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Mini Review

The Bystander's Role in Cyberbullying Prevention: Immersive Learning through Gamification and the Metaverse

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The bullying triangle and educational innovation against cyberbullying

School bullying is a complex social phenomenon represented by the "bullying triangle," which involves aggressors, victims, and bystanders. This model emphasizes that bullying is not merely a two-person interaction, but a process influenced by peer group dynamics. While the aggressor exerts power through violence, bystanders may reinforce, ignore, or intervene. Therefore, effective prevention strategies must address all three actors involved.

The bystander's role is particularly relevant, as their reaction can directly influence whether the bullying continues or stops. Empowering these students through educational programs is essential to foster a zero-tolerance culture. Research shows that around 30% of students experience school bullying or cyberbullying, negatively impacting emotional development, academic performance, and psychological well-being [1].

This problem also transcends the school environment, affecting family and social contexts. Olweus [2] emphasizes global concern about threats within children's immediate surroundings, leading to the concept of "proximity-based cyberbullying." This form of violence can manifest physically, emotionally, or psychologically, causing lifelong consequences [3]. Brank, et al. [4] also warn of the prolonged impact of bullying on victims' social relationships, family dynamics, and physical and emotional health.

Due to the phenomenon's complexity, an interdisciplinary perspective is required, involving psychology, sociology, education, and safety. In addition to collaborative strategies, continuous monitoring of violent behaviors is necessary. Bickmore [5] proposes fostering healthy relationships at school by implementing policies that promote peace and conflict resolution.

Online bullying is even more difficult to detect than in face-to-face settings, due to the anonymity of digital networks [6]. Raskauskas and Stoltz [7] stress that harassment through threatening messages affects adolescents' emotional development. According to Wang, et al. [8], bullying manifests in various forms: physical (20.8%), verbal (53.6%), social (51.4%), and electronic (13.6%). Data reveal gender differences: boys are more involved in physical or verbal bullying, while girls are more frequently involved in relational bullying or are victims of cyberbullying. Some studies associate these behaviors with digital control-based violence and gender-based violence [9,10].

Research by Yoon and Kerber [11] explores teachers' roles in bullying intervention, while studies in Spain [12] link low emotional intelligence to a greater likelihood of being a victim or perpetrator. Thus, promoting emotional intelligence becomes a key educational tool in bullying prevention.

Bystanders play a fundamental role as active agents in both the prevention and intervention of violent situations, especially when they engage in empathetic communication grounded in the principle of shared responsibility. For this reason, it is essential to highlight and strengthen the role of the bystander as a key agent in the detection, management, and transformation of violent behaviors. Awareness and the development of empathy function as both psychological and situational mechanisms that facilitate the transition from

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passive observer to engaged agent, promoting prosocial behaviors and effective responses to conflict [13].

Technology, gamification, and the metaverse for prevention

In this context, gamification emerges as a pedagogical strategy based on applying game dynamics to non-game environments. Its use in education enhances student motivation, engagement, and participation [14,15]. It has been shown that gamified environments improve academic performance and learner involvement [16]. Therefore, gamification energizes not only the teaching-learning process but also serves as a powerful tool for addressing social issues such as bullying.

Furthermore, the metaverse positions itself as an emerging technology enabling the creation of immersive 3D environments where students interact via avatars within the CIBERPROXY platform. This virtuality allows simulation of real-life scenarios, fostering experiential learning and the development of emotional and social competencies. Recent studies [17,18] highlight the metaverse as a global collaboration platform that overcomes the physical limitations of traditional classrooms.

From this perspective, an innovative research project is proposed that focuses on the design of gamified 3D educational content to prevent cyberbullying through immersive experiences. The project consists of four phases: identifying cyberbullying indicators among vulnerable groups, developing interactive content, implementing with control groups, and evaluating the impact on digital competencies and emotional well-being [19].

Using virtual escape rooms and role-playing scenarios allows students to identify violent behaviors, empathize with victims, and learn prevention strategies. These experiences not only promote knowledge but also foster critical awareness and resilience against bullying.

The CIBERPROXY UNED platform integrates an advanced educational gamification system that places the player at the center of interactive cyberbullying scenarios, promoting the transition from passive bystander to active agent. The most prominent game mechanics include immediate feedback loops, motivational reward systems, and scenario branching, all designed to realistically simulate the complexity of interventions in digital bullying situations.

Feedback is continuous and adaptive, provided through a Chatbot–Virtual Educational Assistant that accompanies the user throughout the decision-making process within each scene. This virtual assistant offers guidance, key questions, and immediate reflections that help the player evaluate the potential consequences of their actions and build more empathetic and effective responses. In this way, the experience becomes highly personalized and formative, enabling users to learn in real-time as they engage with ethical and social dilemmas inherent in bullying dynamics.

