

Linguistic Detective: Gamified Storyboard for Scam Detection

Nursyaidatul Kamar Md Shah^{1*}, Ameiruel Azwan Ab Aziz², Ariff Imran Anuar Yatim³, Amirah Mohd Juned⁴, Wan Farah Wani Wan Fakhruddin⁵

^{1,2,3,4}Academy of Language Studies, Universiti Teknologi MARA, Cawangan Melaka, MALAYSIA

⁵Faculty of Social Sciences and Humanities, Universiti Teknologi Malaysia, MALAYSIA

*Corresponding Author

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ABSTRACT

‘Linguistic Detective: Gamified Storyboard for Scam Detection’ is an innovative project aimed at empowering players to become adept at detecting scammers through language analysis. In today’s digital age, where scams proliferate across various communication channels, understanding the linguistic cues scammers use is essential for safeguarding oneself against scams. The project combines elements of gamification and storytelling to create an immersive experience that educates and entertains players. Players assume the role of a linguistic expert recruited by a cybercrime task force, and the mission is to detect the language of scammers and bring them to justice. The game unfolds through a series of levels, each presenting a different scam scenario for players to dissect. Players must analyse the language scammers use to identify persuasive tactics, emotional manipulation, urgency, and linguistic inconsistencies in investment, e-commerce, and other social media scams. Players develop proficiency in detecting subtle linguistic markers of deception through tutorials, challenges, and tools such as linguistic tips and scam dictionaries. Success in the game translates to real-world vigilance against scams, empowering players to protect themselves and others from falling victim to fraudulent schemes. ‘Linguistic Detective’ provides a dynamic and engaging platform for players and the public to hone their linguistic identifying skills while combating scams in the real world. The project opens avenues for commercialisation, ranging from developing educational materials and consultation services to software solutions, training programs, research partnerships, and public awareness campaigns aimed at detecting scams effectively at all levels.

Keywords: e-commerce scam; gamified storyboard; investment scam; linguistic detective; scam detection.

INTRODUCTION

Cybercrime on various internet platforms is a developing concern, attracting the attention of authorities, policymakers, and academics worldwide. People with malicious purposes or scammers try to persuade others (also known as victims) through manipulation, which can be accomplished through language [13]. Many people may be easily deceived by the scammer’s manipulative words [9]. Victims are duped by scammers’ enticing phrases, even without clear and reliable descriptions of the items and services, resulting in poor decision-making and significant financial losses.

Scams have severe repercussions that go beyond money loss. They impair victims' psychological well-being and cause significant emotional and behavioural changes. [17] define trauma, fractured worldviews, and a loss of trust in others as everyday experiences for victims. According to [3], emotional repercussions include fear, rage, suppressed feelings, and post-traumatic stress disorder. The difficulties of prosecuting scammers, as underlined by [1], intensify the problem, leaving victims in severe debt, depression, and a lower quality of life, sometimes leading to broken families and increased suicide rates [7]. Despite laws such as the Financial Services Act of 2013 and various public awareness campaigns, people remain vulnerable to scams due to psychological manipulation, as discussed by [14], with experts advocating for comprehensive public education as the most effective defence against scams [15] [8] [10] [16]. Hence, the concept of gamification as part of creating public awareness of scam prevention emerged from a study conducted by [2] called 'Linguistic Detective.' This paper presents the conceptual design and anticipated advantages of 'Linguistic Detective,' a gamified storyboard designed to raise awareness of digital scams founded on [2]. While the game's complete execution and effectiveness have yet to be evaluated, this concept paper provides the framework for future empirical research.

The 'Linguistic Detective' game is designed with several objectives in mind. Firstly, it aims to educate players about scammers' tactics in e-commerce and investment scams. Doing so provides an engaging and entertaining experience that teaches players how to recognise potential scams in a digital environment. The game trains players to analyse different scenarios and identify scammers among characters, which helps develop critical thinking skills. Additionally, it tests players' knowledge of scam prevention techniques through interactive mini-games, reinforcing the learning process in a fun and challenging way. Another objective is to encourage players to think critically and apply their knowledge to increasingly difficult levels, which require them to analyse subtle clues to catch the scammer. The game also rewards players for their accuracy and speed in identifying scammers, with leaderboards and rewards that foster a sense of achievement and motivation to improve.

