# Evaluation of Training Program Based on Comptencecy of Building Mechanical Works Building using Kirkpatrick

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# Evaluation of Training Program Based on Comptencecy of Building Mechanical Works Building using Kirkpatrick

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**Abstract.** Padang city field one of the cities that have experienced large-scale earthquake, causing buildings badly damaged. To overcome the damage, one of the efforts is done so that the building is resistant to earthquakes with a certain scale, it must be maintained the quality of the building and the quality of the workforce through a technical training according to the standards. The research aims to obtain data and information to provide an overview of the results of the evaluation of the implementation of competency-based training program building mechanical works by using the method of evaluation kirpatrik.Competency-based training methode on the mechanical work of building using weighting formula *Kirkpatrick* conducted on four levels, namely 1) level of participant satisfaction with the implementation of training, as measured by a questionnaire for participants; 2) participants' level of understanding of the training material, as measured by the pre-test and post-test questions for participants; 3) Changes in the work behavior of trainees after returning to work, as measured by questionnaires for supervisors and subordinates of participants; 4) The impact of changes in training participants' work behavior on the level of organizational productivity, as measured by a decrease in absenteeism and delays in training participants. The first three levels of data are processed with mathematical equations forweighting *Kirkpatrick.* The results show that the level of satisfaction of participants ranged from 79.2 to 84%. The initial test average value is close to 47.25%, while the final test average score is 58.50%. Of the 30 participants, 27 people had better work behavior according to their supervisors' ratings, and all were good according to their subordinates. The level of absence and delay was relatively small before training, namely 1.2% delay and 97.4% attendance, while after training no one was late or not present.

## 1. Introduction

The Indonesian archipelago(Fig.1) lies on the boundary of the three main tectonic plates, the Indo-Australian, Pacific and Eurasian plates, extending from Sumatra in the west to Papua in the east. [1]

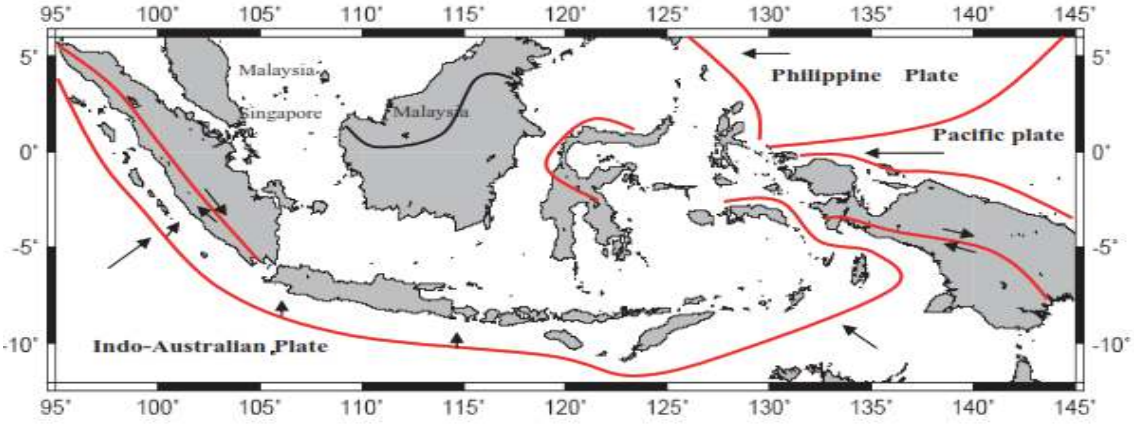


**Figure 1.** Indonesian Geographical Conditions

So that Indonesia is at the point of collision of the three plates which has a tendency for large-scale seismic earthquake(Fig.2).[2][3]

