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Critical Review: Professional Development Programs to Face Open Educational Resources in Indonesia**Rian Fitriansyah¹, Lisfatul Fatinah², Muhammad Syahril³**¹Faculty of Education, the University of Hong Kong, Hong Kong²London School Centre for Autism Awareness³College of Art and Social Sciences, Australian National University

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Received: January 1st, 2019. Revised: January 8th, 2019. Accepted: January 15th, 2019Available Online: January 20th, 2019. Published Regularly: January 1st, 2019**Abstract**

ICT in education has been an important issue to create education reform in many countries within East Asia including Hong Kong and Singapore, the United States (US), and the United Kingdom (UK). Education reform takes part to acquire the skill set in the 21st century. For that critical reason, Indonesia as the third nation country has begun implementing ICT in education since 2002 indicated by the establishment of the Indonesian Telematics Coordinating Team (TKTI). Although the development of ICT is still far away compared to Hong Kong and Singapore, ICT development is still progressing until now. In 2013, Indonesia began to initiate Open Educational Resources (OER) and teacher's training in ICT. Open educational resources are digitized materials that can be freely accessed by those who want to teach, learn or research. The OER initiatives have many challenges ahead, one of them is the development of the OER community which involves a lot of teachers from 17.508 islands. Every island has a different quality of education, different infrastructure, and different resources for education. Consequently, Indonesia must create personalized professional development program based on every island education's needs. After that, the Indonesia government could initiate the OER consortium to unite all the educators on every island to build a knowledge society. The methods of creating a professional development program could be deducted from the U.S. which has many districts that also have different quality of education like Indonesia's condition. The purpose of this paper is to identify how to develop a professional development program in creating the OER community in Indonesia. This paper tries to investigate what kind of professional development that has been undergone in Indonesia, analyzing the problems that would likely to occur and giving some appropriate solutions based on the US professional development programs and other relevant studies.

Keywords: *Professional Development; Open Educational Resources; Teacher Training; OER.**Corresponding Author: Rian Fitriansyah**Author, Affiliation Address: Faculty of Education, the University of Hong Kong**Email: rian@connect.hku.hk***1. Introduction**

Indonesia is a nation that has a total of 34 provinces (Indonesia Education Statistics [IES], 2017). Each province has its government, tradition, and culture that indicate its uniqueness. As well as their education system, some provinces have implemented ICT in their schools and use IT suite to support their learning process, but some provinces don't implement ICT at all and still using a

whiteboard as a tool for their teaching method (Hermawan, Yunita & Deswila, 2018). This shows that Indonesia's education quality might differ and have some gaps in some provinces.

The gaps indicate there might be a need for the Indonesia education system to reform by increasing their teacher quality, implementing ICT into all schools in every province cater to a lot of student's needs, reform-

ing pedagogical practices and plant a good educational leadership in every province. This paper focuses on reviewing the professional development program for ICT implementation especially in open educational resources.

ICT was established by the Indonesian Telematics Coordinating Team (TKTI) in 2000 (Farrel & Wachholz, 2003). They began to implement ICT by 5 years action plan which includes education as the area of improvement. 4 action plans include education as its priorities which are collaboration between ICT industry and ICT educational institutions, ICT will be learned through curriculum, ICT as learning tools in schools, universities and training centers, and establishment of distance learning with the use of Internet (UNESCO, 2003). Unfortunately, all those action plans have not finished yet until recently.

Besides, to help improve the education quality especially for student's and teacher's learning, Indonesia began to initiate open educational resources in 2013, one of its products is <http://belajar.kemdikbud.go.id> (UNESCO, 2013). This platform is used to provide learning resources for both student and teacher and learning management system for the teacher to teach them the new curriculum reform (UNESCO, 2013).

