# ANALYSIS OF EFFECT OF ACHIEVEMENT BETWEEN THE MATHEMATICS AND PHYSICS COURSE TO THE COMPETENCE COURCE IN THE MAKASSAR MERCHANT MARINE POLYTECHNIC

*by* Muh. Jafar -

# ANALYSIS OF EFFECT OF ACHIEVEMENT BETWEEN THE MATHEMATICS AND PHYSICS COURSE TO THE COMPETENCE COURCE IN THE MAKASSAR MERCHANT MARINE POLYTECHNIC

Muh. Jafar

Makassar Merchant Marine Polytechnic

*Abstract:* The purpose of this study is; (1) to find out the magnitude of the influence between learning achievement for Mathematics and Physics courses with the Competency Formation course in the Nautical and Engineering majors, and (2) to find out the possibility of learning achievement in Mathematics and Physics courses can increase the competence of Cadets in the Polytechnic of Shipping Makassar. This research uses descriptive method with correlational approach. The population in this study is the Youth Organization Semester VII and VIII with a total of 200 people from 2 majors each of 100 people majoring in Nautika and 100 people majoring in Engineering. The analytical technique used in this study is a combination of quantitative and qualitative analysis. The results showed that; (1) mathematics and physics courses do not significantly influence the value of the handling of a cadet's content, (2) mathematics and physics courses do not significantly affect a cadet's Astronomy Value, (3) mathematics scores and Physics Values do not significantly influence the value of courses Stability in the cadets, (4) mathematics scores and Physics Values do not significantly influence the value of the Position Determination course in the cadets, and (5) Mathematics and Physics Values do not significantly influence the value of Flat Sailing courses in cadets.

*Keywords:* Mathematics, Physics, Competence, Achievement, Learning.

## 1. INTRODUCTION

The Makassar Merchant Marine Polytechnic (PIP) was established based on the Decree of the Minister of Transportation number: KM. 81 of 1999 concerning organization and work procedures as amended by KM. 070 of 2002. PIP Makassar is an official tertiary institution within the Ministry of Transportation, led by a Director who is below and is responsible to the Head of the Transportation Human Resources Development Agency. PIP Makassar as a daily shipping tertiary education is administratively fostered by the Secretary of the Transportation Human Resources Development Agency and technically operational is fostered by the Head of the Maritime Transportation HR Development Center. PIP Makassar has the task of carrying out professional education of the Sailing Diploma IV Program in the fields of expertise in Nautica, Engineering, and Sea and Harbor Transportation Management (KALK).

Improving the quality of education is always adjusted to the progress of science and technology. Advances in science and technology will make the nation's development better and be able to compete with other countries. Makassar Merchant Marine Polytechnic will receive A accreditation from the Indonesian Director General of Perla for all majors / study programs, the Department of Nautics and Engineering Makassar Merchant Marine Polytechnic which has received

accreditation B. The Department of Nautics and Engineering has very close subjects related to the exact sciences. while the KALK major studies more social sciences. Student achievement in the Department of Nautics and Engineering is lower than in the KALK department. One of the causes of the Nautika & Teknika majors has not yet received an A Accreditation is due to several factors which among others are due to academic achievement in general is quite low. This is interesting to study with the title "Analysis of the Effect of Learning Achievement in Mathematics and Physics Subjects to Competence Subjects in Makassar Merchant Marine Polytechnic"

The purpose of this study are:

1. To find out the magnitude of the effect between learning achievement for Mathematics and Physics courses with the Competence Formation course in the Nautics and Engineering majors.

2. Knowing the possibility of learning achievement in Mathematics and Physics courses can increase the competence of cadets in Makassar Merchant Marine Polytechnic.

## 2.  LEARNING ACHIEVEMENT

In the world of education teaching and learning activities are the most important activities. It can be said that success in achieving educational goals depends a lot on how the teaching and learning process is experienced by students as students. To find out where the progress of students is then assessed. Therefore, assessment plays an important role in the education process. In general, the assessment of a teacher is formulated in a report card or report card and is given to students periodically. The assessment formulated in this report card is a learning achievement achieved after studying for a certain period. According to Sutratinah Tirtonegoro (1984: 43) "Learning achievement is the assessment of learning outcomes expressed in the form of letters, numbers and sentences that reflect the results achieved by each child in a certain period". Meanwhile according to Dimyati and Mudjiono (1909: 3) "learning outcomes are the result of an interaction of learning and teaching actions, from the teacher's point of view the teaching action ends with the process of evaluating learning, from the student's side the learning outcome is the end of the fragment and the peak of the learning process".

