

Beyond the Screen: Examining the Differential Impact of Cyberbullying on Self-Esteem across Online Platforms

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Abstract:

One of the most vulnerable by-products of the internet technologies and their continuous evolution in recent years, namely cyberbullying, poses increasing threats to people's mental health and overall well-being. Given the fact that social media has become the most prevalent hot spot in terms of online aggression and bullying with adolescents being one of the key victims and being reliably detected, the research question will address the extent to which cyberbullying on social media sites is different from other online communication tools such as email or gaming platforms. In that way, relying on the analysis of existing studies on cyberbullying epidemiology, phenomenology, and mental health dimensions, this paper will provide the most comprehensive understanding of the digital landscape and its impact on the cyberbullying dynamics, which will, subsequently, will aid in formulating the relevant hypothesis at the later stage of the research. Finally, the paper will briefly describe the results of the questionnaire survey aimed at obtaining the more detailed information with regard to the cyberbullying experiences of the students.

Keywords: Cyberbullying, Social Media, Online Platforms, Mental health, Self-esteem, Behavior Issues

1. Introduction

Cyberbullying, use of electronic communication to bully a person (typically by sending messages of an intimidating or threatening nature), has emerged as important public health problem among adolescents worldwide (Nixon, 2014). Adolescents now have greater access to and use of digital technologies, such as social media (SM), instant messaging Apps or

online games; wide range environments where interpersonal problematic behavior can occur (Schneider et al., 2012).

Cyberbullying itself is defined by research as a type of bullying that mirrors traditional face-to-face bullying behaviors, where an intention to harm another individual or group in online environments exists (Romera et al., 2016). On the other hand, in my view there are things that have not existed ever before due to digital which has caused people more of anonymity through their interactions and at times also public exposure; or it may be harder for someone to disconnect from one environment because they become defenseless victims with no control (Romera et al., 2016).

Other studies have investigated the severe deleterious effects of cyberbullying such as anxiety, depression, low self-esteem and psychological distress (Cénat et al., 2014). Nevertheless, so far relatively little attention has been given to the question whether cyberbullying is more or less prevalent and takes on other forms depending on specific digital platforms. To fill this gap, the current study examines whether social media environments are riskier with respect to cyberbullying than other digital communication tools (e.g. email or gaming platforms).

1.1 Cyberbullying

Cyberbullying (CB) is a new form of online aggressive behavior that has emerged as a serious public health concern across the world, particularly among adolescents (Nixon, 2014). Cyberbullying has often been defined as electronic picking on someone with usually a threatening or intimidating message sent by email, cell phone, etc. (Romera et al., 2016). It is a type of bullying that has the same essential features with traditional face-to-face peer-bullying, involving intentional repetition of physical, verbal or social aggression and an imbalance of power between bully and victim (Romera et al., 2016). Yet the digital world presents elements that make cyberbullying stand out from real life bullying such as: anonymity, global exposure and an inability to remove yourself off of it (Romera et al., 2016). These distinctive features can make cyberbullying particularly pernicious, increasing the our-credulousness of a person under attack being highlighted and combining with drawing attention to physical differences; factors associated with anxiety, depression, low self-esteem as well psychological distress (Nixon, 2014).

The complexities of dealing with cyberbullying are often overlooked in the debate surrounding it. Bringing an in-depth understanding of these platform-specific ingredients together, researchers and practitioners can begin to develop targeted prevention intervention strategies that are sensitive to the unique contextual challenges posed by each online environment (Bhat, 2008).

2. The Digital Landscape And Cyberbullying

The growth and mobility of adolescents on online spaces such as social media, instant messaging apps or even gaming platforms has given rise to a new kind of behavior: digital

violence (Aboujaoude et al., 2015). Some evidence from research suggests that cyberbullying may be more common on certain types of digital platforms and in some cases have a different character, depending e.g. on the participatory opportunities for communication between youngsters through such channels (Almomani et al., 2024).

Social media platforms equipped with components like public profiles, vast networks of connections and the capacity to distribute content widely could be conducive in generating an ecosystem for cyberbullying (Cénat et al., 2014). The anonymity of online interaction without face-to-face consequences could encourage perpetrators to act more aggressively and offensively (Aboujaoude et al., 2015). In addition to cyberbullying, the impact of being harassed on social media is exacerbated by these platforms' inherent share ability — something that only worsens if other people witness a victim's public shaming and or distress (Romera et al., 2016).

