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Peer Review

Review of: "A Simple Board Game for Modeling the System Dynamics of Deforestation"

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This paper " A Simple Board Game for Modeling the System Dynamics of Deforestation" discusses the importance of intact forests for the planet's biological system, highlighting their role in climate regulation, biodiversity, and recreational opportunities. The author proposes a board game as an educational tool to model the dynamics of deforestation and reforestation, using principles of system dynamics to promote a better understanding of the complex interactions within forest ecosystems. The research indicates that, in addition to making the topic accessible, the game can help raise awareness and encourage sustainable forest management practices.

Key Points

- Forests play a crucial role in combating climate change, serving as carbon sinks and regulators of temperature and precipitation.

- The concept of "Gaia" suggests that human activity, such as deforestation, can cause significant disruptions in ecological systems, potentially leading to social collapse.

- System dynamics is a methodology that can be used to model the complexity of deforestation but faces challenges due to its mathematical formality and accessibility.

- Operational games, such as the mentioned board game, can facilitate learning about complex systems and make the topic more accessible to students and educators.

- The developed game aims to reflect essential behaviors of forest ecosystems, such as "overshoot and collapse," demonstrating how unsustainable practices affect ecosystem health.

- Two variants of the game were tested, resulting in different dynamics: one led to rapid forest collapse, while the other promoted a sustainable balance.

- Simulations indicate that the game not only simulates real deforestation behaviors but also fosters discussions about sustainable forest management and its socio-economic implications.

The presented work has a solid foundation, but there are several areas for improvement:

Mathematical Accessibility: The mathematical complexity of system dynamics models can be a barrier for younger students. Simplifying mathematical concepts or providing additional resources, such as tutorials or visual guides, can help make the content more accessible.

Statistical Validation: While the initial results are promising, statistical validation of the data collected during the game tests is crucial. Conducting more rigorous analyses to confirm the game's effectiveness as an educational tool can strengthen the credibility of the work.

Diversity of Scenarios: The study could include a broader range of game scenarios to explore different dynamics of deforestation and reforestation. This would help capture a wider variety of behaviors and outcomes, better reflecting the complexity of forest ecosystems.

Player Feedback: Incorporating qualitative feedback from players about their experiences and learnings during the game can provide valuable insights for improvements. This could include interviews or questionnaires after game sessions.

Technology Integration: Considering the use of digital platforms or apps to simulate the game could increase engagement and interactivity, as well as allow for more efficient data collection.

Education and Awareness: Expanding the game's focus to include discussions on conservation policies and sustainable practices could enrich the educational experience and raise awareness of the importance of forest management.

Interdisciplinary Collaboration: Working with experts in ecology, education, and game design can bring new perspectives and enrich the game's development, ensuring it adequately addresses the complexities of forest systems.

Documentation and Resources: Providing clear documentation and additional resources for educators who wish to implement the game in their classrooms can facilitate adoption and maximize educational impact.

These improvements can help enhance the game's effectiveness as an educational tool and promote a deeper understanding of the dynamics of deforestation and reforestation.

Declarations

Potential competing interests: No potential competing interests to declare.