The presence of learning achievements in human life at certain levels and types can also give satisfaction to humans, especially for children who are still in school. Learning achievement is increasingly important to be questioned because it has a main function. Zainal Arifin (1990: 3) expresses about learning achievement as follows:

a. Learning achievement as an indicator of quality and quantity that students have mastered;

b. Learning achievement as a threshold of curiosity.

c. Learning achievement as information material in educational innovation. The assumption is that learning achievement can be used as a motivator for students in improving science and technology as a feed back in improving the quality of education;

d. Learning achievement as an internal and external indicator of an educational institution. Internal indicators in the sense that they can be used as indicators of the productivity level of an educational institution. Assumption that the curriculum used is relevant to the needs of the community and students in the community. The assumption is that the curriculum used is also relevant to community development needs;

e. Learning achievement can be used as an indicator of the absorption (intelligence) of students. In the teaching and learning process of students is the main and first problem because students are expected to absorb all the subject matter that has been programmed in the curriculum

## 3.  TARUNA COMPETENCE

Mc Ashan (1981: 45) Compentency is knowledge, skills and abilities or capabilities that a person achieved, which becomes part of his / her being to the extent he or she phsychomotoric behavior (knowledge, skills and abilities mastered by someone who has become part of himself so that he can perform cognitive behaviors, affective and psychomotor as well as possible.According to Crunkilton (1979: 222) Competence is mastery of a task, skills, attitudes and appreciation needed to support success.Learning competence is a form of learning learning objectives in cognitive, affective and psychomotor aspects.

1. Cognitive competence

Cognitive aspects of competence are competencies relating to the ability to recall or get to know, knowledge, development of intellectual abilities, and thinking skills.

Cognitive aspects of competence are also defined as competencies related to remembering and thinking. According to Bloom (1956) with friends (Bloom, 1956), cognitive aspects consist of 6 (six) levels of ability from low to high, namely:

a. Knowledge

Knowledge is the lowest level of cognitive goals, this goal relates to the ability to recall information that has been learned (recall), such as for example: remembering Archimedes' law, the theory of relativity and so on. This kind of remembering facts is very useful and important to achieve the next higher goal

b. Comprehension

Understanding higher levels of knowledge, understanding is not just about remembering facts, but it is related to the ability to explain, explain, interpret or the ability to grasp the meaning or meaning of a concept. Understanding ability can be in the form of: 1) Understanding translating, the ability to translate contained in something, for example translating sentences, passwords and others. 2) Understanding interpreting something, for example interpreting graphics, and 3) Extrapolation.

c. Application / Application

Application is a cognitive goal that is even higher in level than knowledge and understanding. This goal relates to the ability to apply a lesson material that has been studied such as theories, formulas, legal propositions, conceptual ideas and so on into new concrete situations.

Behavior regarding the applicability of this application such as the ability to solve a problem using certain formulas, propositions and laws. Here it seems clear, that someone will be able to master the ability to apply when supported by the ability to remember and understand certain facts or concepts.

d. Analysis (Analysis)

Analysis is the ability to describe or break down a lesson material in parts or elements as well as the relationships between the material parts. Analysis is a complex learning goal that can only be understood and mastered by students who have mastered the ability to understand and apply. This analysis is also related to the ability of reason.

e. Synthesis (Synthesis)

Synthesis is the ability to compile parts into a meaningful whole, such as formulating themes, plans or seeing abstract relationships from various available information. Synthesis is the opposite of analysis. The ability to analyze and synthesize, is the basic ability to be able to develop or create innovations and new creations.

f. Evaluation

Evaluation relates to the ability to make judgments about something based on certain intentions and criteria.

2. Affective competence

Affective aspects competencies are competencies related to interests, attitudes, values, rewards and adjustment. Affective aspects competency is also defined as abilities related to attitudes, values, interests, appreciation (appreciation) and adjustment of social feelings. Affective aspects competency according to Krathwohl (1968) consists of five levels from lowest to highest high:

a. reception or attendance;

b. responding;

c. appreciation of value (valuing);

d. organization (organization);

e. practice (characterization).

