Ciberacoso y Aprendizaje Colaborativo: Una Perspectiva Sociológica en la Educación Virtual

Cyberbullying and Collaborative Learning:
A Sociological Perspective in Virtual Education

Cyberbullying e Aprendizagem Colaborativa:
Uma Perspectiva Sociológica na Educação Virtual

- Artículo de investigación -

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Resumen

El ciberacoso se ha convertido en una preocupación social de relevancia en la era digital actual. Este estudio aborda el fenómeno del ciberacoso a través de una actividad colaborativa virtual en la que participaron 33 estudiantes del Máster en Formación del Profesorado de Educación Secundaria de la Universidad de Lleida (España). Se presenta el caso de una alumna de cuarto curso de Educación Secundaria Obligatoria que fue víctima de la difusión no consentida de una imagen íntima, lo que desencadenó una situación de acoso masivo a través de redes sociales. Los participantes llevaron a cabo una actividad en red, estructurada en siete fases, con el objetivo de analizar las características del ciberacoso y proponer

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posibles estrategias de intervención. La plataforma virtual empleada facilitó el desarrollo de ideas mediante aportaciones originales y adaptaciones realizadas a partir de retroalimentación crítica. El estudio pone de relieve la necesidad de intervenciones multidimensionales que integren el acompañamiento emocional, la educación en valores y la alfabetización digital. Los resultados evidencian el potencial de los entornos colaborativos para generar soluciones prácticas ante problemáticas educativas complejas, permitiendo al profesorado afrontar de forma más eficaz situaciones de ciberacoso y contextos similares. Asimismo, se subraya la importancia de una comunicación fluida entre el profesorado, las familias y las autoridades legales.

Palabras clave: ciberacoso, inteligencia colectiva, educación secundaria, formación del profesorado, intervención educativa

Abstract

Cyberbullying has emerged as a significant social concern in today's digital age. This study examines cyberbullying through a collaborative virtual activity involving 33 students enrolled in the Master's Degree in Secondary Education at the University of Lleida (Spain). It presents a case of a 4th-year student from Compulsory Secondary Education, who experienced a non-consensual distribution of an intimate image, resulting in widespread harassment on social media. The participants engaged in a seven-phase virtual network with an aim to analyse the characteristics of cyberbullying, and propose potential intervention strategies. The platform facilitated the development of ideas through original contributions and adaptations based on critical feedback. The study highlights the need for multidimensional interventions that integrate emotional support, values-based education, and digital literacy. The results demonstrate the potential of collaborative environments to provide practical solutions to complex educational issues, enabling educators to better respond to cyberbullying and similar scenarios. They also underscore the importance of communication between educators, families, and legal authorities.

Keywords: cyberbullying, collective intelligence, secondary education, teacher training, educational intervention

Resumo

O cyberbullying emergiu como uma preocupação social significativa na era digital atual. Este estudo examina o fenômeno do cyberbullying por meio de uma atividade virtual colaborativa que envolveu 33 estudantes do Mestrado em Formação de Professores do Ensino Secundário da Universidade de Lleida (Espanha). Apresenta-se o caso de uma aluna do 4.º ano do Ensino Secundário Obrigatório que foi vítima da distribuição não consensual de uma imagem íntima, resultando em assédio generalizado nas redes sociais. Os participantes envolveram-se em uma rede virtual estruturada em sete fases, com o objetivo de analisar as características do cyberbullying e propor possíveis estratégias de intervenção. A plataforma utilizada facilitou o desenvolvimento de ideias por meio de contribuições originais e adaptações baseadas em feedback crítico. O estudo destaca a necessidade de intervenções multidimensionais que integrem apoio emocional, educação baseada em valores e letramento digital. Os resultados demonstram o potencial dos ambientes colaborativos para oferecer soluções práticas a questões educacionais complexas, permitindo que os educadores respondam de forma mais eficaz ao cyberbullying e a situações similares. Além disso, ressalta-se a importância da comunicação entre educadores, famílias e autoridades legais.

Palavras-chave: cyberbullying, inteligência coletiva, educação secundária, formação de professores, intervenção educativa

Introduction

Aggression and bullying are interconnected phenomena (Mladenović et al., 2022), and the ubiquitous nature of online interactions has facilitated the widespread dissemination of aggressive and bullying behaviours across diverse social media platforms (Fung, 2024). Cyberbullying has become a salient issue within the

contemporary digital era and education, causing substantial psychological distress among those targeted (Leung et al., 2023). Cyberbullying, as defined by UNICEF, refers to harassment or intimidation through digital technologies. It can occur on social media, messaging and gaming platforms, as well as mobile phones, and is characterised by repetitive behaviour intended to frighten, anger, or humiliate others. This phenomenon may manifest in various forms, such as the dissemination of false information or the publication of humiliating photographs or videos of an individual on social media platforms. It may also involve the sending of hurtful, abusive, or threatening messages, images, or videos via messaging platforms.

Additionally, cyberbullying can take the form of impersonation, where an individual assumes another person's identity to transmit aggressive messages on their behalf or through fraudulent accounts. Smith and colleagues (2008) define cyberbullying as a deliberate and aggressive act perpetrated by an individual or group through electronic means, occurring repeatedly over time and targeting a victim who is unable to defend themselves effectively. Relatedly, Nand and colleagues (2016) note that the broader concept of cyberaggression encompasses any use of digital media to intentionally harm an individual or group. This includes direct actions such as name-calling, flaming, denigration, and exclusion, as well as indirect forms, such as the use of profanities, slang, or comments that, while not directed at an individual, are implicitly aimed at their group or the choices made by the individual. The timely identification of harmful content is essential for the effective mitigation and prevention of online aggression and bullying. However, the continuous expansion of social media platforms, coupled with the increasing complexity and variability of these behaviours, presents significant challenges to the development of effective detection and intervention mechanisms (Mladenović et al., 2022; Leung et al., 2023). This study explores the phenomenon of cyberbullying through a collaborative activity conducted within the collective intelligence project "UNIZAR – University of X – Master's Degree in Secondary Education (Cyberbullying)" (1 December 2022 – 30 May 2025). The project aims to foster the exchange of ideas, develop innovative solutions, and encourage collective reflection on cyberbullying among adolescents

and educators. The case presented in this study outlines the experience of Pilar, a 4th-year student from Compulsory Secondary Education (Educación Secundaria Obligatoria - ESO) in Zaragoza (Spain). Following her sharing of an intimate image with her partner, he subsequently disseminated it without her consent on social media. This incident subjected Pilar to public humiliation, verbal abuse, and extensive harassment across various digital platforms. The case underscores the key characteristics of cyberbullying, including anonymity, extensive reach, and the repeated nature of hostile behaviours, all of which culminated in a damaging and humiliating psychological impact on the victim.

