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## Measuring the Effectiveness and Success Rate of Training Programs

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### Abstract

Training activities are designed to achieve targets and the success will be viewed based on the changes. Obstacles occur when running a training program, especially when measurable, accountable and objective methods are imposed to assess success. Formulas and formulations of effectiveness and success are often considered the same. An effective training program is characterized by the understanding of the participants, while the success of the training is seen from the actual implementation of the understanding of the training material into real work. This study intends to analyze and conceptualize ways of measuring the effectiveness and success rate of a training program implementation. The data analyzed are illustrative data for two groups: Training 1 and Training 2. Quantitative analysis and multivariate statistical techniques are employed for several variables. The results of the analysis describe the methods of measurement that can calculate the effectiveness and determine the level of success of a training program. The results obtained are also supported by further analysis of paired samples test, correlation test and model test involving a mediator. The results obtained in this paper are illustrative data so their accuracy should be later practised in activities that require a calculation of effectiveness and success rates, such as interventions, training and counselling

**Keywords:** Effectiveness, Measure, Success

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## 1. Introduction

Measurement of effectiveness shows the important goals whether a work activity is achieved or not (Schermerhorn, Hunt, & Osborn, 1995). As an example, we can see whether the achievements in the training program are effective or not through the comparison between the achievements taught to the participants and the number of achievements they understood. Achievements become objectification in measurable effectiveness. The gap that occurs between expectations and reality is measured by a mathematical formula. The effectiveness rate of the training is seen based on the impact obtained as a consequence of carrying out the assignment. Simply put, the explanation of the formula for measuring effectiveness is the effect metric. We can use the study of effect metrics to find out what was obtained as a result of certain treatments. For example, to find out whether sponsorship communication can provide more financial benefits compared to other communication processes (Olson & Thjømøe, 2009).

We can find out the effectiveness by using the planned achievement objects and the achievements that have been obtained from administering certain treatments. The effectiveness of the training program can be checked by directing the object of examination to be evaluated and the absorption of the understanding of participants' responses in a learning process (Mohanty, Dash, Dash, & Das, 2019). Program effectiveness is an objective reality. An effective program can be measured by the realization and target variables (Cynthia & Kartika, 2019). Disclosure of scientific facts and realities is based on objective measures through fixed numbers that represent reality. The industrial engineering world has used the Overall Equipment Effectiveness (OEE) concept to measure the effectiveness of using production machines in achieving production targets (Prabowo, Suprpto, & Farida, 2018). OEE produces a calculated output in the form of a percentage of effectiveness. The formula for calculating effectiveness has been stated in the scientific literature in the field of human resource management (HRM), particularly to see the level of worker productivity. There is also a quantification of effectiveness applied to the scaling model, for example, a scaling instrumentation technique for measuring the effectiveness of communication training that uses the Science Communication Training Effectiveness Scale to measure the effectiveness of a science communication training program designed to improve communication between scientists and non-scientists (Rodgers, Wang, & Schultz, 2020).

Success is not something accidentally achieved, but rather a condition that begins with planning, treatment goals, strengthening of carrying out treatment, and the impact of treatment. Motivation and orientation towards learning goals are the two variables that evidently contribute the most to predicting training success (Tziner, Fisher, Senior & Weisberg, 2007). In theoretical logic, effectiveness is not enough to be equated to describing success. An effective training program is known for its role in raising awareness and its success in describing the implementation of what is obtained from the training (Clegg, Rees & Titchen, 2010). Training is given to developing the capacity of human resources, and its success is seen through the failure or success of training programs in achieving organizational targets (Brinkerhoff, 2005). Success is formulated by referring to actual targets and assigned targets. Some use the approach to reporting on the implementation of the assignment. In the scope of behaviour and outcomes, success describes the knowledge and skills acquired in training that has been applied to the job and has a wider impact on the organization (Bates, 2004). Success becomes easier to know through the presence or absence of behaviour and attitudes that apply understanding in completing a job to get real work results.