In reviewing, the professional development program (PDP) for the teacher in Indonesia, the author compared the PDP for the teacher in the United States (U.S.) and Indonesia because they have similar conditions in their states/provinces. U.S. has been implemented ICT in their education since 1996 (Roumell & Salajan, 2013) 8 years earlier than Indonesia. In terms of technology readiness, U.S has achieved more than Indonesia, they have achieved a lot of progress in re-

searching how the technology works in education (United States Office of Educational Technology, 2017) and Indonesia could learn a lot from the U.S.

This paper is divided into four parts. The first part is the introduction consists of Indonesia's education background, the brief history of Indonesia ICT implementation, the initiation of Indonesia OER and the teacher's training, and some brief explanations of the U.S. professional development framework. The second part is literature reviews of ICT in education, teachers' professional development program (PDP) in ICT, U.S. professional development framework, community of practice, Indonesia education statistics, Indonesia teachers' professional development program, and Indonesia OER. Then, the third part is the discussion and reviews of the Indonesia education statistics, the author reviewed the teacher's competency and ICT implementation in each school level, then the author will try to analyze the problem that has been found while implementing the PDP and OER. All the problems will be themed to see if there is a similar problem in any area. And then, the author will try to see if there is any community of practice (CoP) that has been created after PDP has finished. After that, the author will give suggestions to the next Indonesia PDP based on the review by adopting U.S. professional development framework and implementing CoP for the OER community. Finally, the last part is the summary and conclusion of the paper.

2. Literature Review

In this section, the author will provide all the literature review that supports the case review study including ICT in Education, Professional Development Program for ICT Implementation, U.S. Professional Development Framework, Community of Practice, Indonesia Education Statistics, Indonesia

Professional Development Program for ICT Implementation and Indonesia Open Educational Resources.

ICT in Education

ICT in education is one of education reform that has been established in many countries like East Asia (Cheng, 2017; Hermawan, Yunita & Deswila, 2018), the U.S. (USOET, 2017) and the U.K. (Condrads et al., 2017). ICT has been considered important to acquire 21st-century skills especially in digital skills (Odewumi, 2019; Law et al., 2016) because the traditional concept of learning is changing from teacher-centered learning to student-centered learning. To implement ICT in education a nation must create ITed policies to be its guideline or pathway.

Teacher's Profesional Development Proram in ICT

Darling-Hammond, Hyler & Gardner (2017) defines teachers' PDP in ICT as a program to support teachers in teaching the students for 21st-century skills. Teachers' PDP in ICT is essential nowadays, the world is growing rapidly and so does the technology, if the teacher lacks competency in digital skills then they may not compete with another teacher who is tech-savvy or might not know what the students' needs in this era. Many nations mentioned that teachers should participate in the PDP to educate themselves in implementing ICT in education (Cheng, 2017; USOET, 2017; Roumell & Salajan, 2016; Conrads et al., 2017), indicates that PDP is important for education reform.

U.S. Teacher's Profesional Development Framework

Desimone and Garet (2015) has suggested best practices in U.S. teacher's professional development framework that consists

of five key features, there are content focus, active learning, coherence, sustained duration, and collective participation. While Darling-Hammond, Hyler & Gardner (2017) suggests three more features which are using models of effective practice, provides coaching and expert support and offers feedback and reflection. In this study, the author used the combined key features because they are inseparable and complete each other.

Content focus is related to the activities which focus on learning material and how to learn from it (Desimone & Garet, 2015). Active learning is activities that are more focused on student-centered learning like discussion, group project, reflection and so on (Desimone & Garet, 2015). Coherence means that the learning material, objectives and activities still align with the school curriculum, teachers' knowledge, students' needs and government policies (Desimone & Garet, 2015). Sustained duration means the duration of professional development is still within 20 hours or more (Desimone & Garet, 2015). Collective participation means there is a community of practice built after the professional development program (Desimone & Garet, 2015). Uses models of effective practice mean the teachers will be provided with the best practice in teaching with ICT (Darling-Hammond, Hyler & Gardner, 2017). Coaching and expert support mean some people are experts in the field that could teach the teachers' needs (LIP, 2017). Then, offers feedback and reflection help teachers to facilitate them in their learning process (LIP, 2017).

