# Survey of Land Measurement Practices Department of PTSP FT UNM on Various Civil Engineering Works

Taufiq Natsir[1*], Bakhrani Rauf[2], Faisal Syafar[3], Krisan Leontino[4]

[1234]Universitas Negeri Makassar, Makassar
South Sulawesi, INDONESIA

[*]*Corresponding auhtor's email: taufiq [AT] unm.ac.id*

**ABSTRACT----** ***This research was conducted to obtain data related to the relevance of the practice material of Land Measurement, Civil Engineering and Planning Education Department, Faculty of Engineering, Makassar State University (UNM) in various civil engineering jobs. The method in this research is quantitative research with descriptive analysis design. The samples taken are 25 alumnus and students who have experience in the field of land measurement. Technical analysis of data using coding techniques (coding), scoring (scoring) and percentages. In collecting research data, using a questionnaire method or a questionnaire containing statements related to jobs taught to students of the Department of Civil Engineering and Planning Education. The results showed that the average value (mean) of the relevance of the practice material of soil measurement of the Civil Engineering and Planning Education Department in various civil engineering jobs is on an interval scale of 3.28 - 4.03 or with the highly relevant criteria.***

**Keywords----** Relevantion, Land Measurement, Civil Engineering

## 1. INTRODUCTION

Education is one of the main targets of the government in order to improve the welfare of the people. In today's life, everyone has an interest in the course of education because education is a place for fostering the workforce, able to increase employment opportunities, and to obtain a certain status in society. Higher education as part of the national education system has a strategic role in educating the nation's life and increasing national competitiveness in the face of globalization in all fields. Thus, public access to higher education needs to be improved. In realizing affordability and equitable distribution to obtain quality higher education that is relevant to the interests of the community, the government and the private sector have built many higher education institutions.

Education today must be oriented to the world of work, so that the emphasis is not solely on cognitive aspects, but also on other aspects of personality that are even more important, such as affective and psychomotor aspects. Thus, today's education must really be oriented to life skills.

Building Engineering Education (PTB) aims to produce Building Engineering Education graduates who have the ability to master the basic knowledge of Building Engineering. As the name implies, graduates from this department are expected to be able to become teaching staff at Vocational High Schools (SMK) but do not rule out the possibility to work in the field of construction services according to their respective skills and abilities. In fact, most of the graduates from this department take non-educational paths in the world of work, be it as consultants, contractors, experts, and even non-civil engineering routes such as bank employees and others. One of the jobs most often taken by graduates of the Makassar State University (UNM) Building Engineering Education is in the field of Surveying. Based on research conducted by (Alam et al., 2015) or writing his thesis, with a trace study of alumni of S1 Civil Engineering Education and Planning, Faculty of Engineering UNM (PTSP FT UNM) for three years, namely alumni in 2012, 2013, and 2014 showing that alumni of the PTSP Department FT UNM for three years, 86% worked in the construction industry sector, and only 14% worked in the education sector. This proves that the percentage of graduates who take jobs in the education sector is very small because the job opportunities provided by the Government in this field in recent years are very few. Therefore, it is very important for PTSP FT UNM students to develop their abilities in the construction industry, one of which is in the subject of Soil Surveying.

## 2. LITERATURE REVIEW

The meaning of Relevance is "relationship, relatedness", in popular scientific dictionaries. Burgin in (Mustangimah et al., 2021) divides the level of relevance into three parts in defining it as follows:

1. Very Relevant, namely that the paper is a direct response to a question.
2. Marginally Relevant, i.e. the topic of the paper is relevant but not a direct response to the question.
3. Not Relevant, namely that the paper is not relevant to the question

According to (Sukmadinata, 2010), relevance consists of internal relevance and external relevance. Internal relevance is the suitability or consistency between curriculum components such as objectives, content, delivery and evaluation processes, or in other words internal relevance concerns the integration of components in the curriculum. While external relevance is the suitability of the curriculum with the demands, needs, and developments in society.