The activity involved 33 students (18 female and 15 male) enrolled in the Master's Degree programme for Secondary School Teachers at the University of X, specialising in Physical Education, History, and English Studies. Over the course of seven structured phases, they engaged in reflective analysis and responded to a series of questions related to Pilar's case, including the identification of the issue as cyberbullying, the characteristics of the phenomenon, the specific type of harassment, and potential interventions from both the role of a teacher and family. These questions were strategically formulated to guide collective reflection and foster the development of practical and sustainable future solutions. They were also intended to optimise the efficiency and quality of responses, promote consensus among participants, and facilitate the identification of the most relevant and impactful ideas. In each phase, participants could contribute original ideas, adopt those proposed by peers, and refine their responses based on the feedback. This structure enabled the observation of how both collaborative and competitive dynamics shape the evolution of ideas and influence collective decision-making processes.

The case of Pilar serves as an example of the challenges that educators may encounter when addressing complex issues, such as cyberbullying, within educational contexts. Solutions to cyberbullying require multifaceted strategies that incorporate emotional support, values-based education, and the responsible use of digital technologies. The case of Pilar also provides a reflective space for future

educators and professionals to critically examine their own preparedness and capacity to respond to similar situations. It also underscores the potential of collaborative environments in addressing complex educational challenges, promoting the development of practical solutions, and fostering a deeper understanding of cyberbullying and related issues.

1. Theoretical Framework

Education, as a social phenomenon and a fundamental aspect of society, constitutes a key area of study within the discipline of sociology. Sociology seeks to understand and interpret the social processes inherent in education. It is within this theoretical framework that our research and contributions are positioned. It is important to recognise that educational relationships, as a distinct form of social relationships, must consider issues related to social conflicts, such as racism, social exclusion, the construction of identity, equal opportunities, equity, gender, and violence, among other factors. Sociology, thus, provides a critical lens through which to examine the dynamics between the individual, society, and culture, with the objective of offering new, insightful, and future insights.

Galtung (1998) compares violence to an iceberg, arguing that only one-third of it is visible (direct, manifest violence), while the remaining two-thirds remain obscured (structural and cultural violence). This dynamic creates a vicious cycle of violence, as these forms reinforce one another: direct violence strengthens cultural violence, making it appear natural and structural. In this sense, visible violence is an expression of underlying structural and/or cultural violence. Cultural violence, which is invisible, is rooted in the transmission of thoughts, values, norms, habits, and behaviours that shape responses to conflict, often in an agonistic and adversarial manner. Structural violence is the denial within social structures (injustices and inequalities) of access to the fulfilment of human needs (biological, physical, psychological, and cultural).

The major part of the responsibility typically lies within structural and cultural violence, while individual perpetrators bear only a minimal share of accountability. Although they hold some degree of responsibility, it is comparatively smaller. Therefore, it is imperative to take direct action to address violent behaviour, whether physical, psychological, or verbal. However, this alone is not sufficient – it is also essential to address the underlying structural and cultural factors that have perpetuated such violence. Galtung (1998) advocates for the transformation of this vicious cycle into a virtuous one through the application of the '3 Rs': 1) Reconstruction, which involves the restoration of harm caused by direct violence; 2) Reconciliation, aimed at fixing relations between conflicting parties within the framework of cultural violence; and 3) Resolution, which seeks to address the systemic inequalities and contradictions intrinsic to structural violence, as these serve as the foundational basis for manifest violence. Galtung further explains that conflict consists of three key components: attitudes and assumptions, behaviour, and contradiction (see Molina-Luque, 2023). Face-to-face bullying and cyberbullying often coexist. However, cyberbullying leaves a digital footprint – a record that can be used as evidence to aid in curtailing the abuse. The social and cultural dynamics of bullying, in conjunction with the conceptual frameworks of space and time, provide critical avenues for examining youth-centred perspectives on students' experiences of bullying. According to Lohmeyer (2022), spatiotemporal analysis reveals the interconnections between similar experiences, such as bullying and relationship violence, which are often examined in isolation. The scholar further highlights the existence of conflicting narratives, articulated by both young people and researchers, that simultaneously depict schools as non-violent environments and as spaces of invisible violence. Thus, Lohmeyer (2022) conceptualises bullying as a form of "social violence," driven by a force that can persist and become institutionalised within the structural frameworks of educational institutions. In order to conduct a thorough analysis of cyberbullying and establish guidelines for action, it is imperative to adopt a theoretical and conceptual framework grounded in the sociology of education. This framework should integrate, alongside Galtung's (1998) conflict theory, the foundational principles of collaborative learning as proposed by

Dewey (2007), Vygotsky's (2010) constructivism, social learning, as well as collective intelligence and the potential of virtual environments.

