

**ARTICLE TITLE WRITTEN BRIEF AND CLEAR, WRITTEN IN TNR-12 BOLD LETTERS, MAXIMUM 14 WORDS**

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### Abstract

Abstracts are written in English, Distance between lines 1 space TNR 11. Abstract contains 150-250 words and consists of only 1 paragraph, contains the main points of research, such as objectives, methods, research results, novelty and implication. Abstract should be able to illustrate how the research done can contribute to the development of science in the field of physics and physics education. Abstracts are written on a different page than the article content.

**Keywords:** 3-5 words or phrases (words 1, words 2, etc)



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## INTRODUCTION

Contains background, rationale, and or research urgency. References (relevant literature or research), need to be included in this section, in relation to the justification of research urgency, the emergence of research problems, alternative solutions, and the solutions chosen. The way of writing sources in the text needs to clearly indicate the name of the author and the citation of the source, in the form of the year of publication. An example is: ... research results show that more than 70% of students are unable to recognize authentic problems ... (Paid, 2008). The problems and objectives, as well as the usefulness of the research are written narratively in paragraphs, no need to be given special subtitles. Likewise operational definitions, if deemed necessary, are also written narratively. The introduction is written in TNR-11 upright, with 1 space. Each paragraph begins with a word that is indented into 5-6 digits, or about 1.2 cm from the left edge of each column.

## RESEARCH METHOD

Contains the type of research, time and place of research, targets/objectives, research subjects, procedures, instruments and data analysis techniques as well as other matters related to the method of research. targets/objectives, research subjects, procedures, data and instruments, and data collection techniques, as well as data analysis techniques and other matters related to the method of research can

be written in sub-chapters, with sub-headings. Sub-subheadings do not need to be notated, but are written in lowercase with a capital letter, TNR-11 bold, left aligned. As an example can be seen below.

### **Research Design**

This study uses a qualitative approach ...

Time and Place of Research

Especially for qualitative research, the time and place of research needs to be written down clearly (for quantitative research, it is also necessary).

### **Research Target/Subject**

Research targets/subjects (for qualitative research) or sample-population (for quantitative research) need to be explained clearly in this section. It is also necessary to write down the technique of obtaining subjects (qualitative research) and/or the sampling technique (quantitative research).

### **Research Procedure**

Procedures need to be described according to the type of research. How the research is carried out and the data will be obtained, needs to be described in this section.

For experimental research, the type of design (experimental design) used should be written in this section.

### **Instruments, and Data Collection Techniques**

The types of data, how the data is collected, with which instruments the data is collected, and the techniques for collecting it, need to be explained clearly in this section.

### **Data analysis technique**

How to interpret the data obtained, in relation to the problems and research objectives, needs to be explained clearly.

*(Note: The sub-chapters may differ, according to the type or research approach used. If there are procedures or steps that are sequential in nature, they can be notated (numbers or letters) according to their position).*

## **RESULTS AND DISCUSSION**

Research results are presented in the form of graphs, tables, or descriptive. Analysis and interpretation of these results is necessary before they are discussed.

The table is written in the middle or at the end of each research result/gain description text. If the width of the Table is not enough to be written in half a page, it can be written in a full page. Table titles are written from the left, all words begin with a capital letter, except conjunctions. If more than one line is written in single space (at least 12). As an example, can be seen in Table 1. Following

Table 1. Students' ability scores to do ... on learning ...

No.	Assessment Aspect	Score
Mea		
n		

The results are in the form of images, or data that is made of images/schemesgraphs/diagrams/the like, the presentation also follows the existing rules; title or image name is placed below the image, from the left, and spaced 1 space (at least 12) from the image. If there are more than 1 line, the lines are single spaced, or at least 12. As an example, it can be seen in Figure 1. below.

