# Monitoring And Evaluasi Training SystemIn Pusat Pengembangan Pemberdayaan Pendidikan Dan Tenaga Kependidikan Ilmu Pengetahuan Alam (P4TK IPA) Bandung

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**ABSTRACT**

The Center of Educational Empowerment Development and Education Workforce of Natural Science (P4TK IPA) Bandung is a government institution that houses the training of science teachers from various levels, which has a goal to develop science through various activities, the training of teachers of natural science throughout Indonesia, as does the assessment, research, and development of teaching materials, and keep trying to improve the quality of human resources for technical and functional staff. The problem faced is the participants in the training have the problems that often occur in the process of training is when the registration process, both registration directly or indirectly (invitation). Then the trainers problems as the speaker is the problem where there are irrelevant material used as training materials, so that the teaching material is difficult to understand by the participants. Head as well as the limitations of facilities and improvement of competence in monitoring the training activities.
The method used for the study is the method of object-oriented approach. This system is built using PHP and MySQL, and using Sublime Text 3 and MySQL Workbench as a tool for system development.
Development of monitoring and evaluation system training activities in P4TK IPA is expected to support the needs P4TK IPA in monitoring and evaluation of training activities more effectively and efficiently, and produce output as expected.

**Keywords**: Research, Monitoring, Evaluation, Web

## 1. INTRODUCTION

On a system when that happens several problems on the training that frequently causing a problem for the committee activities training , now the committee activities training having problems that often occurs on the process training when the registration process , good registration directly or indirectly ( invitation ) is because during of these processes the enrollment of the teachers who follow the activities like training to be done manually namely wrote curriculum vitae participants into books the registration form so that the absence of data storage in computerized which includes data on participants a whole that causes both participants invitation or direct required to conduct back data collection repeated each doing in training. Because data participants who did not is the parties p4tk ipa difficult do tracking history participants who have registered before. This influential to the process invited participants training. Then next problems faced by civil servant training as pemateri or istruktur like the training material issue irrelevant used as the training taught not in accordance with material which is to be used as the to post-test or even not in accordance with background teachers were conduct training , that the material teaching irrelevant or difficult to be understood by participants. Besides problems that side of another problem that often occurs during the training held related with satisfaction participants to facilities activities training, Including the last of the committee learning module due to the amount of participants did not in accordance with the volume module provided , The dissatisfaction participants to classrooms uneasy can affect the study participants, that the facility inadequate, facilitators who less interact for participants so participants uncomfortable for learning, lack of media or instrument supporting learning, so that not all participants were able to practice the training material already used as the teaching. A result of of limitations that are experienced by head of facilities and the increase in competence in know these problems caused delays in do the resolution of problems that occur during training activities. If this keep happening unnoticed in a fast manner then be a disadvantage for participants in training.

### 1.1 PURPOSE

The purpose of he did research is as follows:

1. Simplify the committee do the registration process either directly and indirectly (invitation).
2. Simplify civil servant training in on the monitoring of the and evaluation value participants and matter which is not relevant used as the teaching .
3. Simplify head of facilities and the increase in competence on the monitoring of the and evaluation activities training facilities.

## 2. THE RESEARCH

### 2.1 Scope

As for limit problems in this research is research focused on learning training in p4tk ipa.Started from registration, assessment matter and training facilities activities. Analysis methods used is a method of dashboard , and modeling software used based object ( uml ) .

### 2.2 Methodology

Research methodology is sutu a process used to break a problem logical , where the necessary data which is to support of a research

