Educational
Administration
Theory and Practice

Assessing the Effectiveness of Preventive Measures Against Cyberbullying: A Case Study of Digitally Active Youths and Adults in Imphal City, Manipur

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ARTICLE INFO	ABSTRACT
	This study evaluates the perceived effectiveness of various cyberbullying prevention strategies among 200 digitally active youths and adults in Imphal. Using a structured survey with a five-point Likert scale, respondents rated a range of interventions including school-based programs, community initiatives, social media campaigns, reporting mechanisms, filtering tools, parental controls, and legal corrective measures. Principal component analysis (PCA) revealed two distinct components that together explain 90% of the total variance. Component 1, termed "Awareness and Educational Outreach Measures," accounts for 68% of the variance and comprises school-based prevention programs (with loadings of 0.791 and 0.652), community-based initiatives (loading 0.719), and social media campaigns (loading 0.628). This component reflects moderate effectiveness in shaping digital citizenship and behavioral norms. Component 2, labeled "Regulatory and Technological Control Measures," explains 22% of the variance and includes reporting and flagging mechanisms (loading 0.789), filtering and blocking tools (loading 0.726), parental control software (loading 0.581), and legal awareness and corrective measures (loading 0.523). While these strategies offer immediate, tangible interventions, their effectiveness is moderated by concerns regarding enforcement consistency and adaptability to evolving digital challenges. The findings underscore the need for an integrated approach to cyberbullying prevention that combines long-term educational efforts with robust regulatory and technological safeguards to foster a safer online environment. **Index Terms:** Cyberbullying Prevention, Educational Outreach, Technological Interventions, Principal Component Analysis, Digital Safety.

Introduction

Cyberbullying has become a widespread social problem that affects people of all ages, often causing serious harm to victims' mental health, confidence, and overall well-being (Hinduja & Patchin, 2013, pp. 67–70). Even though many efforts—such as prevention programs, interventions, and legal steps—have been introduced, the emotional damage caused by cyberbullying is still severe. Victims continue to experience harassment, humiliation, and emotional distress both online and offline. Psychological studies explain that cyberbullies often show aggressive behaviour, emotional detachment, and low empathy, which becomes even stronger when they feel protected by online anonymity (Gross, 2004, pp. 12–15). Victims usually face anxiety, depression, and social withdrawal, which may lead to long-term mental health challenges (Dellasega & Nixon, 2003, pp. 28–32). With the rapid growth of digital technology, young people now see online interaction as a major part of their social life, where constant connection feels necessary (Abbott, 1998, pp. 44–46). Although the internet helps people stay connected, it also creates spaces where harmful behaviour can occur easily, especially since anonymity lowers accountability and empathy (Gross, 2004, p. 17). Research also shows that

cyberbullying leads to poor academic performance, low self-confidence, and even suicidal thoughts, with cyberbullies being 1.5 times more likely to attempt suicide (Hinduja & Patchin, 2013, p. 74). These combined social and psychological factors highlight the urgent need for strong and diverse strategies to prevent and tackle cyberbullying.

To effectively fight cyberbullying, a broad strategy is required that covers personal, social, and technological aspects. Educational programs play an important role by helping students learn about safe online behaviour and how to identify or respond to cyberbullying. Schools can use well-structured prevention programs, such as those recommended by the National Association of School Psychologists, which stress empathy, responsible digital actions, and practical steps to stop bullying (StopBullying.gov, n.d.). Research also suggests that general anti-bullying programs—even if not focused only on online behaviour—can reduce cyberbullying by addressing key issues like social aggression and lack of empathy (Salmivalli et al., 2011, pp. 113–115). Moreover, awareness campaigns that consider gender-based differences in cyberbullying experiences can make these programs more effective for all students (Ang & Goh, 2010, pp. 410–412).

In addition to education, strong support systems, legal protections, and technological solutions are necessary for reducing cyberbullying. Counselling services and bystander-training programs help victims cope with emotional stress and encourage others to intervene safely. At the same time, many countries are creating or updating laws that specifically deal with online harassment (Hinduja & Patchin, 2013, pp. 81–83). Technology can also help: tools like parental-control software, online reporting systems, and filtering programs give users options to monitor harmful content and report it quickly (StopBullying.gov, n.d.; Livingstone & Smith, 2014, pp. 52–55). However, while these tools are useful, they cannot work alone. A successful approach must combine education, legal action, supportive communities, and digital tools to truly reduce the spread and impact of cyberbullying.

Cyberbullying has become an increasingly prevalent issue in the digital age, impacting individuals of all ages, including youths and adults. In urban settings like Imphal, where digital engagement is deeply integrated into daily life, the effects of cyberbullying are widespread and can have long-lasting consequences on mental health, well-being, and social dynamics. This paper aims to evaluate the effectiveness of various preventive strategies aimed at addressing this issue. Specifically, the study explores the impact of educational programs, legislative measures, support systems, and technological interventions on the attitudes and behaviours of 200 digitally active individuals in Imphal. By examining participants' experiences and perceptions, the paper seeks to identify which strategies are most effective in combating cyberbullying and promoting online safety. The paper also assesses the role of counselling services and other support mechanisms in shaping victims' experiences and perceptions. The findings of this study are intended to provide insights that can guide future efforts to reduce cyberbullying and create a safer digital environment in Imphal.

