

DUAL MODE IN-SERVICE TRAINING AS AN ALTERNATIVE MODEL FOR TEACHERS PROFESSIONAL (PD) IN INDONESIA

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Abstract

To improve the quality of education, the Indonesian government has been launching a number of teachers' professional development (PD) programs. These, however, brought little impact on the improvement of teaching practice and students' achievement. This paper reports a two-year research project on a dual mode in-service training program that combines a classical in-service training and training via internet. The first year focused on identifying teachers' professional needs while the second year focused on the development of training packages and tried out the training model. The study reveals that science teachers need training both on subject matter and pedagogy. In addition to the traditional face to face workshop, they also expect online training via internet since it allows them to have flexibility in accessing the materials as well as consultation with experts. This study suggests that participation in dual mode teachers PD improve teachers' understanding of subject matter and pedagogy.

Key words: dual mode; in-service training; professional development; science teacher

Introduction

Students' poor achievement in the national exam and internationally organized comparative studies, such as PISA (OECD/UNESCO-UIS, 2003) and TIMSS (Gonzales, Guzman, Partelow, Pahlke, Jocelyn, & Kastberg 2004) have drawn government attention to improve education quality in Indonesia. Although students' achievement is a complex interplay of a number of factors, the lack of teachers' teaching competencies was considered to be the core problem. A number of programs were launched to improve teachers teaching competencies.

Trainings, workshops, and improving education level of the teachers are some of PD programs launched by the government. In Indonesia, there are a number of parties involved in teachers PD, such as the Directorate General for the Improvement of Teachers Quality, Directorate General for Lower and Secondary Education, Directorate General for Higher Education, local education authority, teachers associations, and Non Government Organizations (NGOs).

Despite a number of teachers PD that have been conducted, teachers teaching practice do not significantly

change. It seems that PD programs conducted do not bring any changes in teachers teaching practices. A survey on the impact of teachers PD programs shows a number of weaknesses of the previous PD programs (Widodo, Riandi, Amprasto & Wulan 2006). First, only limited teachers actually were actively participated in the programs. In many cases teachers participated in the programs are actually the same teachers. Due to a number of reasons, teachers appointed to participate in the PD programs are very often teachers who have involved in the previous programs. As a result, although there are a number of PD programs, the participants actually do not change significantly. Second, many of the PD programs do not sufficiently address practical issues. PD programs are usually top down in nature with predetermine subjects, strategies, instructors and time. As a result, teaching problems faced by the teachers in their teaching practice remain unsolved. Third, subject matter and methodology are not addressed in integrated way. Training on subject matter usually does not involve the pedagogical aspects and vice versa. As a result, teachers may have good understanding on subject matter and teaching methods but they are unable to combine them to improve their practice. Fourth, teachers PD programs were conducted at training centers. Teachers have to leave their school during their participation. For a school that can find other teacher to take over the class left by the teacher, this may not create a problem. However, many

schools are not in such position. As a consequence, students are left without a teacher.

Based on their analyses of PD programs conducted in Caribbean and Indonesia, Adey, Hewitt, Hewitt, and Landau (2004) suggest that PD programs should take into account the following issues. First, teachers should be involved in designing the program. Teachers are not simply users of the programs, but they have to be involved in the process of designing the programs. Second, changes are difficult. Teachers should be treated for as partners rather than objects that have to change. Third, Classroom coaching is important for teachers to apply the newly learned skills or knowledge. Fourth, changes are slow and unpredictable. They move backward and forward. The success of learning and applying what teachers learn from PD programs is influenced by the extent to which teachers perceived the program as addressing their needs as teachers and the level of support from the school and how the teacher was able to interact with colleagues and make changes in the classroom (Watson & Manning 2008).

The number of teachers that need to be trained, the limited funding and the geographical situation of Indonesia create even a difficult problem to conduct PD programs that last and cover all teachers. The number of teachers in Indonesia is clearly beyond the capacity of the PD providers. At the current situation there is only one training centre for science teacher that should serve thousands of science teachers. The common strategy was to

train a number of teachers through a series of Training of Trainers (ToT) and then allow them to train other teachers. This strategy, however, seems to be less effective.