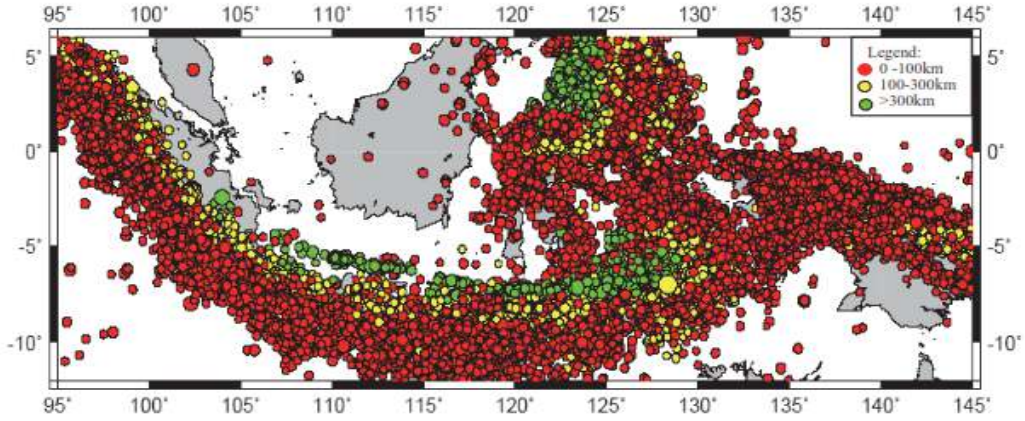


**Figure 2**.Seismicity of years

Reflecting some cases an earthquake in Padang (Fig.3). In the 2009 tectononic earthquake with a 9.1 righter scale, it caused catastrophic damage to building infrastructure.[2][3]

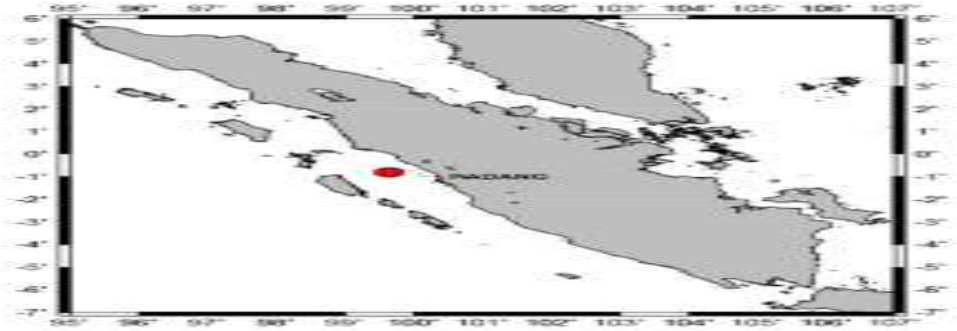

**Figure.3.**Padang city earthquake map 2009

The results of recent verification of damage to the housing sector for the city of Padang carried out until 15 October 2009, the number of damaged houses reached 107,028 building units with damage

distribution of 33,597 building units severely damaged; 35,446 housing units were moderately damaged; and 37,615 lightly damaged housing units*(source. Int. J, of Geomate, Dec., 2014, Vol.7.No.2 (SI.No.14 (, pp.1076-1083 Geotech., Const.Mat.and Env ., ISSN: 2186-2990 (O), Japan))*

**Table 1.** Estimation of damage to buildings due to the September 9, 2009 earthquake

| | Damaged houses | | | Total | Damage ratio | | | Total damaged in US $ (Rp) |
|---|---|---|---|---|---|---|---|---|
| District | Severe | Moderate | Slight | Houses | Severe | Moderate+ | Slight+ | |
| L. Kilangan | 2441 | 2098 | 2315 | 9047 | 0.27 | 0.5 | 0.76 | $363 million |
| K. Tangah | 7191 | 8423 | 7566 | 25888 | 0.28 | 0.6 | 0.9 | $1.21 billion |
| L. Kuranji | 4990 | 4749 | 4753 | 16098 | 0.31 | 0.6 | 0.9 | $767 million |
| P. Barat | 2160 | 2202 | 2399 | 10604 | 0.2 | 0.41 | 0.64 | $347 million |
| P. Utara | 2666 | 3036 | 3102 | 11446 | 0.23 | 0.5 | 0.77 | $450 million |
| P. Selatan | 2436 | 2535 | 2887 | 8843 | 0.28 | 0.56 | 0.89 | $399 million |
| P. Timur | 1670 | 3087 | 3395 | 12152 | 0.14 | 0.39 | 0.67 | $381 million |
| Nanggalo | 2787 | 1911 | 1468 | 11528 | 0.24 | 0.41 | 0.53 | $360 million |
| L. Begalung | 4976 | 5305 | 6506 | 17993 | 0.28 | 0.57 | 0.93 | $836 million |
| Pauh | 1129 | 1426 | 2005 | 6947 | 0.16 | 0.37 | 0.66 | $214 million |
| B.t. Kabung | 1151 | 1044 | 1219 | 3414 | 0.34 | 0.64 | 1 | $176 million |
| Total | 33597 | 35446 | 37615 | | | | | $5.5 billion |