Objectives of the Study

To assess the effectiveness and impact of various preventive strategies—such as educational programs, legislative measures, and technological interventions—on shaping awareness, attitudes, and behaviors related to cyberbullying among digitally active youths and adults in Imphal.

People and Area Under Study

This study focuses on the digitally active youths and adults residing in Imphal, a city in the northeastern part of India, which is rapidly embracing digital technologies. Imphal, like many urban centres, is witnessing an increase in the use of the internet and social media platforms among its residents, particularly among the younger generation. Digital activity has become an integral part of daily life for many, influencing communication, education, and socialisation. Given this widespread engagement with digital media, the study will concentrate on individuals aged 15 and above who regularly use the internet and social media. This age group is particularly relevant, as it includes individuals who are most likely to encounter or engage in cyberbullying behaviors, whether as victims, perpetrators, or bystanders. Youths and adults alike are increasingly becoming targets of online harassment, making it essential to understand their experiences and attitudes toward cyberbullying in the local context of Imphal. By focusing on digitally active participants, the study aims to capture a comprehensive view of how cyberbullying affects individuals who engage with digital platforms on a regular basis.

The participants under study are selected based on their regular use of the internet and social media platforms, excluding those who do not actively participate in online environments. As the study is localised in Imphal, only residents of the city are included, ensuring that the findings are relevant to the specific social and cultural dynamics of this community. Previous research highlights the critical role of community and environmental factors in shaping attitudes toward cyberbullying (Hinduja & Patchin, 2013). By focusing on a geographically specific sample, the study provides valuable insights into how digital activity and local socio-cultural contexts influence the experiences of cyberbullying and the effectiveness of preventive strategies. The exclusion of non-residents and those under 18 yrs ensures that the study remains focused on individuals who are likely to experience or witness cyberbullying behaviours in the digital spaces they frequent. This targeted approach allows for a nuanced exploration of the preventive measures that are most effective in reducing the incidence of cyberbullying in the unique setting of Imphal.

Methodology

The study evaluates the effectiveness of various preventive measures against cyberbullying by examining the attitudes and experiences of 200 digitally active youths and adults in Imphal. The study focuses on assessing the perceived effectiveness of key strategies such as educational programs, legislative measures, technological interventions, and support systems. A structured survey is used to collect data on participants' experiences with cyberbullying, their perceptions of its impact, and their views on existing preventive strategies. To measure the perceived effectiveness of these strategies, the study employs a psychological scale, the Cyberbullying Prevention Strategies Effectiveness Scale (CPSES), which will use a 5-point Likert scale ranging from "Not at all effective" to "Extremely effective." The study's objectives include evaluating the effectiveness of these strategies, analysing attitudes and experiences regarding cyberbullying, and providing actionable recommendations for improving prevention efforts based on the findings. The research adopts a quantitative approach, utilising surveys as the primary data collection method with a structured questionnaire. Statistical Analysis such as principal component analysis (KMO included) is used for differentiation as well as grouping into two highly correlated components. The box plot is also drawn to understand the overall distribution of all the responses for each factor. The study seeks to provide comprehensive insights into the impact of current preventive measures and offer recommendations to enhance existing programs, thereby contributing to the development of more effective interventions to combat cyberbullying in Imphal.

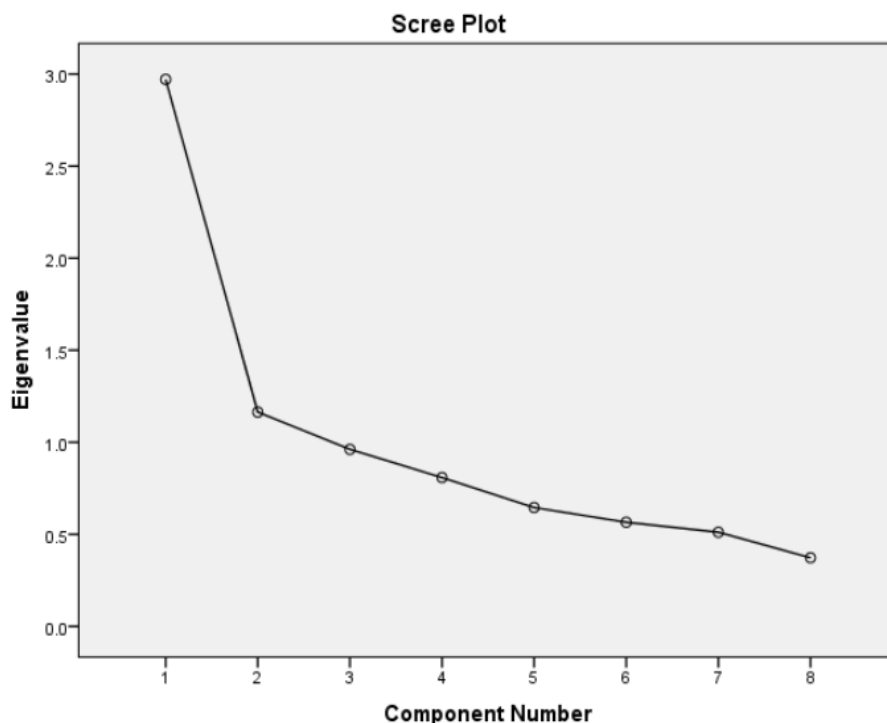| KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.753
Bartlett's Test of Sphericity	Approx. Chi-Square	326.208
	df	28
	Sig.	.000