Indonesia Teacher's Profesional Development in ICT

Indonesia has developed teachers' professional development in ICT since 2000 (UNESCO, 2013). There were no exact

numbers of how many teachers were being trained but the focus on the training is still on how to use ICT not how to teach with ICT (UNESCO, 2013). Fortunately, in 2004 the report (UNESCO, 2013) said that Pustekkom (The center of ICT for Education in Indonesia) focus on training teacher in how to integrate ICT into curriculum and pedagogical

practices to develop 21st-century skills. It was reported that the ministry of education has been developing an ICT competency for the teacher as shown in figure 1 below. Because it is still under development the author still doesn't know how many teachers' in Indonesia are qualified with ICT competency standard.

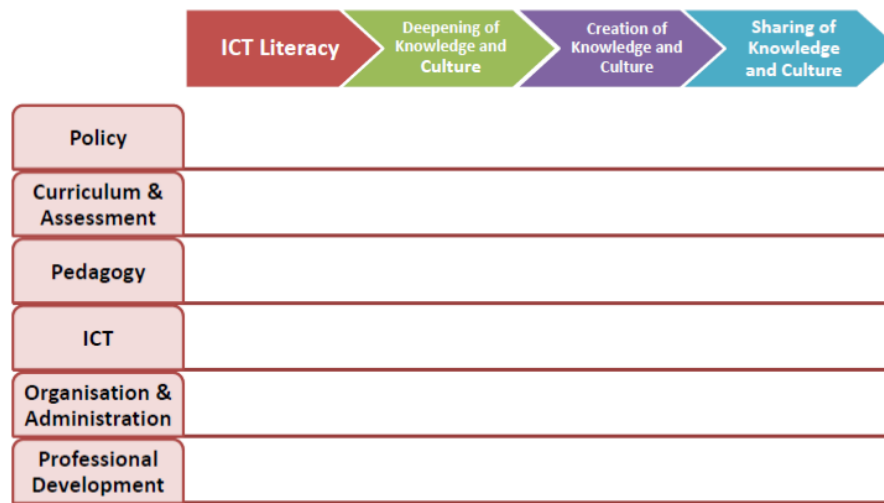


Figure 1. Teacher ICT Competency Standard in Indonesia (UNESCO, 2013)

Community of Practise

Wenger (1998) defines the community of practice (CoP) as a form of participation and people have different experiences in taking part in it. It has different stages of development based on their interaction and activities (Wenger, 1998). It is one example of implementation in 21st-century skill (Pres-tidge & Main, 2018) for collaboration to help build knowledge society especially for teachers' learning. In Indonesia there are some examples of community of practice for teachers, the first one is which was developed by one of the private schools in Indonesia, and Ikatan Guru Indonesia (IGI) which was initiated by Ahmad Rizali in 2000.

Open Educational Resources

Open educational resources (OER) is a movement in building a platform to share each other's educational content (Caswell, Henson, Jensen, & Wiley, 2008). Its purpose solely to provide digital learning material for everyone, so they could learn high-quality material for free (Caswell et al., 2008). Indonesia has initiated OER in 2013 and 2017, which are Rumah Belajar (UNESCO, 2013) and Indonesia Open Educational Resources (I-OER) (2019).

Indonesia Education Statistics

The author provides the education statistics from the Ministry of Education in Indonesia in 2017/2018, unfortunately, the author still hasn't found the recent education data in 2018/2019. The author will be explained deeply in the third part and focused on repre-

sents the data that is aligned with PDP and OER implementation. The data consist of teachers' qualification, percentage of students in each level and school infrastructure implementation.

