**Journal Educational of Nursing (JEN)**
Vol. 4 No. 1 – January – June 2021; page 35-40
p-ISSN : 2655-2418; e-ISSN : 2655-7630
journal homepage: https://ejournal.akperrspadjakarta.ac.id
DOI : 10.37430/jen.v4i1.80

Article history:
Received: February 19, 21
Revised: February 25, 21
Accepted: March 02, 21

# Relationship between Scientific Attitude and Student Learning Outcomes In the Microbiology Course

[1]M. Givi Efgivia, [2]Sumarmi, [3]Ewin Suciana
[1]Postgraduate Educational Technology, University of Ibnu Khaldun Bogor Indonesia
[2]Bhakti Asih Ciledug Midwifery Academy, Indonesia
[3]Informatics Engineering Study Program STTM Muhammadiyah Tangerang - Indonesia
Email: mgivi@uika-bogor.ac.id[1], sumarmi1952@gmail.com[2], sucianaewin@gmail.com[3]

**Abstract**

One of the educational problems faced by Indonesia is the low critical thinking skills of students. The purpose of this study was to determine the relationship between scientific attitudes and student learning outcomes (critical thinking) in the Microbiology course. The method used in this research is correlation. The sample in this study were 28 students. Analysis of the data used in this study using the Kolmogorov-Smirnov data normality test and the Pearson product moment correlation test. The results of this study indicate a relationship between scientific attitudes and learning outcomes which can be seen from the sig value. equal to 0, 343. Meanwhile, the relationship between scientific attitudes and learning outcomes is 46.3%.

Keywords: Learning Outcomes, Microbiology, Scientific Attitude.

## Preliminary

In the last decade, health development in Indonesia has begun to shift from previously focusing on the field of treatment (curative) to a more comprehensive one by covering promotive and preventive fields as illustrated in the primary health care program and the healthy paradigm. from the Ministry of Health. Along with the epidemiological transition in developing countries, especially in Indonesia, there is a Double Burden (double burden) condition where non-communicable diseases are seen to increase in quality and quantity but infectious diseases still play a major role as a cause of death and morbidity in almost parts of the region.

Infectious diseases are currently a big problem and have become a global threat, both in the form of new emerging diseases and reemerging diseases, this is because these diseases have a very high virulence level, have a very fast spread. As reported in the mass media that in Indonesia the bird flu epidemic has attacked 105 regencies/municipalities in 17 provinces, within 30 years since the discovery of the dengue virus in Surabaya and Jakarta there has been a large increase in both the number of sufferers and the spread of the disease. found in 27 provinces and 200 cities have reported outbreaks.

As stated in the health development plan towards a healthy Indonesia 2010, one of the leading health programs is the eradication program for infectious diseases which aims to reduce morbidity, mortality and disability from infectious diseases and prevent spread and reduce the social impact of the disease so that it does not become a health problem.

As an archipelago located in the tropics, from the point of view of

environmental health science, Indonesia has various kinds of things that are both beneficial and detrimental. A favorable environmental factor is the hot air temperature which causes several types of viruses such as SARS (Severe Acute Respiratory Syndrome) to not easily reproduce. Another example is a religious society, especially in reducing the rapid transmission of the HIV / AIDS virus and so on.

On the other hand, environmental factors that are detrimental are due to the low level of community education so that knowledge of environmental health is still low, traditional customs that are not in line with the understanding of environmental health, environmental sanitation problems that have not been completely resolved (standing water and garbage accumulation), humidity , has caused infectious diseases, whether by viruses, bacteria, protozoa or worms that have not been resolved satisfactorily

Education is an essential element in the development and improvement of the quality of human resources. Education in modern thinking is a process of cultural inheritance from society which is passed on from the next generation and that legacy is developed through scientific discoveries. Formal education has a very valuable contribution to change in society, can advance society and development. The relationship between the education process and development, especially human development, explained by Theodore Schultz, assumes that formal education is an important investment for the future, for example in the form of work and social position as well as opportunities for social mobility and is very much needed to produce human abilities, attitudes and productive behavior.

This is of course due to an increase in material difficulties at each semester change. However, this problem can be fixed if the lecturer can design learning according to the learning objectives that have been set. Especially in microbiology courses which require an understanding of the concept to be applied and analyzed in a laboratory lab.

