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Improving Competency Management of Public Health Center In Indonesia Using The Problem Based Learning Model

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Abstract

The ineffectiveness of the existing training model in Indonesia, especially for remote area health center managers, needs to develop a Problem Based Learning model that is appropriate to the problems in the area. The research method uses quasi-experimental, pre-test and post-test control group design. The study subjects consisted of 26 Public Health Centre heads from remote areas in South Sulawesi Province. The data collection instrument used was pre-test and post-test with Alpha Cronbach reliability coefficient of 0.938. The results showed that group competencies taught with Problem Based Learning ($\bar{X}$=88.72) were better than group competencies taught by direct learning methods ($\bar{X}$=73.33). Results showed a significant difference between the experimental group and the control group (p=.022). The correlation coefficient between the post-test score and the answer score of the Problem Based Learning worksheet shows positive significance (p=.000). The use of Problem Based Learning in teaching planning material results in the planning of community health centers in accordance with the problems found in the working area.

Keywords:

problem based learning, managerial competence, training education, public health center

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Introduction

Primary health care in Public Health Centre are still relevant to anticipate future health challenges, such as limited access and quality of service, demographic and epidemiological trends, policy changes (Bappenas, 2018), and new threats due to climate change and global environmental conditions (Barrett, Charles, & Temte, 2015; Harper & Armelagos, 2010). Facing these challenges Public Health Centre must have good performance because empirical analysis in developed countries concludes that the strength of their health system is determined by the strength of the performance of the primary health care system (Macinko, Starfield, & Shi, 2003). One of the ways to strengthen primary health care in Indonesia is through training in Public Health Centre management. The training is carried out in stages starting from the training of Trainers at the national level to the training of Public Health Centre managers conducted at the provincial and district/city levels. Based on the author's observations, the implementation of the training was not in line with expectations, marked by the low achievement of competencies at the end of each training. The conventional model learning process has been complained, and the material seems less attractive because the role of the facilitator is still dominant, the task is fragmented and does not challenge participants to produce good planning work.

Public Health Centre management activities begin with planning. Planning is the basis of all efforts to mobilize resources to overcome health problems in the work area of the Public Health Centre. Planning activities are carried out at certain stages (Handoko, 2003), but in general the planning of Public Health Centre is still made spontaneously, intuitively and subjectively just fulfilling the formal requirements to get the budget. The inability to make a plan is related to the declining performance of Public Health Centre in Indonesia since the era of decentralization, especially in remote and very remote areas, which amount to 2,277 Public Health Centre (Bappenas, 2018).

Limited resources at the Public Health Centre require managers with adequate competence. Competence is a characteristic that underlies a person and is related to the effectiveness of individual performance in his work (Boyatzis, 1982; Lyle M. Spencer Jr., 1993). Competence is defined in the context of certain knowledge, traits, skills, and abilities (Kak, Burkhalter, & Cooper, 2001). Although the competencies of public health professionals are considered to differ from one country to another, there are some broad agreements regarding core competencies, such as communication, information processing, teamwork, leadership, problem-solving, planning, and decision making (Loureiro, Sherriff, & Davies, 2009).

One of the efforts to increase competency is through education and training. A number of studies have shown the positive impact of training on human resource

competencies and their effects on organizational performance (Mansour, 2015; Weiss, Elouard, Gerold, & Merten, 2018). One study on health communication training for child health service medical assistants stated that 93.5% of participants considered the training program to be very good because it could positively change their perceptions and skills in supporting their work (Brown et al., 2013). Conversely, inadequate training will have an impact on the low competence of graduates which ultimately affects organizational performance. There was a mismatch between the health system needs and the education and training of health workers (Pálsdóttir et al., 2016a). As a result, organizations cannot see training activities as a profitable investment (Fletcher, 2000). Even improper training can hurt the health economy globally (Pálsdóttir et al., 2016b).

