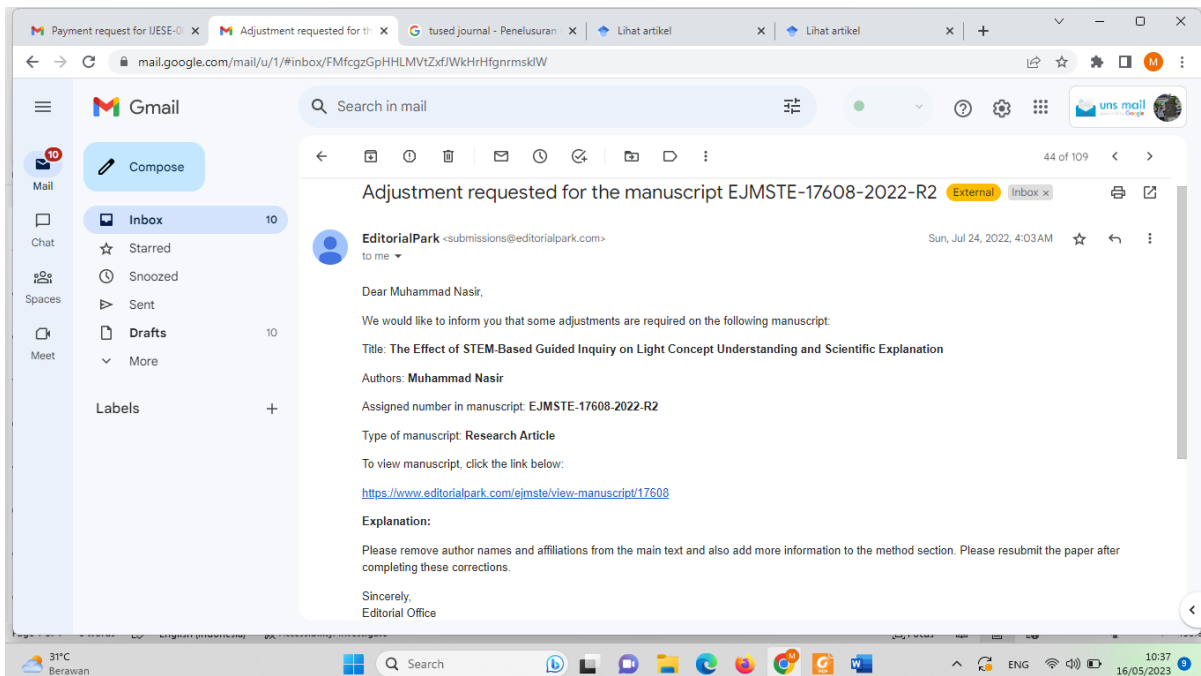
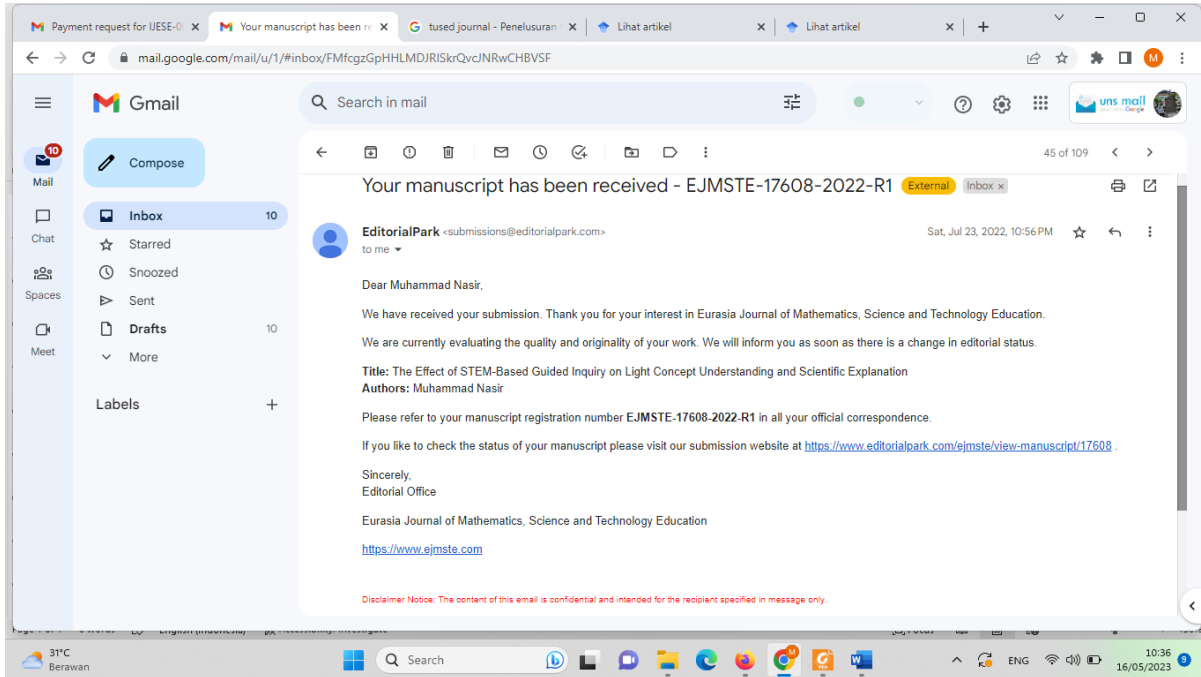


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EURASIA Journal of Mathematics, Science and Technology Education

Judul Artikel: The effect of STEM-based guided inquiry on light concept understanding and scientific explanation



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Edited manuscript has been submitted - EJMSTE-17608-2022-R2 External Inbox x

EditorialPark <submissions@editorialpark.com> to me, Cari, Widha, Fitria Sun, Jul 24, 2022, 7:17AM

Dear Muhammad Nasir,

Thank you for your following edited manuscript submission.