Training effectiveness and success have different operational patterns. The effect of training is only to achieve a certain understanding, such as increasing understanding and knowledge (Cahyo & Reni, 2016), but success is seen through the implementation of the understanding gained through training in real work areas, for example, the participation of trainees in implementing the training model (Fitria, Kristiawan & Rahmat, 2019). Several studies on effectiveness did not continue to observe the effects of training and its application in accomplishing task demands. Studies on the success of human resource management only focus on productivity to achieve organizational targets (Iskandar, 2018). The effectiveness and success of training is a series, in which effective training can support the success of achieving organizational targets. Observation of the effectiveness and success is only carried out towards changes in progress as a result of providing learning programs, for example when we develop student potential through learning (Maheasy, 2018). The reliability of the effectiveness and success rate for its quantitative measure is unknown and tends to refer to the subjective-qualitative sense. The reliability of an intervention module is immeasurable. Also, there is the risk of having a very high value of

subjectivity that will lead to confusion in assessing the impact of the training program or intervention.

This research tries to involve the technique of measuring effectiveness in the industrial fields which will be compiled in a short formula. The training program as discussed in this study is an illustration that describes its process and measures its effectiveness, followed by an illustration of the success rate of the training program (since there is an implementation of the training effect). The calculation results described in this study can be used to measure the effectiveness of training, measure the success rate in other training programs, such as for providing intervention activities, module implementation activities, training in community service activities, and case study research that learns about the effectiveness or success of performance.

## 2. Review of Related Literature

Effectiveness is defined as a description of a state of the effectiveness of a program, given as a mission to achieve certain goals. Organizationally, effectiveness is considered as the ability of the organization to figure out the success of program outcomes and operations (Geartner & Ramnarayan, 1983).

Effectiveness is seen through the planned achievement of objects and the achievements that have been obtained as a result of getting certain treatments. The effectiveness of the training program is checked by directing the object of examination by evaluating it and gaining an understanding as the reaction of participants in participating in learning (Mohanty et al., 2019). Program effectiveness is an objective reality. Effective programs can be calculated using the realization and target variables (Cyntia & Kartika, 2019).

Theoretically, effectiveness cannot describe success. It takes the role of effective training for increasing success. Training is an activity carried out by certain parties to correct and improve attitudes, behaviour, skills and knowledge insights under agency provisions (Ichsan, 2020).

The effectiveness and success of training is a series in which the effects of training can support success in achieving organizational targets.

## 3. Research Methodology

The study used two groups of illustrative data: Training 1 (N=40) and Training 2 (N=40). The data consists of the description of the training to achieve targets at work. The target is derived from the company's plan for one of its work units, and to achieve it, it is carried out through training activities. The training program is structured to provide technical understanding and knowledge. The training is intended to provide learning regarding the number of targets (ie as many as 4) and methods for reaching targets. There are six variables analyzed for the illustrative data. The first is the company's expected target (ETC), which is the company's expected target for one of its work units. Secondly, it is the understanding of the training participants regarding the targets assigned to them by the company (ATP), which is the number of work targets the company expects to be understood through training. Thirdly, it is the training effectiveness variable (TE), which is a variable that can be known by calculating the difference between ETC and ATP, the amount is a percentage. The fourth variable is the target achieved by the workers (TA) in actualizing the understanding of the training. The fifth one is the actual success (AS) which is calculated based on the formulation (referring to TA, ETC and ATP). The last one is the variable success rate of training (SRT), known through the calculation formula (TE and AS).