Problem Based Learning (PBL) attracts the attention of many people, especially those involved in the development of human resources because it enables the achievement of systematic competence. PBL enables learners to systematically acquire the competencies needed to carry out comprehensive planning and decision making on a comprehensive assessment, using practical skills, compromises, negotiations, teamwork, and leadership (Loureiro et al., 2009). The PBL model is not specifically intended to improve academic skills, but also to empower capabilities or abilities (Sonmez, Duygu - Lee, 2003). The PBL model can integrate knowledge and practice well in learning (Savery, 2006; Stankunas, Czabanowska, Avery, Kalediene, & Babich, 2016) and can also be integrated into various ways, tailored to the needs of the institution (Peeples et al., 2017). Research at the Dental School in India, students desire to have active student-centered learning with more clinically oriented teaching using audio-visual aids with comprehensive patient care training to assist in their future clinical practice (Sen & Kundabala, 2018). Other research suggests the need for strategies involving new teaching and learning methods to increase independent learning and learning satisfaction (Lee & Lee, 2018). Although a number of studies have provided quite impressive evidence regarding the superiority of Problem Based Learning towards improving academic skills, several studies in the health field state that there is no significant difference between PBL and non PBL (Almasoudi, 2012; Applin, Williams, Day, & Buro, 2011; Choi, Lindquist, & Song, 2014; Dianati & Adib-Hajbaghery, 2012; Kazemi & Ghoraishi, 2012; Thabet, Taha, Abood, & Morsy, 2017).

Problem Based Learning is the choice of developing various active learning methods, collaboration, feedback, and so on (Woods, 1996), but empirical explanations in the education and training of health workers have not been done much. Therefore this research study focuses on Problem Based Learning as an alternative learning model in education and training. The purpose of this study was

to test the effectiveness of the Problem Based Learning model in improving the competency of Public Health Centre management.

Method

Research Model

This research uses quasi-experimental, pretest-posttest control design. The study subjects consisted of 26 heads of Public Health Centre from remote areas in South Sulawesi Province. The research subjects consisted of two groups, namely the experimental group and the control group. The research subjects were not randomly chosen to be included in the experimental group and the control group (Setyosari, 2013).

The experimental group was interviewed with the PBL model (X_1) and the control class was taught by the direct learning method (X_2) as illustrated in Table 1. Before learning was carried out, both classes were given a pretest (0_1 and 0_3) to measure the equality of the initial abilities of the participants. After the learning process is complete, participants are given a post-test (0_2 and 0_4) to compare the competencies of learning outcomes between before the intervention and after the intervention, and between the experimental class and the control class. This design is carried out with a careful treatment and observation schedule in accordance with the PBL stages made in Table 2.

Table 1.

Research Design Pre-test and Post Test

Subject	Pre Test	Implementation of Learning	Post Test
Group A (Experiment)	0_1	X_1	0_2
Group B (Control)	0_3	X_2	0_4

Data Collection Tool

1) Questions Pre and Posttest

Public Health Centre managerial competence was measured by pre and posttest questions, both the experimental group and the control group. The test questions consist of 15 questions, which have Alpha Cronbach reliability coefficient of 0.938. This test includes questions about understanding Public Health Centre planning and problem-solving methods.

2) Worksheets

The questions on the worksheet are open questions on the topic of Public Health Centre planning by considering the subtopics involved in the competency test (pre and posttest). The worksheet is designed to adopt practical steps for implementing

PBL in teaching, according to Arends (Arends, 2012). This design went through the validation stage of three competent experts, two of whom were practitioners in training and one expert in education. The validation results obtained an average score of 79.50 or a category valid enough to be used.

Data Analysis

Data analysis was tested by independent sample t-test to determine whether there were significant differences in competency scores between the experimental and control groups. Paired sample t-test to determine whether there was a change between pre-test and post-test competency scores in each group. And Pearson's correlation coefficient was calculated to determine whether there was a significant correlation between the scores obtained from the achievement of the post-test competencies and the results of the worksheet questions.

Creating a Problem Based Learning Scenario

PBL is assisted by a worksheet containing five stages of learning. These stages lead the participants to learn gradually to gain an understanding of the concept of health center planning and the ability to solve problems. Learning is planned to take place in 8 meetings following the learning schedule prepared by the training committee.

Table 2.

PBL Implementation Plan

Session	Course Hour (45 minutes)
PBL Session I (Meeting -1)	2 CH
PBL Session II (Meeting -2)	3 CH
PBL Session III (Meeting 3-4)	4 CH
PBL Session IV (Meeting 5-7)	6 CH
PBL Session V (Meeting -8)	2 CH

At the beginning of the meeting, the facilitator explains about PBL and learning objectives, and divides the participants into small groups of 2-3 people. Participants continue to enter the core activities with group learning, as follows:

PBL Phase I aims to find out the performance of Public Health Centre. The chosen scenario is the problem of "Public Health Centre performance." Participants discuss these scenarios and determine performance outcomes based on original Public Health Centre data, so there is an impetus to resolve problems that occur in the work area of the Public Health Centre by making plans.