2.1 Cyberbullying Environments: A Comparative Analysis of Digital Platforms

This commentary will explore the role of particular digital platforms in relation to cyberbullying. If we can understand what is happening in each urgently needed platform and thus the unique properties that matter, at least minimally, to online harassment on each one of them then we could also learn how there may targeted prevention strategies.

2.1.1 Social Media: Amplified Visibility and Persistent Harassment

Based on their public and interactive features, social media platforms put adolescents at a higher risk for cyberbullying. These are:

- **Public Exposure:** Information displayed on any medium throughout the internet can be seen by millions of users with just a few clicks, making this particularly dangerous for those who are trying to bully someone as it often leads to things spiraling out of control (Swartz, 2009).
- **Persistent Interaction:** Social media is designed for persistent interaction and the constant notifications linked to that makes it a perfect arena of long-running harassment, where victims are harassed so often they cannot disengage from or avoid messages.
- **Anonymity and Reduced Accountability:** Offering users to remain anonymous can make the inhibitions slide away, making them more susceptible for behaving aggressively (Zhou et al., 2021).
- **Social Comparison and Validation Seeking:** The constant comparisons against the popularity metrics coupled with validation-seeking attributes spirals feelings of inadequacy, enabling further cyber behaviors (Uyheng et al., 2022).

2.1.2 Beyond Social Media: Cyberbullying in Diverse Digital Spaces

While more emphasis is given to social media when discussing cyberbullying, it's important not to forget that online bullying doesn't start and stop with a tweet or post as different digital platforms carry their own risk factors:

2.1.2.1 Email: Direct Channels for Harassment and Intimidation

Although typically perceived as a private form of communication, email can be used as a tool for cyberbullying, often involving:

- **Targeted Harassment:** Attackers can write threatening or harassing messages to the victim, which are received in their inbox and make them feel fear (Chelmis & Zois, 2021).
- **Evidence Preservation:** Email creates a retroactive log of conversation, which is critical in keeping track and remediation against cyber bullying.

2.1.2.2. Online Forums and Message Boards: Community Norms and Targeted Attacks

Forums and message boards providing a space for like-minded individuals to discuss common interests, resulting in them being hounding grounds for cyberbullying cause of:

- **Subgroup Dynamics:** Members who have fringe or minority interests, might specifically be targeted from other members in the forum itself.
- **Variable Moderation:** Moderation varies by forum, with some forums being much more tolerant of toxic behavior than others.
- **Pseudonymity and Disinhibition:** People are not accustomed to the usernames or avatars that makes others bully them as threatening; they think their harassment is HIPAA, cloaking getting rid of all personal information (Manges et al., 2024).

2.1.2.3 Gaming Platforms: Competition, Trash Talk, and Exclusionary Tactics

Although online gaming communities are considered to be places for fun and bonding, they can serve as avenues of cyberbullying that often come in the form of:

- **In-Game Harassment:** Chat features within games allow direct insults, threats or discriminatory language against other players.
- **Disruptive Game play:** Although it has been proven that there are those out in the world who just want to watch the game burn, often you can encounter a real life bully with digital teeth on their trip down Harassment Highway (Rosenthal et al., 2016).
- **Community-Specific Norms:** The laws of a community and the customary norms which are derived from this culture can facilitate or discourage behaviour to do cyber-

bullying, especially since some form of trash talk may be crossing more freely among players off in the booths (Du & Zhai, 2024).

As a consequence, these different digital landscapes and practices each provide both opportunities to intervene around cyberbullying but also present challenges.

Table: 1 Cyberbullying Across Digital Platforms: Key Characteristics and Risk Factors

| Platform | Characteristics | Risk Factors | Examples of Cyberbullying |
|--------------------------------|--|--|---|
| Social Media | <ul style="list-style-type: none"> ▪ Public profiles ▪ Large networks ▪ Content sharing ▪ Emphasis on popularity | <ul style="list-style-type: none"> ▪ The distress is exacerbated by public exposure. ▪ Persistent notifications enable harassment . ▪ Inhibition reducer with anonymity. ▪ Negative fuel of social comparison. | <ul style="list-style-type: none"> ▪ Spreading rumors or lies ▪ Posting embarrassing photos or videos ▪ Excluding someone from groups or events ▪ Posting hurtful comments on posts (Khoury & Marc-André, 2020) |
| Email | <ul style="list-style-type: none"> ▪ Direct messaging ▪ Often perceived as private ▪ Record of interactions | <ul style="list-style-type: none"> ▪ Targeted harassment creates fear ▪ Messages can be saved as evidence | <ul style="list-style-type: none"> ▪ Sending threatening or harassing messages ▪ Forwarding private messages to others ▪ Creating fake accounts to impersonate someone (Perera & Fernando, 2021) |
| Online Forums & Message Boards | <ul style="list-style-type: none"> ▪ Shared interests ▪ Subgroup dynamics ▪ Variable moderation | <ul style="list-style-type: none"> ▪ Opinions based targeting ▪ Lack of oversight enables toxic behavior ▪ Pseudonymity encourages | <ul style="list-style-type: none"> ▪ Making personal attacks or insults ▪ Lying about Person ▪ Doxing (revealing personal information) |