3. Psychomotor competence

The psychomotor aspect competency is the competence which is motor skills, or motion. Psychomotor aspects of competence are also defined as behaviors related to skills that are manual or motoric. Psychomotor aspects of competence according to Harrow (1972) consists of five levels from lowest to highest:

a. reflex movements (reflex movements);

b. basic movements (basic fundamental movements);

c. perceptual abilities (perceptual abilities);

d. physical motion (physical abilities);

e. skilled movements

f. non-discursive communication (non-discursive communication).

According to Gordon (1988: 109) describes several aspects or domains contained in the concept of competence as follows:

a. Knowledge (knowledge); namely awareness in the cognitive field. For example, a teacher knows how to identify learning needs and how to learn from students according to their needs.

b. Understanding (understanding) the cognitive and affective depth possessed by individuals. For example a teacher who will carry out learning must have a good understanding of the characteristics and conditions of students, in order to carry out learning effectively and efficiently.

c. Ability (skill), is something that is owned by an individual to perform the task or work assigned to him. For example the teacher's ability to choose and make simple teaching aids to provide learning facilities for students.

d. Value (value); is a standard of behavior that has been believed and psychologically united in a person. For example the standard of teacher behavior in learning (honesty, openness, democratic etc.)

e. Attitude (attitude); that is feeling (happy - not happy, like-dislike or reaction to a stimulus that comes from outside.

f. Interest (interest); is someone's tendency to do something. Interest in learning or doing something.

## 4. RESEARCH METHODS

This research uses descriptive method with correlational approach. This means that in this study focused on solving problems now based on existing data to determine the relationship that exists between two or more variables. The type of data used by researchers in this study is qualitative data, namely: data in the form of words, sentences, schematics and images. The population in this study is the Youth Organization Semester VII and VIII with a total of 200 people from 2 majors each of 100 people majoring in Nautika and 100 people majoring in Engineering. The analytical technique used in this study is a combination of quantitative and qualitative analysis. Quantitative analysis is used for measurement data using numbers while qualitative analysis is used for data that cannot be measured by numbers, by describing with words. The analysis technique used to analyze the data in this study consisted of; (1) Descriptive statistical analysis, used to obtain the calculated average value, standard deviation, median. And the mode of each variable examined and (2) inferential statistical analysis, is used to test the research hypothesis that is simple regression analysis. For the purposes of testing hypotheses, the following formula is used

$Yi = \alpha + \beta X_i + \varepsilon i$

Information :

Y = Youth learning achievement

X = The intensity of communication between coaches and cadets

## 5. RESEARCH RESULT

The Influence Between Mathematics & Physics Subjects with Competency Forming Courses in the Nautical Department

1. Handling Load Settings

**ANOVA[b]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | .249 | 2 | .124 | .540 | .585[a] |
| | Residual | 23.290 | 101 | .231 | | |
| | Total | 23.538 | 103 | | | |

a. Predictors: (Constant), Fisika, Matematika

b. Dependent Variable: Penang_Muatan

From the ANOVA test or F-test, an F-count of 0.540 was obtained with a significance level of 0.585. Because the significance level is greater than 0.05, it can be concluded that the value of Mathematics and Physics of a cadet is less influential on the acquisition of scores in the Course of Handling and Content Management.

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 2.707 | .278 | | 9.723 | .000 |
| | Matematika | .070 | .069 | .102 | 1.028 | .307 |
| | Fisika | -.011 | .076 | -.014 | -.140 | .889 |

a. Dependent Variable: Penang_Muatan

The hypothesis that is built is as follows:

Ho = Regression Coefficient Not Significant

Hi = Significant Regression Coefficient

Decision making (based on probability, see column Sig.) Is as follows:

If Sig. > 0.05 then Ho is accepted

If Sig. <0.05 then Ho is rejected, Hi is accepted

Seen that in the Sig. for all three variables, i.e. constant = 0,000. Mathematics = 0.307 and Physics = 0.889 have a significance number> 0.05 thus Ho is accepted or in other words both mathematics and physics courses do not significantly influence the value of a cadet handling charge.