Cyberbullying typically emerges from direct social interactions and, subsequently transitions into digital social life (Cebollero-Salinas et al., 2022; Ortega-Ruiz & Zych, 2016; Mladenović et al., 2022). Experiencing cyberbullying can result in a range of psychological consequences (Cowie, 2013), including depression, diminished self-esteem, elevated levels of social anxiety, as well as stress, sadness, difficulty concentrating, frustration, and, in certain instances, suicidal ideation (Schenk & Fremouw, 2012). Just as cyberbullying can have a profound impact on mental health, the management of emotional intelligence in both victims and perpetrators offers valuable perspectives that warrant further exploration. Chan and Wong (2017) argue that students who have higher levels of empathy, self-esteem, prosocial behaviour, and stronger family and school cohesion are more likely to develop emotional strategies that facilitate coping with cyberbullying (Von Marees & Petermann, 2012; Sittichai & Smith, 2018). Marín-López and Zych (2023) emphasise that well-developed social, emotional, and moral competencies can serve as critical protective factors against involvement in cyberbullying, both for perpetrators and victims. Values education plays an essential role in equipping young individuals with the necessary skills, attitudes, and ethical awareness to navigate the complexities of the digital environment in a responsible and ethical manner. The authors underscore the pivotal role of these competencies in fostering responsible digital citizenship, and enabling individuals to engage in online interactions with greater awareness, empathy, and integrity. However, while stronger emotional competence can help students handle cyberbullying and may prevent them from engaging in such behaviour, questions remain about the underlying factors that drive them to perpetrate cyberbullying. Moreover, excessive internet use is often associated with alterations in behaviour and emotional well-being, encompassing both positive and negative outcomes.

A meta-analysis conducted by Fumero and colleagues (2018) identifies low assertiveness and deficits in social relationships as factors that may lead adolescents to prefer online communication. The anonymity provided by the internet reduces the demands of communication and personal interaction skills, thus contributing to a long-term decline in social competencies. Collective intelligence has become one of the pivotal concepts in the study of human behaviour (Woolley et al., 2010). Its core premise is that group performance in collaborative tasks surpasses that of individuals working in isolation. This phenomenon has also been extensively examined within the broader framework of "crowd intelligence" (Cebollero-Salinas et al., 2022), highlighting the benefits of collective problem-solving and decision-making. Additionally, the transformative capacity of Web 2.0 digital technology is reconfiguring learning, knowledge production, and academic identities within contemporary higher education. The adoption of a microsociological approach provides a critical lens through which to examine the potential of virtualisation to shape new geographies of knowledge production, while also serving as a methodological framework for identifying the ways in which these transformative processes are uneven, problematic, and contested (Taylor & Dunne, 2011).

Collective intelligence is closely linked to collaborative learning, as the teaching-learning dynamic – fundamental to both educational processes and socialization – relies on interaction and cooperation within social relationships. This underscores the significance of collaborative and dialogic learning. In fact, the etymological root of dialogue, derived from the Classical Greek dia logos, emphasises the construction of knowledge through social interaction and interpersonal relationships. As Ramos and colleagues (2015: 2272) argue, cooperative learning extends beyond the simple allocation of tasks among a set number of students. Rather, it requires collective production, which cannot be achieved through procedural implementation alone, but, instead, needs a structured pedagogical approach that begins in primary education. However, as it is not possible to revert to earlier stages of education, and given that students have already progressed beyond initial instructional phases, it is, thus, imperative to consider alternative approaches to higher education that prioritise

collective scientific production. Jeffrey's (2024) longitudinal study, for instance, illustrates how formal grouping and classification practices influence the formation of social networks among university students, revealing a tendency to develop friendships predominantly within their assigned curricular groups. It reveals that the clustering of friendships within curricular groups is largely attributable to co-enrolment in courses (spatial proximity), and underscores the significance of collective intelligence and collaborative learning. These findings have the potential to enhance learning in higher education, and further guide research towards the transformation of educational processes, enabling a more comprehensive examination of cyberbullying and the development of strategies for its resolution.

2. Research Instrument

The study employed the Collective Learning Platform, an online tool designed to foster collective intelligence through the simultaneous interaction of participants. This platform was developed by researchers from the University of X (Spain) in collaboration with the company Kampal Data Solutions. The primary objective was to generate high-quality solutions to complex problems through a model of successive digital social interactions, akin to those observed in social networks. The platform was designed to address common challenges in group work, such as noise (the spread of unfiltered ideas), disruption (participants who tried to disrupt rather than help), and influence (opinions gaining agreement due to the social status of the person suggesting them, regardless of their quality). Additionally, the platform employed an artificial intelligence (AI) system that acted as a moderator, helping to guide the interaction, and removing responses that did not contribute to reaching a consensus. The platform was structured into seven phases, each designed with a specific purpose. The activity took approximately 40 minutes, and phase facilitated different forms of interaction among participants, therefore enabling diverse modes of engagement:

Phase 1: Individual Response (10 minutes):

- Participants respond individually to the posed questions.
- They cannot view the responses of other participants.
- This phase establishes a baseline of individual responses before group interaction.

Phase 2: Neighbour Observation (5 minutes):

- Participants can view the responses of four randomly selected participants.
- They can copy the responses of their neighbour participants.
- There is no swapping of users or removal of responses during this phase.

Phase 3: Neighbour Observation (5 minutes):

- Participants can observe their neighbours' responses in real time.
- User permutation is allowed and the neighbours may change.
- Participants can copy responses.

Phase 4: Response Modification (5 minutes):

- In addition to copying and observing, participants can modify their responses.
- The AI begins to remove responses that do not contribute to consensus.
- Continuous improvement of responses is encouraged.

Phase 5: Response Elimination (5 minutes):

- The AI removes responses that are not valued by the group.
- Participants can continue copying and modifying responses.
- This phase aims to reduce noise and focus on the most popular responses.

Phase 6: Top 10 Selection (5 minutes):

- Participants can view the 10 most popular responses.
- They can copy these responses or retain their own.
- The AI continues to moderate and remove responses that are poorly rated.