LITERATURE REVIEW

Gamification, or using game design principles in non-game environments, has proven to be a powerful technique for enhancing engagement, learning, and behaviour modification. Gamification provides several significant benefits in the context of this project, including improved instructional and preventative aspects of fraud identification.

Gamification appeals to the human need for competitiveness, achievement, and development, which can dramatically increase engagement and motivation. According to [6], game components such as awards, points, and leaderboards promote a sense of achievement and encourage users to participate actively. In "Linguistic Detective," players are encouraged to acquire and practice scam detection abilities through challenges and prizes, making learning more entertaining and inspiring ongoing development.

Gamification improves learning outcomes by enabling interactive and experiential learning. [5] discovered that gamified systems provide real-time feedback, allowing learners to understand and fix their mistakes rapidly. In this initiative, gamers receive quick feedback on their ability to spot scam strategies, allowing them to reflect and strengthen their comprehension of the linguistic indicators employed by scammers.

One of the primary purposes of "Linguistic Detective" is to improve players' critical thinking abilities by requiring them to evaluate and uncover fraudulent language patterns. Gamified settings generate scenarios requiring problem-solving, analysis, and decision-making. [4] found that games created for learning frequently boost critical thinking skills by putting learners in difficult scenarios where they must apply their knowledge

to solve challenges. The game's escalating difficulty levels and different scam situations are intended to improve players' critical thinking skills, making them better at identifying fraud in real life.

Gamification also encourages behavioural change by reinforcing positive acts with frequent practice in a virtual setting. In "Linguistic Detective," players practice recognizing and evading fraud strategies, which can lead to improved scam detection in real-world scenarios. [7] observe that gamified experiences enable users to employ taught abilities regularly by imitating real-life obstacles, increasing scam vigilance and protection.

Gamification encourages collaboration and competitiveness, which can result in shared learning opportunities and community empowerment. [11] found that social components in gamified environments, such as leaderboards and team challenges, stimulate users to interact with their peers and share knowledge. "Linguistic Detective" incorporates social aspects like leaderboards and shared achievements, which encourage players to debate frauds and learn from one another, resulting in a ripple effect of scam knowledge throughout the community.

From the literature, gamification in "Linguistic Detective" enhances learning engagement and effectiveness and promotes critical thinking and real-world behavioural changes. Thus, these advantages position the game as a potentially valuable tool for educating the public about scams and equipping them to detect and avoid fraud.

METHODOLOGY

This study employed a qualitative method of content analysis. This study's data was analysed using the qualitative content analysis approach [13], a research method for the subjective interpretation of text data content via a systematic classification process of coding and detecting themes or patterns. The game starts with an animated sequence that sets the stage, depicting the protagonist, a linguistic expert, being enlisted by a cybercrime task force to combat scammers by analysing their language. This captivating introduction immerses players into the game's narrative, setting the tone for their linguistic sleuthing adventure.

The tutorial level serves as the player's initiation into scam detection. Here, they learn the fundamental concepts of scam language, including common linguistic ploys employed by scammers, such as persuasive language, emotional manipulation, and urgency tactics. Players are equipped to navigate the subsequent primary levels, each presenting unique scam scenarios ranging from e-commerce fraud to investment scams. In these levels, players must carefully scrutinise the language used by scammers to identify and thwart their deceptive schemes.

Players encounter language analysis challenges between levels designed to sharpen their linguistic acumen. These challenges may involve spotting grammar errors, detecting emotional triggers, or recognising patterns in language use. Additionally, players can access invaluable tools and resources, including a *Linguistic Analyser* highlighting suspicious language patterns and a *Scam Dictionary* containing common scam phrases and keywords. Furthermore, players can earn resources such as *Language Proficiency Boosters* to enhance their ability to detect subtle linguistic cues temporarily.

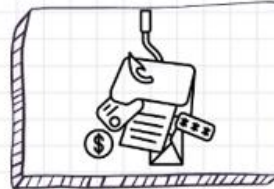
As players progress, they unlock profiles of different scammers, each with distinct linguistic tactics and characteristics. Understanding these profiles becomes crucial as players advance, enabling them to anticipate and counteract the strategies employed by scammers effectively. Moreover, the game features leaderboards where players can compete based on their accuracy in identifying scam language and completing levels within specified time limits. Achievements are also awarded for reaching milestones, such as mastering specific linguistic analysis techniques or apprehending a certain number of scammers.