Due to the financial situation, government funding for teachers PD could not cover all teachers. Indeed, there were a number of large scale projects, such as PKG, that was financially supported by UNESCO, UNDP, and World Bank. Although the project was actually successful in improving teachers' competencies, however, this success was not last for very long. The lack of financial support is usually a key factor that limits a program to maintain its success record. In the last years there is an initiative to adopt a Japanese PD called Lesson Study (Saito, Harun, Kuboki & Tachibana 2006). Although lesson study was believed to be the Japan keys success to improve their education quality, it seems, however, that this program does not work very well in Indonesian context.

The geographical situation of Indonesia brings a unique problem to conduct a nation wide teachers PD program. As an archipelago country with more than 10,000 islands, teachers are spread in hundreds or even thousand islands. Some of the islands are very isolated that required a teacher to travel a couple of days to reach the training centers. With the conventional strategy, it is impossible to conduct teachers PD program that covers all teachers.

Dual Mode PD Programme

One of alternative solutions to the current problems is using ICT to

support teachers PD. Internet is very popular using in education, especially for the purpose of supporting students learning (Urthahne, Schanze, Bell, Mansfield & Holmes 2010). One form of internet utilization is e-learning. Although e-learning is more common in higher education (Ballis & Fetscher 2009), some schools start to introduce e-learning. Research on the use of internet at schools (Mistler-Jackson & Songer 2000) reveals that internet can improve students' motivation.

There are a number of issues related to the use of e-learning in schools. First, some schools are not well-equipped with computers and internet connections. As a result, students do not have sufficient access to make use the e-learning materials. More serious issue, however, is pedagogy (Sorensen, Twidle, Chils & Godwin 2007). The pedagogy currently applied at schools is developed prior to internet time. Most teachers are not well-prepared to teach using ICT in their classroom. As indicated by research on the use of multimedia (Zacharia 2003), the use of computer simulations improve not only students' understanding but also broaden teachers' views of science teaching. This suggests that ICT benefit the students as well as the teachers. Research on pedagogy that incorporate ICT is needed to develop a more suitable pedagogy.

Currently e-learning is more common in preservice training rather than in inservice training (Sorensen, Twidle, Chils & Godwin 2007). Although a number of research (e.g. Noh, Cha, Kang & Scharmann 2004) suggest that teachers express their

interest in participating online training, there are also teachers who prefer face to face training. A combination of both conventional training and online training can be an alternative model of teachers PD program.

It is the aim of this study to develop an alternative teachers PD that overcome the weaknesses of the conventional PD program. This study proposes a dual mode teachers PD program in which some part of the training are conducted in conventional ways and the other parts are delivered through e-learning program. Dual mode teachers PD have a number of advantages over the conventional teachers PD. First, in dual mode PD teachers do not need to leave their class for very long since some part of the courses can be conducted via internet.

Second, teachers have the flexibility to learn. Teachers may access the learning material in their convenient time. Third, since internet can be accessed almost everywhere, geographical hindrance should not be an issue any more. Finally, dual mode PD allows teachers to share and consult their individual teaching problems with other teachers and the expert via internet.

Method

This study follows a Research and Development (Borg & Gall 1989) that consists of three main steps, i.e. 1) need assessments of teachers’ professional needs, 2) developing model, and 3) trying out the model. In this study, the first step was conducted in the first year while step 2 and step 3 were conducted in the second year (Figure 1).