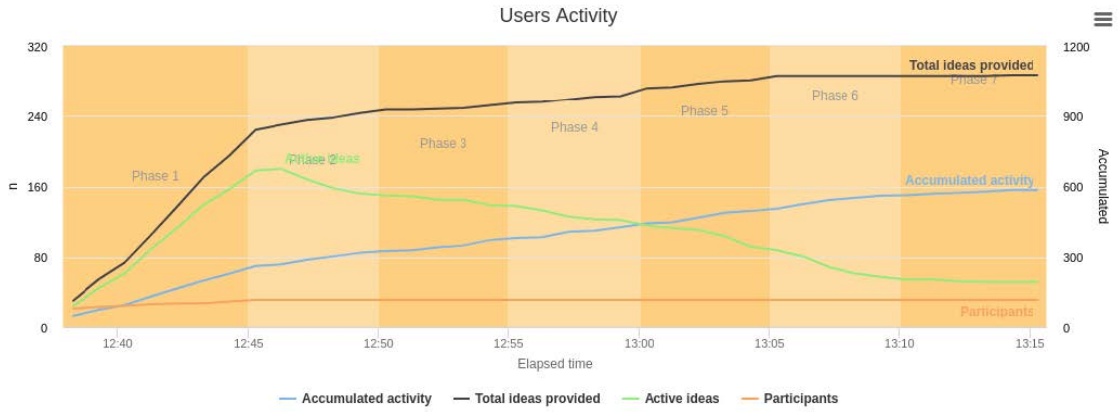
Phase 7: Final Selection (5 minutes):

- Participants choose from the top 10 responses.
- They cannot modify their responses, only select from the most popular ones.
- This phase aims to generate a final consensus.

3. Participation and Experiment Dynamics

The session was conducted on 5 December 2023, from 12:40 pm to 1:15 pm, in a classroom at the University of X. The participants were organised into a virtual network designed to facilitate interaction and collaboration. The primary objective was to investigate how collaborative and competitive environments can influence the development of solutions to cyberbullying. Several specific dynamics were used to shape the participants' interactions: user permutations, item copying, and a progressive extinction of items. These strategies facilitated the analysis of the evolution of ideas within the system, while also promoting the continuous adaptation and improvement of the generated responses. Figure 1 illustrates the activity of users across the different phases:

Figure 1: User Activity



Source: authors' own.

Figure 1 displays four main curves:

. Accumulated Activity (blue curve): It represents the total number of actions performed, including the creation of new ideas, copying of responses, and modifications made. The blue curve shows a continuous upward trend, reflecting the users' consistent level of participation.

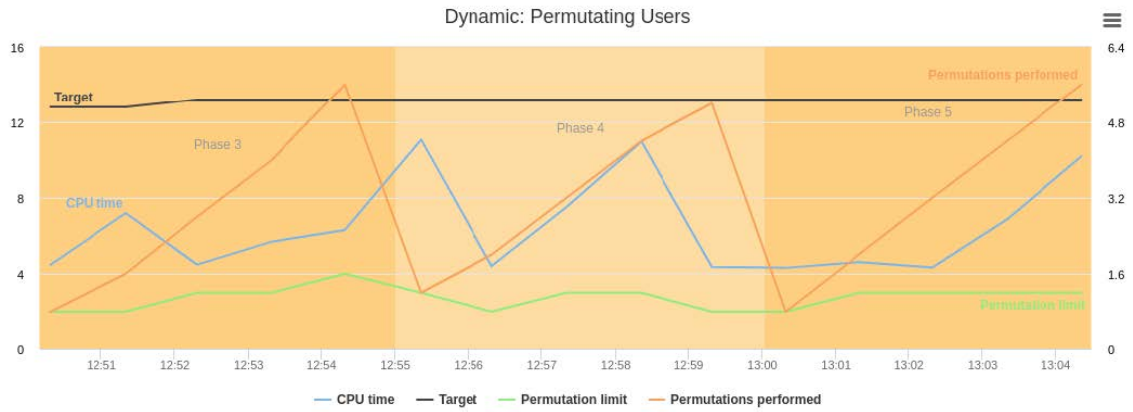
. Total Ideas Contributed (black curve): It indicates the total number of different responses generated. Its initial growth stabilised as the extinction dynamics began to reduce the number of active ideas.
. Active Ideas (green curve): It shows the number of ideas that remained active in the system. Its gradual decline highlights the impact of extinction and overwrite dynamics, which eliminated the less relevant responses.
. Active Participants (orange curve): It reflects the number of active users at each phase. The orange curve remained stable, demonstrating consistent participation.

The first phase (Figure 1) is marked by a rapid increase in participants and a significant rise in ideas. The blue curve of accumulated activity climbs quickly. In the middle phases, the activity stabilises, and the total number of ideas converges, while accumulated activity continues to increase. This period moves into qualitative refinement. In the final stages, the number of participants gradually decreases. Active ideas drop, but total activity stays steady. The curve shows the end of the collaborative cycle. The graphical analysis highlights an initial phase of high productivity, followed by a period of refinement, and a conclusion focused on the most relevant contributions.

3.1 User Permutations

The permutation dynamic randomly repositioned participants in the virtual network, constantly changing their immediate neighbours, which allowed for greater exposure to different ideas. Permutations played a significant role in the diffusion of knowledge and the diversity of perspectives for each participant. The percentage of permutations was 80%, indicating that a large majority of participants changed positions during the phases. Figure 2 presents data on the changes and evolution of the users.