3. Method

The present study applied integrative literature review which reviews, examine, and synthesizes representative literature and the main ideas on relationship of issues above. The review is organized thematically or using conceptual categories around the topics rather than the progression of time. Four phases are used to review and assess the quality of the literatures. There are designing, conducting, abstracting and analysing data, and structuring and writing the review phase. On the designing phase, the author determining the motivation, the purpose, the research questions, and search strategy clearly. Conducting phase is the literature searching process. The next phase, abstracting and analysing phase, the data abstracted from the articles in concordance with overall purpose of the review accurately. Then the chosen data are analysed in relation on the overall research and questions and the data abstracted. All the analysis process were described transparently. The last phase is structuring and writing the review where the review article is organized coherently in relation to the overall approce and research questions, the result of the review is reported clearly, and the questions and directions for the further research are included.

All the reviews were being analysed by using descriptive method because the data were already been managed by the source, thereafter the author interpreted the Indonesia education data with the implementation data specifically in OER to answer these

questions, what is the correlation and the effect by implementing OER into the education system, is it thorough? And is all teachers have already been given access to OER? Is there any PDP that have been created to train teacher in using OER? And others question related to PDP in OER. The data that were used mostly from Indonesian reports in UNESCO, so they were credible because they were representatives to present Indonesia education in UNESCO forum.

4. Discussion

In this part, the author discussed deeply how to create PDP that is suitable to face OER. First, there will be a deep review in Indonesia education statistics consists of the teachers' competency level in Indonesia and ICT implementation in Indonesia. Then, there will be a deep review of Indonesia teachers' professional development in ICT. After that, a deep review of Indonesia OER and finally a discussion in how Indonesia implement PDP based on U.S. PDP framework.

Deep Review of Indonesia Education Statistics

Here are the lists of Indonesia education statistics, the first on is the students' graduate-level in Indonesia. Figure 2 shows the teachers' qualifications in 2009, and figure 3 shows the teachers' qualifications on every education level in 2017. In figure 2 we see that the highest qualification of teachers is PhD., but only 60 teachers that are qualified with that degree. And the lowest degree is below D1 (Extension level before the bachelor's degree) for about 722.293 teachers. Furthermore, most of the teachers are qualified for a bachelor's degree for about 1.032.349 teachers.

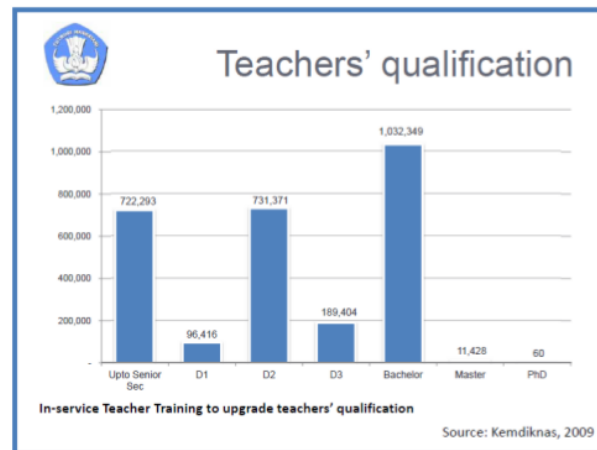


Figure 2. Teachers' Qualification (UNESCO, 2013)

Meanwhile, in figure 3 we see that most of the teachers are qualified within a bachelors' degree (red bar) than below bachelors' degree (green bar) which shows that there is a significant difference between 2009 and 2017 in teachers' qualification. This is a very good reform in teacher's qualification.

On the other hand, Indonesia educational system has Teacher Competency Test (TCT) that quantifies teacher competency which is online based test since 2012. Based on Ministry of Edu-

cation and Culture data, in 2012 the highest score of TCT is 47.84/100 whereas the minimum standard of the test is 70/100. In 2019, despite the minimum standard is still 70/100, the highest score of TCT is 69.12/100. Teachers who could not reach the passing grade were not teachers with a lack of knowledge or experience in teaching. They failed simply because of their low basic ICT skill level. They did not know how to use a mouse and keyboard, how to open the examination application, and how to answer the online examination (Yusri, Iin Karmila, et.al, 2013).

