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## CONNECTING THE WORLD: THE UTILIZATION OF ICT FOR RURAL TEACHER EDUCATION IN INDONESIA

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### Abstract

This study aims to explore the impacts of the convergence of ICT (information and communication technology) for training in-service elementary school teachers in Indonesia. As a country in which almost a half of its population live in rural areas, Indonesia has a very serious issue with the quality divide which is quite extensive between urban and rural teachers. Thus, the use of ICT can be an alternative to reduce the gap, facilitate social justice and, therefore, connect the rural teachers to the world. Particularly, this study is focused on benefits and constraints of the issue when applied in that rural setting. The investigation is based on a literature review that certain academic refereed journal articles are analysed. Then, the analysis shows that infusing ICT can impact positively in the way that its advantages involve the expansion of opportunities for rural teachers to receive continuous training, collaborative actions among teachers from different schools, skills and resource development to upgrade their competencies. However, the implementation invites several limitations linked to financial, technical, geographical, and personnel-related issues. Also, the study points out several implications regarding policy and research areas. Then, some recommendations are offered to tackle the possible challenges that may occur.

**Keywords:** ICT in education; teacher education; rural education

### Abstrak

Penelitian ini bertujuan untuk menggali dampak konvergensi TIK (teknologi informasi dan komunikasi) untuk pelatihan calon guru sekolah dasar di Indonesia. Sebagai negara di mana hampir separuh penduduknya tinggal di daerah pedesaan, Indonesia memiliki masalah yang sangat serius dengan perbedaan kualitas yang cukup luas antara guru perkotaan dan pedesaan. Dengan demikian, penggunaan TIK dapat menjadi alternatif untuk mengurangi kesenjangan, memfasilitasi keadilan sosial dan, oleh karena itu, menghubungkan para guru pedesaan ke seluruh dunia. Secara khusus, penelitian ini difokuskan pada manfaat dan kendala masalah saat diterapkan di lingkungan pedesaan tersebut. Penyelidikan didasarkan pada tinjauan literatur di mana beberapa artikel jurnal akademik dianalisis. Kemudian, analisis menunjukkan bahwa menanamkan TIK dapat berdampak positif dengan cara bahwa kelebihanannya melibatkan perluasan kesempatan bagi guru pedesaan untuk menerima pelatihan berkelanjutan, tindakan kolaboratif di antara guru dari berbagai sekolah, keterampilan dan pengembangan sumber daya untuk meningkatkan kompetensi mereka. Namun, implementasinya mengundang beberapa keterbatasan terkait masalah keuangan, teknis, geografis, dan personil. Selain itu, penelitian tersebut menunjukkan beberapa implikasi mengenai area kebijakan dan penelitian. Kemudian, beberapa rekomendasi ditawarkan untuk mengatasi kemungkinan tantangan yang mungkin terjadi.

**Kata kunci:** TIK; pendidikan guru; pendidikan daerah pedesaan

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## Introduction

While many developed nations are moving forward to achieve the goals of Education for All<sup>1</sup>, the developing ones, on the other hand, are still striving to realise 'teacher quality for all', particularly their rural regions. FAO and UNESCO add that rural education is influenced by the poor quality of the education due to the deficiency of resources and infrastructure and the insufficient training for teachers as well as little incentives for them ("FAO & UNESCO propose a joint partnership to promote education in the rural world," 2002). Many factors are affecting the quality of (rural) education. In particular, teacher quality is one of the main features that determine the rates of children participating in schools and their education quality (OECD, 2005). Correspondingly, to develop their quality, teachers, especially those teaching at rural classrooms, are required to participate in series of training programs. A number of studies have addressed that the development of ICT has supplemented new choices for teacher education programs in correlation with alleviating problems among disadvantaged communities, in this case, rural teachers. The use of ICT in teacher capacity building programs can, hopefully, enhance teacher performances at remote schools in many developing countries in general and, more importantly, in Indonesia in particular.