Figure 2: User Changes



Source: authors' own

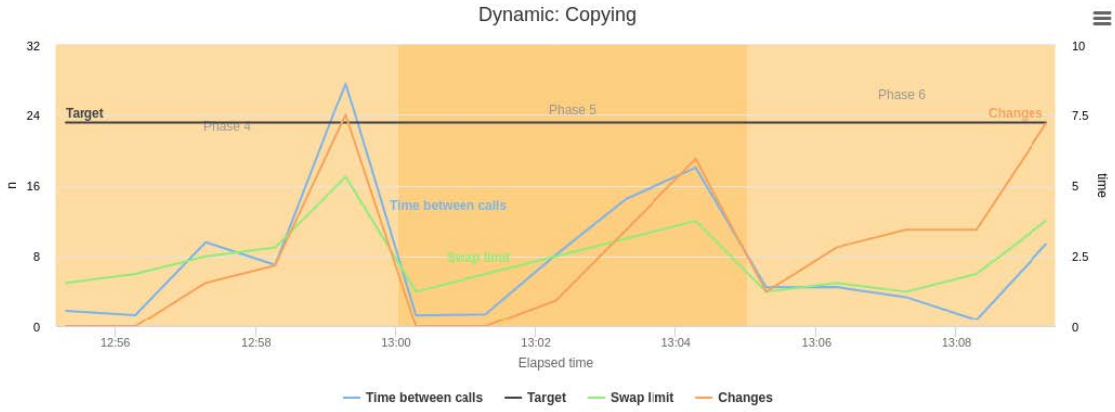
The black curve represents the cumulative number of permutations performed, with the peaks indicating the phases where this mechanism was most active. Permutations rose notably in the initial phases, encouraging diverse interactions and preventing the formation of static groups. This strategy sought to avoid isolated or stagnant groupings, and ensure the continuous flow of ideas. By altering the positions of users, opportunities for the exchange of innovative ideas were enhanced, thereby enriching the collective responses.

3.2 Item Copying Between Participants

This function was active throughout several phases, and allowed the users to adopt the ideas of their peers. The system automatically replaced less popular responses with those that were more widely accepted, thereby facilitating the consolidation of the most relevant proposals. The copying process was particularly effective in the phases where the participants could view their neighbours' responses in real time. This encouraged feedback and the evolution of ideas, as the users had the opportunity to enrich their initial responses based on the contributions of others. In the final stages of the activity, participants were able to copy the top 10 responses,

thus ensuring a convergence towards higher-quality solutions. Figure 3 illustrates the data regarding the copied responses:

Figure 3: Copies of Responses



Source: authors' own

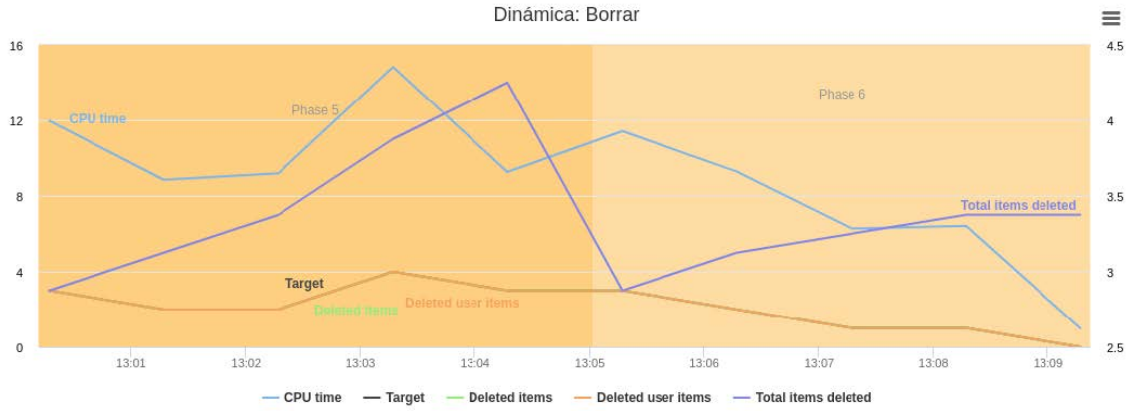
The black curve denotes the system's intended objective in terms of expected changes, while the orange curve reflects the changes that were actually made. The upward trajectory of both curves illustrates how the participants adopted more popular responses or adjusted their own based on the ideas presented by their peers. This dynamic facilitated a process of collective refinement and enhancement, thus consolidating the most pertinent responses. The system implemented a mechanism to optimise activity: if a user retained an unpopular solution for an extended period, it was replaced by a more widely accepted idea from one of their peers.

3.3 Item Extinction Dynamics

This mechanism was designed to gradually reduce the total number of active responses in the system by eliminating those that were less popular or relevant. The extinction process was triggered automatically and regulated by specific parameters,

such as the frequency of ideas and participant activity. The extinction curve revealed two main effects: first, it simplified the system by reducing the number of active items, thus making it easier to identify the most valuable ideas. Second, it encouraged participants to contribute more compelling proposals, as weak or repetitive ideas were quickly eliminated. This fostered a positive competitive environment where quality was prioritised over quantity. Figure 4 presents data on item extinction dynamics.

Figure 4: Item Extinction Dynamics



Source: authors' own

The black curve represents the items removed per user, while the blue curve indicates the total number of distinct responses eliminated. The progressive decline in items reflects how the system filtered out less popular responses, focusing on those most valuable to the collective. The evolution of activity illustrates how the dynamics of permutation, copying, and extinction interacted to optimise the process of idea generation and consolidation. The data demonstrate an effective balance between diversity and consensus, facilitating the evolution of initial proposals into more well-substantiated and broadly accepted solutions. This analysis underscores the potential of collaborative environments to address complex problems in a structured and efficient manner.

3.4 Balance of Dynamics

The combination of permutation, copying, and extinction facilitated a balance between diversity and consensus. Permutations promoted diversity by increasing the participants' exposure to different ideas, while copying enabled knowledge transfer and the refinement of responses. Meanwhile, extinction ensured that only the most relevant and widely supported solutions remained active, therefore consolidating the results around the most effective proposals. These dynamics proved effective in examining how collaborative environments can address complex issues such as cyberbullying. The structured and adaptive interaction generated a set of practical solutions, which show the potential of collective intelligence in educational and social contexts.

4. Responses

The activity enabled students to critically reflect on cyberbullying, and propose solutions based on their experience and knowledge. Through a dynamic and collaborative process, responses were gathered for seven key questions related to Pilar's case. The following section presents an analysis of the results and the consensus achieved for each question.