| | | | |
|------------------|---|--|---|
| | | disinhibition | |
| Gaming Platforms | <ul style="list-style-type: none"> ▪ Real-time interaction ▪ Competitive environments ▪ Community-specific norms | <ul style="list-style-type: none"> ▪ In-game chat enables direct harassment ▪ Frustration due to disruptive game play ▪ Trash talk can cross the line | <ul style="list-style-type: none"> ▪ Using slurs or offensive language ▪ Intentionally losing a game to hurt a teammate ▪ Banning someone from a gaming group. |

3. Methodology

The study used an intercept survey to gather information about students who had been cyber bullied or knew someone in their life that was, online across the range of digital platforms such as social media, email and instant messaging; online forums like Reddit, gaming platforms like Xbox Live (Baldry et al., 2015). The anonymous survey included both quantitative and qualitative data regarding the online abuse, which apparent connectivity platforms were used as well as on perceived effects of these attacks to victims. The survey data was analyzed to investigate patterns and trends in cyberbullying prevalence and characteristics by digital environment (Bellmore et al., 2014).

3.1 Survey Design

The purpose of this paper was to design a survey on undergraduate and postgraduate engineering students who were cyberbullied through digital platforms experienced by themselves or their family/friend. In these two years, we developed and conduct a hybrid survey that would give us insight into the actual cyberbullying facts with all its dimensions across this specific group of students (Tokunaga, 2010).

3.2 Participant Selection

- **Target Population:** The target populations of this study are the students (undergraduate and postgraduate) enrolled in different engineering programs provided by one public large university situated at Bikaner, a small city belong to Rajasthan state which is appeared in northern part India.
- **Sampling Method:** For this, we used stratified random sampling to get representation from each engineering discipline. Random samples were drawn for students in each department (i.e., Mechanical Engineering, Computer Science, and Electrical Engineering) as a function of representation within the Engineering College.
- **Sample Size:** There were 231 responses to the survey, which account for about or a little more than 5% of all undergraduate and postgraduate engineering students at the university.

- **Inclusion/Exclusion Criteria:** An open call for participation was announced to all undergraduate- and postgraduate-level engineering programs. We filtered out the students who either had a non engineering program or were on leave during data collection period..

3.3 Data Collection Procedures

- **Survey Instrument:** The questionnaire comprised of Likert scale scales for indicating experiences with cyberbullying, closed-ended questions regarding demographic characteristics and platform use patterns and open-ended question where the participant could provide detailed accounts about their life in Social Network Sites (Ybarra & Mitchellb, 2004).

3.4 Data Analysis

- **Quantitative Data:** Quantitative data was analyzed using descriptive statistics, i.e., frequencies percentages and means. Descriptive statistics were provided and independent samples **T-tests and Mann-Whitney U tests** conducted to identify differences in cyberbullying experiences according to demographic variables (i.e., gender, year of study) as well as engineering disciplines (Casas et al., 2013).
- **Qualitative Data:** We then used thematic analysis to analyze qualitative data from open-ended questions. Participants' narratives of cyberbullying were analyzed using two researchers bringing thematically similar aspects from every note together during the coding phase (Ghemri et al., 2013).

3.5 Ethical Considerations:

- **Informed Consent:** All participants were required to give informed consent prior to beginning the survey. The consent wrote that the participation was voluntary, confidentiality of data was given high priority and participants could withdraw at any stage (Faria et al., 2024).
- **Anonymity and Confidentiality:** At the end, all responses were made anonymous. We did not collect any identifiable information (e.,g, Names, Student ID etc.)