From the results of the regression analysis it can be concluded that the Mathematics Value and Physics Value do not significantly influence the value of the Cargo Handling subject in cadets.

2. Astronomy Merchant Marine

**ANOVA[b]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | .342 | 2 | .171 | .571 | .567[a] |
| | Residual | 30.273 | 101 | .300 | | |
| | Total | 30.615 | 103 | | | |

a. Predictors: (Constant), Fisika, Matematika

b. Dependent Variable: Astronomi

From the ANOVA test or F-test, an F-count of 0.571 was obtained with a significance level of 0.567. Because the level of significance is greater than 0.05, it can be concluded that the value of Mathematics and Physics of a cadet has less effect on the acquisition of scores in the Astronomy Sailing Course.

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 2.263 | .317 | | 7.128 | .000 |
| | Matematika | -.043 | .078 | -.054 | -.551 | .583 |
| | Fisika | .079 | .087 | .090 | .909 | .365 |

a. Dependent Variable: Astronomi

The hypothesis that is built is as follows:

Ho = Regression Coefficient Not Significant

Hi = Significant Regression Coefficient

Decision making (based on probability, see column Sig.) Is as follows:

3 If Sig. > 0.05 then Ho is accepted

If Sig. <0.05 then Ho is rejected, Hi is accepted

Seen that in the Sig. for all three variables, i.e. constant = 0,000. Mathematics = 0.583 and Physics = 0.365 have a significance value> 0.05, thus Ho is accepted or in other words both mathematics and physics courses are not significant enough to affect the value of a cadet's astronomy.

From the results of the regression analysis it can be concluded that the Mathematical Value and the Physical Value do not significantly influence the value of the Astronomy Sailing course in cadets.

3. Ship Building and Stability

**ANOVA[b]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 2.911 | 2 | 1.455 | 2.368 | .099[a] |
| | Residual | 62.080 | 101 | .615 | | |
| | Total | 64.990 | 103 | | | |

a. Predictors: (Constant), Fisika, Matematika

b. Dependent Variable: Stabilitas

From the ANOVA test or F-test, an F-count of 2.368 is obtained with a significance level of 0.099. Because the significance level is greater than 0.05, it can be concluded that the Mathematics and Physics value of a cadet has less effect on the acquisition of grades in the Subject Building and Ship Stability.

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 3.319 | .455 | | 7.300 | .000 |
| | Matematika | -.204 | .112 | -.177 | -1.825 | .071 |
| | Fisika | .145 | .125 | .113 | 1.163 | .247 |

a. Dependent Variable: Stabilitas

While the t-test is used to test the significance of constants and each independent variable

The hypothesis that is built is as follows:

Ho = Regression Coefficient Not Significant

Hi = Significant Regression Coefficient

Decision making (based on probability, see column Sig.) Is as follows:

3 If Sig. > 0.05 then Ho is accepted

If Sig. <0.05 then Ho is rejected, Hi is accepted

From the results of the regression analysis it can be concluded that the Mathematical Value and Physical Value do not significantly influence the value of the Stability courses in cadets.

4. Position determination

**ANOVAᵇ**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | .029 | 2 | .015 | .077 | .926ᵃ |
| | Residual | 19.317 | 101 | .191 | | |
| | Total | 19.346 | 103 | | | |

a. Predictors: (Constant), Fisika, Matematika

b. Dependent Variable: Penpos

This section describes the level of significance.

From the ANOVA test or F-test, an F-count of 0.077 was obtained with a significance level of 0.926. Because this probability (significance level) is greater than 0.05, this regression model cannot be used to predict the value of a cadet's Positioning Course. In other words, the Value of Mathematics Subjects and the Physics Subject of a cadet together have less effect on the Value of Positioning Courses.

**Coefficientsᵃ**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 2.872 | .254 | | 11.326 | .000 |
| | Matematika | -.023 | .062 | -.036 | -.366 | .715 |
| | Fisika | -.010 | .070 | -.014 | -.144 | .886 |

a. Dependent Variable: Penpos

While the t-test is used to test the significance of constants and each independent variable

The hypothesis that is built is as follows:

Ho = Regression Coefficient Not Significant

Hi = Significant Regression Coefficient

Decision making (based on probability, see column Sig.) Is as follows:

If Sig. > 0.05 then Ho is accepted

If Sig. <0.05 then Ho is rejected, Hi is accepted

Seen that in the Sig. for all three variables, i.e. constant = 0,000. Mathematics = 0.715 and Physics = 0.886 have a significance number> 0.05, thus Ho is accepted or in other words both mathematics and physics courses do not significantly influence the value of a cadet's Positioning.

