Types of Knowledge Elicited from Games With A Purpose Using Large Language Models

exploring collaboration between AI techniques and human-centric game designs

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Good To Know

- **LLMs**: Large Language Models
- **GWAPs**: Games With A Purpose
- **Elicitation**: The process of getting or producing something, in our case, especially information

1 Introduction

The expanding application of LLMs across various interactive gamified environments, highlights their potential to revolutionize these fields [3]. This study addresses the types of knowlegde elicited through a comprehensive literature survey on the use of LLMs in GWAP settings.

2 Methodology

- The literature survey was conducted following the PRISMA guidelines [5].
- The review process started with an initial big pool of articles from academic databases like Google Scholar.
- After a full text-review, the selection was refined to approximately 30 papers that seemed highly relevant.
- These studies were used to extract data on the types and effectiveness of LLM applications in GWAPs.

Fun Facts

Did You Know?

- The first GWAP was developed by Luis von Ahn in 2006 to improve image recognition algorithms [1].
- LLMs like GPT-3 can generate human-like text, opening new frontiers in educational technology [4].

3 Research questions

The first sub-question was inspired, among others, by the application Word Ladders, which collects semantic data [2]. The second sub-question explores the research limits, while the last one examines its variables.

Research

Main Research Question:

- What types of knowledge can be elicited using LLMs in GWAPs?

Sub-Questions:

- How do interactions of players with LLMs in GWAPs reveal semantic associations?
- What are the challenges and limitations of using LLMs to elicit specific types of knowledge in a GWAP setting?
- How does the player's demographics (age, educational background, etc.) influence the quality and type of knowledge elicited by LLMs in GWAPs?

4 Types of Knowledge Elicited

The following types of knowledge were identified by combining our findings from sub-questions and other academic sources:

- **Semantic Associations**: How users perceive and relate different concepts and capturing these complex relationships.
- **Factual Information**: Eliciting accurate and detailed data on various subjects.
- **Commonsense Knowledge**: Gathering everyday practical knowledge and social norms through scenarios that require players to apply their understanding of the world.
- **Contextual Insights**: Understanding the factors of the players that influence how knowledge is applied.
- **Experiential Knowledge**: Capturing personal insights and understanding that users hold about the game.

5 Discussion

- **Implications**: LLMs enhance knowledge elicitation in GWAPs, transforming data tasks into engaging activities.
- **Research Process**: Using the PRISMA workflow ensured transparent and reproducible literature analysis, identifying key trends and gaps.
- **Impact on Society**: Integrating LLMs into GWAPs enhances public engagement with science and technology, though ethical concerns like data privacy and biases need addressing.
- **Future Work**: Future research should include long-term studies on LLMs' impact, improved data filtering, and consideration of player demographics.

6 Limitations

- **Diversity of Sources**: Our survey includes diverse sources from Google Scholar, covering theoretical and practical applications of LLMs in GWAPs. Some viewpoints from less advanced regions may be underrepresented.
- **Biases and Mitigation**: We minimized selection bias with multiple screenings, including preprints to address publication bias.

7 Conclusion

This research demonstrates that integrating LLMs into GWAPs enhances knowledge elicitation. It gathers various knowledge types, improve user engagement, and increase data quality. Despite challenges like data noise and ethical issues, this integration shows significant promise for advancing AI and data collection.

References

Scan the QR-code for the list of references:

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