### a. Success Rate of Training

$$SRT = \frac{(TE+AS)}{2} \times 100\%$$

The results of the calculation of SRT are categorized in the form of

**Table.1 Success Rate Category Range**

Category	Percentage Range	Description
Not Successful	≤ 25%	Failed
Less Successful	> 25% - 51%	Failed

Quite Successful	>51% - 77%	Need Improvement
Very Successful	>77% - 100	Succeed

On the illustrative data of Training 1 and Training 2, a follow-up test was applied. The illustrative data is used to obtain supporting facts that will strengthen the results of the TE and SRT calculations. Statistical analysis was carried out on the data of Training 1 and Training 2 to compare them with the paired sample t-test technique. Statistical analysis of correlation and regression was then used as a second follow-up test. Correlation and regression were performed to obtain variables related to TE and SRT and variables that contributed to both (TE and SRT).

#### 4. Results and Interpretation

##### 4.1. Results

The training program is designed to achieve targets, for example in the form of Target 1, Target 2, Target 3 and Target 4. All targets are designed in the learning process; in the training of work targets. Everything is delivered through training activities. The results of the calculation provide data on the ETC and ATP variables. Both are then analyzed to obtain data on the effectiveness of the implementation of the training.

**Table.2 Results of Training 1 Effectiveness Test**

Training 1 (N=40)	ETC	ATP	Training Effectiveness
Amount	4	148	3700
Average	4	3,7	92,5
Category	<b>Very Effective</b>		

*Source: comparative calculation results based on the Training 1 and 2 data*

The calculation results found that the training is prepared and carried out very effectively in achieving the targets expected by the company. On average, the trainees gained an understanding of the targets assigned to them by 3.7 (equal to 4). The result of measuring the effectiveness of the training program is 92.5%. Referring to the category intervals, Training 1 is a very effective training program. Training 2 has similar illustrative data, but with different subjects. The data of Training represents training that has not achieved maximum results. It is used to compare the effectiveness of Training 1 to Training 2. Understanding of the targets assigned by the company and the effectiveness of training become variables processed and analyzed so that the differences between the two can be seen.

**Table.3 Results of Training 2 Effectiveness Test**

Training 2 (N=40)	ETC	Target understood	Training Effectiveness
Amount	4	84	2100
Average	4	2,1	52,5
Category	<b>Fairly Effective</b>		

*Source: comparative calculation results based on the Training 1 and 2 data*

Based on the calculation results for the Training 2, of the 4 targets taught to the training participants, the  
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average target understood by the training participants is 2.1. Furthermore, the percentage of effectiveness which means the achievement of the training objectives is only 52.5. These results indicate that Training 1 is more effective than Training 2 ( $92.5 > 52.5$ ). Based on the effectiveness category interval, Training 2 is in the moderately effective category. Training with moderately good effectiveness still requires further steps, so a success rate test is needed.

**Table.4 Success Rate of Training 1**

Training 1 (N=40)	ETC max	ETC Limit	ATP	Training Effectiveness	Actual Target	Actual Success	Training Success Rate
Amount	4	3	148	3700	146	3793	3746,43
Average	4	3	3,7	92,5	3,65	94,82	93,6607
Category				<b>Very Effective</b>			<b>Very Successful</b>

Source: comparative calculation results based on the training 1 and 2 data

Regarding training and the calculation of its effectiveness, the success rate will depend on the implementation of the training program in real work areas. This implementation is seen based on the achievement of the actual target of workers. The average Actual Target of Training 1 is 3.65 consisting of 40 workers who have received training. The results indicate that understanding of the target tends to be relevant to the actual target achieved (3.65 AT of 4 ETC). The training success rate is about +93.7%. The results of this calculation provide an illustration that the training carried out was very successful in helping the company achieve its targets. The training successfully affects the achievement of targets above the minimum target threshold value ( $TA > ETC$  Limits). These results place Training 1 as having the maximum success rate (Very Successful).