From some of the definitions above, it can be concluded that relevance is the relationship or compatibility between the curriculum in the world of education and the outside world that has been designed regularly in order to face the developments or demands of life in society.

Relevance is the most important component because it is a factor that can determine the existence of the educational institution concerned. A higher education institution is said to be relevant if all or most of its graduates can be absorbed by the world of work in accordance with the field and strata ranking according to Sadjad (2002) in (Muhson et al., 2012). (Muhson et al., 2012) also said that the relevance of an educational program (study program) contains elements: objectives, inputs, processes, outputs/outcomes and impacts (outcomes). In addition, he also mentions that the relevance of education can be related to one of them being courses that are useful/supporting the work of alumni in the world of work (Muhson et al., 2012).

## 3. METHOD

### *3.1. Types of research*

The type of research used is survey research, namely the collection of information carried out by compiling a list of questions posed to respondents. The approach used in this research is a qualitative and quantitative approach. This approach is used to collect information, opinions, data and input from alumni about the relevance of the PTSP FT UNM Soil Survey material with civil engineering work.

This research method uses a combination research method (Mixed Methods). According to (Sugiyono, 2017) that, "Combined research methods (mixed methods) is a research method that combines or combines quantitative methods and qualitative methods to be used together in a research activity in order to obtain more comprehensive data, valid, reliable and objective.

### *3.2. Research Subject*

The subjects of this study were students or alumni of PTSP FT UNM who had work experience in the field of Land Surveying in the field which were used as the population in this study. While the sample was taken by snowball sampling, which is a technique of determining the sample which was initially small in number, then this sample was asked to choose friends to be sampled and so on, so that the number of samples increased until it reached 25 people as samples. It's like a rolling snowball, getting bigger and bigger (Sugiyono, 2017).

Data collection technique

Data collection technique is an activity to find and obtain the data needed so that it can be processed and presented according to the problems faced and to be studied (Mulyani et al., 2021). The data collection technique used by the researcher in this study was a questionnaire technique and field observation. This research questionnaire aims to determine the relevance of soil surveying practice material in the PTSP FT UNM department with various civil engineering jobs. The questionnaire is an online questionnaire using a Google Form containing the jobs taught in this course. While observations were made to determine the implementation of land measurements in the field.

### *3.3. Data analysis technique*

Interval Scale

To determine the perception score interval scale, the following formula is used:

Information:

a = Number of attributes

$$\text{Scale Interval} = \{a\ (m\text{-}n)\}: b$$

m = Highest Score

n = Lowest Score

b = Number of rating scales to be formed

In this study the rating scale to be formed is a score of 4, where the lowest score is 1 and the highest score is 4, thus the perception interval scale can be calculated as follows:

Interval Scale = {1 (4-1)}: 4

= {1 (3)}: 4

= 3: 4

= 0,75

So, the distance between each point is 0.75 so the perception assessment in this study is:

a. Very Relevant 3,28 – 4,03

b. Relevant 2,52 – 3,27

c. Less Relevant 1,76 – 2,51

d. Not Relevant 1,00 – 1,75

### *3.4. Average Score (Mean)*

Formula:

$$M = \frac{\sum Xi}{N}$$

Description:

M = Average (Mean)

Xi = Value x 1 to n

N = Total

### *3.5. Standard Deviation*

Formula:

$$\text{Standar Deviasi} = \sqrt{\frac{\sum(xi-x)}{n}}\ .$$

The standard deviation informs about how far the variance of the data is with the mean value. The greater the value of the standard deviation, the larger the data (heterogeneous).