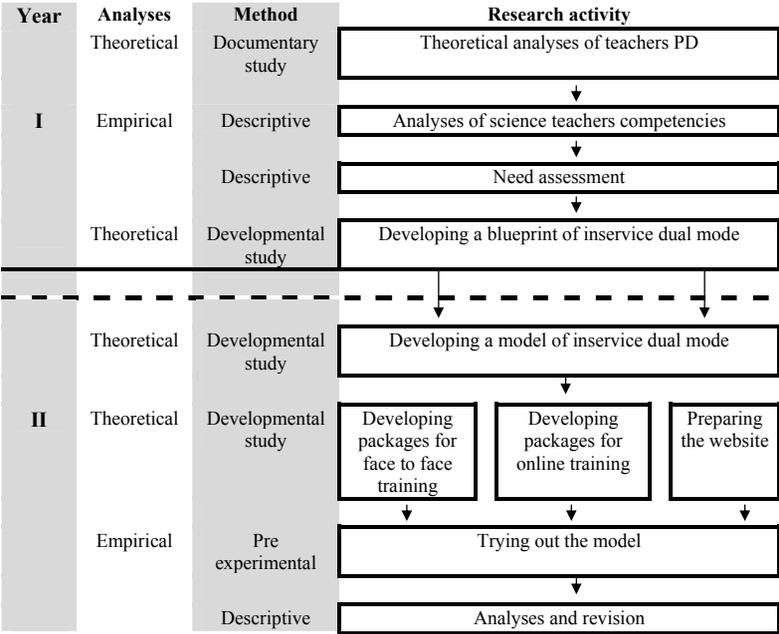


Figure 1. Research framework

Science teachers from three districts in West Java Province, i.e. Bandung, Karawang, and Sumedang participated in the study. The samples are chosen from teachers participating in Teachers Forum from the three districts. Teachers Forum is a PD forum which members are science teachers in the districts. Teachers are scheduled to regularly meet every week to discuss issues related to science teaching and to improve teachers' competencies. A total of 183 teachers participated in this study.

Findings

Types of PD programs

As presented in Table 1, face to face training and web-based training programs are two types of PD programs expected by teachers. Many teachers expressed that they need to participate in training either face to face training or web based training. This finding suggests that teachers are getting aware of the importance of improving their competencies.

Table 1 Types of PD programs expected by teachers

No	Types of PD program	Percent
a.	Seminar	36.6
b.	Workshop	20.2
c.	Training	89.1
d.	Courses	23.0
e.	Web-based training	46.4

The number of teachers who want to participate in a web-based training program is relatively high (46.4%). This suggests that teachers need a new model of PD program. The finding also

suggests that teachers are quite well informed with the latest development of communication technology and its application to education.

Pedagogical content of the training

Table 2 shows that teachers need training on almost all pedagogical aspects. The only aspects that do not draw teachers' interests are curriculum and planning a lesson and assessment. Teacher high interest in teaching models, teaching media, laboratory works, and web-based learning programs suggest that teachers are very focus on how to organize lesson in the classrooms.

Table 2 Pedagogical content needed by teachers

No	Pedagogical issues	Percent
a	Curriculum and planning a lesson	31.1
b	Teaching models	73.2
c	Assessment	32.2
d	Laboratory works	60.1
e	Teaching media	66.7
f	Web-based learning program	61.7

Subject matter (content) needed

Understanding of content is an essential aspect of teachers teaching competencies. Without sufficient understanding of the content teachers cannot develop suitable teaching. Research conducted by Jeanpierre, Oberhauser and Freeman (2005) suggests that teachers understanding of subject matter influence the success of a PD program.

Genetics and biotechnology are two biology content needed by teachers (Table 3). It is very understandable since compare to other biological topics, the development of genetics and biotechnology are very fast in the last few years. Moreover, both topics are considered as abstract and difficult topics both by students and teachers (Johnson & Stewart 2002; Venville, Bribble & Donovan 2005).

Table 3 Biological content expected in the training

No	Concept	Percent
a	Cell and tissues	38.3
b	Microbiology	51.4
c	Genetics	65.0
d	Biotechnology	72.1

Training approach

PD programs were commonly conducted in whole class settings. The topics of the program were generally a predetermined topic decided the PD providers. There was very limited opportunity to discuss individual problems of the participants. As a consequence, teacher individual problems are rarely discussed. Table 4 shows that PD programs should be conducted in both individual and classroom settings.

Table 4 Training approach

No	Training approach	Percent
a	Individual	6,6
b	Groups	15,8
c	Combination of individual and group	83,6

Teachers computer skills

Good computer skill is a prerequisite for teachers to participate in a web-based training program. Table 5 shows, however, that teachers' computer skills vary significantly. Most teachers mention that they can make use of word processor and power point presentation. However, there are a number of teachers who do not know at all how to use a computer.

Table 5 Teacher computer skills

No	Computer skills	Percent
a	Word processor	73.8
b	Presentation (power point)	42.6
c	Numerical and simple calculation (excel)	33.3
d	Graphics (Photoshop)	4.9
e	Programming (macromedia)	4.4
f	No skills	16.4

Teachers skills in using internet

There is a great variation of teacher skills in using internet (Table 6). On one hand there are a number of teachers who are very familiar with internet but on the other hand there are a number of teachers who have no internet skills at all. Most teachers uses internet to find information and to communicate with others.