**Table.5 Success Rate of Training 2**

Training 2 (N=40)	ETC	ETC Limit	Target Understood	Training Effectiveness	Actual target	Actual Success	Training Success Rate
Amount	4	3	84	2100	74	2426	2263
Average	4	3	2,1	52,5	1,85	60,6	56,57
Category				<b>Very Effective</b>			<b>Need Correction</b>

Source: Comparative calculation results based on the Training 1 and 2 data

Regarding the results of the SRT calculation for Training 2, the average AT of workers who received training was 1.85. This result is quite far from the average AT in Training 2. The SRT of Training 2 is + 56%, categorized as training that needs to be improved with reference to ETC Limit. The AT achievement in Training 2 has a difference of 1.15 compared to the ETC limit. Training 2 is assumed to contain errors and problems since expectations do not match reality.

Training 1 & Training 2 have different levels of impact. Training 1 is more effective and more successful than Training 2 as seen based on numbers and percentages. This is also corroborated by the results of the comparison analysis of paired samples. The test results found a significant difference between Training 1 and Training 2. The test was conducted on TE, AT, and ETC data.

**Table.6 Paired Samples T-test Calculation Results**

Training 1	Training 2	t	df	p
Effectiveness Training 1	- Of Effectiveness Training 2	Of 15.064	39	< .001
Actual Target Training 1 Results	- Of Actual Target of Training 2 Results	Of 10.437	39	< .001
Success Rate Training 1	- Of Success Rate Training 2	Of 12.372	39	< .001

Source: Comparative calculation results based on the Training 1 and 2 data

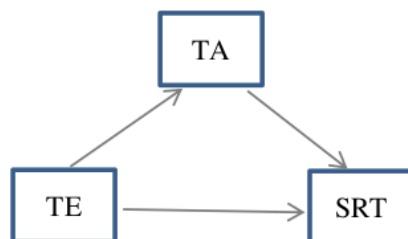
Regarding the probability level of the difference between Training 1 and training on the TE variable, the t value is 15,064 with a significance level of t table  $p < 0.001$ . This means that the magnitude of the impact (TE) between Training 1 and Training 2 is significantly different. The same level of probability also occurs in the other two variables (AT and SRT). Thus, Training 1 has more impact on the actual target achievement than Training 2 ( $p < 0.001$ ), and Training 1 has a higher success rate than Training 2 ( $p < 0.001$ ). The results of this comparison of paired samples test have managed to illustrate the difference between effective training and the less effective one, successful training and unsuccessful one.

**Table.7 Correlation Coefficient Test Results**

Training 1	Coefficient R			
	ATP	TE	TA	SRT
ATP	-			
TE	1.000	-		
TA	0.362	0.362	-	
SRT	1.000	0.611	0.958	-
Training 2				
ATP	-			
TE	1.000	-		
TA	<b>0.203</b>	<b>0.203</b>	-	
SRT	0.454	0.454	0.963	-

Source: Comparative calculation results based on the Training 1 and 2 data

The effectiveness and success of the training program were continued by examining the interrelationships between the variables based on the Training 1 and Training 2 groups. The Training 1 data are analyzed on the target variables understood by the participants, effectiveness, the number of actual targets achieved and the level of success of the training. The results of the correlation test found a relationship between all the variables analyzed. All of them show a significant correlation with one another. Data analysis of Training 2 is also carried out on the same variables. The results of the correlation test found that the targets understood among the training participants (ATP) are not related to the actual targets successfully achieved.

**Figure. 1 Training Success Rate Model**

The same also applies to the effectiveness of Training 2 which has nothing to do with the achievement of the actual targets. This indicates that the amount of AT achieved by the participants has nothing to do with the two preceding variables so the targets achieved by workers have nothing to do with the training program. For this reason, the success in Training 2 is not due to the understanding gained during the training. There should be other

things related to AT, that's why improvements are needed for Training 2.