Title: **The Effect of STEM-Based Guided Inquiry on Light Concept Understanding and Scientific Explanation**

Authors: **Muhammad Nasir, Cari Cari, Widha Sunarno, Fitria Rahmawati**

Assigned number in manuscript: **EJMSTE-17608-2022-R2**

Type of manuscript: **Research Article**

To view manuscript, click the link below:

<https://www.editorialpark.com/ejmste/view-manuscript/17608>

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Major revisions required for the manuscript EJMSTE-17608-2022-R2 External Inbox x

EditorialPark <submissions@editorialpark.com> to me, Cari, Widha, Fitria Tue, Aug 30, 2022, 1:16AM

Dear Muhammad Nasir,

Thank you for submitting your manuscript to Eurasia Journal of Mathematics, Science and Technology Education. Your manuscript numbered EJMSTE-17608-2022, entitled **The Effect of STEM-Based Guided Inquiry on Light Concept Understanding and Scientific Explanation** has been reviewed by expert reviewers in their field. The referees have suggested some revisions that will improve your manuscript. I invite you to respond to the referee comments and revise your manuscript accordingly.

I kindly request you to perform necessary corrections on the text according to reviewers' suggestions. Please include a cover letter stating, item by item, the changes you have made in response to reviewer comments. Additionally, the changes you have made in the article should be clearly marked by highlighting the relevant sections with a separate color. Changes to multiple reviewer comments should be highlighted using a different color for each reviewer. Please make requested corrections and send as revised manuscript once again to our Journal.

To view manuscript, click the link below:

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Reviewer Comments:

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Reviewer Comments:

Comments from Reviewer1 (Recommendation: MAJOR REVISION)

Introduction

The problem statement was not well crafted and the research questions were not clearly written in the introduction section.

Methodology

An inappropriate methodology was used in the research.

In the research design, the author used "the pretest-posttest control group design". The type of experimental design was not mentioned. I think a quasi-experimental design is appropriate for such a study. There was no evidence showing that the samples were randomly selected.

The reason for taking the 4th-semester semester group for the experimental class and the 6th semester for the controlled group was not mentioned. Why groups from different semesters were chosen? Why deliberately assign the 4th-semester semester group to the experimental class and the 6th semester to the controlled group?

Were the conceptual tests used adopted/adapted or developed by the author? The question of the reliability and validity of the tests were not mentioned.

some minor comments are given in the text attached.

[EJMSTE-17608-2022-R2.docx](#)

Comments from Reviewer2 (Recommendation: MAJOR REVISION)

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Comments from Reviewer2 (Recommendation: MAJOR REVISION)

Please find below my suggestions to improve the manuscript entitled "The Effect of STEM-Based Guided Inquiry on Light Concept Understanding and Scientific Explanation".

Introduction

On page 3

Please indicate the definitions of both concept understanding and scientific explanations as well as their dimensions.

On Page 4

Please provide further evidence regarding students' lack of concept understanding and scientific explanations on light topics and the context of research studies.

Please give the reasons why PhET simulation could improve understanding of abstract concepts of light.

Please give the reasons why the flipped classroom learning strategy could improve scientific explanations.

Page 5

Please identify limitations of guided inquiry design model to improve students' concept understanding and scientific explanations that encourage the authors to integrate it to STEM.

Please provide details of the teaching steps of STEM-based guided inquiry learning model and guided inquiry design model.

Method

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Method

For experimental design, how the authors ensure that the two groups are similar in both concept understanding and scientific explanations at the start of the experiment. Please provide methods that the authors randomized treatments to participants. Additionally, please provide the details of the number of treatment sessions and its duration. Moreover, please present steps of STEM-based guided inquiry learning model that the authors delivered to students.

For instruments, the authors must present more details about the instruments, i.e., formats, number of items, dimensions, and the most important aspect, their psychometric properties. To do so, it reaffirms that research findings were investigated based on accurate, precise data.

For equation 2, the authors should change from unbiased estimate of d to Hedge's g .

According to equation 3, please give the reasons why the authors converted Hedge's g or corrected Cohen's d to correlation coefficient.

Please present the formula to calculate the N-gain score.

Importantly, the authors should employ a one-way MANOVA to analyze data because there are two correlated dependence variables, i.e., concept understanding and scientific explanation. If the authors analyzed data by separate two t-tests, results are likely to show low statistical power and high errors. In other words, the research findings are not credible and accurate. Thus, the authors should reanalyze data by using a one-way MANOVA and reorganize the result heading.

Result and discussion

The authors should separate the result and discussion heading into two headings, i.e., result heading and discussion heading, for smooth reading.