From the results of the regression analysis it can be concluded that the Mathematical Value and Physical Value do not significantly influence the value of the Position Determination course in the cadets.

5. Flat Shipping

**ANOVAᵇ**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 2.328 | 2 | 1.164 | 4.320 | .016ᵃ |
| | Residual | 27.211 | 101 | .269 | | |
| | Total | 29.538 | 103 | | | |

a. Predictors: (Constant), Fisika, Matematika

b. Dependent Variable: IPD

This section describes the level of significance.

From the ANOVA test or F-test, an F-count of 4,320 was obtained with a significance level of 0.016. Because this probability (significance level) is smaller than 0.05, this regression model can be used to predict the value of a Flat Sailing

Page | 35

Course in a cadet. In other words, the Mathematics Subject's Value and the Physics Subject of a cadet jointly influence the Position Value Course.

**Coefficients^a**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 2.023 | .301 | | 6.721 | .000 |
| | Matematika | .215 | .074 | .277 | 2.905 | .005 |
| | Fisika | .040 | .083 | .046 | .483 | .630 |

a. Dependent Variable: IPD

While the t-test is used to test the significance of constants and each independent variable

The hypothesis that is built is as follows:

Ho = Regression Coefficient Not Significant

Hi = Significant Regression Coefficient

Decision making (based on probability, see column Sig.) Is as follows:

If Sig. > 0.05 then Ho is accepted

If Sig. <0.05 then Ho is rejected, Hi is accepted

Seen that in the Sig. for all three variables, i.e. constant = 0,000. Mathematics = 0.005 and Physics = 0.630 have a significance number> 0.05, thus Ho is accepted or in other words both mathematics and physics courses are not significant enough to influence the value of a cadet's Flat Sailing Science.

From the results of the regression analysis it can be concluded that the Mathematical Value can provide a strong influence on the value of the Mathematics course and the Physics Value does not have a significant effect on the value of the Flat Sailing course in cadets.

## 6. CONCLUSION

1. Mathematics and physics courses do not significantly influence the value of a cadet handling charge

2. mathematics and physics courses do not significantly influence the value of a cadet's astronomy

3. Mathematics and Physics scores do not significantly influence the value of the Stability courses in cadets

4. Mathematics and Physics scores do not significantly influence the value of the Positioning course in the cadets

5. Mathematics and Physics Values do not significantly influence the value of the Flat Sailing Science course in cadets.

### REFERENCES

[1] Indonesia (2003) *Undang-Undang Republik Indonesia Nomor 20 tahun 2003 tentang Sistem Pendidikan Nasional*. Bandung: Citra Umbara

[2] IMO (1978) Standart Training Certification and Watch Keeping for Seafarer ,Londong 2010

[3] IMO Cadet Record Book for Deck Cadet

[4] IMO Cadet Record Book for Engine Cadet

[5] Muhibbin Syah. 2005. *Psikolagi Belajar*. Jakarta: Raja Grafindo Persada

[6] Mulyasa 2002, Kurikulum berbasis kompetensi, PT. Remaja Rosdakarya Bandung 2006

[7] Wina Sanjaya 2008, Kurikulum dan Pembelajaran, Jakarta Kencana 2008

[8] Watoyo Dwi (2008) Hubungan antara Lingkungan Belajar Dan Minat Belajar Dengan Prestasi Belajar

# ANALYSIS OF EFFECT OF ACHIEVEMENT BETWEEN THE MATHEMATICS AND PHYSICS COURSE TO THE COMPETENCE COURCE IN THE MAKASSAR MERCHANT MARINE POLYTECHNIC

# ANALYSIS OF EFFECT OF ACHIEVEMENT BETWEEN THE MATHEMATICS AND PHYSICS COURSE TO THE COMPETENCE COURCE IN THE MAKASSAR MERCHANT MARINE POLYTECHNIC

FINAL GRADE

/0

GENERAL COMMENTS

**Instructor**