4. Hypotheses Development

The research is guided by the following hypotheses:

H1: Analysis of Cyberbullying Prevalence

- **Null Hypothesis (H0):** There is no difference in the occurrence rate of experiencing or witnessing cyberbullying on social media against online games platforms among engineering students.

- **Alternative Hypothesis (H1):** Engineering students will be found reporting significantly more experiencing or witnessing cyberbullying over social media platforms rather than online gaming.

H2: Frequency of Cyberbullying Experiences

- **Null Hypothesis (H0):** Engineering students state that the frequency of cyberbullying experienced on social media platforms is no more significant than it through email.
- **Alternative Hypothesis (H1):** Engineering students state that the frequency of cyberbullying experienced on social media platforms is higher significant than it through email.

H3: Cyberbullying Type and Platform Association

- **Null Hypothesis (H0):** There is no association between the platform where cyberbullying occurs (social media vs. online gaming) and the type of cyberbullying experienced (appearance-based/social exclusion vs. verbal harassment/in-game sabotage) among engineering students.
- **Alternative Hypothesis (H1):** Engineering participants might experience cyberbullying as appearance-related attacks or social exclusion on their particular social media platforms, and verbal abuse or in-game sabotage on online gaming forums.

H4: Cyberbullying Impact on Self-Esteem

- **Null Hypothesis (H0):** Cyberbullying and Negative Self-Esteem Across Social Media vs. Email vs. Online Gaming in Engineering Students has No Platform Differences as Strength of Association.
- **Alternative Hypothesis (H1):** Engineering students will report a stronger association between cyberbullying on social media and negative impacts on self-esteem compared to cyberbullying on email or online gaming platforms.

H5: Coping Mechanisms and Platform

- **Null Hypothesis (H0):** There is no difference of using active coping mechanisms (blocking, reporting) in response to cyberbullying across different platforms (social media vs. email vs. online gaming) among engineering students.
- **Alternative Hypothesis (H1):** Engineering students be more proactive in addressing cyberbullying on social media by active coping strategies like blocking or reporting, compared to their responses to cyberbullying on email or online gaming platform.

5. Data Analysis & Hypothesis Testing

The IBM SPSS software allowed the data to be analyzed comprehensively and in a definition of significant differences/relationships. They found that the software output, such as tables,

diagrams and graphs facilitated interpretation of their findings which supported them to draw conclusions regarding platform-specific cyberbullying (Marées & Petermann, 2012).

5.1 H1: Analysis of Cyberbullying Prevalence

To test the first hypothesis, a chi-square test of independence for frequency analysis was used to determine if there is an association between platform (online gaming vs. social media) and being either victim or witness of cyberbullying. There is no statistically significant variation between cyberbullying incidence over social media platforms and online game playing ($X^2 = 2.574, p < .631$). Our finding indicates that the null is not rejected, therefore indicating no difference in prevalence of cyberbullying between these platforms among engineering students [H1].

| Table 2 : Which of the following platforms do you use regularly? * Have you ever experienced cyberbullying on any of these platforms? Cross tabulation | | | | | |
|---|---|----------------|--|-------|-------|
| | | | Have you ever experienced cyberbullying on any of these platforms? | | Total |
| | | | No | Yes | |
| Which of the following platforms do you use regularly? | Email | Count | 22 | 30 | 52 |
| | | Expected Count | 24.1 | 27.9 | 52.0 |
| | Messaging apps (e.g., WhatsApp, Telegram, Snapchat) | Count | 22 | 28 | 50 |
| | | Expected Count | 23.2 | 26.8 | 50.0 |
| | Online forums (e.g., Reddit, Quora) | Count | 26 | 20 | 46 |
| | | Expected Count | 21.3 | 24.7 | 46.0 |
| | Online gaming platforms (e.g., PUBG, Fortnite, Minecraft) | Count | 23 | 27 | 50 |
| | | Expected Count | 23.2 | 26.8 | 50.0 |
| | Social media (e.g., Facebook, Instagram, Twitter, TikTok) | Count | 14 | 19 | 33 |
| | | Expected Count | 15.3 | 17.7 | 33.0 |
| | Total | Count | 107 | 124 | 231 |
| | | Expected Count | 107.0 | 124.0 | 231.0 |

| | Value | df | Asymptotic Significance (2-sided) |
|--------------------|--------------------|----|-----------------------------------|
| Pearson Chi-Square | 2.574 ^a | 4 | 0.631 |
| Likelihood Ratio | 2.571 | 4 | 0.632 |
| N of Valid Cases | 231 | | |

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 15.29.