As an archipelagic country, Indonesia has a severe problem with rural education since almost a half of the republic's citizens live in rural locations. Data from the World Bank show that the percentage of rural population in Indonesian

in 2014 come to the number of 47% which is 119,586,112 people out of the total population. The number increases by about 3% from 2010. The term rural population here refers to people who live in remote regions as explained by nation-wide statistical bureaus ("Rural population (% of total population) in Indonesia," 2014). According to Chen and Liu (2013), islands that lie on distance (rural) are usually hard to be reached by quality education. More unfortunately, rural communities or rural schools, in particular, have a close relation with poverty. Goodpaster, Adedokun, and Weaver (2012) argue that remote schools face some problems of geographic isolation and poor economic conditions due to infrastructures and facilities of many pastoral areas are worse than urban cities (Roberts, 2004, as cited in White, 2015). This results in low test scores achieved by students of rural schools (White, 2015). In these circumstances, as mentioned earlier, teachers play a very critical role in helping the students against all the odds.

Teacher quality has been a lifetime issue in Indonesian education and elementary school teachers are in the worse condition because there are about 92% of them who do not hold the bachelor's degree certificates (Pannen, Riyanti, & Pramuki, 2007). The government has already put the issue as the priority by enacting the law on teachers and lecturers released in 2005, No. 14/2005. Its article 9 states that academic qualification that teachers should meet is a four-year bachelor degree (*Undang Undang Nomor 14 Tahun 2005 tentang Guru dan Dosen* 2005). In Indonesia, the number of teachers is approximately 2,667,655, but only 34% of them or 887,751 teachers have met the bachelor degree qualification (Pannen et al., 2007, p. 2). Further, Pannen et al. (2007) explain that Indonesian government has been mandated to achieve a goal of providing in-service training for about 110,000 teachers, but teachers' colleges

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<sup>1</sup> The Education for All (EFA) movement is a global commitment to provide quality basic education for all children, youth and adults. At the World Education Forum (Dakar, 2000), 164 governments pledged to achieve EFA and identified six goals to be met by 2015. Governments, development agencies, civil society and the private sector are working together to reach the EFA goals (UNESCO, 2016).

(which are only 278 institutions providing the training) the government has are inadequate to reach the target. Hence, infusing ICT into the training can be a feasible alternative, and Indonesia is progressing to it. For instance, 23 teachers' colleges out of 278 have been already providing ICT, with distance education platform, to train teachers in some cities. This ICT integration is also supported and strengthened by the Decree of the Ministry of Education, No. 107/2001. However, how does the ICT integration impact rural communities? In this essay, I will discuss the effects of the issue by evaluating its benefits and challenges as my key arguments, but prior to it I will address the notion of ICT in rural teacher education.

## **ICT in Rural Teacher Education:**

### **An Overview**

In this part, it is briefly presented the concept of the rural area and ICT in teacher education. First of all, regarding the term rural, Cloke (2006) defines rural regions as locations which have lands mostly used for agriculture and forestry, do not have many buildings, and their local people acknowledge their hometown as rural in which they have a cohesive identity. In relation to schools, the characteristics of rural schools: are small buildings, poorer than other districts, with lower average of wages for both teachers and administrators, have lower percentages of minority students and staff, have lower dropout rates and pupil-teacher ratios, and have poor internet connections (Hepp & Laval, 2002; Vaughan et al., 1989). Rural communities, including ordinary people, teachers, and students, usually live in poverty and hardly receive a quality education. Turning to the latter notion, information and communication technology (ICT) is a broad term. Clement (2007, as cited in Hasan & Khan, 2013) argues that in a very short period

ICT has become one of the core foundation in constructing a modern civilization. The term ICT covers any communication device and application, such as: "radio, television, cellular phones, computer, and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, like video conferencing and distance learning" (from searchcio.techtarget.com as cited in Kumar, 2008, p. 556). According to Kumar (2008), in the field of educational technology ICT can be categorized as its subfield and there are three major modes of ICT-infused in educational contexts, namely e-learning, blended learning, and distance learning.