Question 1: Identification of the Case as Cyberbullying

The first question aimed to determine whether the students recognised the described case as cyberbullying. The consensus was unanimous: 100% of the participants identified the case as a clear example of cyberbullying. This response reflected the clarity of the example provided as well as the widespread understanding among the participants of the defining elements of cyberbullying, such as emotional harm, the use of digital technologies to harass, and the repetition of hostile behaviours. The unanimity in this response provided a strong starting point for the subsequent analysis, as it indicated that participants shared a basic and common understanding

of the phenomenon. This consensus also underscored the severity of the case, highlighting the need for immediate intervention from multiple perspectives.

Question 2: Characteristics of Cyberbullying

The participants described the main characteristics of cyberbullying. The most common responses were:

. Anonymity of the perpetrator: A distinguishing feature of cyberbullying is that perpetrators often conceal their identity, which makes it more difficult to identify them and prevent their actions.
. Massive reach: Social media and digital platforms allow content to spread rapidly to a large audience, amplifying the emotional impact on the victim.
. Repetition of hostile behaviours: Bullying is not a one-off act, but a series of persistent actions aimed at humiliating, intimidating, or harming the victim.

These characteristics underscore the psychological impact of cyberbullying, including stress, anxiety, and depression, particularly pronounced among adolescents. The participants in the study highlighted the detrimental nature of digital harassment, wherein the aggressions infiltrate every aspect of the victim's daily life due to the ubiquitous presence of technology, and are especially humiliating and psychologically harmful.

Question 3: Type of Cyberbullying

The analysis of responses to this question identified the specific type of cyberbullying. The main categories were:

. Non-consensual sexting: The dissemination of Pilar's intimate image without her consent constitutes a clear case of non-consensual sexting, which can have serious

legal and emotional implications. It involves the distribution of explicit sexual content without the consent of the person involved.

. Distribution of sexual content: This term was used to describe the intentional spreading of the intimate image across both public and private platforms, which exacerbates the magnitude of the harm caused.

. Sextortion: Some participants proposed that the situation could potentially escalate into sextortion if Pilar was subjected to blackmail.

These responses underscore the need to address the phenomenon from both legal and educational perspectives with a focus on prevention and victim protection.

Questions 4 and 5: Intervention and Advice

Participants proposed various ways to intervene and provided advice to help Pilar. The most common suggestions were:

. Creation of a safe environment: Many participants suggested that the first step should be to provide Pilar with a trusted space where she could express her emotions without fear of judgment. This includes establishing empathetic and supportive relationships.

. Legal recommendations: The participants highlighted the importance of informing Pilar about her legal rights and the available procedural avenues, such as reporting the unauthorised dissemination of her image. They also suggested activating the school's protocols to ensure the protection of the victim.

. Education and prevention: Some participants recommended using the case as an opportunity to better inform Pilar (and other students) about the risks of sexting and the importance of protecting one's privacy. Training on how to identify, block, and report inappropriate content on various social media platforms was also suggested.

These proposals reflect a holistic approach, integrating immediate support for the victim with educational and preventive measures to address cyberbullying in the long term.

Question 6: Educators' Capacity to Act

The participants' opinions were divided between those who felt prepared to act as future educators and those who identified the need for further training and better knowledge:

. Ethical commitment: Some participants expressed confidence in their ability to intervene, emphasising their responsibility as future educators to protect students, and seek support from both internal and external educational and professional communities.
. Lack of specific training: Others acknowledged their lack of preparation, highlighting the need for specialised training in legal, psychological, and technological matters.
The future educators recognised the importance of their role in addressing cases such as cyberbullying and similar scenarios. However, many expressed a lack of the necessary knowledge to address such cases with confidence and effectiveness.

Question 7: Guidance for the Family

Finally, the participants proposed recommendations to support the victim's family. The most relevant responses were:

. Emotional support: It was suggested to work with the family to create a safer and emotionally supportive environment for Pilar, helping her rebuild her self-esteem and confidence.
. Effective communication: Participants emphasised the importance of fostering dialogue between Pilar and her parents, enabling them to better understand the situation and offer support without judgement.
. Legal resources: Many proposed providing guidance to the family on the legal steps they could take to report the case, and protect the victim from potential future harm.

The analysis of the responses demonstrates a high level of consensus in key areas, such as the identification of cyberbullying, and the main characteristics of the phenomenon. However, areas requiring further attention were identified, such as teacher training and strengthening collaboration with families. This collective intelligence exercise highlights the importance of a multidimensional approach to addressing cyberbullying, combining strategies for emotional support, preventive education, and legal action.

5. Comparative Analysis

The comparative analysis of the study aims to assess the most popular responses based on their alignment with pedagogical and legal guidelines, as well as to examine the evolution of consensus and originality throughout the different phases. It provides insight into how collaborative dynamics enhanced the quality and effectiveness of the proposed solutions.

5.1 Evaluation of the Most Popular Responses and Their Consistency with Pedagogical and Legal Guidelines

The most highly rated and adopted responses by the participants show a strong alignment with the established educational and legal guidelines for addressing cyberbullying. The following key aspects of this evaluation are outlined below:

Pedagogical Guidelines

. Creation of a safe environment: The responses emphasised the importance of providing the victims with a trusted space within the educational institution (classroom) to express their feelings and reflect on the issue. This approach aligns with best practices for emotional education, which promote an inclusive and empathetic environment within educational institutions.

. Prevention and education: The proposals included educating both Pilar and other students about the risks associated with social media use and the importance of protecting their privacy. These initiatives align with the objectives of digital literacy programmes, which aim to equip young people with the skills to navigate digital environments safely.
. Early intervention: The need to activate school protocols in order to manage cases of bullying and cyberbullying was emphasised. This type of response reflects a sound understanding of educational policies that prioritise timely intervention to protect victims.