Based on the results of interviews with lecturers in microbiology courses, usually in conveying theories in these courses the lecturers still use the conventional model with the lecture method. Lecturers use textbooks agreed upon by the study program as a learning resource. If the material in learning is missing, the lecturer provides additional material from other sources and students write it down from the blackboard, after which the lecturer continues his explanation in front of the class. Students have not asked in depth about the material presented, so learning goes in one direction and students have not spurred themselves in critical thinking.

The lack of total student involvement in learning is due to the fact that students are less trying to find information on their own, and this reduces the meaning of active and effective learning. Students tend to learn to be able to answer test questions by memorizing subject matter instead of understanding, analyzing a problem, and solving problems that may be faced everyday, so that their critical thinking is less trained (Insyasiska et al, 2015).

The problems in the field are in accordance with Sanjaya's opinion that one of the problems faced by the world of education today is the weak learning process (Sanjaya, 2016: 1). Learning must be concerned with the opportunities given to students to build knowledge in their cognitive processes. Students need to be encouraged to work on solving problems, find everything for themselves, and strive to realize their ideas in order to understand and be able to apply their own knowledge. This of course also aims so that the learning process is not just transferring information from lecturers to students, but so that students are also encouraged to build their knowledge so

that they are able to prove a concept, then use it to solve existing problems.

It can be concluded that in reality in the field of microbiology, students' scientific attitudes are still low. This can be seen when the learning process takes place, students' curiosity is still low in the learning process, such as students who are not brave enough to convey their ideas or ideas so that the lecturer has to lure students to ask questions. Included in group assignments, not all students play an active role in doing part of their assignments, this means that students are less disciplined, and responsible for the assignments given and are less proficient in working together.

Though a scientific attitude is very important in the learning process. because scientific attitudes are also closely related to learning outcomes. If students have a scientific attitude it can be used as motivation and guidance in learning. The guidelines in question are how or what attitudes students should have in learning. The level of students' scientific attitudes can be seen from how they have a very high sense of curiosity, understand a new concept with their abilities without any difficulty, are critical of a problem that needs to be verified, and evaluate their own performance.

The purpose of this study was to obtain data / information about the relationship between students' scientific attitudes and learning outcomes (critical thinking) in the microbiology course.

## Research methods

This study uses a quasi-experimental method. The type of research used is correlational, namely the research method that is intended to determine the reciprocal relationship or the relationship between two or more variables. The relationship between two variables, for example the relationship or correlation between scientific attitudes (variable X) and learning outcomes (variable Y), where there is a relationship between scientific attitudes and student learning outcomes.

Population is a generalization area consisting of: Objects or subjects that have certain qualities and characteristics that are determined by the researcher for study and then draw conclusions. Population is not only people, but also objects and other natural objects. population is also not just the number of objects or subjects studied, but includes all the characteristics or properties possessed by the subject or object. The population in this study were students of the Faculty of Health Sciences, University of Ibnu Khladun Bogor, with a sample of 28 people.

In this study, the test used was a description test or essay test. The essay test is a question that requires students to answer it in the form of describing, explaining, discussing, comparing, giving reasons, and other similar forms in accordance with the demands of the question using their own words and language. The essay test in this study was used to measure students' critical thinking skills in the microbiology course.

## Result

### Hypothesis testing

Before testing the hypothesis, the analysis prerequisite testing is carried out in the form of a normality test and a homogeneity test.

### Normality test

The normality test is carried out to determine whether the data obtained is normally distributed or not. In this study, researchers conducted the Kolmogorov-Smirnov test assisted by IBM SPSS version 26. The basis for decision making on the Kolmogorov Smirnov normality test was: Sig 0,000 < 0.05 then H0 was rejected or Sig 0,000 > 0.05 then H0 was accepted.

**Learning Outcomes Normality Test**

**One-Sample Kolmogorov-Smirnov Test**

| | | |
|---|---|---|
| N | | 28 |
| Normal Parameters[a,b] | Mean | 77.86 |
| | Std. Deviation | 6.445 |
| Most Extreme Differences | Absolute | .222 |
| | Positive | .191 |
| | Negative | -.222 |
| Test Statistic | | .222 |
| Asymp. Sig. (2-tailed) | | .1[c] |

Figure 1 Normality Test

Based on the picture above, it can be concluded that the significance value is 0.1 <0.05, so the data is normally distributed.