In terms of teacher education, ICT can be used as a core or a complementary means to the teacher training process (Collis & Jung, 2003, as cited in Jung, 2005). Robinson (2008) argues that more teachers involved in more professional education more intensive than previously and with more options through the combination of distance learning, ICT and face-to-face activities or blended learning. Given that, the ICT convergence is not static that any instructional activities in training are conveyed through technology, rather there must be diverse modes and procedures in running the activities. According to Collis & Jung (2003, as cited in Jung, 2005) ICT teacher training can be in the form of various arrangements, meaning ICT not only can be used as an essential tool, but also as the supplementary one in the teacher training process. For example, teachers can be trained to learn the ways how to use ICT, or they can be trained via ICT itself. In this essay, this discussion is limited to only promote ICT as a complementary means for rural in-service teacher of elementary schools since, based on data from Pannen et al. (2007), in Indonesia there are about 1,1 million (92% of all) elementary school teachers who have not yet met the equivalent of bachelor's degree requirement.

It is time to introduce several positive sides of the ICT utilization.

## Valuable Rewards of Infusing ICT In Training Rural Teachers

As rural communities seem receive a lot of inequalities in their lives, the emergence of the information and communication technology (ICT) infusion may bring a little joy for them. There are several advantages that teachers can gain from the implementation. These benefits are classified into four main points, namely expanding *opportunities*, *collaboration*, *skills*, and *resources*. Firstly, the ICT convergence can widen opportunities for teachers from remote schools regardless any geographical constraint. According to Robinson (2008, p. 11) rural teachers see the opportunities to experience using ICT as a breakthrough in realizing equity in which they are introduced to “modern world” and usually they say, “Now we can do all the things that a city teacher can”. It seems that through ICT they are able to have contacts with the real world in an instant way since rural teachers in Indonesia are quite busy, having a lot of things to do (for economic reasons as well as the lack of teachers the school has). The use of ICT can help them facilitate learning. As Pannen et al. (2007) argue, a distance education, as one of the modes in ICT, allows student teachers to participate in the training without having to leave their work. However, having said that, the quality of the training must be maintained. One way to guarantee quality instruction, a teachers’ college nearby can delegate its staff or trainers to supervise the effectiveness of the program.

Next, rural teachers can benefit from participating in the ICT-based training in that they can improve their teaching skills and knowledge. Many reports from different nations show that the training can change teachers’ teaching methods as well as their attitudes

(Robinson, 2008). In particular, through the program the teachers have an opportunity to access new knowledge and skills, improve educational materials, and solve the traditional isolation of teachers (that they can collaborate with other teachers—further this is discussed in the following benefit) and even generate personalized training prospects (UNESCO Bangkok, 2004, as cited in Hasan & Khan, 2013). New skills and knowledge are required for every teacher since the world is moving and also their students are progressing. Henceforth, the teachers are demanded to be more creative and innovative in their professional practices, and this can be achieved if they receive adequate and continuous in-service training organized by any stakeholders.

In addition, the third benefit is that with ICT the trainee can expand their horizon by interacting with many other teacher colleagues, especially those from more urban schools, even from the international ones. The ICT utilization can be helpful to serve rural schools in the way that it assists teachers to connect with their peers and other schools through online networks and create an environment for enhancing their competencies in using ICT, so that the teachers improve their service for the community (Hasan & Khan, 2013). Collaboration among teachers is useful since the teachers can share their ideas, knowledge, and experience about what happens in their workplace. More importantly, they can exchange solution to any problems. Provided that, there must be a certain procedure and mechanism of how the teachers can interact each other. In this sense, “microcenters” may accommodate the idea. Microcenters are kinds of clusters used to foster the collaboration among the remote schools and also to provide information, ideas and solutions shared within the communities (Miguel 1999; Wenger 1998; as cited in Hepp & Laval, 2002). For example, every month a group of schools geographically

close to one another are managed in a cluster of five to twelve schools to establish the collaborative partnership.