Table 6 Teacher internet skills

No	Internet skills	Percent
a	Using internet to search for information	57.4
b	Using email	29.0
c	Internet as learning resources	25.7
d	Developing website/blog	9.3
e	No skills	40.4

Developing training website

A training website called “Pusat Kajian Pembelajaran Sains” (<http://biologi.upi.edu/pkps/>) was developed to provide teachers with learning resources. Resources available in the website includes literature on teachers professional development, such as

how to conduct classroom research and how to write publication articles, articles on teaching methods, articles on teaching media, electronic modules, and school electronic books. These resources can be accessed by teachers who have registered as a member of the project (Figure 2).



Figure 2 Training website

Dual mode training and improvement of teachers' competencies

In the second year a dual mode teachers PD that consist of face to face PD and online PD was arrange for the teachers (Figure 3). In the first phase, there was a conventional face to face program that involved teachers and lecturers. During the session, training on subject matter, pedagogy and ICT was provided. By the end of the session, a step by step guidance was given on how to access the training website. In the second phase, teachers individually access the resources provided in the training website. By the time a teacher

access the website they can access the training materials as well as having a discussion both with their colleagues teachers and with the instructors.

As presented in Figure 4, teachers participated in dual mode training program show significant improvement of their understanding of subject matter (genetics) that was considered as difficult a subject (Johnson & Stewart 2002, Venville, Bribble & Donovan 2005). Indeed, the level of the understanding was still low but most teachers show significant improvement of their understanding.

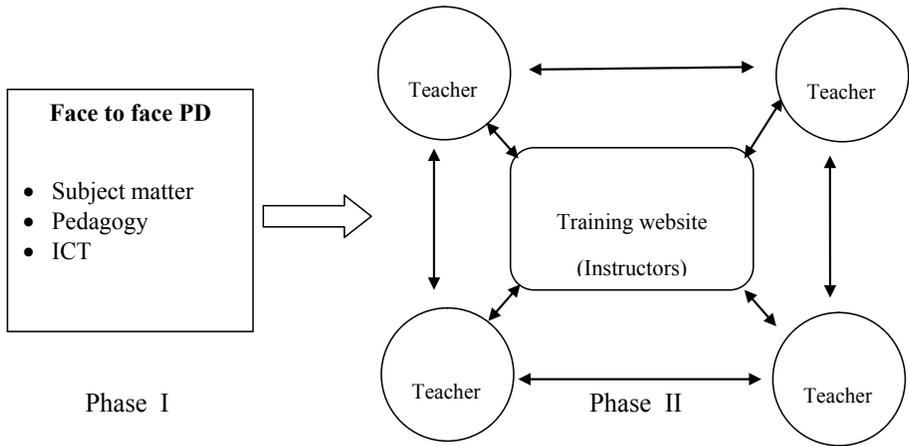


Figure 3 Dual mode PD program

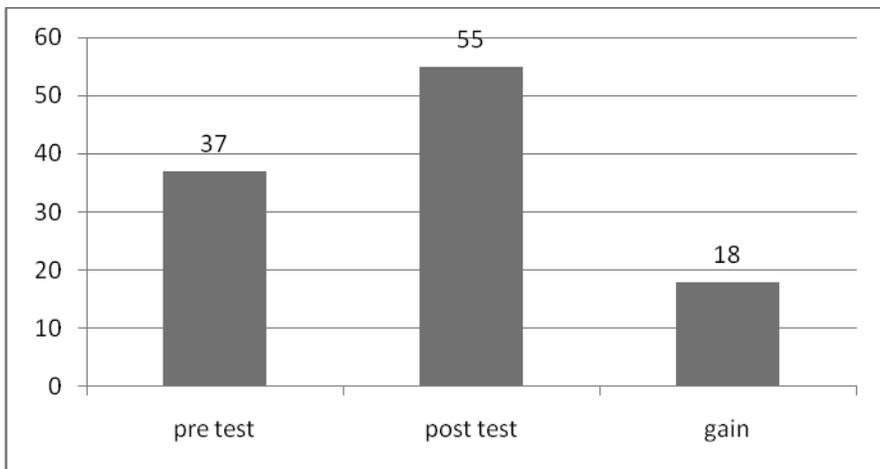


Figure 4 Teachers understanding of genetics prior and after the training.