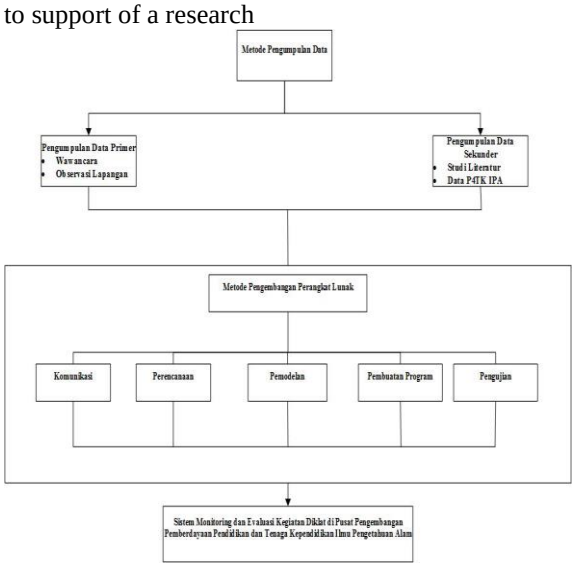



Figure 1. a groove research methodology

A groove on metodelogi research first one was done data collection , two types of data collection that is primary and secondary data . Method of development software an early stage through communication, At this stage process was completed communication by means of observation with head evaluation to to determine channel application and program objectives, the planning stages after the communication done done to plan activity framework and describe duties , Stage modeling made to know picture process of working application made so that could be referred to the process of the implementation of the system to in the form of code. Then stage making program , this process combining code program coding and testing required to uncover errors at code . The last stage that is testing , this stage used by user and then this stage will be evaluated has meet goals. An to uncover errors at code. Then an evaluation is made possible to of an improvement on a system so that the system which built were working and should .

### 2.2Metode

To make monitoring and evaluation systems the use writers method performance dashboard Is a an effective method to compile the report that contains a summary key performance indicator ( kpi ) the institution presented in the form of format a visual presentation as a chart , diagram , and table [1]. Through this method , the reports will easy to understand by the head of because of the they have very limited. Moreover the p4tk ipa will more easily take action and anticipate the changes is visible on report so the institutions p4tk ipa can identify the machinery they take.

### 2.3 *Key Result Indicator*

There are four range [Parmenter, 2001]

1. Key result indicator (KRI) Tells how to your performance of one perspective or factor the success of critical.
2. Result indicator (RI) tell what has been done
3. Performace indicator (PI) Tell what to do
4. KPI Tell what to do to increase kinarja dramatically .

### 2.4 Kirkpatrick

Training model that is designed as an order of ways to evaluate a training program. Model evaluation training kirkpatrik is model evaluation training developed by Donal L.Kirkpatrik ( 1959 ) using four level in categorizes outcomes training.

1. Reaction

Components that are part the level of reaction: instructors

a) facilities
b) schedule training
c) the training material
d) training consumption

2. Learning

At this stage knows what studied by participants know the level evektifitas learning determined based on an increase in mastery study results before and after the training calculated by score an dinormaliasai .With the formula as follows:

$$< g >= \frac{\%<G>}{\%<G>max} \quad (1)$$

$$< g >= \frac{(\%<Spost> - \%<Spre>)}{(\%<Smax> - \%<Spre>)} (2)$$

3. Behavior

Change performance after undertaking training or pengaplikasian what obtained in training to the work. At this level , it was hoped after follow the training evidence for changes behavior participants (employees ) in do the work.

4. Result

The last result obtained for adhering to training .The final result has included , the results of an increase in the production and the quality of , the drop in the price , sales increase .The purpose of the gathering of information at the level of this is to test the impact of training to working group or organization as a whole.

**2.5 Monitoring dan Evaluasi (Monev)**

Monitoring and evaluation in principle are the activities daily management. Monitoring and evaluation are two activities conducted in integral and planned to know exactly level keterlaksanaan program or a project training . [4]

Monitoring can be defined as a task daily in the management of institutions training .In monitoring is a management or empowered collect and review and looked again information describing how a kegaitan / program walk and allow what needs to be improved , if necessary , to achieve objectives appointed. In monitoring, one of the main activities of pemonitor, i.e. collecting information or data which is closely related to the management of training, and then analyzing that data for the material created as a report, create a report or reporting activities is an integral part of the process monitoring.

The purpose of an evaluation is the purpose that has been set could be achieved . Monitoring and evaluation in training institutions could not be separated it is implemented in order to get the benefits of that is to be maximized it means the project or program that have been carried out can reach its destination efficiently and effectively .