PBL Phase II aims to find a model of the problem-solving process. At this stage, participants construct the concept of Public Health Centre planning and problem-

solving methods by answering questions in the worksheet covering topics: planning preparation, data collection and analysis, and methods of problem-solving processes.

PBL Phase III aims to produce a health center planning design. At this stage, participants make a plan by applying the problem-solving process model as follows: 1)Data Analysis, 2)Formulation of the problem, 3)Identification of the problem, 4)Determine the priority of the problem, 5)Finding the cause of the priority problem, 6)Determine how to solve the problem , and 7)Prepare a plan for implementing activities.

PBL Phase IV aims to produce planning work. At this stage the participants developed the Public Health Centre planning design in the form of posters to display and explain the results to all participants.

PBL Phase V aims to evaluate the results and the learning process. At this stage the participants were asked to reflect on the learning process that had been carried out and the obstacles experienced in designing the Public Health Centre planning. Each participant is given the opportunity to express their experiences that are different from other participants. The facilitator must identify the experiences of participants who support or who experience difficulties in the learning process.

Results

PBL Implementation Results

Some planning designs were successfully made by the participants in accordance with the original Public Health Centre data. As seen in Table 3, there were four groups that used the original Public Health Centre data but only three groups succeeded in completing the design completely. While one group did not identify the problem in the problem-solving process. Although the method of prioritizing the problem is correct, without identifying it will not describe the specific problem formulation, the gap is not clearly stated qualitatively and quantitatively and is not systematically formulated.

Table 3.

Planning Design in Accordance with Original Data of Public Health Centre

Group	Data Analysis	Identification of Problems	Determine Priority of Problems	Finding The Root Cause of Problems	Determine How to Resolve Problems	Activity Implementation Plan	Results
Group I	√	√	√	√	√	√	Complete
Group II	√	√	√	√	√	√	Complete
Group III	√	√	√	√	√	√	Complete
Group IV	√	-	√	√	√	√	Incomplete

The results of implementing PBL are described as follows:

In **PBL Phase I**, Participants found performance problems in all Public Health Centre, namely the Healthy Family Index (IKS) still below the standard. To solve the problem, participants model the problem-solving process in **PBL Phase II**, namely data analysis, problem identification, prioritizing the problem, finding the root causes of the problem, and determining how to solve the problem. Next, in **PBL Phase III**, participants applied a model of the problem-solving process using original Public Health Centre data. At this stage a Public Health Centre planning plan was produced. The problem-solving process is carried out as follows:

1) **Data analysis**; Participants present the results of the performance of Public Health Centre based on 12 indicators of healthy families, namely: (1) Families join the family planning program; 2) Mother gives birth at the health facility; (3) Babies get complete basic immunizations; (4) Babies get exclusive breastfeeding; (5) Toddler growth is monitored; (6)Patients with pulmonary TB get treatment according to the standard; (7) Patients with hypertension undergo regular treatment; (8) People with mental disorders get treatment and are not abandoned; (9) No family members smoke; (10) The family has become a member of JKN; (11) Families have access to clean water facilities; and (12) Families have access and use healthy latrines.

2) **Identification of problems**; Based on the results of data analysis, participants identified specific problems for each Public Health Centre performance indicator by comparing the performance achievements and targets. A gap between achievements and targets is made a statement of the formulation of the problem, for example: "There are still 80% of pulmonary TB patients who have not received treatment according to standards at Public Health Centre X in 2017". The results of the identification of problems found that in general the achievements of the Public Health Centre program were still below standard.

3) **Determine priority problems**; Limited resources and technology do not allow all problems in the Public Health Centre area to be handled simultaneously. Therefore, participants determine the priority of the problem by considering the

level of urgency, seriousness, and development of the problem. Examples of selected priority problems, namely: (1) patients with pulmonary TB have not received standard treatment; (2) Mother has not delivered at the health facility; (3) Patients with hypertension have not been treated regularly,_ and (4) Infants have not received complete basic immunizations.