Additionally, scenario branching enables participants to explore diverse narrative paths and outcomes, increasing their sense of autonomy and emotional involvement. This non-linear structure is further enriched by the incorporation of QR codes that, when scanned, lead to collaborative group dynamics with Scape Room. These group activities, also mediated by the Chatbot, enable students to share perspectives, justify their decisions, and reach consensus on intervention strategies through a group chat environment. This approach fosters collective reflection, shared empathy, and the development of coordinated responses to cyberbullying situations, encouraging the transfer of learning to real-life contexts.

Altogether, these game mechanics offer not only an immersive and dynamic experience but also promote education in digital, social, and ethical competencies, contributing to the formation of active, aware, and responsible bystanders capable of intervening effectively in cyberbullying scenarios.

Role of the bystander in bullying and cyberbullying

Shared responsibility in school bullying means that all members of the educational community—students, teachers, families, and staff—must actively work together to prevent, detect, and address bullying, fostering a safe and respectful environment for all. Within this framework, the bystander's role is crucial, as their ability to recognize and report bullying is key to timely intervention and stopping the violence [18,20].

Bystanders hold significant power in bullying and cyberbullying dynamics. Their actions can either prevent further harm or, through inaction, enable the continuation of violence. Some bystanders intervene to stop bullying, while others remain passive, which can worsen the victim's experience. To address this, gamified sessions are designed to raise awareness and empower students to become active defenders. Through immersive experiences, such as using Oculus Metaverse goggles to adopt the victim's perspective, students develop empathy by experiencing the emotional impact of bullying firsthand. This first-person approach deepens their understanding and encouraging responsible actions such as reporting incidents and seeking support from trusted adults or peers. Ultimately, these experiences aim to transform bystanders from passive observers into proactive agents of change, playing a vital role in creating safer school communities.

The pilot study sample consisted of 9 Spanish adolescents, aged between 12 to 13 years old, from a high school in Madrid, Spain. This pilot study employed a qualitative research design, using observation, interview, and data sample recording techniques, which allowed for to gathering of participants' experiences and perceptions to validate the experience from the practical application of the use of the immersive technology Metaverse in the educational field.

Data analysis

Following the structured methodology in the above paragraph, the data analysis was conducted using a qualitative approach. The pilot's immersive experience in the Metaverse has been qualitatively analysed to raise students' bullying awareness from the outsider's perspective.

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Phase	Application gamification in Ciberproxy -Goal	Description
Phase	**Goal / Objective**	
Phase 1: Introduction to the Topic	Explain bullying as a social issue from a bystander's perspective.	A police officer specialized in this topic meets with students to define bullying, explain how to recognize it, and provide strategies to act when witnessing such situations. Real or fictional examples are used, and interactive questions are asked to ensure understanding.
Phase 2: Contextualization	Prepare students to personally experience the signs of bullying as outsiders in the Metaverse.	Students are informed about the educational purpose of the immersive experience, how to use the Meta glasses, clarifying the types of scenes students will encounter. Expectations and exercise goals are clarified to ensure students understand these are simulations.
Phase 3: Immersive Experience in the Metaverse (CIBERPROXY Platform)	Enable students to learn about simulated bullying situations in a safe environment.	Students use the Oculus Meta Quest to explore and observe immersive bullying scenes in and around a virtual high school setting. They have sufficient time for exploration under supervision to ensure a smooth experience.
Phase 4: Individual Opinion Gathering	Collect students' first impressions and opinions about the immersive experience.	Immediately after the Metaverse experience, each student responds to open-ended questions regarding their impressions and reflections. Audio and video recordings capture their spontaneous responses for later analysis.
Phase 5: Focus Group (students/teacher)	Encourage group reflection on the immersive experience and deepen the learning process.	Students share their experiences and feelings in a group discussion led by their teacher. Open-ended questions facilitating collective reflection and viewpoint exchange. Observers take detailed notes on students' contributions.
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The process of coding has been carried out with the categories below:

- **Scene clarity:** This dimension covers how the Metaverse enables users to observe specific details crucial for understanding bullying scenarios. The detail of bullying is delved into the avatars' expressions and the use of offensive language during harassment situations.
- **Empathy and understanding of the bullying situation:** This dimension allows the Metaverse to help users to understand what the bullying victims frequently suffer, which makes them feel afraid, helpless, and alone. Thus, the immersive scenes foster empathy, awareness and preventing bullying situations. Once students understand bullying and its impacts from the bystander's perspective, they build resilience skills extending positive and compassionate thoughts toward themselves and others.
- **The metaverse impact:** This dimension aims to assess the effectiveness of the Metaverse, conveying real-world and immersive educational bullying experiences in a virtual and safety environment. Thus, users feel like they are in a real-time interaction, providing an opportunity for participants to interpret scenes.

Student responses indicate that immersive virtual scenes within the Metaverse realistically depict bullying situations, which is crucial for those students who do not what happen when they have never been bullied. Moreover, the ability to see a sets facial expression of avatars and hear offensive language directed at victims, develop responses among bystanders, fostering empathy and increasing willingness to engage in supportive behavior with the bullied victim.