**2.6 Analysis Parameter Activity Monitoring And Evaluation Training**

Stage analysis monitoring and evaluation on a system this is the first is to put indicators which is used to to reach a source of data the evaluation required in the need monitoring necessary in the need evaluation .Indicators it can be seen in table 1

Tabel 1 Analysis Indicator Monitoring and Evaluation

| No | Parameter | Indicators | Data Sources | Purpose |
|---|---|---|---|---|
| 1 | Academic | Material Activities Training | Material | Assess material in training activities |
| | | Value daily participants | Academic report teachers | Judge participants during the training |
| | | Pre-post test | Academic report teachers | Know competence of teachers before and after training and after safety training |
| 2 | Non Academic | The performance of an organizer | The questionnaire activities | Evaluate performance implement |
| | | of the training activities | training facilities | ing training |
| | | Reaction Teachers | The questionnaire smileys face | Teachers know reaction to learning training |

Fourth indicators will be used to determine the level of success of the implementation of the program training .

**2.7 Analysis Academic Parameters**

On the parameter academic a teacher was the target indicators to be achieved can be seen as follows:

**1. Subjects of Training**

Tabel 2 Subjects That Will Be To Evaluate

| No | The Name of The Aspect of Leasson |
|---|---|
| 1 | Objects and The Conversion |
| 2 | Dynamic Electricity |
| 3 | Concept of Scientific Approach |
| 4 | Models of Learning |
| 5 | Simulation Teaching in Primary School High-Class Integrated Learning |

The following is explanation some material activities training who will be evaluated can be seen in table 3

Tabel 3 Subjects Indicator

| No | Lessons | Lessons will be evaluated | Type of indicators |
|---|---|---|---|
| 1 | Objects and the conversion | Identify the form and nature | Product indicators |
| | | Identify the factors that influence changes in the nature of things | Product indicators |
| | | Identifying characteristics of physical and chemical changes in the body | Product indicators |
| | | Sublimation Camphor | process indicators |
| | | eggs float | process indicators |
| | | ice melts | process indicators |
| | | Blowing up balloons using kitchen vinegar and baking soda | process indicators |
| | | Make ice shake | process indicators |
| | | Muddying the waters lime | process indicators |
| | | wax is heated | process indicators |
| | | candles were lit. | process indicators |
| | | recycled water | process indicators |

| | | | |
|---|---|---|---|
| | | Make caramel from sugar | process indicators |
| **2** | **Dinamic Electricity** | Explaining the concept of the strong current and potential difference | Product indicators |
| | | Summing up the relationship between voltage and current strength (Kk. Ohm) | Product indicators |
| | | Differentiating circuit series and parallel circuits | Product indicators |
| | | Investigating the relationship between voltage and current strength | process indicators |
| | | Devised a series of lights series | process indicators |
| | | Devised a series of parallel light | process indicators |
| 3 | Concept of Scientific Approach Models of Learning | Viewing and listening to instructional videos SD applying scientific approach | Product indicators |
| | | Describes an example of learning science by applying scientific approach | Product indicators |
| | | Make an example of RPP IPA by applying scientific approach | Product indicators |
| **4** | Concept of Scientific Approach Models of Learning | Learning model explains Project Base Learning | Product indicators |
| | | Make an example of the learning model (Project Based Learning | Product indicators |
| | | Learning model explains Project Base Learning | Product indicators |
| 5 | Concept of Scientific Approach | Simulating teaching in high grade with an integrated learning | process indicators |

The following is a list lessons will to evaluate in , this lesson berlak list for all classes of the KKG and MGMP.

The following is a list of lessons that will be to evaluate in , a list of the subject as berlak for all classes of the gfc and mgmp.pada for each subject daily having value the target of academic indicators for each matapelajaran which is 60. The whole point of the target of academic indicators which is to every day widyaiswara as instructors training or of teaching staff examine the increase in competence participants ( teachers ) , on certain aspects of the judgment of for each subject can be seen in table 4.

Tabel 4. Aspects value daily teachers

| No | Aspect value | Type of value |
|---|---|---|
| 1 | journal of Learning | Product |
| 2 | Worksheet | Product |
| 3 | Lesson plan | Product |
| 4 | Follow up plan | Product |
| 5 | Activity Report | Product |
| 6 | Discipline | Attitude |
| 7 | Activity in learning | Attitude |
| 8 | Responsible | Attitude |

**Index**

Tabel 5. Key Result Indicator Index

| Key Result Indicator | Frequency |
|---|---|
| All value index appellation academic achievement at least enough teachers | Phase |

The purpose of the key result indicator, the above is to determine whether the value of the index participants filled key result indicator.