4) **Look for the root cause of the problem**; Priority issues that are selected are searched for root causes using the "Ishikawa Diagram" method. The causes of the priority problems found include the number and quality of health workers at the Public Health Centre, Standard Operating Procedures (SOPs) not being implemented, budget constraints, inadequate medical equipment and medicines, no means of transportation of officers, lack of public awareness of healthy living, cooperation and lack of cross-sectoral support, wide and difficult-to-reach work areas, lack of health care support, not all people are taking BPJS insurance.

5) **Define the method of solving the problem**; the method of solving the problem is done by brainstorming, but in this way no agreement is reached between the participants in the group, so the problem-solving table is used by considering the level of urgency, seriousness, and development of the issue. Examples of how to solve problems that are selected are: (1) to overcome the high number of TB patients who have not received treatment according to the standard, it is suggested that TB staff and cadre training activities are proposed. (2) The problem of hypertension sufferers not yet doing regular treatment needs to be done counseling and carrying out routine sports health activities with the community, and (3) For the problem of infants not getting complete basic immunizations need to increase immunization visits and counseling involving parents of children.

6) **Activity Implementation Plan**; Participants make plans to carry out Public Health Centre activities according to planning guidelines that contain selected activities, for example: training of TB officers and cadres, construction of village maternity centers and training of village midwives, counseling and routine sports activities.

In PBL Phase IV, participants produced 4 planning posters, with the types of activities, namely (1) TB staff training and cadre training, (2) Village Health Pos development and village midwife training routinely, (3) regular health education and sports activities with the community, and (4) increase immunization and outreach visits involving children's parents. Posters were exhibited and explained the process to all participants. **PBL Stage V** is the final stage of PBL. At this stage an assessment of the results of planning products is carried out. Of the 4 posters produced, there were 3 that successfully described the planning process in full, one group was unsuccessful because it did not do one stage of the problem-solving process. At this stage the participants also reflected on their experiences in following the learning

process. Participants respond well to the learning model used especially with the help of worksheets that are considered very helpful in learning. Constraints faced by the participants included incomplete data from the Public Health Centre, poor internet access and limited time.
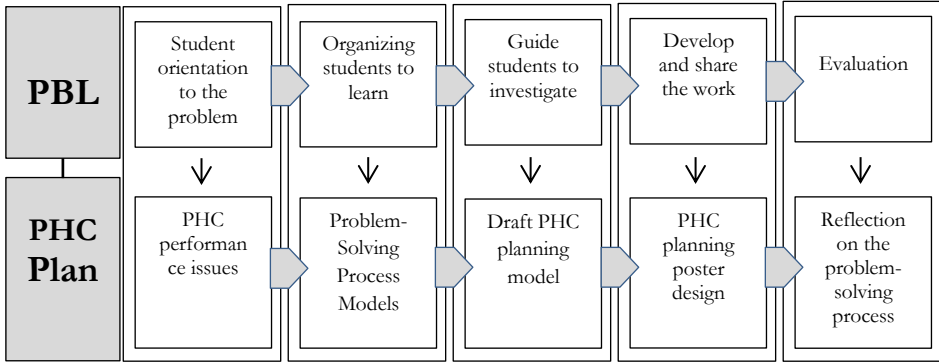

Figure 1.
PBL Implementation in Public Health Center (PHC) Planning

Statistical Test Analysis Results

Independent t-test results are used to determine whether there are significant differences between the pre and post-test competency scores in the experimental and control groups, shown in Table 4 and Table 5. And the results of the Paired t-test are shown in Table 6 and Table 7:

Table 4.
Comparison of Pre-test Competencies between Experiment Groups and the Control Group

Group	N	Mean	Mean Difference	p
Experimental	13	57.95	-3.08	0.672
Control	13	61.03		

Table 5.
Comparison of Post-test Competencies between Experiment Groups and the Control Group

Group	N	Mean	Mean Difference	p
Experimental	13	88.72	15.38	0.002
Control	13	73.33		

Table 6.

Changes in Pre-test and Post-Test Competencies in Groups Experiments and Control Groups

Group	Pre-test	Posttest	P
Experimental	57.95	88.72	0.000
Control	61.03	73.33	0.030

Table 7.

Comparison of Change in Percentage of Pre-test and Post-test Competency Scores In the Experiment Group and Control Group

Group	Median	Mean Difference	P
Experimental	30.75	18.46	0.022
Control	12.31		

Table 8.