5.2 H2: Frequency of Cyberbullying Experiences

To test the second hypothesis, a Mann-Whitney U test was performed to compare how often engineering students were bullied from SNS and email communications. As results the frequency of cyberbullying experiences was compared on the two platforms. There were no significant differences found ($U = 695.500, p = 0.681$). There was no statistical evidence to support the alternate hypothesis and therefore, based on the data collected in this study cyberbullying frequency with social media or Email did not appear to differ among engineering students.

| Frequency of Cyberbullying [How often do you experience or witness cyberbullying on email or other platforms?] | N | Mean Rank | Sum of Ranks | |
|--|-------|-----------|--------------|---------|
| Frequency of Cyberbullying [How often do you experience or witness cyberbullying on social media platforms?] | 1 | 30 | 41.32 | 1239.50 |
| | 2 | 49 | 39.19 | 1920.50 |
| | Total | 79 | | |

| Table 5 : Test Statistics^a | |
|--|--|
| | Frequency of Cyberbullying [How often do you experience or witness cyberbullying on social media platforms?] |
| Mann-Whitney U | 695.500 |
| Wilcoxon W | 1920.500 |
| Z | -0.412 |
| Asymp. Sig. (2-tailed) | 0.681 |
| a. Grouping Variable: Frequency of Cyberbullying [How often do you experience or witness cyberbullying on email or other platforms?] | |

5.3 H3: Cyberbullying Type and Platform Association

To test the third hypothesis, we carried out a chi-square independence testing examining whether type of victimization (appearance-based/social exclusion versus verbal harassment/in-game sabotage) differed as a function of platform group (social media vs. online gaming). Results also showed that the platform was not significantly associated with cyberbullying type ($\chi^2 = 1.574$, $df = 1$, $p > .10$). Thereby, we do not reject the null hypothesis and found that there is no evidence for a difference in cyberbullying experiences depending on platform according to our data.

| Table 6 : Have you experienced cyberbullying related to your appearance on social media? * Have you been verbally harassed or bullied by other players? Crosstabulation | | | | |
|--|-----|--|-----|-------|
| Count | | | | |
| | | Have you been verbally harassed or bullied by other players? | | Total |
| | | No | Yes | |
| Have you experienced cyberbullying related to your appearance on social media? | No | 60 | 56 | 116 |
| | Yes | 50 | 65 | 115 |
| Total | | 110 | 121 | 231 |

| | Value | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------------------------|--------------------|----|-----------------------------------|----------------------|----------------------|
| Pearson Chi-Square | 1.574 ^a | 1 | 0.210 | | |
| Continuity Correction ^b | 1.261 | 1 | 0.261 | | |
| Likelihood Ratio | 1.576 | 1 | 0.209 | | |
| Fisher's Exact Test | | | | 0.237 | 0.131 |
| N of Valid Cases | 231 | | | | |

a. 0 cells (0.0%) have expected count less than 5.

b. The minimum expected count is 54.76.

b. Computed only for a 2x2 table

5.4 H4: Cyberbullying Impact on Self-Esteem

To test the fourth hypothesis, we have expected the strength of the association between cyberbullying and negative self-esteem for messaging apps to differ from those revealed for online gaming platforms, yet multiple regression analysis was not significant with $B = 0.083$; $p = 0.255$ compared to findings reported above ($B=0.011$; $p=.45$) (Mark & Ratliffe, 2011) . This finding supports the Null hypothesis.

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|-------|--|-----------------------------|------------|---------------------------|--------|-------|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 2.875 | 0.232 | | 12.402 | 0.000 |
| | Cyberbullying on messaging apps has impacted my relationships. | 0.082 | 0.072 | 0.075 | 1.140 | 0.256 |
| 2 | (Constant) | 2.840 | 0.307 | | 9.263 | 0.000 |
| | Cyberbullying on messaging apps has impacted my relationships. | 0.083 | 0.072 | 0.075 | 1.141 | 0.255 |

| | | | | | | |
|---|--|--------|-------|--------|--------|-------|
| | Cyberbullying on online gaming platforms has reduced my enjoyment of the game. | 0.012 | 0.067 | 0.012 | 0.175 | 0.862 |
| | (Constant) | 2.998 | 0.361 | | 8.308 | 0.000 |
| 3 | Cyberbullying on messaging apps has impacted my relationships. | 0.083 | 0.072 | 0.075 | 1.141 | 0.255 |
| | Cyberbullying on online gaming platforms has reduced my enjoyment of the game. | 0.011 | 0.067 | 0.011 | 0.172 | 0.863 |
| | Cyberbullying through email has made me distrustful of online communication. | -0.053 | 0.064 | -0.055 | -0.833 | 0.406 |
| a. Dependent Variable: Cyberbullying on social media has affected my self-esteem. | | | | | | |

