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Peer Review Reports

The creativity of chemistry education students in the digital age

The article underwent 2 rounds of review. The authors agreed to disclose the reviewers' reports and their responses to the reviewers' comments.

Disclaimer: The peer review report content is the entire copy of the reviewers' and authors' comments. Typing and punctuation errors are not edited.

ROUND 1

Reviewers A and B have agreed in advance to publish their reports, anonymously.

Reviewer A: Anonymous
Recommendation: Revisions Required

Firstly, I would like to congratulate the autors of this article, to sharing the studies that aim to improve the undergraduate chemistry learning. The teacher training needs these initiatives to bring meaningful ICT into classrooms, both for students and teachers.

I will make some considerations about the text considering the following points:
1 – Introduction: I assess that the work is well-founded theoretically. I understand that the authors could better discuss what they call the "Digital Era". What does this term mean theoretically, when considering academic literature? They could make a reference to Pierre Levy to address and define the term.

2 – Objectives of the study: In the last paragraph of the introduction, three objectives of the study are listed. I understand that the authors did not discuss, throughout the text, the impacts of the "Digital Era" on the creativity of chemistry students. The authors discuss the use of creativity in implementing ICT for teaching chemistry, but do not explore how this is done in the way of teaching chemical concepts? I realize that students are equipped to effectively use ICT in the classroom. However, how is this considered in the development of learning chemical concepts?

Another objective that was only touched upon consisted of the challenges and barriers that may arise when integrating technology into Chemistry teaching and possible strategies to overcome these obstacles. What were the challenges and barriers that undergraduate chemistry students faced when proposing solutions to chemistry teaching problems in Indonesia using ICT-Based Learning Design associated with HDLC? I understand that this objective was not sufficiently discussed in the text.

3 – Results and Discussion: When discussing the student groups, the authors said: "The groups are formed randomly and it is expected that students can exchange opinions and help each other in classes. 72% agreed with this organization, 10% disagreed.

Question – How did the groups influence students' creativity? If 10% expressed disagreement with this form of organization, doesn't this influence the way opinions and help to colleagues are processed in the classroom? I believe that such questions should be answered in the text.

4 - About the ICT-Based Learning Design Course
QUESTION – Was the teacher who offered the ICT-Based Learning Design course a chemistry teacher? This question is directed towards another perspective of analysis: How was the ICT-Based Learning Design Course able to improve the learning of chemical concepts? This was not discussed in the article.

5 – Advantages and disadvantages of digital products:
When the authors explain HDLC in ICT-Based Learning Design courses, in the explanation phase, they said that each group tested digital learning media on a respondent, so that they knew the advantages and disadvantages of digital media products. However, they do not explain how students evaluate the advantages and disadvantages of digital media products. Is the respondent making this note to the students or is this a deduction that the students make from the interview? This question needs to be answered in the text.

6 – Elaboration phase: At this stage of development, I believe that the discussion needs to advance regarding the following questions that were not answered by the authors of the article:

How is the creativity of chemistry students explored to develop digital media that can promote the learning of chemical concepts? Was creativity discussed only for the creation of media? What another way ICT in Chemistry teaching was explore by students ?

In the elaboration phase, when the product is presented to the class, how does creativity explore chemical concepts? The argument of the autors said that students create videos and this is the moment of greatest creativity. Do the contents of the videos refer to chemical concepts, chemical processes, chemical reactions? What is the content of the videos prepared by the students and how is creativity materialized in these videos and in chemical concepts?

I consider that the article can be resubmitted for a new evaluation after readjusting the text, deepening the data analysis with regard to chemistry teaching and the training of undergraduate chemistry students.
Reviewer Files

Reviewer B: Anonymous
Recommendation: Revisions Required

This manuscript presents an interesting theme and an innovative study, therefore, I recommend the publication of the article as long as some corrections are made. I leave below some notes in order to refine the work:
1) I recommend that authors use keywords different from the words contained in the title of the article, as this way the work can be found in different searches.
2) In the received file, the graphical abstract images are not clear, presenting low quality. Perhaps another image can be constructed, with other elements better connected.
3) In the introduction, some terms were repeated too much, even in the same sentence. I suggest using synonyms to make the text more fluid.Observe standardization when using capital letters in words such as "Chemistry".
4) Figure 4 was not clear, with several elements that were too small. I believe it can be reformulated so that it makes more sense with the text.

AUTHORS' ANSWERS – ROUND 1

Author's Files

ROUND 2

Reviewers A and B have agreed in advance to publish their reports, anonymously.

Reviewer A: Anonymous
Recommendation: Accept Submission

Greetings to the authors,
The work presented demonstrates an improvement in the writing and analysis of data, after having accepted the suggestions raised in the previous review. It is clear that the article has advanced in its theoretical-analytical proposition, presenting an advance and robustness of the research, which qualifies the article for science communication.
I therefore assess that the article is suitable for publication.

Reviewer B: Anonymous
Recommendation: Accept Submission

The authors made the suggested corrections. Considered suitable for publication.

ARTICLE ACCEPTED