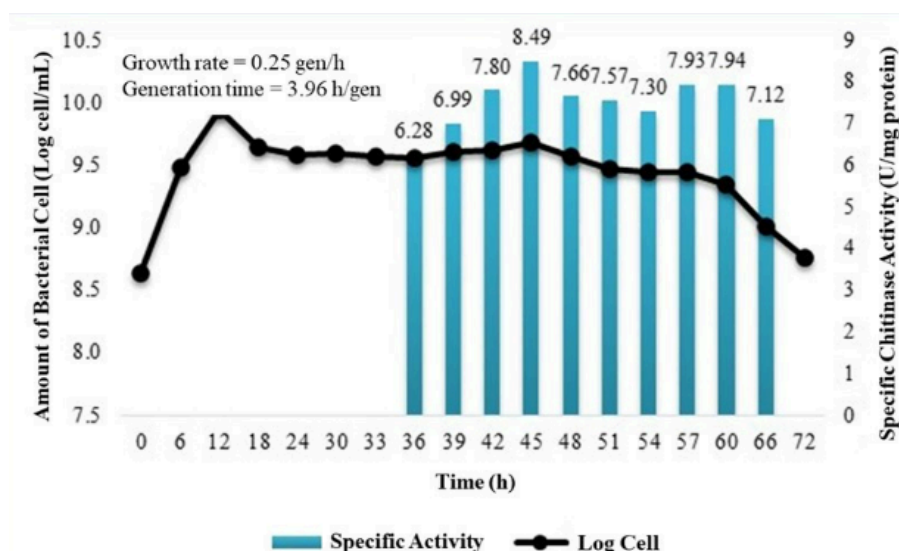


Figure 1. Growth curve and chitinase activity ...

The discussion is focused on connecting data and analysis results with the problem or research objectives and the wider theoretical context. Could this discussion be the answer to the question why these facts were found in the data?

A written discussion is attached to the data discussed. The discussion is inseparable from the data discussed, as well as conveying the *novelty in this research and its implications*.

## CONCLUSION

Conclusions can be generalized findings according to research problems, can also be in the form of recommendations for the next step.

## ACKNOWLEDGMENTS

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## AUTHOR CONTRIBUTIONS

For research articles with several authors, a short paragraph specifying their individual contributions must be provided. The following statements should be used "Conceptualization, X.X. and Y.Y.; Methodology, X.X.; Software, X.X.; Validation, X.X., Y.Y. and Z.Z.; Formal Analysis, X.X.; Investigation, X.X.; Resources, X.X.; Data Curation, X.X.; Writing – Original Draft Preparation, X.X.; Writing – Review & Editing, X.X.; Visualization, X.X.; Supervision, X.X.; Project Administration, X.X.; Funding Acquisition, Y.Y.”.

## CONFLICTS OF INTEREST

Authors must identify and declare any personal circumstances or interest that may be perceived as influencing the representation or interpretation of reported research results. If there is no conflict of interest, please state "The authors declare no conflict of interest." Any role of the funding sponsors in the choice of research project; design of the study; in the collection, analyses or interpretation of data; in the writing of the manuscript; or in the decision to publish the results must be declared in this section....

## REFERENCES

Written in the style of an educative environment, as stated in the guidelines for this journal (which ratified APA VII Edition).

Written in single space (or at least 11pt), each bibliography is spaced 1 space. Some examples of how to write references in the bibliography are given below.

### a. Example if coming from a textbook:

Gronlund, N.E. & Linn, R.L. (1990). *Measurement and evaluation in teaching*. (6<sup>th</sup>ed.). Macmillan.

**b. From the thesis / thesis / dissertation**

Hollander, M. M. (2017). *Resistance to authority: Methodological innovations and new lessons from the Milgram experiment* (Publikasi No. 10289373) [Disertasi, University of Wisconsin-Madison]. ProQuest Dissertations and Theses Global.

Slamet Suyanto (2009). *Keberhasilan sekolah dalam ujian nasional ditinjau dari organisasi belajar*. [Disertasi belum dipublikasikan]. Universitas Negeri Jakarta.

**c. From the journal**

Pritchard, P.E. (1992). Studies on the bread-improving mechanism of fungal alpha-amylase. *Journal of Biological Education*, 26(1), 14-17. <https://doi.org/10.1037/0012-1649.44.4.1055>.

**d. From a collection of research abstracts or proceedings**

Paidi. (2008). Urgensi pengembangan kemampuan pemecahan masalah dan metakognitif siswa SMA melalui pembelajaran biologi. *Prosiding, Seminar dan Musyawarah Nasional MIPA yang diselenggarakan oleh FMIPA UNY, tanggal 30 Mei 2008*. Yogyakarta: Universitas Negeri Yogyakarta.