From table.1 above the Kuranji area suffered the largest heavy damage, namely 4990 buildings, followed by Lubuk Begalung 4976 buildings and the smallest area Pauh 1129 buildings. The Koto Resident Resident had the largest moderate damage 8423 buildings and the smallest smashed rods. For the largest mildly damaged condition, Kota Tanggah District was 7566 buildings.Economically the worst value occurred in the components of residential buildings with damage and losses reaching Rp. 15 41 trillion. The infrastructure sector suffered damage and losses reaching IDR 963 billion

In order to ascertain whether a building is worthy of use requires further analysis related to its resistance to the earthquake, a condition evaluation is needed building which was built based on technical and non-technical requirements on rocks and soil from the building.[2][3][4]

In order to maintain a high-quality building, it is necessary to continuously improve the quality of the workforce through planned and effective training so that the quality of the building if it experiences an earthquake, the building remains safe with competent workers.

According to Law Number 13 of 2003 concerning Manpower states that the training program refers to the level of the Indonesian National Qualification Framework (KKNI). The Competency unit adopted in this training is: Applying workplace awareness (K3), Communicating at work, Preparing supervision of mechanical work, Supervising mechanical work, and Making monitoring reports.Compiling training programs on competency based on mechanical work of buildings requires the ability to conduct training needs analysis, job analysis, packaging related competency units and curriculum development, as well as competency-based training syllabi the training program is established, then the training objectives are determined.

The training objectives are further specified in the training material arranged in the curriculum and syllabus by taking into account the prerequisites of the participants[5][6].In addition to the preparation of training programs that are not the importance is the learning process, facilities and infrastructure. Basically the learning process is a communication activity. Teaching or training is an environmental system that allows the learning process to occur. In the learning process there are components that influence each other, namely the components of learning objectives to be achieved, the material

taught, instructors and participants who must play their respective roles, as well as learning facilities and infrastructure that are in accordance with learning needs.[7][8]

## 2. Literature Review

### *2.1. The Training Model (Kirkpatrick)*

Model can be used in evaluating various types of training with various conditions and situations. In *Kirkpatrick's*, evaluation is carried out through four levels (Kirkpatrick, D., L. & Kirkpatrick J., D.[9][10][11][12]. namely:

- **Level 1 (Reaction)**

  Evaluation at level 1 aims to measure the level of satisfaction of training participants in the implementation of training participant satisfaction will have direct implications for the motivation and enthusiasm of the participants in the implementation of training

- **Level 2 (Learning)**

  Evaluation at level-2 relates to measures of increasing competency of participants, both in terms of knowledge, skills, and attitudes, so as to measure participants' level of understanding towards material training and absorption capacity of training program participants before and after the training program.

- **Level 3 (Application)**

  This evaluation aims to measure what knowledge, skills, or attitudes are learned to be applied or transferred to work.

- **Level 4 (Impact)**

  Evaluation at this level to determine the impact of changes in participants' work behavior training on organizational productivity.