The authors should break this heading into four subheadings, i.e., results of descriptive statistics, results of comparison of means, result of correlation analysis, and results of practicality of STEM-based guided inquiry learning model.

The authors should add descriptive statistics results subheading to describe characteristics of concept understanding and scientific explanation of experimental group and control group, e.g., minimum value, maximum value, mean, and standard deviation.

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Result and discussion

The authors should separate the result and discussion heading into two headings, i.e., result heading and discussion heading, for smooth reading.

The authors should break this heading into four subheadings, i.e., results of descriptive statistics, results of comparison of means, result of correlation analysis, and results of practicality of STEM-based guided inquiry learning model.

The authors should add descriptive statistics results subheading to describe characteristics of concept understanding and scientific explanation of experimental group and control group, e.g., minimum value, maximum value, mean, and standard deviation.

For discussion, the authors should elaborate the effectiveness of STEM-based guided inquiry learning model to improve concept understanding and scientific explanation by comparing it with guided inquiry design model. To do so, it shows clear understanding why the STEM-based guided inquiry learning model is more effective than the guided inquiry design model.

On page 12, please explain in detail how STEM-based guided inquiry learning model can improve students' scientific explanation.

For table 7, the authors can remove this table because there is only one correlation coefficient. The authors should report it in a descriptive format.

Please provide discussions about the result of correlation analysis and the results of practicality of STEM-based guided inquiry learning model.

The first paragraph on page 15 should be removed and place after the first paragraph on page 13.

The second paragraph from page 15 onwards should be placed in the discussion about improving concept understanding and scientific explanations (page 8-12). As suggested in the above paragraph, if authors break the result and discussion heading into two headings, i.e., result heading and discussion heading, the readers would be able to better follow the authors' discussions.

Conclusion

The authors should provide the detailed implications of this study. That is, they should provide steps and suggestions about the employment STEM-

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Conclusion

The authors should provide the detailed implications of this study. That is, they should provide steps and suggestions about the employment STEM-based guided inquiry learning model to improve students' concept understanding and scientific explanations. Consequently, other people can apply this learning model to improve their students effectively and accurately.

Note:

1- You can submit your revised manuscript and revision information file (docx) via the file upload step on the manuscript editing page.

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Muhammad Nasir <muhammad_nasir@student.uns.ac.id> Sep 1, 2022, 3:13AM

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Muhammad Nasir <muhammad_nasir@student.uns.ac.id> Sep 1, 2022, 3:13AM

Dear Editorial Office of Eurasia Journal of Mathematics, Science, and Technology Education

Thank you for reviewing my manuscript numbered EJMSTE-17608-2022, entitled **The Effect of STEM-Based Guided Inquiry on Light Concept Understanding and Scientific Explanation**. I have corrected the manuscript based on suggestions for improvement from the two reviewers. The results of improvements from the first reviewer are marked with **green writing** and the results of improvements from the second reviewer are marked with **red writing**. I have uploaded the revised manuscript to the Eurasia Journal of Mathematics, Science, and Technology Education.

Sincerely,
Muhammad Nasir
Sebelas Maret University, Indonesia

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Your revised manuscript has been received - EJMSTE-17608-2022-R3

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EditorialPark <submissions@editorialpark.com>
to me, Cari, Widha, Fitria

Thu, Sep 1, 2022, 3:16 AM

Dear Muhammad Nasir,

Thank you for your following revised manuscript submission:

Title: The Effect of STEM-Based Guided Inquiry on Light Concept Understanding and Scientific Explanation

Authors: Muhammad Nasir, Cari Cari, Widha Sunarno, Fitria Rahmawati

Assigned number in manuscript: EJMSTE-17608-2022-R3

Type of manuscript: **Research Article**

To view manuscript, click the link below:

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Minor revisions required for the manuscript EJMSTE-17608-2022-R3

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EditorialPark <submissions@editorialpark.com>
to me, Cari, Widha, Fitria

Sun, Sep 25, 2022, 1:10 PM

Dear Muhammad Nasir,

Thank you for submitting your manuscript to Eurasia Journal of Mathematics, Science and Technology Education. Your manuscript numbered EJMSTE-17608-2022, entitled **The Effect of STEM-Based Guided Inquiry on Light Concept Understanding and Scientific Explanation** has been reviewed by expert reviewers in their field. The referees have suggested some revisions that will improve your manuscript. I invite you to respond to the referee comments and revise your manuscript accordingly.

I kindly request you to perform necessary corrections on the text according to reviewers' suggestions. Please make requested corrections and send as revised manuscript once again to our Journal.

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Reviewer Comments:

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Reviewer Comments:

Comments from Reviewer 1

There are a few minor issues which require revise. Details are provided below.

In abstract, please change "t-test independent samples test" to "one-way MANOVA".

In the body of article, please change "MANOVA" to "one-way MANOVA".

Please use the term "STEM-BGI" consistently in the whole article.

Please provide the detail of dimensions of practicality questionnaire.

According to equation 3, please give the reasons why the authors converted Hedge's g or corrected Cohen'd to correlation coefficient.

Please revise the sentence "The standard deviation of the scientific explanation in the GIB-STEM model and the GID model is almost the same, causing uniform data distribution" due to the fact that the standard deviation of scientific explanation in the GIB-STEM model is smaller than that of GID model.