In relation to this, a student during his interview stated that this technology can help others to better identify bullying experiences because they can see what they feel and suffer the victims, which underlines the potential of this immersive technology (the Metaverse) as an educational and awareness-raising tool to develop effective bullying prevention programs in High-schools.

Conclusion

The integration of the metaverse in the prevention and management of school bullying and cyberbullying via gamified strategies offers an innovative approach for fostering empathy, awareness, and shared responsibility among students. Gamification, by offering immersive and participatory experiences, allows users to empathize directly with victims, facilitating a deep understanding of the consequences of bullying. Furthermore, this methodology promotes the active participation of all stakeholders, notably bystanders, transitioning from passive witnesses to responsible agents capable of intervening and reporting acts of violence. Thus, the metaverse functions as both a virtual space and an educational platform that enhances collective collaboration to build safer and more inclusive school environments where bullying prevention is a shared and effective commitment.

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References

1. Evans, CBR, Fraser, MW, Cotter, KL. The effectiveness of school-based bullying prevention programs. Campbell Systematic Reviews. 2014;19(1):532-44. Available from: https://doi.org/10.1016/j.avb.2014.07.004
2. Olweus, D. The Olweus Bullying Prevention Programme. International Journal of Adolescent Medicine and Health. 2006;18(1):23–31.
3. Berger, K. Child and adolescent development. Madrid: Paraninfo; 2007.
4. Brank, EM, Hoetger, LA, Hazen, KP. Bullying. Annual Review of Law and Social Science. 2012;8(1):213–30. Available from: https://doi.org/10.1146/annurev-lawsocsci-102811-173820

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5. Bickmore, K. Peacebuilding education in post-conflict contexts. Prospects. 2013;43(1):3–14

6. Mishna, F, Saini, M, Solomon, S. Ongoing and online: Children and youth's perceptions of cyber bullying. Children and Youth Services Review. 2009;31(12):1222–8. Available from: https://doi.org/10.1016/j.childyouth.2009.05.004

7. Raskauskas, J, Stoltz, AD. Involvement in traditional and electronic bullying among adolescents. Developmental Psychology. 2007;43(3):564–75. Available from: https://psycnet.apa.org/doi/10.1037/0012-1649.43.3.564

8. Wang, J, Iannotti, RJ, Nansel, TR. School bullying among adolescents in the United States. Journal of Adolescent Health. 2009;45(4):368–75. Available from: https://doi.org/10.1016/j.jadohealth.2009.03.021

9. González-Ortega, E. Cyberbullying among adolescents: Prevalence and associated factors. Psicothema. 2008;20(4):614–20.

10. Azpitarte, M. Digital gender violence: new modes of control and domination. Cuadernos de Trabajo Social. 2014;27(1):131–46.

11. Yoon, JS, Kerber, K. Bullying: Elementary teachers' attitudes and intervention strategies. Research in Education. 2003;69(1):27–35. Available from: https://doi.org/10.7227/RIE.69.3

12. Garaigordobil, M, Oñederra, JA. Emotional intelligence and bullying. Revista Latinoamericana de Psicología. 2010;42(3):473–82.

13. Sánchez-Romero, C. Proximity cyberbullying: How to avoid it through gamification with the metaverse? (Research project TED2021-129132B-I00). Ministry of Science and Innovation. MCIN/AEI/10.13039/501100011033 and by the European Union NextGenerationEU/PRTR; 2020.

14. Peppler, K. The SAGE Encyclopedia of Out-of-School Learning. SAGE; 2017. Available from: https://pcl.sitehost.iu.edu/papers/transferKnowledge.pdf

15. Basten, D. Gamification. IEEE Software. 2017;34(5):76–81. Available from: https://doi.ieeecomputersociety.org/10.1109/MS.2017.3571581

16. Su, C-H, Cheng, C-H. A mobile gamification learning system for improving the learning motivation and achievements. Journal of Computer Assisted Learning. 2015;31(3):268–86. Available from: https://doi.org/10.1111/jcal.12088

17. Siyaev, A, Jo, GS. Towards metaverse simulation of speech-based service scenario in elevator using cloud-based spoken dialog system. Applied Sciences. 2021;11(18):8496.

18. Davis, A, Murphy, J, Owens, D, Khazanchi, D, Zigurs, I. Avatars, people, and virtual worlds. Journal of the Association for Information Systems. 2009;10(2):90–117. Available from: https://aisel.aisnet.org/jais/vol10/iss2/1

19. Sánchez-Romero, C, Muñoz-Jiménez, C. Proximity-based cyberbullying and gamification in the metaverse: A preventive educational project. Educación y Tecnología. 2024;11(2):34-48.

20 Romero, C. Design of an intelligent virtual assistant for the prevention of bullying and cyberbullying in education. Open Journal of Applied Sciences. 2025;15:874-84. Available from: https://doi.org/10.4236/ojapps.2025.154059

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