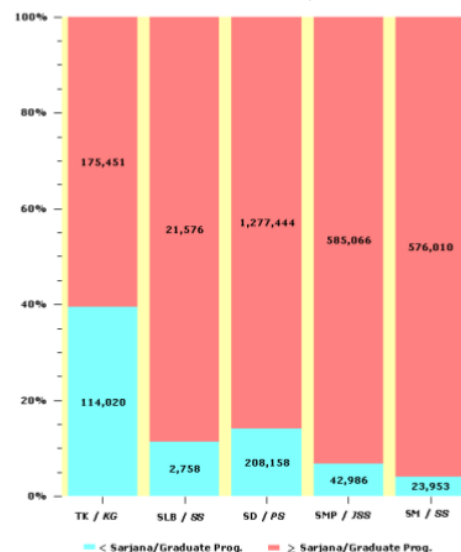


Figure 3. Percentage of Number of Teacher by Highest Certificate and Level of Education (IES, 2017)

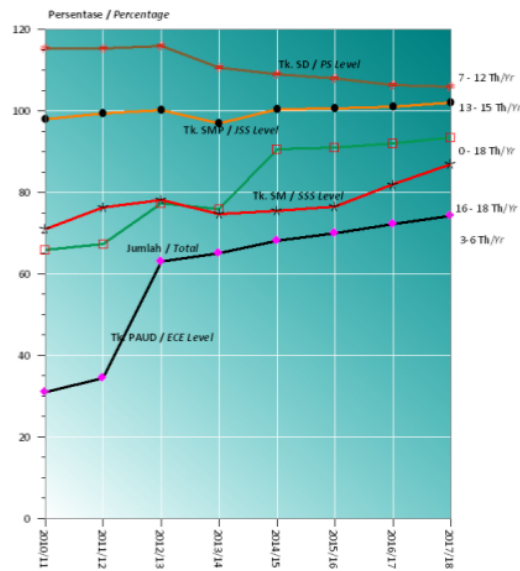


Figure 4. Trend Percentage of Pupils to School-Age Population 2010/2011-2017/2018 (IES, 2017)

Afterward, to implement ICT in education, the infrastructure must be ready to serve the ICT. Figure 5 shows the ratio and projection PCs needed by schools in 2010-2025 from the 2009 report. We see that the total number of an ideal of PCs is 3.650.640. In 2020 for elementary schools, each school should have 40 PCs, for junior high school, each school should have 60 PCs, for

senior high schools, each school should have 108 PCs and for university level, each university should have 240 PCs. The author still doesn't know whether this was implemented successfully or not because there no follow-ups report found in the UNESCO database or within the Ministry of Education in Indonesia database.

No.	Level	Number of School	Σ Ideal of PCs	Ratio 1 School : Σ Komputer			
				2010	2015	2020	2025
1.	SD	144.228	1.442.280	1 : 10	1 : 20	1 : 40	1 : 60
2.	SMP	28.777	5.75.540	1 : 20	1 : 40	1 : 60	1 : 80
3.	SMA	10.762	387.432	1 : 36	1 : 72	1 : 108	1 : 144
4.	SMK	7.592	273.312	1 : 36	1 : 72	1 : 108	1 : 144
5.	SLB	1.686	8.430	1 : 3	1 : 9	1 : 15	1 : 20
6.	MI	21.529	215.290	1 : 10	1 : 20	1 : 40	1 : 60
7.	MTs	13.292	265.840	1 : 20	1 : 40	1 : 60	1 : 80
8.	MA	5.648	203.328	1 : 36	1 : 72	1 : 108	1 : 144
9.	PT	3.532	282.560	1 : 80	1 : 160	1 : 240	1 : 320
	Total Number	237.046	3.650.640				