The authors should test the assumption of normality by using data that combine participants' responses from GIB-STEM and GID.

Please remove superscripts in table 8 and table 9.

Comments from Reviewer 2

Comments to the Author

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Comments from Reviewer 2

Comments to the Author

1. I have observed significant progress in the manuscript in comparison to the first submission, however, still some sound issues must be addressed or clarified.
2. In the abstraction section, the previous comments were not addressed. It was commented that the design has to be quasi-experimental and that t-test would not help to analyze a statistical difference. In the methods part, it was corrected that MANOVA was used. This change must be addressed in the abstract section also.
3. The reliability coefficient of the conceptual test developed by the researcher was reported as 0.6. For research reliability of a test must be at least 0.7. With the reported reliability it is very difficult to trust the validity of the result. This problem arises because the research didn't undertake a pilot test of the instrument's reliability before undertaking the main study. I suggest avoiding some items that reduce the reliability of the test and making amendments in the result section. Otherwise, it is difficult to recommend the manuscript for publication at this doubtful reliability coefficient.

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Muhammad Nasir <muhammad_nasir@student.uns.ac.id> to info
Mon, Sep 26, 2022, 12:59 PM

Dear Editors of Eurasia Journal of Mathematics, Science and Technology Education

I have revised the manuscript numbered EJMSTE-17608-2022, entitled **The Effect of STEM-Based Guided Inquiry on Light Concept Understanding and Scientific Explanation** based on suggestions for improvement from both reviewers. The improvement results for the first reviewer are written in red and for the second reviewer are written in green.

Clarification for the second reviewer:
The Cronbach's Alpha 0.6 in my manuscript in the method section is not the value of the calculation result of Cronbach's Alpha but the standard that I use to decide the reliability of the research instrument. Thank you for providing information on the Cronbach's Alpha standard that researchers should use, which is 0.7. I have mistakenly taken Cronbach's Alpha standard of 0.6 because it was followed by some researchers in Indonesia using it. A sample of Indonesian articles that use Cronbach's Alpha standard of 0.6 is attached.

The Cronbach Alpha value of the conceptual understanding instrument that I developed was 0.759 while the Cronbach Alpha value for scientific explanations was 0.756.

Best Regards,
Muhammad Nasir
Sebelas Maret University, Indonesia.

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Mon, Sep 26, 2022, 1:17 PM

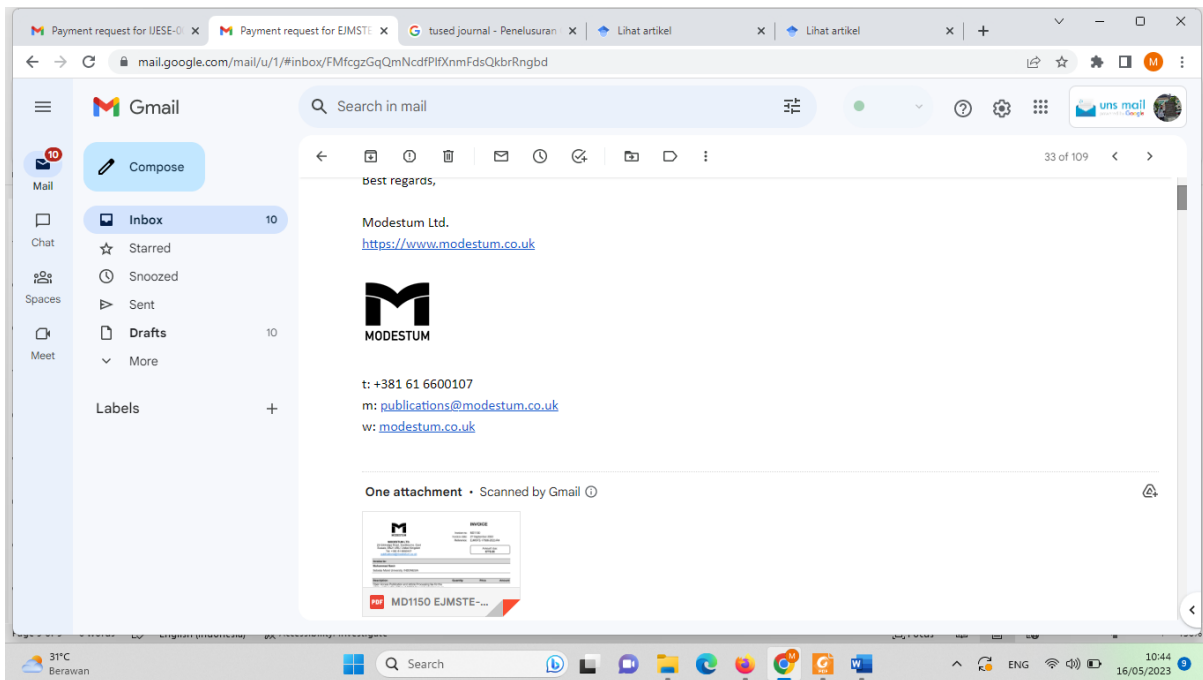
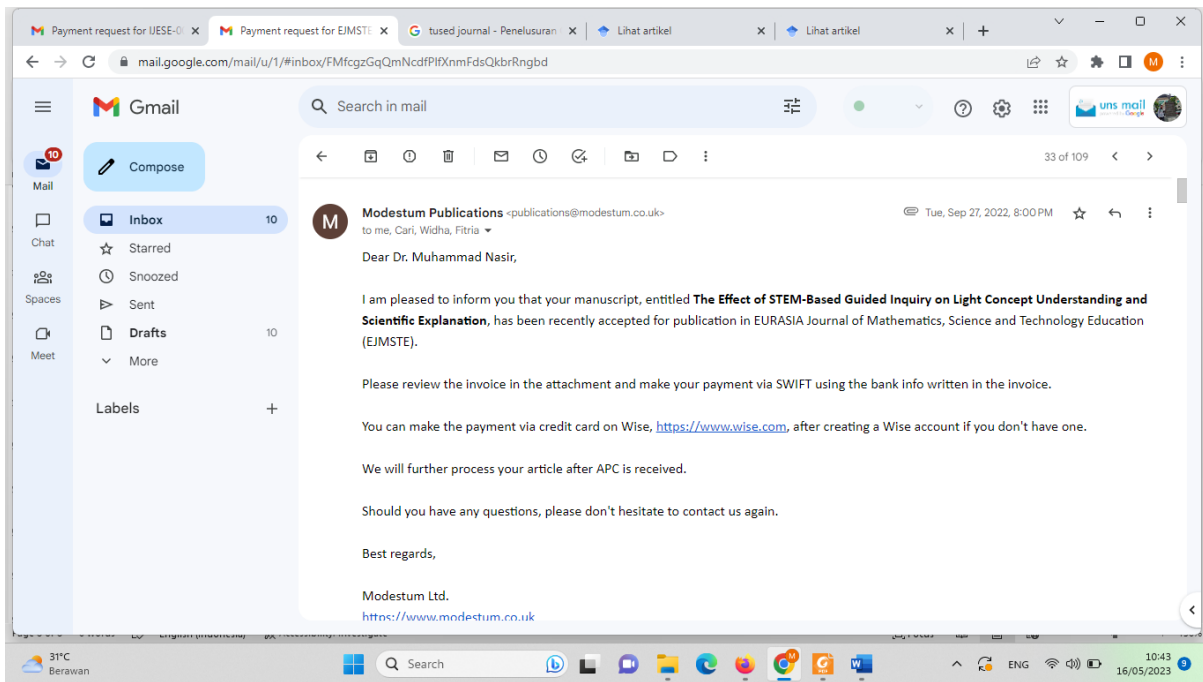
Dear Muhammad Nasir,