For the last advantage, regarding resources, the ICT-based trainees are able to have abundant teaching and learning materials. I would like to use an example of another context of developing country Chile from the study of Robinson (2008). Before the establishment of TLRCs (Teachers' Learning Resource Centres), a sort of in-service training using ICT, there were no learning resources for teachers in almost all schools to use and they only possessed school textbooks to help them teach. From the interview of the study, it is also shown that the teachers felt that they had opportunities to gain quality resources, just like other teachers in cities (see a study from Robinson, 2008). In Indonesia, Pannen et al. (2007) explain that by participating the program the rural teachers can use various forms of learning resources like printed instructional materials. That kind of resources has been widely known as the main media used in most open and distance learning universities in the world. Moreover, in a rural situation using physical printed materials is considered to be more efficient than the digital ones since the lack of computers the teachers own. These all advantages of the ICT implementation in rural teacher training, but, on the other hand, the application is quite challenging.

### **Emerging Constraints in Applying ICT in Rural Indonesian Teacher Education**

Despite the ICT utilization offering some valuable rewards, the implementation, however, has some barriers when applied in the training. The barriers are labelled as *financial*, *technical*, *geographical*, and *personnel-related constraints*. Initially, Boit, Menjo, and Kimutai (2012) argue that applying ICT into any teacher training

classes require large funds, especially in installing IT equipment. The implementation requires both hardware devices and software applications from computers, routers, to the Internet connectivity and also other types of technical issues including the need for ICT experts. Moreover, in a developing country like Indonesia, the barrier even become more severe since any innovation in teacher capacity building programs needs financial supplies for affording any technological devices and, hence, sometimes it is tough to be allocated and managed by the local government due to poverty (Hasan & Khan, 2013). Yuhetty (2004) once said:

No wonder the biggest obstacle faced by Indonesia regarding ICT is the economic crisis. This condition forces the government to prioritize on short term programs to help improve the economy of the general population through social security net, aids to poor students to decrease drop-out rate, improvement of teacher's welfare, etc. (p. 8)

Indonesia, like other developing peers, still prioritize other areas, rather teaching staff competence building programs. This also may be one of the factors that contribute to ineffective teacher training across the nation, especially relating to the rural settings.

Secondly, intertwining with the financial issue above, technical barriers, regarding quality and quantity, emerge when ICT is converged into rural teacher training. According to de la Varre et al. (2010), rural communities are a lack of many technical matters, such as technology-enhanced classrooms, poor internet connectivity, and inadequate maintenance of the technology itself. One of the factors determining the effective communication can be achieved if access to digital equipment is available (Enochsson & Rizza, 2009, as cited in Hasan & Khan, 2013). Relating to Indonesian's experience when applying the HYLITE Program

(Hybrid Learning for Indonesian Teachers launched in 2007), which is ICT-based online distance learning, Pannen et al. (2007) report that the Internet connection appears to be the primary challenge in the implementation of the HYLITE Program, since they are not fully provided by computers and connections. How possibly has the training run without having any devices or no connection at all? As a consideration, before designing any training programs, the government has to ensure the availability of such technical issues.

In addition to financial and technical constraints, the third point is a remote geographical problem. Based on the study carried out by Robinson (2008), it is very obvious that another significant barrier creating ICT-based training for the more rural teachers lies in distant locations they live. Hepp and Laval (2002) assert that the long distances that are typically required to reach a rural school and restricted access in some regions during some bad weathers require a teacher training and support strategy. Most remote regions can only be reached by cars and, hence, it costs a lot of money (Halsey, 2009). In particular, Hepp and Laval (2002) assert that as well as the long distances usually need to reach a remote location, the weather also needs to be considered since in winter, for example, it is even harder to reach the site. This is the common problem of the rural areas, in particular for the ICT application. However, once the implementation is established the use of ICT, through the Internet, is the easiest way to find answers for problems in rural environments (Chen & Liu, 2013). In this circumstance, time and space do not matter for the rural communities are interconnected via a virtual world.