**Table.8 Role of Effectiveness on Success with Actual Target Mediator**

	Estimate	Error Std.	Z Mark	p	95% Trust Range	
					Lower Limit	Upper Limit
TE→TA→SR T	0.24 5	0.10 0	2.457	0.014	0.050	0.441

*Source: Calculation results of the mediator model of Training 1 Data*

Data analysis was continued to examine the variables that influenced the success rate of the training. The data tested are TE, AT and SRT variables. To prove its effectiveness and success, testing the pathway model is required. TE as a predictor variable, AT as a mediator and SRT as the outcome of the effect of TE and AT. The mediator pathway test shows that TE has a direct effect on

SRT and an indirect effect on SRT (mediated by AT). We can use model analysis to ensure the effectiveness and success of the training program. Effective training has a positive impact on the success rate of training. The meeting point of both is the achievement of actual targets and effective training that has an impact on the achievement of AT. The success rate of training will be influenced by the number of actual targets achieved

#### 4.2. Interpretation

The effectiveness of the training must be seen from the perspective of the beneficiaries (Mohanty et al., 2019). Learning programs provide a mechanism to develop all recipients in overcoming any challenges given by the environment, educational programs can play an effective role because they can play a direct role in learning program participants. The strategic goal is the development of knowledge of work skills (Ancok, 2012). If training has a very good level of effectiveness, the training system will support the implementation of the organization's strategic goals with a positive motive and all parties are committed to working together to make it effective (Sinambela, 2016). The training program is structured to increase understanding whose effectiveness indicators are increasing knowledge about competencies in carrying out certain activities (Fitria et al., 2019), and also increasing awareness about the importance of applying the competencies gained through training (Hutahaean, Pertiwi, Pohan, Perdini, & Novitasari, 2022).

As stated by Sinambela (2016) that the effectiveness of training requires the support of commitment of all parties. The less effective training means that parties do not optimally carry out their commitments, especially in terms of carrying out their roles in a way that tends to be less professional (Bates, 2004). Another cause of the training ineffectiveness is the human factor as people tend to be unstable. We can carry out effective learning by fostering motivation to always be involved and participate in the learning process. Creating an effective learning atmosphere is to create a sense of comfort, fun and motivation so that it becomes a driving force and encouragement for participants to learn more (Maheasy, 2018). One of the reasons is that the knowledge adopted from the training results will make people who take part in the training need to reconfigure the knowledge (Luozzo, Pop, & Schiraldi, 2021) that has been stored for a long time.

Ideally, the success of a training program must be based on needs (Suci & Jamil, 2019), such as the needs of the organization to achieve certain targets. The success rate of training must be seen based on the actual performance that has been achieved since it has an impact on increasing competence in doing and getting things done. One part of the training that can support success is job aids which provide the beneficiaries with the opportunity to apply the training at work (Kumiadi, 2007). Through training, organizations try to achieve success and avoid the risk of not achieving targets. Although there are training methods that apply the concept of simulation, this only teaches the steps to do and complete a task. The success or failure of a training program can be known through real performance that represents individual performance and the achievement of organizational targets. A successful training program is characterized by its ability to help the organization achieve its goals. If otherwise, it means that there are points in the training program that must be improved. There is an obligation to improve the training program and represent an error so that training will not fail to help the organization achieve its targets.

#### 5. Conclusions and Suggestions

The effectiveness of training is about the accuracy of training methods to achieve the objectives of the training. Training programs and materials are prepared based on certain expectations of the organization, especially the expectations of achieving job targets. Effective training can have an impact on instilling an

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understanding of the expected targets, so understanding becomes an important capital in mastering work behaviours that will support work performance. The success of training is an advanced stage of effective training because success can be known through the implementation of the understanding gained into real work demands. Understanding of the amount and how to get the target is carried out towards the achievement of the actual target, then the difference between the training and the actual target achieved will be calculated. The actual target unrelated to the training effect explains the achieved target is not due to the training factor.

The data analyzed in this study are based on conditions of very effective and moderately effective training. To support the usefulness of the formula on effectiveness and success rate, it is expected that further research will be implemented into real training activities, including other activities in the form of social intervention. Regarding the intended targets in the formula, targets are highly adaptable to the objectives of the training carried out.

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