Legal Guidelines

. Reporting the case: The unanimous recommendation to report the non-consensual dissemination of Pilar's image is consistent with legal frameworks that criminalise non-consensual sexting, especially when minors are involved. Laws in many countries recognise this behaviour as a serious offence, subject to legal prosecution.
. Protection of the victim: Participants suggested measures to ensure Pilar's safety, such as the removal of content from social media platforms and restricting access for the perpetrators within the school environment. These actions are consistent with legislation aimed at minimising harm to victims of digital harassment.
. Overall, the most popular responses demonstrate an effective integration of pedagogical and legal principles, highlighting the potential of collective intelligence to generate solutions that are both practical and ethically responsible.

5.2 Comparison Between the Phases in Relation to Originality and Consensus Reached

The design of the activity allowed for observation of how originality and consensus evolved across different phases. This analysis reveals a dynamic balance between the diversity of ideas and the convergence towards common responses.

Originality in the Initial Phases

. In the initial phases, participants had the freedom to generate ideas independently, without direct influence from their peers. This resulted in a broad range of responses, many of which demonstrated unique perspectives and innovative approaches to addressing the case.

. The high level of originality was primarily driven by the absence of restrictions and the encouragement to propose individualised solutions. However, certain responses lacked depth or specificity, thus emphasising the need for refinement and enhancement in the subsequent phases.

Evolution of Consensus

. As the phases progressed, the dynamics of copying and overwriting helped to consolidate certain ideas. Participants either adopted more popular responses or adapted their own proposals based on those of their peers, leading to greater uniformity in the responses.

. This process reduced the number of active ideas, while simultaneously increasing their average quality. The most relevant and detailed responses gained prominence, while other ideas were eliminated through the extinction dynamic.

Impact of the Permutations

. The permutations introduced an additional layer of diversity. By altering the participants immediate neighbours, opportunities were created for ideas to circulate and to be reconsidered from a variety of perspectives.

. This dynamic balanced originality and consensus, allowing valuable solutions to spread, while maintaining the initial diversity of ideas.

Final Consolidation

. In the final phases, the participants were given access to a set of the top 10 responses, which accelerated the convergence process. This led to a broad consensus on the most effective solutions, albeit at the expense of a reduction in individual originality.
. The ideas selected at this stage demonstrated a high level of coherence with pedagogical and legal expectations, and reflected the success of the activity in synthesising diverse contributions into solid and viable proposals.

The comparative analysis underscores how the conducted activity balanced originality and consensus. In the initial phases, the diversity of ideas was essential for exploring a wide range of approaches and enriching the discourse. As the experiment progressed, the dynamics of copying, permutation, and extinction facilitated the consolidation of responses around more coherent and practical solutions. This process demonstrates the potential of collective intelligence in addressing complex issues, and integrating diverse perspectives in order to generate consensual, pragmatic, and contextually relevant proposals. The dynamics improve solution quality by combining ideas, speed up the balance between innovation and practicality, and offer potential for application in educational, professional, and social contexts.

Conclusions

The escalating prevalence of cyberbullying underscores the urgent need for a more comprehensive and holistic understanding of its root causes, along with the development of effective prevention and intervention strategies. Addressing harmful online behaviour and its manifestations across digital platforms necessitates a multidimensional approach that integrates psychological, social, and technological factors (Leung et al., 2023). The development of social, emotional, and moral competencies is also fundamental to both the prevention and mitigation of

cyberbullying among children and adolescents (Marín-López & Zych, 2023). This article aimed to demonstrate how collaboration can generate effective solutions and deepen the understanding of complex phenomena, such as cyberbullying, within educational contexts. The conclusions can be categorised into three main areas: 1) the impact of collective intelligence; 2) the quality of the proposed solutions; and 3) the challenges encountered. Collective intelligence emerged as a valuable tool for analysing and addressing intricate issues. The collaborative dynamics that involved permutations, item copying, and the extinction of responses, facilitated a balance between the diversity of ideas and the consensus for practical solutions. The participants were able to refine their proposals, improving the quality of their responses and achieving a high level of consensus.

The study also highlighted the potential of collective learning and creativity, allowing participants with limited experience in the topic to make meaningful contributions. This collaborative approach enhanced the understanding of cyberbullying, while also promoting a more comprehensive and multidimensional perspective to the case. The solutions proposed by the participants were consistent with existing educational and legal guidelines (Mladenović et al., 2022). The most popular responses included concrete and action-oriented measures, such as creating a safe environment for the victim, activating school protocols, providing legal advice, and promoting prevention education. These proposals reflect a balanced perspective that combines immediate attention to victims with long-term strategies in order to prevent similar cases. Additionally, the recommendations provided to the victim's family underscored the importance of emotional support, effective communication, and access to legal resources. These aspects reflect a comprehensive understanding of the needs of victims and their social environments, emphasising the critical role of collaboration between educators, families, and legal authorities.

Despite these positive outcomes, several challenges were identified, with a key limitation being the lack of specialised training in addressing cyberbullying. Many future educators expressed a commitment to taking action within their professional

roles, but also recognised the need to develop additional competencies and knowledge, including emotional management, legal intervention, and digital literacy. Ultimately, the study aimed to demonstrate that collective intelligence constitutes a sociological educational methodology with the potential to transform pedagogical processes. Collaborative dynamics not only help find practical solutions, but also support educators in becoming more critical, reflective, creative, and empathetic. Education should transcend the passive transmission of knowledge, and evolve into a dynamic ecosystem, in which teaching and learning are co-constructed. Educators should use methods that incorporate diversity, critical thinking, and innovation to tackle complex challenges like cyberbullying. Collective intelligence also represents an important paradigm shift in the conceptualisation of knowledge – one that is collaborative, ethical, and, most importantly, human. Further research is needed to examine the long-term impact and efficacy of collective intelligence and values-based education interventions in reducing cyberbullying rates (Marín-López & Zych, 2023). Additionally, cross-cultural studies could provide deeper insights into the complex interplay between collective learning and virtual education across diverse cultural contexts, thereby enriching our understanding of how these factors influence cyberbullying prevention and intervention strategies.

