

Review of: "How Effective are Tabletop Role-Playing (Serious) Games in Understanding and Validating the Predictive Capabilities of Disaster Response Agent-based Models?"

Giovanni Romagnoli¹

¹ University of Parma

Potential competing interests: No potential competing interests to declare.

The paper states the following research question: "This study examines the effectiveness of integrating role-playing to engage both healthcare professionals and nonexperts (students) in understanding and validating an agent-based model of disaster response strategies."

First of all, thank you for the opportunity to review the paper, which focuses on an interesting and relevant topic and is relatively well written and easy to read. I do believe, however, that the present form of the paper presents several limitations, which I will try to report in the following.

A minor but annoying limitation of the paper concerns the use of acronyms. Once an acronym has been defined (only once and at its first use), the acronym itself must then be used without further definition. The paper, on the contrary, presents the following issues:

- (i) it repeats several times the definition of acronyms (e.g., RPG - Role-Playing Game is reported at least 3 times);
- (ii) it uses acronyms that have not been defined or are defined later (e.g., GM/MoD are reported in Table 2 and not defined); and
- (iii) acronyms present variations or misspellings (e.g., ABMs become ABMS and ABMSs in Section 2; TRPG and RPG could be uniformed into a single acronym, and in the Literature Review section it is once reported TTRPG).

More importantly, in the present form, the connection between emergency responders, ABMs, and TRPGs is not very clear. Although I agree with the authors that TRPGs could be beneficial and effective for educating emergency responders and validating ABMs, it's not clear to me the connection among these elements. Also, I would suggest the authors clearly define what they mean by "ABMs," as I guess the readers could interpret them as different from "multi-agent systems or simulations," and thus I'd ask the authors to better explain this part.

The limitation I mentioned emerges from the following sentences:

The authors state that *"TRPGs are useful tools for training, improving the preparedness of emergency responders, and understanding/validating agent-based models (ABMs)."* and

“A study by Hosseini et al. (2022) revealed that disaster and crisis games are more efficient than case-based approaches for improving nursing students' understanding and behavioral skills in crisis management. The use of role-playing in the development and validation of agent-based models offers several advantages.”

Also “This study examines the effectiveness of integrating role-playing to engage both healthcare professionals and nonexperts (students) in understanding and validating an agent-based model of disaster response strategies. This research is significant because it introduces a method to improve model validation and capture the complexity of agent-based models by leveraging the formal and informal knowledge and behavior of stakeholders, thereby bridging the gap between theoretical modeling and real-world situations. Hence, this study aims to evaluate the effectiveness of utilizing disaster response tabletop role-playing games (DRTRPGs) in facilitating the understanding of disaster management concepts and in validating the predictive capabilities of an agent-based model for a hypothetical disaster setting.”

These sentences are not clear to me, and they mess up close but different concepts that have not been clearly defined beforehand. I suggest that the authors clearly define those terms and better relate them, also by means of schemes and diagrams. As an example, I believe that Figure 1 is not needed, as it is hard to understand without proper explanation. I would rather opt for two schemes explaining (i) how the ABM works, with a in-depth definition of the agents, and (ii) how the DRTRPG has been built according to the ABM structure. This is presently attempted by Table 1, which is too general and reports only text. I believe that a scheme/diagram is needed here.

In the Materials and Methods section, and particularly in the Research Methodology, the authors try to connect ABMs and (DR)TRPGs. This part is quite confused, in my opinion, as I cannot really understand why and how these elements interact and build synergies together. Furthermore, little to no detail is provided about the agents themselves: I believe that more detail about how the agents work is needed to help the readers understand the functioning logic of the agents.

Furthermore, the provided Github links do not work. If details are to be provided through an external link, it definitely must work.

Finally, qualitative results come a bit out of the blue; as an example, the definition of performance evaluation parameters is missing, and the method for the (self-)evaluation is not reported.

Lastly, and maybe most importantly, I do not believe that any validation could come out of Fig. 4: the figure clearly tells that ABM outcomes and DRTRPG outcomes are completely different. Still, the authors claim that “Although the combination of RPGs and ABMs is not one of the most popular ABM validation techniques, this study produced promising results.” I am completely not convinced of these conclusions, as the only validation provided by the DRTRPG is a similar trend, with completely different values.

For all these reasons, I suggest that the authors significantly revise the paper to answer the mentioned points.