Table 1: KMO and Bartlett's Test
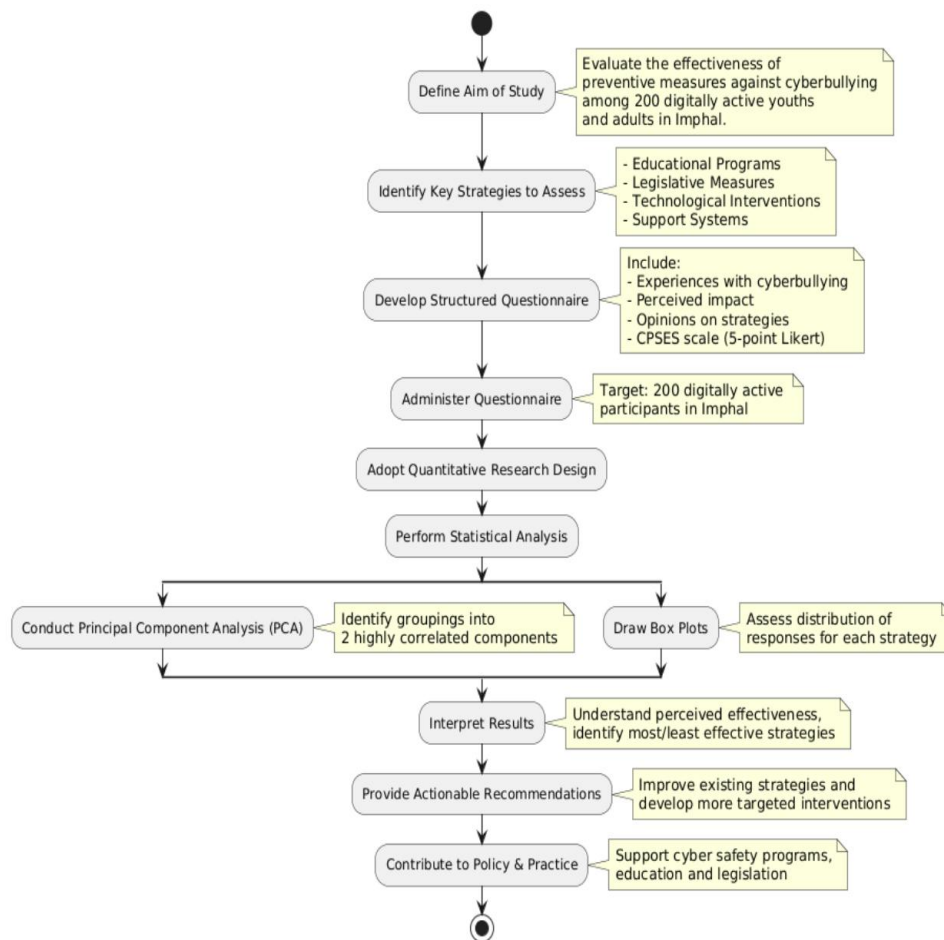

Figure 1: Scree Plot

Figure 2: Methodology

Results and Discussion

Table 2 presents eight strategies aimed at addressing cyberbullying incidents, with respondents rating each strategy on a five-point Likert scale from "Not at all effective" (1) to "Extremely effective" (5). For each strategy, both the mean score and the mode are provided, offering insights into the average effectiveness as perceived by the 200 digitally active youths and adults in Imphal, as well as the most frequently selected rating. By examining these descriptive statistics, we can discern how participants view the relative impact of each intervention. The first strategy in the table is the effectiveness of school-based cyberbullying prevention programs. With a mean score of 2.97 and a mode of 3, this item is positioned near the middle of the scale. The near-median average suggests that respondents perceive these programs as moderately effective. While schools often provide structured interventions, clear policies, and educational sessions to prevent cyberbullying, the moderate rating might imply that there are limitations in how these programs are executed or their overall reach. It is possible that participants feel that while schools are making an effort, the preventive measures might not be sufficiently comprehensive or consistently applied across the board. This middle-of-the-road perception could be due to variations in program quality, resource constraints, or the challenge of addressing cyberbullying in an environment that is not fully digital.

Next, the strategy of online resources and tutorials receives a slightly higher mean score of 3.06, with the mode remaining at 3. The incremental improvement in the mean rating indicates that participants find online educational content somewhat effective in addressing cyberbullying. Online resources have the advantage of accessibility and convenience; they are available on-demand and can reach a wide audience. Tutorials and digital guides might offer practical advice on safeguarding one's digital footprint, recognizing harmful behaviors, and providing immediate steps to counter cyberbullying. However, the modest increase in perceived effectiveness suggests that while these resources are useful, they may not be enough on their own to fully mitigate the problem. The effectiveness of these resources likely depends on how actively individuals seek them out and the extent to which the content is engaging and relevant.

