

Dear Editor and Reviewers,

Thank you for allowing us to submit a revised manuscript of our paper “Effects of Web GIS Technology and Curriculum Approaches on Education for Disaster Risk Reduction” to the Natural Hazards and Earth System Sciences (NHES). We appreciate the time and effort that you and the reviewers have dedicated to provide valuable and insightful review comments. We tried to incorporate changes to reflect the suggestions from the reviewers. We have highlighted the resultant changes within the manuscript.

Here is a point-by-point summary of our responses to the reviewer comments.

Comments from Reviewer 1

To improve the quality of the manuscript the authors should better explain how and why systematic educational work by using WebGIS technology with students could improve hazard understanding. Does it depend on the novelty of using digital geographic maps more interesting than school books? Starting from their DRRE experience the authors can discuss if and how it can also use to increase risk awareness and risk prevention among young people and teachers and as second hands information among parents. Here are some comments I would like to share:

- 10 tables are really a lot, the authors should aggregate the outputs of the analyzes differently,

Response: Thank you for pointing this out. In light of your feedback, we've taken the necessary steps to merge the redundant tables, aiming for clarity and conciseness in the presentation of our data. We believe this refinement enhances the comprehensibility of our research.

- boxplot figure captions should contain information about reported outlier values,

Response: Thank you for pointing this out. We have revisited the boxplots and ensured they are appropriately labeled. Thank you once again for your invaluable feedback.

The description of the results should be better highlighted:

- the type of test that the authors have performed to define statistically significant scores,**
- the role of gender and whether it affects student learning, especially in the post-test,**
- the role of school proximity (inside or outside) in relation to hazard maps.**

Finally, more details should be provided explaining the differences, if any, between the two countries.

Response: Thank you for your thoughtfulness. In terms of the results, thank you for pointing out that the description of the test types and the influence of gender on student learning could be further clarified. I apologize for any confusion caused. I would like to clarify that in our manuscript, we have provided an explanation of the test types used to analyze the data, and we will expand on this explanation to make it more explicit and detailed. Additionally, we have already mentioned and discussed the potential influence of gender on student learning in the article. However, we understand the importance of providing a more comprehensive and explicit explanation of this aspect, and we will ensure to address it in greater depth in our revised manuscript. Moreover, to provide

further clarity, in our study, the hazard maps were categorized into local hazard maps and non-local hazard maps. The schools in the local hazard maps were situated in non-hazardous areas on the maps. We did not specifically consider the proximity of schools to hazardous zones in our analysis. However, we acknowledge that this aspect presents an interesting topic and avenue for future exploration. We appreciate your insight and will take it into consideration for future research.

We are writing a comparison article focusing on China and Japan, which encompasses various similarities and differences, and are eager to share the results in the near future. Please stay tuned for our future work. We sincerely appreciate your feedback and your contribution to improving our manuscript.

Comments from Reviewer 2

I present some key points (general and specific) that should be considered.

- Lines 46-47: I do not agree that DRR must be prioritized in education, but instead DRR must be really and seriously integrated in education.

Response: Thank you for pointing this out. In light of your recommendation, we have thoroughly revised the specific wording in question. Your feedback greatly contributes to refining the clarity and rigor of our manuscript.

- Line 51: Petal 2008

Response: Thank you for pointing this out. We modified the author name of the cited paper.

- Lines 57-63: Some comments should be made regarding the limitation of usage of digital technologies by poorer populations, at least in poor countries.

Response: We greatly appreciate your insightful observation regarding the limitations faced by economically disadvantaged populations. We have incorporated relevant comments on this matter in lines 57-68. Thank you for bringing this to our attention.

- Lines 81: Recent scientific works have proposed to abolish the term "natural disaster", as disasters are understood to be result of social construction. I suggest using only disaster or disaster related to natural hazards.

Response: We have revised the text and now consistently use the term "disaster" as appropriate. Thank you for your valuable input.

- Section 1. Introduction: The manuscript is about DRRE. Then, the authors should present a short review, based on the literature, about the content/materials and methods adopted in projects of DRRE carried out in schools in different countries. It is important to contextualize the methods/materials and after that to talk about the use of maps.

Response: We genuinely appreciate your constructive feedback. We have expanded the Introduction section,

specifically from lines 69-93, to provide a concise literature review detailing DRRE methodologies and materials implemented in school-based projects across various countries. Thank you for helping enhance the quality of our manuscript.

- Page 6: fig. 2 must be shown after being cited.

Response: Thank you for pointing this out. We have adjusted the position.

- Section 3. Implementations:

Which kind of disaster exists in the regions of the schools? They must be mentioned.

Which kind of material and quizzes were used in the teaching process?

The pretest, the posttest, and, also, the questionnaire, which are the main studied objects in the work, need to be presented.

