Bandung-Subang-Cianjur [1], among of them are chatting session in a certain time where all participating teachers interact with each other online as well as online discussion forum among teachers and experts (see Fig. 3).

Figure 3. The WiFi-based digital learning network using

star topology in Keerom-Papua

The ICT for Class is implemented by providing a virtual classroom services for supporting distance learning. The main idea is that ICT will be used to allow a teacher help teaching a class in different school without having to physically attend to that school, for example using a recorded multimedia (offline mode) or through multimedia streaming on the Internet (online mode) [1]. Fig. 4 shows the diagram of online virtual classroom scheme through WiFi-based network in Keerom-Papua. In the online mode that uses teleconference and IP telephony system, a more interactive session can be conducted between students and remote teacher.

Figure 4. Diagram of online virtual classroom scheme in

Keerom-Papua [3]

CHALLENGES

The scenario for implementing ICTs in rural primary schools is difficult. Study by Misuraka show that there are a number of technological and human barriers that threaten the utilization of ICTs, primarily in rural areas [4].

Our prior study also reveals that there are number barriers in the deployment of digital learning system in Keerom-Papua including the limitation of electricity availability, the bottleneck of WiFi-based intranet in several network paths, inflexibility of digital learning applications, and the human barriers in system operation and maintenance. In the future, some research activities will be conducted to address those issues. To overcome the human barriers, a combination of structured training and training-by-doing also will be conducted.

CONCLUSION

We have described our experiences last year in utilizing ICTs for improving the quality of primary school teachers and the students' learning process so that improves the quality of primary education. A case study is undertaken in Keerom Regency, Papua Province. Today, the implementation of digital learning program is still in progress, particularly the implementation of ICT for Teachers and ICT for Class. Although the result of this research has not been conclusive yet, we believe that our research will be promising to address some quality issues of primary education, particularly in rural areas.

ACKNOWLEDGMENT

This research is partially supported by Directorate General for Highly Education - Ministry of National Education and is conducted at Research Center on Information and Communication Technology, Bandung Institute of Technology.