### *3.6. Percentage*

Formula:

$$P = \frac{F}{N} \text{ x } 100\%$$

Information:

P = Percentage

F = Frequency

N = Total

## 4. RESULTS AND DISCUSSION

**Table. 1 The following are the characteristics of the respondent's data**

| *No.* | *Information* | *Total* | *Percentage* |
|---|---|---|---|
| *1* | *Generation* | | |
| | *2010* | *5* | *20%* |
| | *2012* | *5* | *20%* |
| | *2013* | *5* | *20%* |
| | *2015* | *5* | *20%* |
| | *2016* | *5* | *20%* |
| *2* | *Employment Status* | | |
| | *Company* | *12* | *48%* |
| | *Freelancer* | *13* | *52%* |

The results of this study indicate that the relevance of the geometry course can be seen through the average score (mean) of each question item in the questionnaire as we can see in table 2 below:

**Table 2. The Relevance of The Geometry Course**

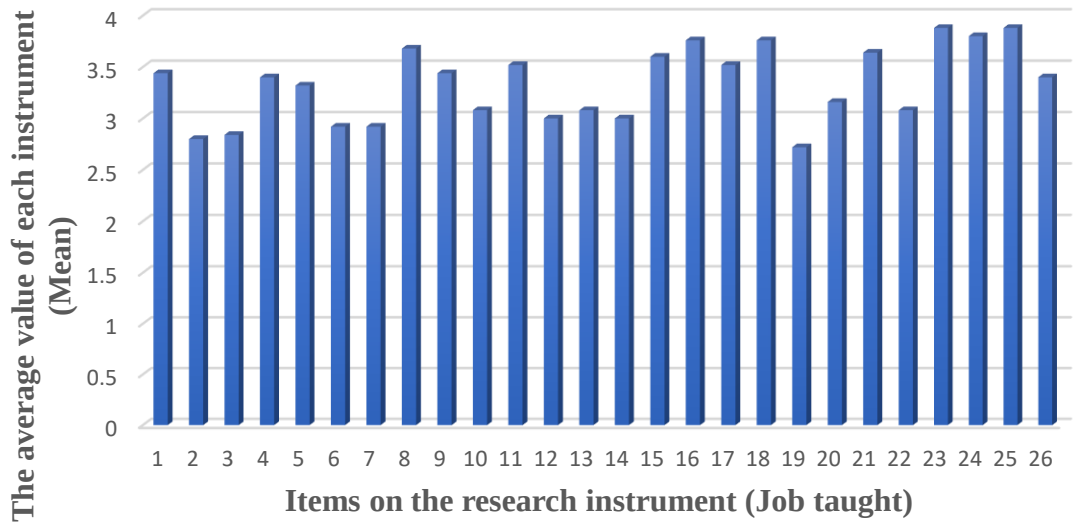
| *No* | *Job Name* | *Average value (Mean)* | *Information* |
|---|---|---|---|
| *1* | *Introduction to Simple Measuring Instruments (Pegs, Roll Meter, Yalon, Measuring Cross, EDM)* | *3.44* | *Very Relevant* |
| *2* | *Draw straight lines on the field using Yalon* | *2.8* | *Relevant* |
| *3* | *Calculating the distance blocked by the river using the Measuring Cross* | *2.84* | *Relevant* |
| *4* | *Introduction of Waterpass Measuring Instrument* | *3.4* | *Very Relevant* |
| *5* | *Single Longitudinal Waterpass Measurement* | *3.32* | *Relevant* |
| *6* | *Double Stand Waterpass Measurement* | *2.92* | *Relevant* |
| *7* | *Homecoming Waterpass Measurement* | *2.92* | *Relevant* |
| *8* | *Polar Method Waterpass Measurement* | *3.68* | *Very Relevant* |
| *9* | *Round-trip Single Longitudinal Waterpass Measurement* | *3.44* | *Very Relevant* |
| *10* | *Introduction of Digital Waterpass Measuring Instrument* | *3.08* | *Relevant* |
| *11* | *Introduction to the Theodolite Angle Measuring Tool* | *3.52* | *Very Relevant* |
| *12* | *Repetition Method Angle Measurement* | *3* | *Relevant* |
| *13* | *Reiteration Method Angle Measurement* | *3.08* | *Relevant* |
| *14* | *Closed Polygon Measurement Without Compass* | *3* | *Relevant* |
| *15* | *Closed Polygon Measurement With Compass* | *3.6* | *Very Relevant* |
| *16* | *Polar Closed Polygon Measurement* | *3.76* | *Very Relevant* |
| *17* | *Coordinate Closed Polygon Measurement* | *3.52* | *Very Relevant* |