**Scientific Attitude Normality Test**

**One-Sample Kolmogorov-Smirnov Test**

| | | |
|---|---|---|
| N | | 28 |
| Normal Parameters[a,b] | Mean | 202.32 |
| | Std. Deviation | 13.033 |
| Most Extreme Differences | Absolute | .112 |
| | Positive | .112 |
| | Negative | -.100 |
| Test Statistic | | .112 |
| Asymp. Sig. (2-tailed) | | .200[c,d] |

Figure 2 Scientific Attitude Normality Test Results

Based on the Figure above, it can be seen that the significance value is 0.200, which means that the data is normally distributed.

**Hypothesis testing**

Hypothesis testing is done to answer the hypotheses that have been proposed in this study. Hypothesis testing conducted in this study is the Pearson product moment correlation test, assisted by SPSS 26.

**Correlations**

| | | Attitude Scientific | Result Study |
|---|---|---|---|
| Attitude Scientific | Pearson Correlation | 1 | .681 |
| | Sig. (2-tailed) | | .343 |
| | N | 28 | 28 |
| Result Study | Pearson Correlation | .681 | 1 |
| | Sig. (2-tailed) | .343 | |
| | N | 28 | 28 |

Figure 3 Correlation Test Results The following is the hypothesis in this study:

H0: There is no relationship between scientific attitudes and learning outcomes.
H1: There is a relationship between scientific attitudes and learning outcomes.

With the test criteria:

Reject H0 if sig. ≥ 0.05 and accept H0 if sig. ≤ 0.05 Reject H1 if sig. ≤ 0.05 and accept H1 if sig. ≥ 0.05

Based on the table above, it can be seen that the significance value is 0, 343 so it can be concluded that H0 is rejected and H1 is accepted. That is, there is a relationship between scientific attitudes and student learning outcomes.

**Discussion**

Based on the results of the hypothesis test, it shows that the value of 0.343 ≥ 0.05, which means that there is a relationship between scientific attitudes and student learning outcomes in the Microbiology course on Gram Staining material. Furthermore, to find out how big the relationship between variable X and variable Y can use the coefficient of determination, namely the square result of the simple coefficient stated in the formula:

KD = $rxy^2$( Pearson Correlation) x 100%
= $(0,681)^2$ x 100%
= 0, 463 x 100%
KD = 46,3 %

From these calculations it can be concluded that the relationship between scientific attitude (X) and learning outcomes (Y) is 46.3%.

**Conclusion**

Based on the results of the data analysis of the research results and the discussion in this study, it can be concluded that there is a positive relationship between scientific attitudes and student learning outcomes in the Microbiology course on Gram Staining material. The magnitude of the relationship between scientific attitudes and learning outcomes is 46.3%.

**Bibliography**

[1]. Al-Tabany, Trianto Ibnu Badar (2017). Mendesain Model Pembelajaran Inovativ, Progresif, dan Kontekstual. Jakarta: Kencana

[2]. Arief, Zainal Abidin (2015). Landasan Teknologi Pendidikan. Bogor: UIKA Press

[3]. Arikunto, Suharsimi. 2008. *Prosedur Penelitian Suatu Pendekatan Praktek*, Jakarta: Rineka Cipta

[4]. Bina Husada, Palembang: STIK Bina Husada, Vol. 1, No. 1, Oktober.

[5]. Carin, Arthur A. (1993). Teaching Science Through. Macmillan Publishing Darwis, R. (2015). Pembelajaran berbasis inkuiri dengan aktivitas laboratorium untuk meningkatkan penguasaan konsep siswa SMP. *Prosiding Simposium Nasional Inovasi dan Pembelajaran*,hlm. 493-496.

[6]. Diana, R. (2017). *Analisis sarana dan intensitas penggunaan laboratorium biologi serta kontribusinya terhadap hasil belajar kelas XI pada mata pelajaran biologi di SMA swasta sekota Bandar Lampung* (Skripsi) Program Sarjana, Universitas Raden Intan, Lampung.