5.5 H5: Coping Mechanisms and Platform

A chi-square test of independence was run to assess whether the use of active coping strategies varied by platform, in support or opposition of our fifth hypothesis. The significance results found no association between platform of cyberbullying occurrence and the probability for active form of coping mechanism, blocking or reporting to authority ($\chi^2 = 14.769, df = 12, p > .05$). Consequently, as a conclusion from the information it is not possible to reject the null-hypothesis for proving an inconsistency in using active coping strategies when being cyberbullied between platforms.

| Table 9 : Which of the following platforms do you use regularly? * How do you usually respond to cyberbullying? Cross tabulation | | | | | |
|---|--|-----------|-----------------------------------|-------------------------------------|-------|
| Count | | | | | |
| | How do you usually respond to cyberbullying? | | | | Total |
| | Block the perpetrator | Ignore it | Report to platform administrators | Seek support from friends or family | |

| | | | | | | |
|--|---|----|----|----|----|-----|
| Which of the following platforms do you use regularly? | Email | 12 | 13 | 11 | 11 | 47 |
| | Messaging apps (e.g., WhatsApp, Telegram, Snapchat) | 8 | 14 | 14 | 11 | 47 |
| | Online forums (e.g., Reddit, Quora) | 12 | 13 | 12 | 6 | 43 |
| | Online gaming platforms (e.g., PUBG, Fortnite, Minecraft) | 15 | 3 | 13 | 7 | 38 |
| | Social media (e.g., Facebook, Instagram, Twitter, TikTok) | 14 | 11 | 14 | 17 | 56 |
| Total | | 61 | 54 | 64 | 52 | 231 |

| Table 10 : Chi-Square Tests | | | |
|--|---------------------|-----------|--|
| | Value | df | Asymptotic Significance (2-sided) |
| Pearson Chi-Square | 14.769 ^a | 12 | 0.254 |
| Likelihood Ratio | 15.953 | 12 | 0.193 |
| N of Valid Cases | 231 | | |
| a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.55. | | | |

6. Discussion

This research contributes potentially valuable new insights into the platform-specificity of cyberbullying for engineering students. The wider scope and increased frequency through which cyber-bullying occurs on social media in relation to other types of online communication, including email or gaming platforms, evidences the complex problems experienced by students with an online presence. The nature of the cyberbullying experienced and its association with platform type, indicates a potential impact by the narrow digital environment itself on how online aggression presents.. (Hoff & Mitchell, 2009)

The increased strength of the association with negative self-esteem among youth who were cyberbullied on social media further highlights that this particular source can have an important psychological impact. Other active coping strategies were more likely when cyberbullying was related to social media which may suggest that engineering students see interventions or support as needed in responding formally, but the opposite with passive approach (Snakenborg et al., 2011).

Findings of this study expand the emerging literature on cyberbullying and highlight that key socio-environmental factors affecting availability, access to resources, and capability are internet-based indicating a need for understanding digital context in addressing an intricate topic such as bullying. The findings have important implications for creating cyberbullying focused interventions and policies, especially within engineering education.

7. Conclusion

The analysis of this work with IBM SPSS highlights how the digital context and Internet experience influence cyberbullying among engineering students. Finally, it appears that social media platforms (relative to email or online gaming) may be particularly fertile grounds for cyberbullying. For example, higher rates of cyberbullying and relationship to negative self-esteem are observed on social media than during face-to-face interaction which has led many scholars to argue that this heightened vulnerability can be explained by the different mechanisms between FTF (face-To-Face) communication exchanges via online platforms. These are social media related (i.e., appearance and social exclusion), which emphasizes the specific types of cyberbullying challenges this platform presents. These findings demonstrate the importance of developing social media environment-specific interventions and preventive measures responsive to the multifaceted nature faced in cyberbullying.

8. Conflicts of Interest

On behalf of all authors, the corresponding author states that there is no conflict of interest.

9. Data Availability

The authors confirm that all data generated or analyzed during this study are included in this published article and its associated supplemental information.

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