Social media campaigns, the third strategy, show a mean score of 3.13, again with a mode of 3. Social media campaigns have gained prominence as a method to raise awareness about cyberbullying by leveraging the viral nature of online platforms. The slightly higher mean in comparison to school-based programs and online resources might reflect the dynamic nature of social media, which can quickly disseminate messages and create

community-driven support. Yet, even with the potential to generate rapid engagement, the central tendency still indicates moderate effectiveness. This could be because, despite high visibility, social media campaigns may lack the depth and continuity required to effect lasting behavioral change. Many respondents might view these campaigns as temporary bursts of attention rather than sustained initiatives that lead to concrete action. The fourth item in the table pertains to community-based initiatives, which have a mean score of 3.27 and a mode of 3. Community-based approaches typically involve local organizations, youth groups, and neighborhood forums that come together to address cyberbullying through grassroots efforts. The higher mean score for community-based initiatives suggests that respondents view these efforts as more effective than the previous strategies. The personal touch and localized focus of community initiatives could explain this perception. Such initiatives may involve regular in-person meetings, workshops, and support groups, which can create stronger bonds among community members and foster a collaborative environment for tackling cyberbullying. The familiarity and relatability of community-driven programs might resonate more with individuals who value personal interaction and localized solutions.

When we move to the measures that rely on more formal structures, such as legal and regulatory approaches, the ratings shift further. The perceived effectiveness of legal awareness and corrective measures has a mean of 3.33 and a mode of 4. The higher mode, in this case, indicates that a significant number of respondents rated legal measures as "Effective." This suggests that many participants believe in the power of formal legal frameworks to deter cyberbullying by setting clear consequences for harmful behavior. Legal measures can provide a sense of security and accountability, reinforcing the idea that there are institutional recourses available when cyberbullying occurs. However, the mean score, while higher than the earlier strategies, still reflects a moderate level of confidence. This might be attributed to concerns about the consistency of legal enforcement or uncertainties about how effectively legal measures are implemented in real-world scenarios.

Table 2 : Evaluation of the Effectiveness of Cyberbullying Prevention Measures

Sl. No.	Particulars	No of respondents associated with degree of effectiveness: 1-5					Total	Mean	Mode
		1	2	3	4	5			
1	Perceived effectiveness of school's cyberbullying prevention programs	19	44	66	55	16	200	2.97	3
2	Perceived effectiveness of online resources and tutorials help in addressing cyberbullying incidents	9	43	68	59	21	200	3.06	3
3	Perceived effectiveness of social media campaigns help in addressing cyberbullying incidents	8	39	79	55	19	200	3.13	3
4	Perceived effectiveness of community based initiatives help in addressing cyberbullying incidents	13	35	82	54	16	200	3.27	3
5	Perceived effectiveness of Legal awareness and Corrective measures help in addressing cyberbullying incidents	9	37	63	74	17	200	3.33	4
6	Perceived effectiveness of Filtering and Blocking tools help in addressing cyberbullying incidents	11	38	58	76	17	200	3.34	4
7	Perceived effectiveness of Parental Control Software tools help in addressing cyberbullying incidents	12	38	78	58	14	200	3.25	3
8	Perceived effectiveness of Reporting and Flagging Mechanisms help in addressing cyberbullying incidents	10	35	74	71	10	200	3.34	3

Filtering and blocking tools, listed as the sixth strategy, yield a mean of 3.34 with a mode of 4. These tools are technical interventions designed to prevent harmful content from reaching users. The close similarity in mean and mode to legal measures indicates that respondents see filtering and blocking as robust, actionable steps toward protecting individuals online. These technological solutions empower users by giving them the ability to control what they see, thereby reducing exposure to abusive or harmful interactions. Despite their technical promise, the ratings also suggest that while these measures are useful, they might not be foolproof due to potential limitations like the circumvention of blocks or the challenge of keeping up with rapidly evolving online platforms. Parental control software, the seventh item, has a mean of 3.25 and a mode of 3. This strategy is particularly aimed at protecting younger users from cyberbullying by enabling parents to monitor and restrict digital interactions. Although parental controls are valued, the slightly lower mean compared to filtering tools and legal measures could indicate mixed perceptions among respondents. Some may view parental controls as invasive or not entirely effective in a rapidly changing digital landscape where children

often find ways to bypass restrictions. The moderate rating reflects an acknowledgment of the potential benefits of parental control tools, tempered by skepticism about their overall efficacy in safeguarding against cyberbullying. The eighth strategy, reporting and flagging mechanisms, records a mean of 3.34 with a mode of 3. Reporting mechanisms on social media platforms and other online services are designed to quickly alert authorities or platform administrators to instances of cyberbullying. The ratings for this strategy indicate a moderate level of confidence among respondents. Many participants likely appreciate the notion that there is a direct channel for addressing problematic content. However, the fact that the mode remains at 3 suggests that while these mechanisms are recognized as useful, there might be frustrations related to their responsiveness or the consistency with which reported issues are resolved. The perceived delay or inadequacy in follow-up action could be contributing factors to the moderate rating.