Another topic of the training was writing test items. Teachers are asked to write test items that required different thinking levels (recall, understanding, application, and analyses). After participating in the training, teachers

show significant improvement of their competencies (Figure 5). Prior to the training, only few teachers can write test items on application and analyses but after the training there was a significant improvement.

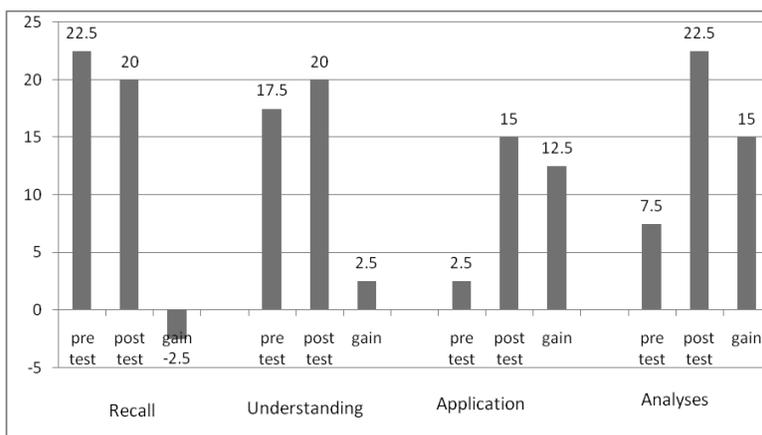


Figure 5 Improvement of teachers competencies in writing test items

Discussion

Results of need assessment conducted in the first year suggest that dual mode PD program meet the expectation of the teachers. Many teachers express that web-based PD program is an alternative PD program that suits their conditions. Web-based PD program has a number of differences to the common e-learning program designed for students. Participants of e-learning are relatively homogenous in terms of their knowledge background, computer and internet skills, and time schedule. As a result, e learning program do not encounter problems observed in dual mode PD programs. In dual mode PD programs, teachers are very different in their knowledge background, computer and internet skills, and opportunity to access the learning resources.

In terms of the computer and internet skills, for example, there are a number of teachers who are very knowledgeable but there are also a number of teachers who do not know

how to operate a computer. In this dual mode PD program, therefore, participants were provided with trainings on using computer and internet. These training are needed because computer and internet skills are prerequisite to the participation in the program, although the PD program initially did not include computer and internet training.

As identified through need assessment, teachers basically need training on three issues, i.e. computer and internet skills, pedagogy, and content knowledge. In the previous PD programs, training on pedagogy and training on content are usually conducted separately. This separation did not help teachers to apply the training into their classroom (Gunstone, 1999). For this reason, training on content and pedagogy should be conducted in an integrated training program.

Data on improvement of teachers understanding of subject matter and pedagogy show that participating in dual mode training program help

teachers to improve their competencies. Another important aspect emerge from this study is the improvement of teachers independence. Teachers realise that they have to keep improving their competencies as part of their professional status (Stigler & Hiebert). Being independent learners and take the responsibility for their own PD is a key factor for the sustainability of any PD program. Previous experience with PD programs in Indonesia, e.g. PKG (Teachers Forum) strongly suggest that even a successful PD program cannot sustain because teachers did not develop commitment and independence (Adey, Hewitt, Hewitt & Landau 2004). As consequence, as the initiator leave the PD program, the program will slowly come to an end. The use of internet should open teachers mind about the importance of improving their professional skills and therefore encourage them to participate in PD programs (Yumuk 2002).

Conclusion

Need assessment conducted to science teachers reveals that teachers need PD program. Dual mode PD program can be one of the alternatives since many teachers reveals that they want face to face training and a web-based PD program. Since a number of teachers reveal that they do not know how to operate computer and to use internet, training on both topics need to be provided. Analyses on pre and post participation suggest that teachers participated in dual mode PD show noticeable improvement in terms of their understanding of subject matter

and their pedagogy. In addition, teachers also show motivation and responsibility on the improvement of their professional competencies.

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