| | | | |
|---|---|---|---|
| *18* | *Measurement of Situation Map (Contour)* | *3.76* | *Very Relevant* |
| *19* | *Map Measurement using Planimeter tool* | *2.72* | *Relevant* |
| *20* | *GPS Hand* | *3.16* | *Relevant* |
| *21* | *Introducing the Total Station Measuring Instrument* | *3.64* | *Very Relevant* |
| *22* | *Total Station Measurement Manual Method* | *3.08* | *Relevant* |
| *23* | *Total Station Measurement Recording Method* | *3.88* | *Very Relevant* |
| *24* | *Closed Polygon Measurement with Total Station* | *3.8* | *Very Relevant* |
| *25* | *Measurement of Situation Map (Contour) with Total Station* | *3.88* | *Very Relevant* |
| *26* | *GPS Geodetic* | *3.4* | *Very Relevant* |
| *Total* | | *86.64* | |
| | | | |
| **Average (*Mean*)** | | **3.332** | Very Relevant |

The following is an overview of the final average score (Mean) of the relevance of the soil surveying course majoring in Education

Civil Engineering and Planning FT UNM on various civil engineering jobs in the following bar chart form:

**Figure 1. The average value of the relevance of soil surveying courses in various civil engineering jobs**




Based on Table 2 and the bar chart above, it can be seen that the sum of the average (mean) of each item is 86.64 and when averaged, the final average (mean) value of the entire data is 3.332. This value is on an interval scale of 3.28 – 4.03 or with very relevant criteria. So from the results of data processing, it can be concluded that the subject of soil surveying majoring in Civil Engineering and Planning Education in various civil engineering works is very relevant, so we can also conclude that the implementation of the Soil Surveying Course, Department of Civil Engineering Education and Planning, Faculty of Engineering, State University Makassar is in accordance with the needs of the field.

The median or middle value on the overall results of data analysis of the relevance of the PTSP FT UNM soil surveying course is 3.4 and the mode or data description that appears the most in the overall data analysis is 3.08. While the standard deviation of the results of the analysis of the relevance of soil surveying courses PTSP FT UNM is 0.361. This value indicates that there is only very little variation in the data that has been obtained.

In addition to the above, the researchers tried to find out about other measurement methods that have not been covered by the PTSP FT UNM Soil Surveying Course which are often also used in the field, namely:

1. Staking Out method, this method is used to determine points in the field whose coordinates are known. So, this method is used with the help of a Theodolite or Total Station tool to get the distance and horizontal angle of the point you want to find.

2. Measuring the level of elevation, this measurement has actually been covered by this course, but there are still several techniques that are also often used, the first is leveling using a hose, a conventional method but very effective when a measuring instrument is not available. Then use the Auto-Level tool, this tool is simple to use and very helpful in measuring elevation.
3. Measurement of road bends, this measurement is very necessary for road planning projects, especially in calculating bends.

## 5. CONCLUSIONS AND SUGGESTIONS

### *5.1. Conclusion*

Based on the results of research and data analysis, the following conclusions are obtained:

1. The implementation of land measurements in the field of civil engineering includes: measuring land area, measuring field conditions, measuring Long-Cross (Roads, Rivers, Channels, etc.), determining and taking coordinates, and measuring the elevation (height) of a point in the field.
2. The material for the practice of soil surveying at the PTSP FT UNM Department has been carried out well and in accordance with or Very Relevant to the demands in the field.

### *5.2. Suggestion*

Based on the results of the study, the authors provide the following suggestions:

1. For institutions, to pay more attention to Soil Surveying, especially in facilitating this course in order to support the success of students' learning
2. For the Department of Civil Engineering Education and Planning PTSP FT UNM to pay attention to measurement methods that have not been covered and work on them so that students can learn.
3. For students, increase their interests and abilities and understand well the materials and practices of land surveying so that they can be used and applied in the world of work
4. For further researchers, it is hoped that they will be able to dig deeper into the subject of Soil Measurement, which is certainly very useful for students

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