Level 1, 2 and 3 measurement data will be calculated using the weighting formula from *Kirkpatrick* where ; Item weights to i is a comparison of the Total value of the answers to items to the highest value i scale measurements are multiplied by the number of respondents and multiplied again a hundred parsen. There are four weighting evaluation criteria for level 1 based on the training participants' interpretation of the satisfaction of the training implementation as follows, namely; **1**) If the participants shows an adverse reaction to the training score of a small score of 50%, **2**) If the participant shows a better reaction to the training the score score ranges from 50% to 60%, **3**). If the participants shows a positive reaction to score training values range from 61% to 80%, and **4**). If participants show a positive reaction to the training the score score ranges from 81% to 100%.

## 3. Research Methodology

This type of research is descriptive research with quantitative data. The initial data is collected based on the selection of trainees who will be used as respondents in the study. subjects in this study were trainees with mechanical competencies in building with a population of 120 people divided into 4 training classes. While the sample in this study were 30 people from the four existing classes. The next process is to determine the criteria to be measured for each level of evaluation and how to take measurements.

## 4. Results and Discussion

Based on the results of the research that has been done, the processed data are as follows: First, the level of satisfaction with the implementation of the training is based on an average assessment item of 82.5%, facilities and infrastructure items 82%, instructor ratings 79.2%, and assessment material 84.4%. Secondly, understanding of participants before and after training for thirty participants with an average achievement of score weight before the initial test of 48% and before the final test 58.67%. There was a difference of 10.67%. Third, the results of the evaluation of superiors and subordinates on the application of training materials by participants in the workplace average peniaian 78.16 and subordinates 82.49. Fourth, the decrease in average attendance and delay in each week three months before and after the training results of the measurement before the training was carried out from the first to the third month there was an average decrease of 1.2% and 97.4% attendance.

Furthermore, from processing the results of the research data, a discussion is carried out in accordance with the assessment components of each level of the four levels, namely;

- **Level 1.**The level of participant satisfaction with the implementation of training From the result prosesing shows that the level of satisfaction of participants ranged from 82-84%. This means that participants show a positive reaction (feeling satisfied with the implementation of the training) because they are aware of getting useful input during the training. Sub elements that still need to be improved are the benefits of training material in the work, the language used by the instructor, the willingness of the committee to assist participants, and the technique of delivering material by the instructor. The four sub-elements have a relatively smaller weight
- **level 2.** Evaluation of the initial and final tests can be seen shows that out of a total of 30 participants, 27 participants experienced an increase in understanding of the material. There were 3 people who experienced a decline in understanding of training materials. The average initial test score for all participants was 48.00% and the average final test score for all participants was 58.7%. Thus there is an increase in knowledge about aspects related to competency even though the increase is only 10.67%. If it is associated with the results at level 1, it turns out that the high level of satisfaction has a relatively small effect on increasing participants' knowledge.
- **Level 3.**The results of the evaluation of superiors and subordinates shows that out of 30 participants, 29 participants had better work behavior in the workplace according to their superiors, whereas according to subordinates all participants had better work behavior in the workplace. If it is related to the results at level 2, it can be seen that although the increase in knowledge is relatively small, many trainees try to apply that knowledge at their workplace.
- **Level 4.**From the results of measurements at level 4 in show clearly visible before the training, namely from the first to the third month there was an average decrease in delay of 1.2% and 97.4% of attendance. After the training there was no decrease in the level of delay or attendance.

## 5. Conclusion

From the results of the study it can be concluded the following:

1. The level of satisfaction of the training participants on the implementation of the training showed a high positive reaction in participating in the training activities. However, the sub-elements of the benefits of the training material in the work, the language used by the instructor, the willingness of the committee to assist participants, and the techniques for delivering material by the instructor still need to be improved.
2. Out of a total of 30 participants, 27 participants experienced an increase in material understanding. Increased knowledge of training materials was relatively small at 10.7%. It turns out that the high level of participant satisfaction has little influence on the level of knowledge.
3. According to the assessment of superiors and subordinates of the training participants, most of the training participants were able to apply training materials well in the workplace.
4. The decrease in attendance and average delay in each week three months before and after training was very small and insignificant.

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