**2.8 The Target Pre-Post Inficator Test**

Monitoring the enhancement of value academic teacher or participants training has a target indicators to be achieved can be seen in table 6

Table 6 increase competence of teachers

| The target indicators | Frekuensi Pengukuran |
|---|---|
| Value normalization the gain at least 0 3 | Phase |

Mean of the target indicators above which is to every stretch out evaluator will check the increase in competence of teachers after undergoing training. The target is obtainable based on a comparison value obtained by participants before undergoing knee training and after undergoing training and to be achieved targets of value where the value of normalization the gain at least 0.3 the following aspects quality assessments of training facilities activities in table 7

Table 7 aspects of an increase in academic judgment

| No | The aspect of assessment |
|---|---|
| 1 | Value Pre-test |
| 2 | Value Post-test |

Tabel 8 Analysis comparison pre-post test

| No | Pre-test | Post-test | Absolute gain (d) | Xd | X²d |
|---|---|---|---|---|---|
| 1 | 20 | 30 | -10 | -8.857 | 78.449 |
| 2 | 40 | 30 | 10 | 11.143 | 124.163 |
| 3 | 32 | 34 | -2 | -0.857 | 0.735 |
| 4 | 60 | 56 | 4 | 5.143 | 26.449 |
| 5 | 40 | 50 | -10 | -8.857 | 78.449 |
| 6 | 32 | 40 | -8 | -6.857 | 47.020 |
| 7 | 40 | 40 | 0 | 1.143 | 1.306 |
| 8 | 30 | 30 | 0 | 1.143 | 1.306 |
| 9 | 30 | 30 | 0 | 1.143 | 1.306 |
| 10 | 50 | 52 | -2 | -0.857 | 0.735 |
| 11 | 60 | 60 | 0 | 1.143 | 1.306 |
| 12 | 20 | 25 | -5 | -3.857 | 14.878 |
| 13 | 40 | 40 | 0 | 1.143 | 1.306 |
| 14 | 32 | 42 | -10 | -8.857 | 78.449 |
| 15 | 60 | 56 | 4 | 5.143 | 26.449 |
| 16 | 40 | 56 | -16 | -14.857 | 220.735 |
| 17 | 32 | 35 | -3 | -1.857 | 3.449 |
| 18 | 40 | 47 | -7 | -5.857 | 34.306 |
| 19 | 30 | 0 | 30 | 31.143 | 969.878 |
| 20 | 30 | 32 | -2 | -0.857 | 0.735 |
| 21 | 50 | 46 | 4 | 5.143 | 26.449 |
| 22 | 60 | 56 | 4 | 5.143 | 26.449 |
| 23 | 43 | 51 | -8 | -6.857 | 47.020 |
| 24 | 43 | 43 | 0 | 1.143 | 1.306 |
| 25 | 56 | 61 | -5 | -3.857 | 14.878 |
| 26 | 45 | 47 | -2 | -0.857 | 0.735 |
| 27 | 60 | 60 | 0 | 1.143 | 1.306 |
| 28 | 45 | 43 | 2 | 3.143 | 9.878 |
| SUM | 1160 | 1192 | -32 | 0.000 | 1,839.429 |
| Mean | 41.429 | 42.571 | -1.143 | | |

It can be seen that the effectiveness of learning calculated by value score a normalized.

Mean pre-test = $\frac{\sum \text{pre-test}}{n} = \frac{1160}{28} = 41.429$

Mean post-test = $\frac{\sum \text{post-test}}{n} = \frac{1192}{28} = 42.571$

$$< g >= \frac{\text{Mpost} - \text{Mpre}}{\text{max} - \text{Mpre}}$$

$$< g >= \frac{41{,}429 - 42{,}571}{61 - 42{,}571} = \frac{-1{,}142}{18{,}4291} 1 = -0{,}062$$

Of results in get value a normalized of -0,062 , where the value of the means that the effectiveness or the target of the training that is low.