Sumber: Indonesia Educational Statistics in Brief 2008/2009, Balitbang Kemdiknas 2009

Figure 5. PCs Projection and Ratio Needed by Schools 2010-2015 (UNESCO, 2013)

For the rural area the ICT was implemented with 14 learning resources center utilized by solar panel, parabola dish and LAN (UNESCO, 2013). Unfortunately, there is no progress report for ICT implementation in both school levels or rural area within ministry of education in Indonesia database or the UNESCO database. To develop PDP in OER the author strongly suggests that the infrastructure should be ready for used, because it needs strong Internet connectivity and some hardware specifications.

Deep Review of Indonesia Teacher's Profesional Development in ICT

Based on the Farrel & Wachholz report (2003), there are several attempts for teachers' PDP in ICT, one of them is the collaboration of Pustekkom and the Directorate General of Primary and Secondary Education (DGPSE) which trained some 800 high school teachers for computer-assisted learning. The groups of teachers were trained in using ICT, create digital learning materials and tools for their own pedagogical practices (Farrel & Wachholz, 2003, 2003). The purpose of this PDP is the teachers will be able to provide their own learning instruction tools, but the objectives have not been met yet because they still using tools provided by Pustekkom rather than creating one for themselves (Farrel & Wachholz, 2003). There is also a basic computer training provided by APEC Cyber Education Network (ACEN) in 2001 and continued by National Office for Educational Research and Development (Balitbang) for implementing the e-learning platform in 2002 (Farrel & Wachholz, 2003).

We see that there is a lot of training that has been provided but unfortunately, not all the PDP meet the expected results. There are due to multiple factors, first is limited teachers' participations due to training location, time, and opportunity (Yusri, Iin Karmila et. al, 2013), second is a lack of motivation as mediation toward teachers' readiness to apply ICT in teaching and learning (Compriady, 2015). This second problem affects teachers' knowledge, skills, and usage of ICT. Third is teachers are lack of design thinking and

disposition, forth is no strategic plan in implementing ICT in education nor a teachers' competency standards in ICT, fifth is the government at that time focuses on basic welfare and political stabilization because of mid-crisis in 1997, the last one is the learning content for using ICT is limited in Indonesian language (Farrel & Wachholz, 2003).

For the first problem, the author suggests that the government provide PDP in ICT in many types, not only face to face PDP, in-house training, web based, and blended PDP but the mobile learning for ICT training as well. This is to remove geographical challenge, cost, and time problem so that teachers' participation can be increased. For the second problem, accordingly develop a positive attitude toward ICT in education Copriady (2015) suggests that the government provides facilities to train teachers and advocate for technology's advantage to the teachers and students alike. For the third problem, the author suggests that teachers develop technological pedagogical content knowledge (TPACK) to resolve technology integration issues related to ICT. The forth problem, the author suggests the government continue to develop ITed policies and teacher's competency standards in ICT, those policies will be the guideline for all schools in Indonesia to create their own teachers' PDP or by governments' initiative. For the second problem, the author suggests that if we want to have a total reform in education then the education must be a priority for the nation's development, consider the education's reform is align with sustainable growth of nation's economy (Salas-Pilco & Law, 2018). And for the last problem, the author suggests that there should be a budget to translate the learning content into Indonesian mother's language because not all the teachers have the competence to understand English.

Deep Review of Indonesia Open Educational Resources

Based on the literature review, Indonesia has developed an open educational resource which is Rumah Belajar and I-OER. In Rumah Belajar, there are a total of 779.365 users divided

by 224.394 teachers and 554.971 students (Ministry of Education in Indonesia, 2019). Based on the UNESCO report (2013), there were 3.7 million teachers and 51.3 million students in Indonesia, in other words, the platform has just been used by 1% of the total of teachers and students.