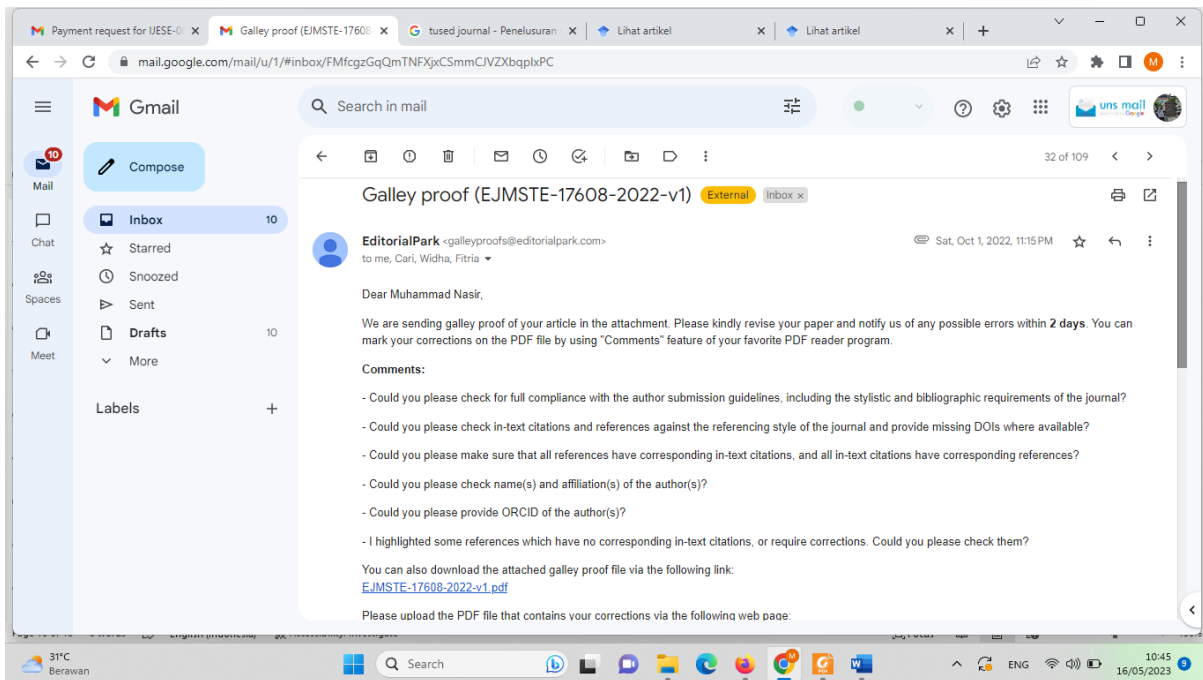
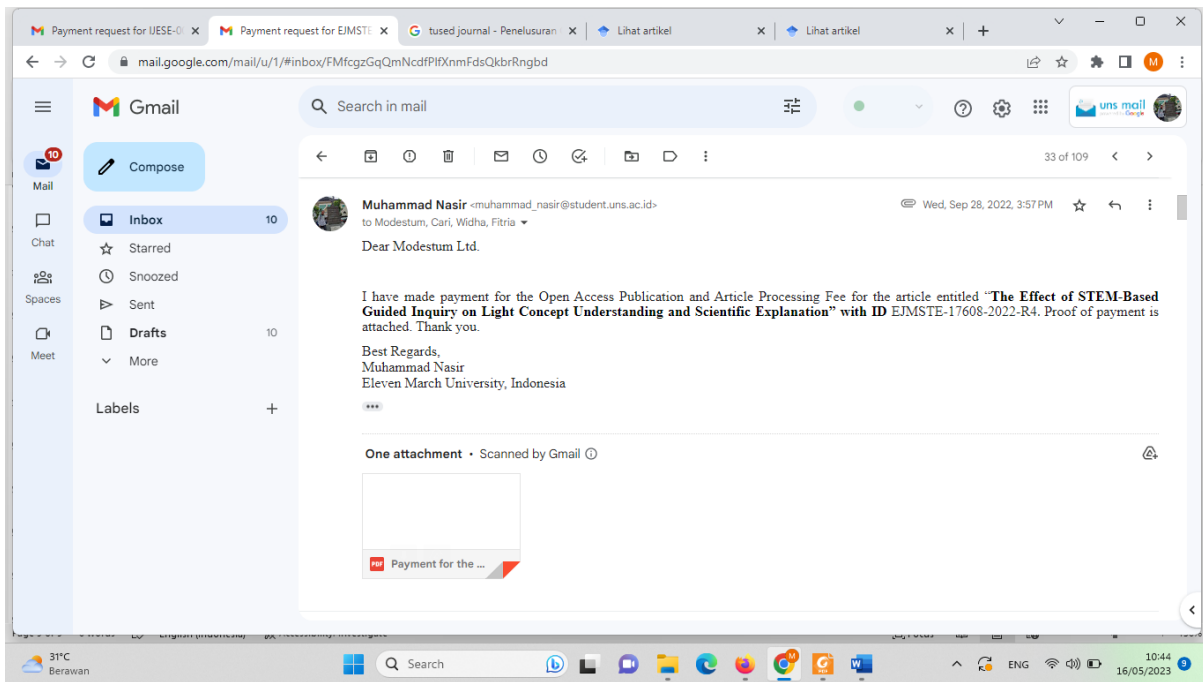
It is my pleasure to inform you that your manuscript entitled **The Effect of STEM-Based Guided Inquiry on Light Concept Understanding and Scientific Explanation** (EJMSTE-17608-2022) has been accepted for publication in "Eurasia Journal of Mathematics, Science and Technology Education" in its current form.