Despite the overall positive view of counselling and support services, its distinct rating pattern also suggests that it is perceived differently from the other preventive measures. While the other strategies are largely seen as systematic approaches that prevent cyberbullying from occurring, counselling is viewed as a necessary remedy for those who have already been affected. This difference in perception highlights a critical aspect of cyberbullying prevention: it is essential to combine proactive measures with reactive support. Although the strategies such as school programs, online resources, community initiatives, legal measures, technological interventions, and reporting systems are all aimed at preventing cyberbullying, counselling addresses the aftermath and helps individuals rebuild their well-being.
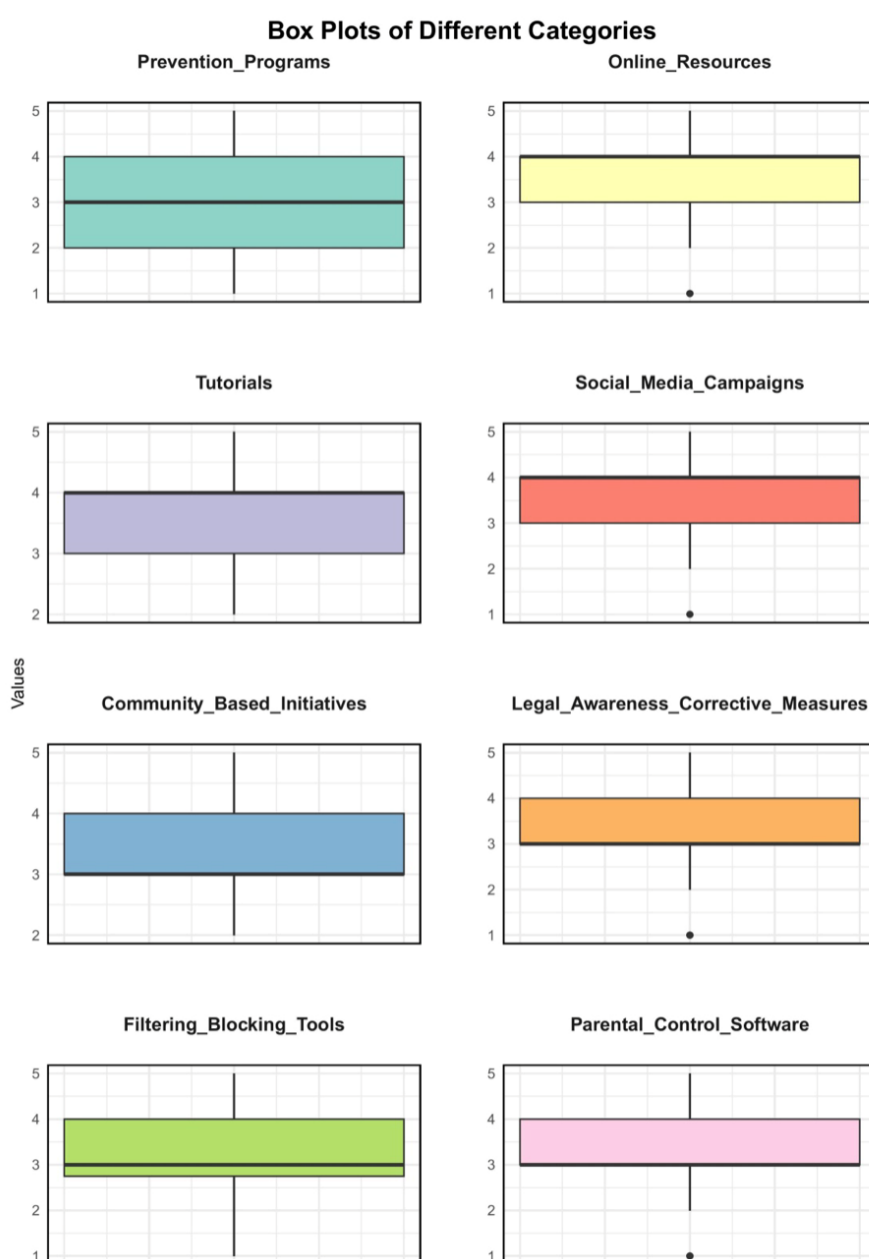

Figure3: Categorical Distribution

In short, the table provides a multifaceted look at how various cyberbullying prevention strategies are viewed by digitally active individuals in Imphal. The first four items—school-based programs, online resources, social media campaigns, and community-based initiatives—are generally rated as moderately effective, reflecting an appreciation for educational and awareness-driven approaches. Strategies that rely on formal enforcement and technology, such as legal awareness, filtering tools, and reporting mechanisms, receive slightly higher ratings, suggesting a belief in their potential to provide clear and enforceable solutions. Parental control software, while recognized for its utility, is met with some reservations, perhaps due to concerns about privacy and the adaptability of young users. Counselling and support services, with the highest mean and mode of "Extremely effective," are seen as critically important for addressing the personal impact of cyberbullying. The distinct response pattern for counselling underscores its unique role in offering emotional and psychological support, distinguishing it from more systemic or preventive measures. This analysis reveals that while there is confidence in a range of strategies to prevent cyberbullying, there is also a strong consensus on the need for targeted, individualized support to help victims recover from the harm they experience online.