Another platform is I-OER developed by the University of Indonesia. In the website, it is said that it has acquired 50 universities to collaboratively develop the website's content (I-OER, 2019). Then, based on the UNESCO report (2013) there are 3.696 higher education institutions in Indonesia, so the website acquisition is still 1% of the total universities. It is very sad to see how the platforms are still not acquiring a lot of users even though the material is free and could be accessed anywhere and anytime.

Now, we tried to compare the government-made OER with the private-made OER. One of the private-made OER in Indonesia are SUAKA-UT made by Open University (Universitas Terbuka). They made the OER within 4 scoops which are faculty of science, faculty of social science and political science, faculty of education and graduate program. They have made an OER within K1 to K12 education level in different website. Unfortunately, the author didn't find the exact data of how many users are in those websites. But this movement made by UT were very promising and a great start to support the OER movement.

After we see that the open educational resources are still not used by many students and teachers, the author suggests the government focus on acquiring a lot of users by digital advertising or collaborating with a lot of schools or higher education institutions. For digital advertising, the government could use TV ads or attach their ads in social media platforms, or they could attach it too in Google ads. Moreover, creating ads in digital world is cheaper than in conventional way.

Discussions Indonesia Teacher's PDP in OER based on U.S. Profesional Development Framework

Indonesia teachers' ICT competency standards are still in development although the draft of the policy exquisite in the first look. It covers most of the areas for ICT development including policy, curriculum & assessment, pedagogy, ICT, organization & administration, and professional development. Their knowledge is based on their digital literacy skills which is one of the 21st-century skills. So, the author agrees for the first look of the draft and looking forward to the full text of teachers' competency in ICT.

Furthermore, OER is still in development until now, so PDP regarding OER is still relevant. The author suggests that the PDP should investigate eight key features from U.S. Professional Development Framework which are the content focus, active learning, coherence sustained duration, collective participation, uses models of effective, coaching and expert support then offers feedback and reflection.

The training should focus on just using OER as a learning tool, the training should define which OER that will be used to demonstrate the training is it <http://belajar.kemdikbud.go.id> or <http://i-oer.cs.ui.ac.id/> or maybe another OER collaborate with third-party institutions. Then, the training should be active learning or so we called student-centered learning, the teachers must have a group project like developing content materials together or maybe discussing their own experience with other teachers, so they don't need to passively listen to the instructor. Another one is the training' learning material should be coherence to the recent curriculum and follow the guideline of ITED policies. The training shouldn't be too short or long, it may be two days in a row. The training should provide coach and expert that is expertise in the OER field so they could have direct feedback from the coaches. The coaches will be responsible for 5 teachers, for example, cater to the teachers' individual needs. And finally, post-training there should be a development of a community of practice in a form of Facebook group or Whatsapp group so everybody could follow up their training result and learn again from each other's teaching in the future.

The author didn't find any factors related to education differences in every province to develop an effective PDP in U.S, in other words there's no need to implement personalized professional development program in each province. But, the author suggests if there is any area that hasn't implemented ICT in their education then the government should focus on building the infrastructure first, after that they could start to teach the teachers how to integrate ICT in their learning process. This could be seen by thorough research which area is still vulnerable in implementing ICT in education.

5. Conclusion

In conclusion, Indonesia is still developing the ICT in education in its nation especially in OER Indonesia still has a lot of homework regarding infrastructure, the acquisition of the OER platform, and the readiness of teachers' ICT competency. The author suggests some teachers' PDP in OER based on the U.S. professional development framework that may be beneficial in the future PDP like the content focus, the training must be active learning, coherence and should be done within 2 days. Furthermore, there should be coaches and experts to provide direct feedback and in the post-training, there should be a creation of a community of practice to follow-up each other's teaching in the future. Each province has their own education priorities, the government should know if the province is ready to be taught how to integrate ICT in their education or not. If it is ready then the government should focus on enhancing teachers' quality with PDP, if it's not ready then the government should focus on building the infrastructure for ICT implementation first.

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