LINGUISTIC DETECTIVE: GAMIFIED STORYBOARD FOR SCAM DETECTION



1: INTRODUCTION

The game opens by introducing the protagonist, a linguistic expert, being recruited by a cybercrime task force to catch scammers by analyzing their language.



2: TUTORIAL LEVEL

The player is introduced to the basics of scam language, learning about common linguistic tricks used by scammers to deceive people such as persuasive language, emotional manipulation and urgency.



3: MAIN LEVELS

Each level presents a different scam scenario include e-commerce scams and investment scams where the player must analyze the language used by the scammer to identify them.



4: LANGUAGE ANALYSIS

Between levels, players encounter language analysis challenges which may involve spotting grammar errors, detecting emotional triggers, or recognizing patterns in language use.



5: TOOLS AND RESOURCES

Players have access to tools such as a Linguistic Analyzer that highlights suspicious language patterns and a Scam Dictionary with common scam phrases and keywords.



6: SCAMMER PROFILES

As players progress, they unlock profiles of different types of scammers, each with their own linguistic tactics and characteristics.



7: LEADERBOARDS

Players can compete on leaderboards based on their accuracy in identifying scam language and completing levels within certain time limits.



8: FINAL ACHIEVEMENT

Achievements are awarded for reaching milestones such as mastering specific linguistic analysis techniques or catching a certain number of scammers.

Fig. 1 The storyboard of the linguistic detective game

FINDINGS AND DISCUSSIONS

The “Linguistic Detective” game offers numerous outcomes and benefits for the community, positioning it as a significant tool in the fight against scams. First and foremost, the game enhances scam awareness by exposing individuals to common scam tactics. As players engage with the game’s scenarios, they become better equipped to recognise potential scams in real life, thereby protecting themselves and their communities from financial loss and deception. This heightened awareness is crucial in today’s digital age, where scams are increasingly sophisticated and widespread.

In addition to raising awareness, “Linguistic Detective” is an educational tool. Its interactive and engaging format makes learning about different types of scams and preventive measures more accessible, particularly for younger generations who are frequent targets of cybercriminals. The game’s design encourages critical thinking, requiring players to analyse information and identify scammers. These skills are transferable to real-life situations, helping individuals become more discerning consumers and vigilant citizens.

Community empowerment is another significant benefit of the game. As players share their achievements and the knowledge they gain, they create a ripple effect of increased scam awareness within their community. This collective knowledge fosters a sense of vigilance and readiness, making communities better equipped to handle scam threats. Moreover, the game’s focus on prevention can decrease the number of successful scams, as informed players are more likely to recognise red flags and take appropriate actions to avoid being scammed.

The economic benefits of “Linguistic Detective” are also noteworthy. By reducing the incidence of scams, the game helps prevent financial losses that can affect individuals, families, and businesses. This positive economic impact contributes to overall financial stability and security. Additionally, the game’s integration with social media and the ability to compete with friends foster social interaction and discussion around the topic of scams. These conversations further enhance the community’s understanding and preparedness.

Finally, the global nature of “Linguistic Detective” extends its impact beyond local communities. By educating a broad audience about the universal threat of scams and how to combat them, the game contributes to a more informed and resilient global society. In summary, “Linguistic Detective” is not just a game; it is a community initiative that promotes cyber safety, financial literacy, and critical thinking, ultimately contributing to a more resilient and informed society.

CONCLUSION

This concept paper introduces the design and anticipated benefits of “Linguistic Detective,” a gamified storyboard to increase awareness of digital scams. Grounded in established theories of gamification, language analysis, and scam detection, the game is designed to enhance scam awareness, critical thinking, and community empowerment. This project aims to combat the rising problem of digital scams by empowering individuals to identify scammers through linguistic analysis. Through immersive gameplay, players act as linguistic experts in a cybercrime task force, analysing various scam scenarios to identify persuasive tactics, emotional manipulation, urgency, and linguistic inconsistencies. Players are entertained, and the project’s multifaceted benefits include enhanced awareness, improved educational access to scam prevention, community empowerment, and potential economic savings. However, while the concept offers promising prospects, its effectiveness has not yet been tested in real-world scenarios. The projected outcomes remain theoretical, and future empirical studies will be necessary to assess the game’s actual impact through controlled testing and user feedback. As the project progresses, the team behind “Linguistic Detective” envisions a future where the game becomes a cornerstone of public-private partnerships in cyber safety education, ultimately fostering a more resilient and informed global society.

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