Awareness and Educational Outreach Measures

In the digital era, cyberbullying has emerged as a significant challenge that demands a proactive and comprehensive response. One of the most promising approaches to address this issue is through enhancing public awareness and education. The present analysis focuses on a key component derived from a study examining the perceived effectiveness of various cyberbullying prevention strategies among digitally active youths and adults in Imphal. This component, termed "Awareness and Educational Outreach Measures," captures strategies that are designed to inform, educate, and engage the community in combating cyberbullying. Through principal component analysis (PCA), this component was found to explain 68% of the total variance, underscoring its central role in shaping respondents' perceptions.

At the heart of this component are several interventions that collectively represent a multi-pronged strategy to raise awareness and instill behavioral norms that discourage cyberbullying. These interventions include school-based cyberbullying prevention programs (appearing twice in the analysis), community-based initiatives, and social media campaigns. Each of these strategies plays a unique yet interrelated role in the overall framework of cyberbullying prevention. The first and perhaps most influential element within this component is the perceived effectiveness of school-based cyberbullying prevention programs. In the analysis, this item appears twice, with loading values of 0.791 and 0.652, respectively. The high loading of 0.791 indicates that school programs are considered a primary pillar in the fight against cyberbullying. The descriptive statistics associated with this item—a mean of 2.97 and a mode of 3—suggest that while respondents recognize the importance of these programs, their effectiveness is rated as moderate. This moderate rating might reflect several factors inherent to school settings. Schools are traditional institutions for imparting education and fostering social norms, yet they may be constrained by limited resources, varying levels of teacher preparedness, and inconsistent implementation of policies. The fact that the same item appears twice, with slightly different loadings, emphasizes its significance across multiple dimensions of the educational outreach effort. It also suggests that while schools are pivotal in shaping the discourse around cyberbullying, there is an evident need for improvement in program delivery to move beyond a moderate level of effectiveness.

Schools, as educational institutions, provide a structured environment where students can learn not only academic subjects but also essential life skills such as empathy, respect, and responsible digital citizenship. In the context of cyberbullying, school-based programs typically incorporate curriculum components that address the consequences of online harassment, promote positive behavior, and encourage the reporting of bullying incidents. Despite these initiatives, the moderate mean score of 2.97 implies that respondents may feel that these programs are only partially effective. This could be due to several reasons. For example, schools might face challenges integrating cyberbullying prevention into an already crowded curriculum, or there might be a lack of specialized training for educators on the nuances of online behavior. Additionally, the rapid evolution of digital communication channels means that school programs must continually update their content and strategies to remain relevant—a task that is often easier said than done.

Complementing the role of school-based initiatives are community-based initiatives, which received a loading value of 0.719. With a mean of 3.27 and a mode of 3, community-based initiatives are viewed slightly more favorably than school programs. These initiatives are typically characterized by grassroots efforts that involve local organizations, parent groups, and community leaders working together to create safe digital environments. The higher mean suggests that community initiatives might be more flexible and context-specific than their school counterparts. They can be tailored to address the unique needs of different neighborhoods or cultural groups, thereby potentially achieving greater resonance with the target audience. The mode of 3 across this item indicates a general consensus on its moderate effectiveness, yet the slightly elevated mean (3.27) hints at a greater degree of optimism among respondents regarding the impact of community-based efforts.

Community initiatives often serve as a bridge between institutional policies and the everyday experiences of individuals. They provide a localized platform for dialogue, support, and mutual learning. For instance, community workshops, local support groups, and neighborhood campaigns can foster a sense of collective responsibility and vigilance. These initiatives can also adapt more rapidly to emerging trends and challenges compared to more bureaucratic school systems. However, even with these advantages, the effectiveness of

community-based initiatives is still rated as moderate. This suggests that while they hold promise, there is still a need for enhanced coordination, resource allocation, and perhaps more innovative approaches to maximize their impact on cyberbullying prevention. The final element in the Awareness and Educational Outreach Measures component is the perceived effectiveness of social media campaigns, which registers a loading value of 0.628. Social media campaigns are a relatively modern tool for spreading awareness about cyberbullying. With a mean of 3.13 and a mode of 3, these campaigns are perceived as moderately effective by respondents. The power of social media lies in its ability to reach a wide audience rapidly and engage users in a dynamic and interactive manner. Campaigns on platforms such as Facebook, Twitter, Instagram, or TikTok can disseminate information quickly, encourage participation through hashtags and challenges, and foster an online culture that discourages cyberbullying.

Despite these advantages, moderate ratings suggest that the impact of social media campaigns may be transient. The viral nature of social media means that while messages can achieve high visibility in a short span of time, sustaining that impact and translating awareness into long-term behavioral change remains a challenge. The moderate mode of 3 further indicates that although many respondents recognize the potential of social media campaigns, there is an underlying skepticism about their durability and consistency. This skepticism may stem from the perception that social media trends are often short-lived, and that campaigns may not always address the root causes of cyberbullying.

Collectively, these three types of interventions—school-based programs, community-based initiatives, and social media campaigns—form a coherent framework centered on education and awareness. The high overall variance explained by this component (68%) underscores the pivotal role that awareness and educational outreach play in shaping public perceptions of cyberbullying prevention. In other words, most respondents' attitudes toward preventing cyberbullying are influenced by how well these educational and outreach measures are implemented and perceived.