References

Cebollero-Salinas, A., Cano, J., Bautista, P., & Orejudo, S. (2022). E-competencias e inteligencia colectiva: Propuestas para el desarrollo emocional en las interacciones en línea. *Revista Internacional de Educación Emocional y Bienestar, 2*(1), 13–32.

Chan, H. C. O., & Wong, D. S. (2017). Coping with cyberbullying victimization: An exploratory study of Chinese adolescents in Hong Kong. *International Journal of Law, Crime and Justice, 50*(1), 71–82. https://doi.org/10.1016/j.ijlcj.2017.04.003

Cowie, H. (2013). Cyberbullying and its impact on young people's emotional health and well-being. *The Psychiatrist, 37*(5), 167–170. https://doi.org/10.1192/pb.bp.112.040840

Dewey, J. (2007). *Cómo pensamos: La relación entre pensamiento reflexivo y proceso educativo*. Paidós.

Fumero, A., Marrero, R. J., Voltes, D., & Peñate, W. (2018). Personal and social factors involved in internet addiction among adolescents: A meta-analysis. *Computers in Human Behavior, 86*, 387–400. https://doi.org/10.1016/j.chb.2018.05.005

Fung, A. L. C. (Ed.). (2024). *Cyber and face-to-face aggression and bullying among children and adolescents: New perspectives, prevention and intervention in schools* (1st ed.). Routledge.

Galtung, J. (1998). *Tras la violencia, 3 R: Reconstrucción, reconciliación, resolución*. Bakeaz–Gernika Gogoratuz. https://www.unicef.org/es/end-violence/ciberacoso-que-es-y-como-detenerlo

Jeffrey, W. (2024). Curricular differentiation and informal networks: How formal grouping and ranking practices shape friendships among students in college. *Sociology of Education*. https://doi.org/10.1177/00380407241300602

Leung, A. N. M., Chan, K. K. S., Ng, C. S. M., & Lee, J. C.-K. (Eds.). (2023). *Cyberbullying and values education: Implications for family and school education* (1st ed.). Routledge.

Lohmeyer, B. (2022). The institutionalised momentum of slow violence: Spatiotemporal contradictions in young people's accounts of school bullying. *British Journal of Sociology of Education, 44*(2), 259–275. https://doi.org/10.1080/01425692.2022.2145932

Marín-López, I., & Zych, I. (2023). Cyberbullying and social, emotional, and moral competencies. In A. N. M. Leung, K. K. S. Chan, C. S. M. Ng, & J. C.-K. Lee (Eds.), *Cyberbullying and values education: Implications for family and school education* (pp. 89–103). Routledge.

Mladenović, M., Ošmjanski, V., & Vujičić Stanković, S. (2021). Cyber-aggression, cyberbullying, and cyber-grooming: A survey and research challenges. *ACM Computing Surveys, 54*(1), 1–42. https://doi.org/10.1145/3424246

Molina-Luque, F. (2023). Infancia, violencia y deporte: Propuestas de gestión de conflictos desde la socialización profigurativa y la Educación Física. In D. Moscoso & R. Sánchez (Eds.), *Sociología del deporte*. Dykinson.

Nand, P., Perera, R., & Kasture, A. (2016). 'How bullying is this message?': A psychometric thermometer for bullying. In *Proceedings of the International Conference on Computational Linguistics (COLING'16): Technical Papers* (pp. 695–706).

Ortega, R., & Zych, I. (2016). La ciberconducta y la psicología: Retos y riesgos. *Psicología Educativa, 22*(1), 1–4. https://doi.org/10.1016/j.pse.2016.04.001

Ramos, C., Ariño, M., Berasaluze, A., Dellavalle, M., Lorenzo, J., Munuera-Gómez, M., Pascual-Fernández, M., & Pelluch, M. (2015). Estrategias de aprendizaje colaborativo en Trabajo Social. In M. T. Tortosa, J. D. Álvarez, & N. Pellín (Coords.), *Nuevas estrategias organizativas y metodológicas en la formación universitaria para responder a la necesidad de adaptación y cambio (XIII Jornadas de Redes de Investigación en Docencia Universitaria)* (pp. 2270–2282). Universidad de Alicante.

Schenk, A. M., & Fremouw, W. J. (2012). Prevalence, psychological impact, and coping of cyberbully victims among college students. *Journal of School Violence, 11*(1), 21–37. https://doi.org/10.1080/15388220.2011.630310

Sittichai, R., & Smith, P. K. (2018). Bullying and cyberbullying in Thailand: Coping strategies and relation to age, gender, religion and victim status. *Journal of New*

Approaches in Educational Research, 7(1), 24–30. https://doi.org/10.7821/naer.2018.1.254

Smith, P., Mahdavi, J., Carvalho, M., Fisher, S., Russell, S., & Tippett, N. (2008). Cyberbullying: Its nature and impact in secondary school pupils. *Journal of Child Psychology and Psychiatry, 49*(4), 376–385. https://doi.org/10.1111/j.1469-7610.2007.01846.x

Taylor, C. A., & Dunne, M. (2011). Virtualization and new geographies of knowledge in higher education: Possibilities for the transformation of knowledge, pedagogic relations and learner identities. *British Journal of Sociology of Education, 32*(4), 623–641. https://doi.org/10.1080/01425692.2011.578441

UNICEF. (n.d.). *Cyberbullying: What is it and how to stop it*. https://www.unicef.org/end-violence/how-to-stop-cyberbullying

Von Marees, N., & Petermann, F. (2012). Cyberbullying: An increasing challenge for schools. *School Psychology International, 33*(5), 467–476. https://doi.org/10.1177/0143034312445241

Vygotsky, L. S. (2010). *Pensamiento y lenguaje*. Paidós.

Woolley, A. C., Chabris, C. F., Pentland, A., Hashmi, N., & Malone, T. W. (2010). Evidence for a collective intelligence factor in the performance of human groups. *Science, 330*(6004), 686–688. https://doi.org/10.1126/science.1193147