**2.9 Analysis Parameter The Implementation Quality Training**

Monitoring the implementation quality training for facilities activities training, has a target indicators that achieved can seen in table 9

Tabel 9 The quality of the implementation of training

| Performance Indicator | Frequency |
|---|---|
| The implementation quality training at least enough . | Phase |

The whole point of indicators above the target that is for each stretch out evaluator will evaluate the level of the quality training .This quality is judged based on the aspect that had been determined and must be achieved the target of much value. The following aspects quality assessments of training facilities activities in table 10

Tabel 10 Assessment activities in training facilities

| No | Indicator | Aspects assessment |
|---|---|---|
| A | The implementation of the increase in competence ptk | Conformity matter for the purpose the implementation of the increased competence |
| | | Conformity matter to the needs of participants increase competence |
| | | Conformity a method of the implementation of the increased competence with matter |
| | | Systematic presentation of conformity with the purpose of learning |
| | | Conformity schedule with the execution of an increase in competence |
| | | Conformity the implementation time an increase in competence to the calendar education |
| | | Sufficiency time with an increase in kompetens matter |
| | | Mastery of the facilitator in an increase in competence matter |
| | | Mastery of the facilitator in the media of learning |
| | | The implementation reflection |

| | | |
|---|---|---|
| | | at each end matter increase competence |
| | | Discipline of the facilitator |
| | | interaction of facilitator with participants |
| | | Cooperation between facilitator |
| B | Academic facilities | The availability teaching materials or module |
| | | The availability media weighting ( lcd projector / props ) |
| | | The completeness of a laboratory facility workshop |
| | | The availability of internet facilities as a source of learning |
| C | Supporting element | The quality of services committee |
| | | The presentation cleanliness consumption |
| | | The quality of nutrition variation consumption |
| | | The availability of atk training |
| | | Comfort classrooms |

Indicators above will used for evaluation non academic the implementation of the training .

### 2.10 Analysis Parameter Reaction Teachers

Performance indicators reaction can be seen in table 11Tabel 11. Performance Indicator

| Performance Indicator | Frequency |
|---|---|
| Reaction smiley face which must be achieved that is | Phase |

The whole point of performance indicator are for each stretch out civil servant training would examine the level of satisfaction teachers in undergo training. Reaction smileys face will be assessed on some aspects that had been determined and must be achieved: index enough.The following aspects assessment smileys face can be seen in table 12

Tabel 12 The aspect of assessment list smiley face

| No | Aspect |
|---|---|
| 1 | Conformity program P2KM this with your job as a teacher |
| 2 | The quality of the training material provided by the program p2km |
| 3 | Usefulness of training materials to be applied to your regular duties as a teacher |
| 4 | Their mastery of the material the facilitators |
| 5 | The quality of a method of teaching and the training of used |
| 6 | Efficiency time program |
| 7 | The use of the media in learning |
| 8 | Program P2KM overall improve the ability you as a teacher and practical in your work |

These indicators used to measure reaction teachers to learning training implemented then obtained the results of relevance and the effectiveness of to individual questions .

**Example**

Of recapitulation questions smileys face with 28 respondents held in aceh jaya on class the gfc , dapat Reported those rerata the percentage of participants who feel eight question. Will be processed value relevance and the effectiveness of learning training based on the questionnaire smileys face .

Tabel 13 Recapitulation Smiley Face

| Question number | Recapitulation | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total | | | | | Percentage | | | | |
| | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| | Perfect | Excellent | Good | Fair | Poor | Perfect | Excellent | Good | Fair | Poor |
| 1 | 0 | 10 | 14 | 14 | 14 | 0 | 35,7 | 50 | 50 | 50 |
| 2 | 0 | 9 | 13 | 13 | 13 | 0 | 32 | 46 | 46 | 46 |
| 3 | 0 | 11 | 15 | 15 | 15 | 0 | 39 | 54 | 54 | 54 |
| 4 | 0 | 7 | 19 | 19 | 19 | 0 | 25 | 68 | 68 | 68 |
| 5 | 0 | 1 | 23 | 23 | 23 | 0 | 3,6 | 82 | 82 | 82 |
| 6 | 0 | 2 | 13 | 13 | 13 | 0 | 7,1 | 46 | 46 | 46 |
| 7 | 0 | 3 | 18 | 18 | 18 | 0 | 11 | 64 | 64 | 64 |
| 8 | 0 | 7 | 20 | 20 | 20 | 0 | 25 | 71 | 71 | 71 |