Thank you for your fine contribution. On behalf of the Editors of Eurasia Journal of Mathematics, Science and Technology Education, we look forward to your continued contributions to the Journal.

Sincerely,
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Please do not hesitate to contact us if you need any further assistance.

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EditorialPark <galleyproofs@editorialpark.com>
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Sun, Oct 2, 2022, 5:17 PM

Dear Muhammad Nasir,

Your comments on the galley proof EJMSTE-17608-2022-v1 have been received.

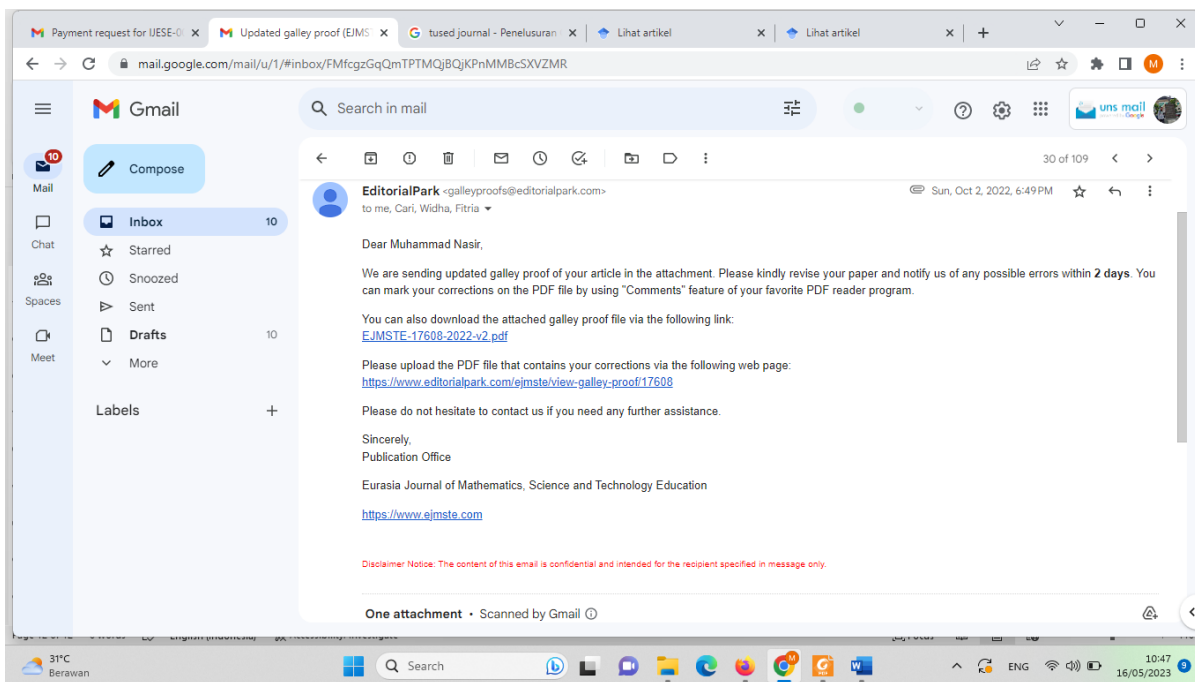
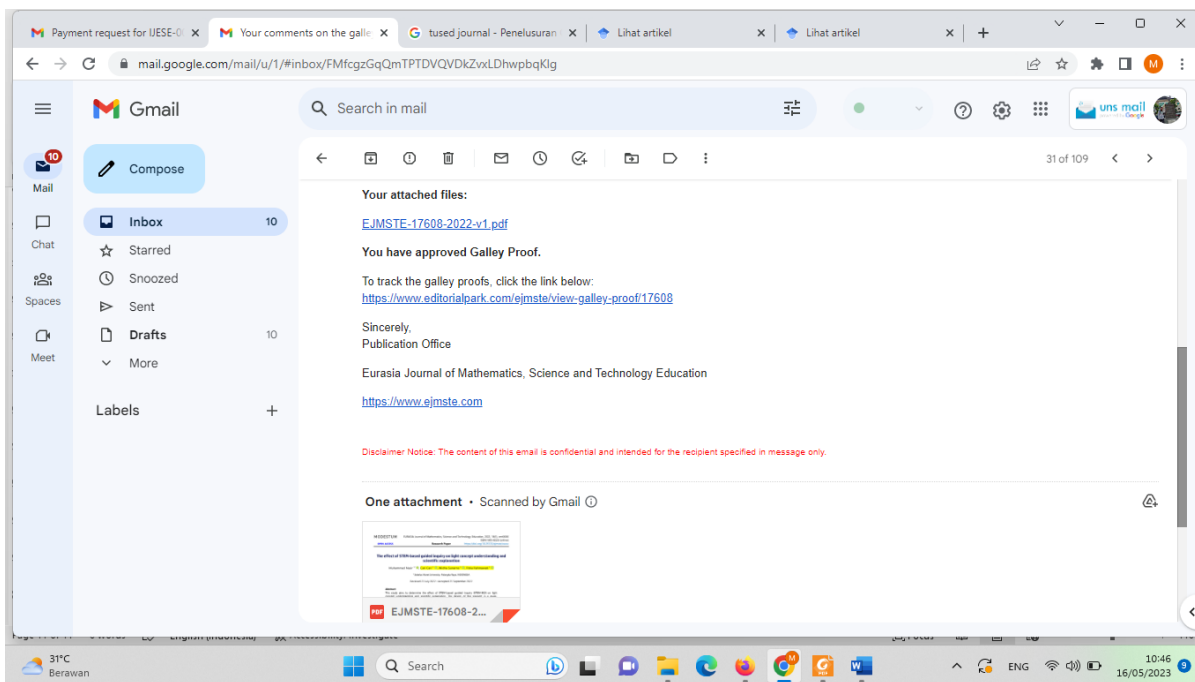
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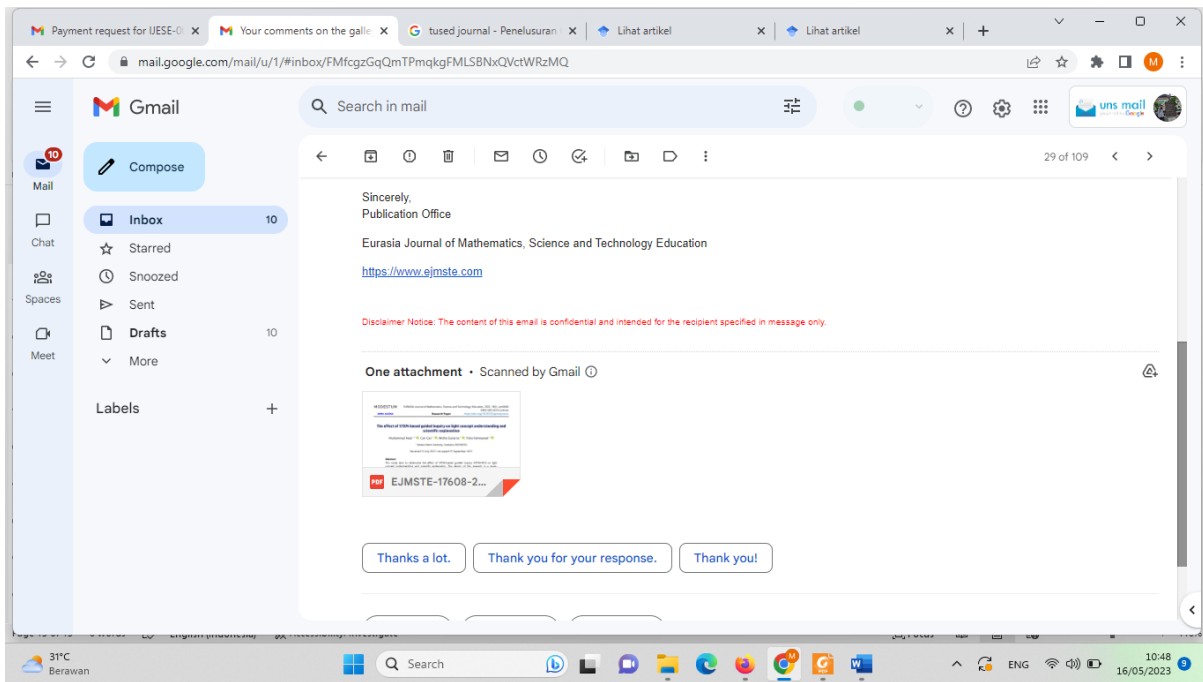
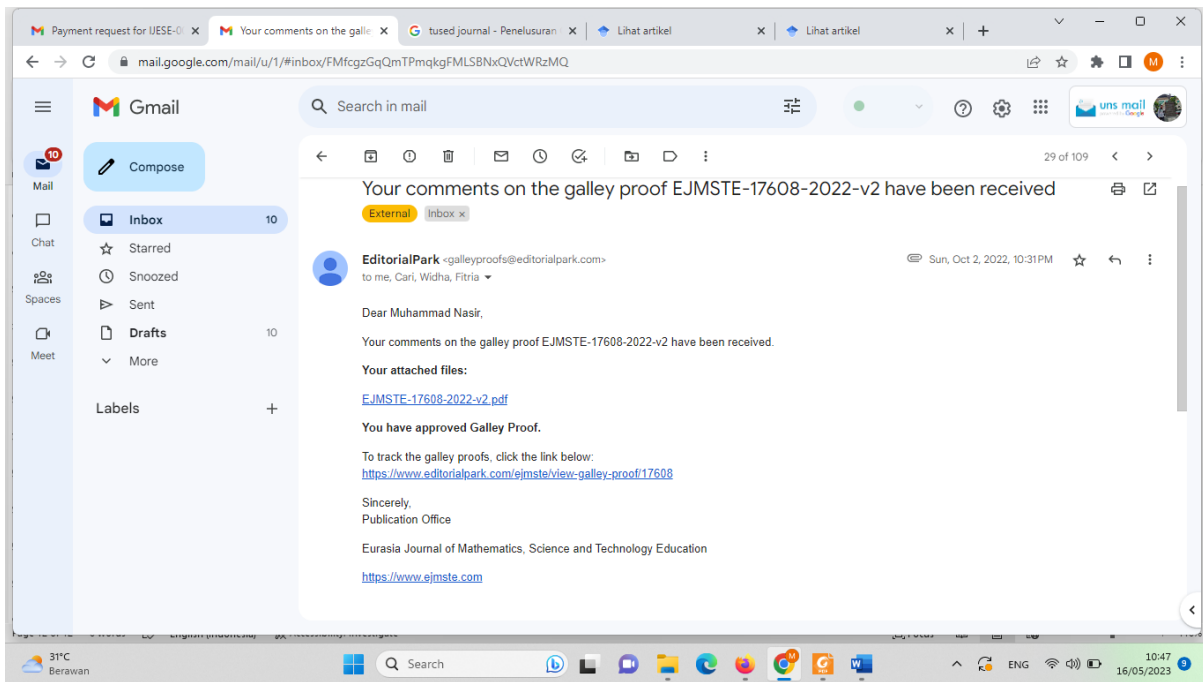
Comments:

- Please change the name of the city of Palangka Raya to Surakarta
- Muhammad Nasir's ORCID ID: 0000-0003-0245-4033, Cari's ORCID ID: 0000-0002-5717-1156, Widha Sunamo's ORCID ID: 0000-0002-0805-8042, Fitria Rahmawati's ORCID ID: 0000-0002-3145-9063
- Please replace this reference "Maera, J. (2016). Physics teaching methods. Maasai Mara University" with
 Johns, G., & Mentzer, N. (2016). STEM integration through design and inquiry. Technology and engineering teacher, 76(3), 13.

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Your article has been published in EJMSTE External Inbox x

EJMSTE <ejmste@ejmste.com> to me, Cari, Widha, Fitria Mon, Oct 3, 2022, 12:23AM

Dear Dr. Nasir,

We would like to inform you that your article entitled **The effect of STEM-based guided inquiry on light concept understanding and scientific explanation has been published in Eurasia Journal of Mathematics, Science and Technology Education**:

URL: <https://www.ejmste.com/article/the-effect-of-stem-based-guided-inquiry-on-light-concept-understanding-and-scientific-explanation-12499>

DOI: <https://doi.org/10.29333/ejmste/12499>

Thank you publishing with us. We are looking forward to your future publications.

Best regards,

Eurasia Journal of Mathematics, Science and Technology Education

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Thanks a lot. Congratulations! Congratulations.

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