Response: We deeply appreciate your insightful feedback, which underscores key elements essential for our study's clarity and robustness. In response, we have provided detailed information regarding the types of disasters prevalent in the regions of the schools under study, which can be found in lines 163-166. Furthermore, to offer a comprehensive understanding of the teaching process, we've expanded on the materials and quizzes used. We also recognize the importance of presenting the pretest, posttest, and questionnaire in detail. Thus, we have included their content in the appendix for thorough examination. Thank you for your continued support in this endeavor.

- Lines 178-179: The contents must be explained.

Response: We sincerely appreciate your careful observation. These clarifications can now be found in lines 192-199.

- Line 183: The problems and questions solved by the students must be described.

Response: We greatly appreciate your attention to detail. In accordance with your recommendation, we have elaborated on the problems and questions addressed by the students in lines 200-201. Specifically, these queries primarily revolved around the utilization and operation of the provided materials.

- Lines 199-204: The experiment assessment should be based not only on the tests but also on observations of the student's behavior and interactions. The lasting effects on the learning process must be evaluated.

- Lines 204-205: This statement is very qualitative and deficient. More data is lacking.

Response: Thank you for pointing this out. We have supplemented it in lines 222-224. Furthermore, acknowledging the qualitative nature of the statement in lines 204-205, we have opted to remove it. We concur that the statement lacked empirical support and further investigation would be necessary for such claims. Its removal does not detract from the main objectives or conclusions of our study. Your insights have been invaluable in refining our manuscript to meet rigorous academic standards.

- Lines 224-226: Explain the purpose of the use of computers and smartphones. General purposes or DRR learning? The section is about "DRR learning".

Response: We sincerely appreciate your meticulous observation. To provide clarity, lines 243-245 have been elaborated upon to specify the use of computers and smartphones in the context of DRR learning. Our apologies for any oversight in the initial explanation, and we're grateful for the opportunity to rectify and enhance the clarity of our work.

- Fig. 4: The figure legend is lacking.

Response: Thank you for pointing this out. We have made modifications.

- About Fig. 5: Some comment on the difference of information they have from the different sources is needed.

Response: We deeply appreciate your insightful feedback regarding Fig. 5. In response to your suggestion, we have incorporated comments highlighting the variations in information derived from different sources. These clarifications can now be found in lines 259-264. We hope these additions enhance the understanding of the figure and its context.

- About Fig. 6: What does "pay great attention to DRR-related information in their daily lives" mean? This kind of response is very subjective and qualitative. I believe the correlation is almost obvious because people who pay little attention to DRR are not interested in DRR materials, regardless they are electronic or not.

Response: We sincerely value your observation regarding Fig. 6. The primary intention behind this was to focus on whether DRR has any correlation with the efficacy of using instructional materials for DRR learning. Your feedback has provided an opportunity for us to refine our manuscript, ensuring clarity and specificity, and we're grateful for it.

- Table 2: not necessary

- Some figures and tables should be grouped.

Response: Thank you for pointing this out. We have made modifications.

- The meaning of the statistics parameters must be shown and explained.

- Lines 362-364: Mention where and when this research was carried out.

- Lines 364-366: The effect of covid-19 could be the cause of this difference?

- Line 366: You say that "school education still plays a certain role". I believe this role is high (67%), compared to computer/smartphone (87%).

- Lines 368-369: There is a long and complex distance between scientific knowledge and awareness. You

must be more specific about how media can aid to reduce this gap. And, also, mention the limitations of this aid.

Response: In light of your suggestions, we have elaborated and provided clearer explanations for the statistical parameters. The specifics of the research, including its location and duration, have been detailed (Lines 362-364 in the original manuscript). We have also incorporated discussions regarding the possible effects of COVID-19 and re-emphasized the significant role of school education. We have addressed these concerns in lines 384-404 of the manuscript. Your comments have significantly enhanced the clarity and comprehensiveness of our manuscript, and for that, we are grateful.

- Lines 410-425: The work should address if there are inequalities related to the quality of internet connections and the technological devices among the groups of students.

Response: We greatly appreciate your insight on this matter. We have incorporated further discussion in lines 454-456.

- Section 6. Conclusions: Based on the research findings, the authors should present an objective proposal for the integration of these technologies and content in education to improve the DRRE. The limitations of the research must be added.

Response: Your feedback is greatly valued. In response, we have revised the Conclusions section, incorporating an objective proposal for technology and content integration in education to enhance DRRE. Additionally, we have highlighted the research limitations. We have detailed these revisions on lines 490-505.

We look forward to hearing from you in due time regarding our submission of a revised manuscript. We are happy to answer further questions and comments you may have.

Sincerely,

Song Jiali

2023/08/19