Lastly, the barrier number four is related to the issue of the personnel readiness. Hasan and Khan (2013) said that if we want to make the dream of infusing ICT into teacher training

program come true, we must have a sufficient number of trained resource people. They add that as the ICT convergence is quite a new idea in some developing countries, consequently the countries are a lack of trained or expert resource individuals who manage the training program effective and achieve its goals. Looking to situations in Indonesia, the numbers of trainers delegated from some teachers' college institutions are still not sufficient. Pannen et al. (2007) argue that some teachers' colleges cannot provide enough trainers for every subject to supervise the student teachers when doing independent learning. Henceforth, recruiting, training and retaining tutors must be well organized by each teachers' college. These all the four limitations of ICT utilization for teacher education in rural locations.

## Implications from the ICT-Based Rural Teacher Training

Undeniably the ICT infusion into rural teacher training can raise many implications for some aspects. A number of studies have presented that the implementations can affect *policy* and *research*. From the perspective of policy implications, there will be two different areas influenced by the issue: first, the field of the law legislation. Because pastoral areas are unique that they have some characteristics different from the urban, in terms of location, infrastructure, size and culture, they offer new challenges (Robinson, 2008). Therefore, the government needs to enact a special law regulation dedicated to the ICT-based rural teacher training because it is urgent in answering any possible limitations occur. For instance, the regulation can address financial, technical, and resources-related issues. Specifically, the government may cooperate with other organizations, both private and public institutions, in providing appropriate tutors and

trainers as well as they are required to instruct every teachers' college to develop its trainers and tutors with a particular expertise in the use of ICT for rural contexts. Second, the ICT convergence implicates the policy regarding the field of the curriculum design (Robinson, 2008). The intended meaning of curriculum here is the guidelines committed to tutors and trainers who will run the program. Hopefully, by designing adequate ICT-based curriculum, the tutors and trainers will have a clear picture of how to conduct the training program. The guidelines may include certain procedures and frameworks of ICT-based rural teacher training, but, this requires research-based evidence.

Research areas are critical in finding an appropriate design for rural settings. Moreover, research around the particular issue of the rural teacher training in the context of Indonesia is hard to find. This may be studies about the issue are still very limited. The investigations conducted by Pannen et al. (2007) and Yuhetty (2004) are too broad that they discuss the general issue of teacher training in Indonesia, though they also address a little bit about the rural context. There is the demand for more specific investigations on the notion of rural Indonesia since, as Jung (2005) said, research and development is needed for the sake of ICT in rural teacher education. Also, there are interesting points from Jung's study (2005) showing the facts that the issue of ICT-based rural teacher education has implicated the researcher to suggest several considerations in designing a framework for the rural teacher capacity building program with the use of ICT in a context of developing countries. The considerations are about procedures and a framework how to create an effective rural teacher training using ICT (see Jung's study in 2005). Those are the two implications that occur when ICT-infused in teacher training programs in rural contexts.

## Conclusion

To sum up, utilizing ICT into rural in-service elementary school teacher education can be efficient and beneficial to some extent. The advantages are categorized as the expansion of opportunities for rural teachers to receive continuous training, collaboration actions among teachers from different schools, skills and resource development to update their teaching practices and knowledge. In spite of the benefits, several challenges related to financial, technical, geographical, and personnel-related issues need to be solved to make the implementation run more effectively and, in general, facilitate social justice among the issue of teacher education. Therefore, I present some recommendations obtained from some studies for the effectiveness of the ICT-based rural teacher training program:

First, the ICT-based rural teacher training must use cost-effective strategies by attracting investment and other supports from any stakeholders. Second, adapting and adopting the ICT for teacher training experienced by other countries because it is important to provide a variety of both formal and informal systems for trainers to take advantages of the methods suitable for their context. Third, the government or teachers' colleges seeking to encourage national and global cooperation must: provide incentives for private and public participation and investment in ICT teacher training, remove legal challenges, like the requirement of relevant academic backgrounds of the training's tutors, and design a plan and mechanism regarding digital gaps exist between urban and remote regions.

Hopefully, these recommendations can alleviate the problems, yet it is realized that this needs further scrutinized investigations for the better outcomes. Finally, because many studies show the usefulness of the ICT integration with all its challenges, in the future, it is expected that

further research on this issue will be conducted and realize the dream of connecting rural communities to the world.

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