Value relevance of the activities training is Q1= 0 % + 35,7 %= 35,7% + Q8= 0 % + 25 % = 25% = (37,5% + 25%) /2= 30,36%

Tabel 14. A recapitulation of the questionnair smiley face

| Question number | Recapitulation | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total | | | | | Percentage | | | | |
| | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| | Perfect | Excellent | Good | Fair | Poor | Perfect | Excellent | Good | Fair | Poor |
| 1 | 0 | 10 | 14 | 14 | 14 | 0 | 35,7 | 50 | 50 | 50 |
| 2 | 0 | 9 | 13 | 13 | 13 | 0 | 32 | 46 | 46 | 46 |
| 3 | 0 | 11 | 15 | 15 | 15 | 0 | 39 | 54 | 54 | 54 |
| 4 | 0 | 7 | 19 | 19 | 19 | 0 | 25 | 68 | 68 | 68 |
| 5 | 0 | 1 | 23 | 23 | 23 | 0 | 3,6 | 82 | 82 | 82 |
| 6 | 0 | 2 | 13 | 13 | 13 | 0 | 7,1 | 46 | 46 | 46 |
| 7 | 0 | 3 | 18 | 18 | 18 | 0 | 11 | 64 | 64 | 64 |
| 8 | 0 | 7 | 20 | 20 | 20 | 0 | 25 | 71 | 71 | 71 |

Q2= 0 % + 32 % + Q3= 0% + 39 % + Q4= 0 % + 25 % + Q5= 0 % + 3,6 %+ Q6=0% +7,1% + Q7= 0% + 11 = 117,7 %
=(Q2+Q3+Q4+Q5+Q6+Q7)/6 = 117,7%/6 = 19,64%

Of the result of reckoning above obtained the evaluation results , relevance of: 30,36 % and the effectiveness of as much as: 19,64 %. This meaningful that the results of the training p2km aceh jaya district, the relevance matter training to the needs of participants were of 30,36 %, and the effectiveness of the implementation of the training two days is of: 19,64 %. With the results of this shows that they are still needed improvement in matter training and implementation of training to come so the results it is even higher.

**2.11 Testing Hardware**

Testing system is the most important thing aimed to find of their sins or deficiencies at software being tested. Testing mean to know software that made already meet the criteria that were consistent with the goals of the design of the software. Testing this software use black box. Testing the black box of focus on the requirements software functionality.

**Testing Alpha**

Testing alpha do by using the method black box. For testing alpha is in testing users.

**Conclusion from testing alpha**

Based on the results of testing a system that has been done in whole may be taken the conclusion that on a system websites have through stage improvement and already maximized to these processes and by function systems are can be used and expected output .

**Testing Beta**

Testing beta is tests carried out objectively where tested directly to the institute concerned about satisfaction user to contents points that isthe fulfillment of a need and objectives early development website and display interface the website. Testing beta was conducted on two technique the data for example through interviews and the questionnaire.

**Conclusion from testing alpha**

Based on beta testing, it can be deduced that:

1. Monitoring and evaluation systems activities training ease participants the registration
2. Monitoring and evaluation systems activities training ease participants in monitoring value .
3. Monitoring and evaluation systems activities training readily in operation.
4. Monitoring and evaluation systems activities training help civil servant training managing data participants.
5. Monitoring and evaluation systems activities training ease widyaswaral servant training in managing value participants training
6. Monitoring and evaluation systems in training activities ease widyaiswara in monitoring the value of participants in training and the teaching material.

Display interface menu at the website system activity monitoring and evaluation training is in line with its function .

## 3. CLOSING

Based on the results obtained in making duty end of this , so a conclusion can be drawn as follows:

1. Monitoring and evaluation systems activities training to walk with its objectives, which is a application of websites which to simplify head of facilities and the increase in competence and evaluation activities on the monitoring of the training
2. Ease participants do the registration process either directly and indirectly ( invitation ).
3. Ease widyaswara training in on the monitoring of the and evaluation value participants and matter which is not relevant used as the teaching.

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