Correlation of Post-test Competencies and Worksheet Answer Scores

	Worksheet	Experiment Group
	R	0,884**
Posttest	p	0,000
	N	13

Based on Table 4, there were no significant differences between the experimental and control groups according to the pre-test competency score (p> 0.05). While Table 5, according to the post-test competency score, shows that there are significant differences between the two groups that favor the experimental group (p <0.05). According to Table 6, the change between the pre-test and post-test competency scores was found to be statistically significant in both groups, namely experiment (p=0,000) and control (p=0.030), meaning there was a significant increase in competence in the experimental and control groups . Furthermore, in Table 7 it can be observed that the level of increase in scores before and after the tests in the two groups was significantly different (p<0.022).

Next, Table 8 is the result of Pearson's bivariate correlation analysis to measure the relationship between the scores of the post-test competencies and the scores of the answers of participants' worksheets in the experimental group. The results showed a positive and significant relationship (r=0.884 and p>0,000). These results indicate that PBL has a positive impact on increasing the managerial competence of Public Health Center.

Discussion

This research study departs from a number of issues regarding the poor performance of Public Health Center in Indonesia, especially in remote areas. This is partly related to the lack of planning capacity at the Public Health Center. To improve the competence of the managers, a management training center was held, but the implementation of the training was not in line with expectations, marked by the low learning outcomes in each training. The conventional model learning process applied in the training has long been complained about, the material seems less attractive because the role of the facilitator is still dominant, the task is fragmented and does not challenge participants to produce good planning work. This research focuses on problem based learning as an alternative model of learning in education and training.

The findings in this study indicate that there are significant differences between PBL and direct teaching models. The PBL model and direct teaching increase the value of participants at different levels who favor the PBL model. This means that problem-based learning is more effective in increasing the competency of participants' learning outcomes. Other research in the health sector also supports this finding, namely that PBL has an effective role in increasing competence (Albanese & Mitchell, 1993; Burgess, Roberts, Ayton, & Mellis, 2018; Cartwright, Bruce, & McInerney, 2016; Dods, 1997; Hoover, Wong, & Azzam, 2012; Khatiban, 2018; Schmidt, Vermeulen, & Van Der Molen, 2006).

The relationship between posttest competency scores with answer scores from worksheets that occurred significantly and positively shows that the role of PBL-based worksheets in this study really helps participants learn independently. These results are in line with research on electrochemistry with the PBL model in a course on Analytical Chemistry at the Faculty of Education at Dokuz Eylul University (Günter & Alpat, 2017). Some research suggests the importance of the learning process that requires self-regulation and the construction of conceptual structures through reflection and abstraction. stated that the application of PBL strategies was very effective in increasing intrinsic motivation for learning (Masek, 2015). The PBL model activates a reflection process that allows students to participate in something different from their previous experiences of teaching and learning methods and forces them to critically reflect on their actions (Korpi, Peltokallio, & Piirainen, 2018). Education and training participants are those who already have qualifications and experience in their work, so PBL is needed to support and strengthen the decision to learn, which is important in professional life (Cónsul-Giribet & Medina-Moya, 2014).

Conclusion

This research study focuses on problem based learning as an alternative model of learning in education and training. This research was conducted at the Public Health Center management training which participants came from remote areas in South Sulawesi Province. The results showed that the use of problem based learning models to teach Public Health Center planning material was more effective than conventional learning methods used so far. The problem based learning model shows better learning outcomes and at the same time produces a Public Health Center planning model according to needs. Learning with problem based learning also seems more challenging because learning starts with real problems faced in the workplace.

In the PBL model, the focus of learning is on the chosen problem so that the participants not only learn the concepts related to the problem but also the scientific method to solve the problem. Therefore, participants must not only understand the concepts relevant to the problem at the center of attention but also gain learning experiences related to the skills of applying scientific methods in problem solving and fostering critical thinking patterns. The application of problem based learning in learning can encourage participants to have the initiative to learn independently. This experience is very necessary in his work where the development of one's mindset and work patterns depends on how he learns himself.

Problem Based Learning can be a choice of learning models in education and training of similar types by taking into account environmental learning factors, such as adequate time, the need for learning media, and other supports such as internet access. Such support is needed to maximize the potential of the participants and provide opportunities for participants to create better work.

Policy makers who begin to look at education and training of remote system health workers (online) can consider integrating problem-based learning in it as a learning model so that the learning objectives can be in accordance with the needs or problems in the respective participants' assignments.

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