[7]. Decaprio, Richard. 2013. Tips Mengelola Laboratorium Sekolah. Jogjakarta: DIVA Press.

[8]. Hunaepi. (2016). Kajian Literatur Tentang Pentingnya Sikap Ilmiah. Prosiding Seminar Nasional Pusat Kajian Pendidikan Sains dan Matematika Tahun 2016 *"Assessment of Higher Order Thinking Skills"*. Hlm. 548-550

[9]. Guritno, Tri Aulia Mutia Rahma., Masykuri, M., Ashadi (2015). Pembelajaran kimia melalui model pemecahan masalah dan inkuiri terbimbing ditinjau dari keterampilan proses sains (KPS) dasar dan sikap ilmiah siswa. *Jurnal Inkuiri*, 4(2), hlm. 1-9

[10]. Indriyani, Dina., Mawardi., Mawardi, Krisma Widi. (2019). Peningkatan keterampilan berpikir kritis melalui model inkuiri berbantuan media konkret pada siswa kelas 5 SD Negeri Mangunsari 05 Tahun Pelajaran 2018/2019. *Jurnal Basicedu,* 3(1), hlm. 27-32.

[11]. Insyasiska, Dewi., Zubaidah, Siti., Susilo, Herawati. (2015). Pengaruh project based learning terhadap motivasi belajar, kreativitas, kemampuan berpikir kritis, dan kemampuan kognitif siswa pada pembelajaran biologi. *Jurnal Pendidikan Biologi*, 7(1), hlm. 9-21

[12]. Juhji. (2016). Peningkatan keterampilan proses sains siswa melalui pendekatan inkuiri terbimbing. *JPPI. Jurnal Penelotian dan Pembelajaran IPA,* 2(1), hlm. 58-70

[13]. Kuhlthau, Carol C., Maniotes Leslie K., Caspari, Ann K. (2007). *Guided Inquiry Learning in The 21st Century*. USA: Libraries Unlimeted.

[14]. Nasution, Sri Wahyuni Rozi. (2018). Penerapan model inkuiri terbimbing (guided inquiry) dalam meningkatkan kemampuan berpikir kritis pada pembelajaran fisika. *Jurnal Education and Development Institut Pendidikan Tapanuli Selatan,* 3(1), hlm. 1-5

[15]. Notoatmodjo, Soekidjo. 2003, *Ilmu Kesehatan Masyarakat*. Jakarta: Rineka Cipta.

[16]. Pelczar. 2009. *Dasar-dasar Mikrobiolog.* Jakarta Universitas Indonesia Press.

[17]. Nugraha, Arief Juang., Suyitno, Hardi., Susilaningsih, Endang. (2017). Analisis kemampuan berpikir kritis ditinjau dari keterampilan proses sains dan motivasi belajar melalui model PBL. *Journal of Primary Education*, VI(1), hlm. 35-43.

[18]. Purwanto, Ngalim. (2008). Evaluasi Hasil Belajar.Surakarta: Pustaka Belajar.

[19]. Razak, Firdha dan Kamaruddin, Rahmat. (2018). Pengaruh Sikap Ilmiah Siswa Terhadap Hasil Belajar Bangum Ruang Siswa Kelas VIII SMP Negeri 3 Minasatene. Jurnal Mosharafa, 7(1), hlm. 133-142.

[20]. Sanjaya, Wina. (2016). *Strategi Pembelajaran Berorientasi Standar Proses Pendidikan.* Jakarta: Prenadamedia Group.

[21]. t.n. (2009) Profil Mikrobiologi Kedokteran. [Online]. Tersedia di:https://fk.unair.ac.id/archives/2009/03/06/profil-mikrobiologi-kedokteran.html. Diakses 24 Februari 2020.

[22]. t.n. (2020) Program Studi Sarjana Mikrobiologi. [Online]. Tersediadi:https://www.itb.ac.id/program-studi-sarjana-mikrobiologi. Diakses 24 Februari 2020.

[23]. Zikrika. (2015). Efektivitas Penggunaan Laboratorium IPA dalam Pembelajaran Biologi di SMP Negeri 3 Palembang (Skripsi) Program Sarjana, Universitas Islam Negeri Raden Fatah Palembang.