The analysis of these items provides important insights into the strengths and weaknesses of current cyberbullying prevention strategies. On the one hand, the high loadings associated with school-based programs (0.791 and 0.652) emphasize that educational institutions are viewed as key arenas for intervention. Schools are not only places for academic learning but also environments where social behavior is cultivated. The emphasis on school-based prevention reflects an understanding that early intervention can set the stage for lifelong digital citizenship.   However, the moderate descriptive statistics—specifically, the mean of 2.97—signal that there is significant room for improvement. Enhancements might include better teacher training, updated curricula that reflect current digital trends, and increased investment in programs that address the psychological aspects of cyberbullying.

Similarly, community-based initiatives, with a loading of 0.719 and a mean of 3.27, reveal that localized, grassroots efforts are perceived as effective, perhaps even more so than institutional programs. The slightly higher mean indicates that community initiatives may benefit from their adaptability and closer connection to the lived experiences of individuals. They can be tailored to reflect local cultural values and address specific issues that may not be adequately covered by broader school-based programs. Nevertheless, the mode of 3 points to a consensus that, while beneficial, these initiatives are not yet achieving optimal effectiveness. This calls for strategies to enhance community engagement, such as increased collaboration with local stakeholders, more frequent feedback loops, and a greater focus on sustainability.

The role of social media campaigns in the awareness component is equally intriguing. With a loading of 0.628 and a mean of 3.13, social media campaigns emerge as a vital tool for information dissemination. They have the unique capacity to mobilize large groups of people quickly and can create powerful movements through viral content. However, their transient nature—as suggested by the moderate rating—indicates that while they are effective in generating short-term awareness, they may struggle to maintain momentum over time. To improve their impact, it might be necessary to integrate social media campaigns with more enduring educational efforts, ensuring that the messages delivered online are reinforced by offline initiatives such as school programs and community events.

Beyond the individual contributions of each intervention, the combined effect of these strategies highlights a broader trend in the field of cyberbullying prevention. The fact that the Awareness and Educational Outreach Measures component explains 68% of the total variance suggests that educational interventions are the dominant factor influencing public perceptions. This dominance is not surprising, given that education is widely recognized as a fundamental tool for addressing social issues. In the case of cyberbullying, education serves not only to inform individuals about the risks and consequences of harmful behavior but also to empower them to take proactive steps in their digital lives.

The implications of these findings are significant for policymakers, educators, and community leaders. First, the moderate ratings across the board indicate that while there is a foundational level of effectiveness in current programs, there is ample room for enhancement. In schools, for example, administrators could consider investing in specialized training for teachers on digital safety, incorporating interactive and scenario-based learning modules, and fostering partnerships with experts in cyberpsychology. Enhancing the quality of school-based programs could lead to higher mean ratings, moving from a moderate effectiveness to a more robust, impactful level.

Community-based initiatives, too, could benefit from additional support and coordination. Local governments and community organizations might collaborate to design comprehensive programs that integrate cyberbullying prevention with broader initiatives on youth empowerment and digital literacy. By fostering a

collaborative environment that includes parents, educators, and community leaders, these initiatives could address the unique challenges faced by specific neighborhoods, thereby increasing their overall effectiveness. Furthermore, while social media campaigns are inherently dynamic, there is potential to improve their lasting impact. Campaign designers could focus on creating content that not only attracts immediate attention but also encourages ongoing engagement and dialogue. For example, campaigns that incorporate user-generated content, interactive challenges, or follow-up educational sessions might help sustain interest over longer periods. Integrating social media efforts with traditional educational outreach can create a more cohesive and sustained approach to cyberbullying prevention.

It is also important to consider the broader societal context in which these interventions operate. The digital landscape is continuously evolving, and new platforms and technologies are constantly emerging. As such, cyberbullying prevention strategies must be flexible and adaptive. Educational programs and community initiatives should be designed with an eye toward future developments, ensuring that they remain relevant and effective as digital trends change. The moderate effectiveness ratings observed in this analysis could, in part, reflect the challenges of keeping pace with rapid technological change. Continuous evaluation, feedback, and adaptation are therefore essential components of any long-term strategy.

In summary, the Awareness and Educational Outreach Measures component represents a comprehensive and multifaceted approach to preventing cyberbullying. It encompasses school-based programs, community initiatives, and social media campaigns—each of which contributes uniquely to raising awareness and fostering behavioral change. The strong loadings associated with these items (0.791 for school programs, 0.719 for community initiatives, 0.652 for the repeated school program, and 0.628 for social media campaigns) highlight their importance in the overall framework. However, the moderate descriptive statistics—mean values ranging from 2.97 to 3.27 and consistent modes of 3—indicate that while these strategies are recognized as effective to some extent, there is significant potential for improvement.

Given that this component explains 68% of the total variance in respondents' perceptions, enhancing awareness and educational outreach is critical to a successful cyberbullying prevention strategy. Moving forward, efforts should focus on improving the implementation and quality of these programs, ensuring that they are both adaptable to evolving digital environments and responsive to the specific needs of diverse communities. By doing so, policymakers and practitioners can build a more informed, engaged, and resilient digital community that is better equipped to prevent and address cyberbullying in all its forms.

Regulatory and Technological Control Measures

In today's digital society, the proliferation of cyberbullying has spurred an urgent need for interventions that not only educate and create awareness but also provide direct, immediate responses to harmful online behavior. Component 2—Regulatory and Technological Control Measures—captures the latter category by focusing on strategies that empower users and institutions to react swiftly and decisively when cyberbullying occurs. Although this component explains 22% of the total variance—compared to the larger 68% explained by educational outreach—it represents a critical pillar in the overall architecture of cyberbullying prevention. Its significance lies in its ability to deliver actionable, enforceable protections that address cyberbullying in real time, mitigating harm while reinforcing a structured digital environment.

The first element within this component is the perceived effectiveness of reporting and flagging mechanisms, which boasts the highest loading at 0.789. With a mean rating of 3.34 and a mode of 3, respondents indicate a moderate level of confidence in these systems. Reporting and flagging mechanisms are ubiquitous on digital platforms, serving as the first line of defense by enabling users to alert administrators to abusive content. Their high loading suggests that these systems are conceptually central to the regulatory response, as they represent the initial point of contact between victims and the institutions responsible for safeguarding online communities. However, the moderate descriptive statistics highlight a critical caveat: while users appreciate the existence of such tools, there remains a pervasive concern regarding their practical efficacy. For instance, delays in response time, inconsistent enforcement, or opaque processes for resolving reports can erode user trust. Such shortcomings may discourage individuals from reporting incidents altogether, thereby undermining the protective potential of these mechanisms. In this context, enhancing the transparency, speed, and reliability of reporting systems becomes a paramount goal.

Closely following in importance is the effectiveness of filtering and blocking tools, which register a loading of 0.726. With an identical mean of 3.34 and a mode of 4, these technological measures are perceived slightly more favorably than reporting mechanisms. Filtering and blocking tools offer users immediate control over their digital environments by automatically screening out content deemed abusive or harmful. The relatively high mode of 4 indicates that a significant portion of respondents view these interventions as quite effective. The appeal of such tools lies in their proactive nature: instead of waiting for an incident to be reported and addressed, users can preemptively shield themselves from exposure. The immediacy of this defense is particularly important in mitigating the psychological impact of cyberbullying, as it reduces the chance for harmful content to circulate widely. Nonetheless, these tools are not without their challenges. Sophisticated bullies may use multiple accounts or alternative communication channels to bypass filtering algorithms, and there is also the risk of over-blocking, where benign content might be inadvertently filtered out. Despite these issues, the positive perception of filtering and blocking tools underscores the critical role of technological innovation in creating a safer online experience.

Parental control software tools are another integral part of this regulatory component, with a loading of 0.581, a mean of 3.25, and a mode of 3. These tools are particularly relevant in the context of protecting minors, as they provide parents with the means to monitor and restrict their children's online activities. While the lower loading compared to other items might suggest a more mixed perception, parental controls still represent an important safeguard. Their moderate ratings may be attributed to a variety of factors. On the one hand, these tools empower parents to create a controlled environment that limits children's exposure to potentially harmful interactions. On the other hand, they are often criticized for being overly restrictive or invasive, leading to concerns about privacy and the erosion of trust between parents and children. Additionally, as children become increasingly tech-savvy, the efficacy of parental controls can diminish if young users find ways to circumvent restrictions. In light of these challenges, the role of parental control software should be viewed as part of a broader, multi-faceted strategy that includes both technical solutions and open communication within families. By integrating these tools with educational initiatives that promote digital literacy among both parents and children, it may be possible to achieve a more balanced and effective approach to online safety.

The final element of Component 2 is the perceived effectiveness of legal awareness and corrective measures. This item, with a loading of 0.523, a mean of 3.33, and a mode of 4, reflects the importance of formal, institutional responses to cyberbullying. Legal awareness encompasses initiatives aimed at educating the public about their rights and the legal repercussions of engaging in cyberbullying, while corrective measures involve the actual enforcement of laws designed to deter such behavior. The relatively lower loading suggests that, while legal interventions are valued, they may be perceived as less immediate or impactful compared to technological solutions. The moderate mean indicates a cautious optimism—respondents seem to believe in the deterrent power of legal frameworks, yet they remain aware of the practical challenges associated with legal recourse. These challenges include inconsistent enforcement, lengthy judicial processes, and the potential for legal measures to be inaccessible to certain segments of the population. Nevertheless, the high mode (4) for this item signifies that a substantial number of respondents have strong confidence in the potential of legal measures when they are applied effectively. Legal interventions not only provide a formal mechanism for addressing cyberbullying but also serve to signal societal intolerance for abusive behavior online. In this way, legal awareness and corrective measures contribute to the broader cultural narrative that cyberbullying is unacceptable and subject to punitive action.

When taken together, these four elements illustrate a coherent and multifaceted approach to direct intervention in cyberbullying. Regulatory and Technological Control Measures, as a component, emphasize immediate, actionable strategies that provide users with both preemptive defenses and post-incident remedies. This dual approach is vital in a digital environment where harm can occur rapidly and spread widely before awareness and remedial measures can be mobilized. The component's ability to explain 22% of the variance indicates that while it may not dominate public perceptions to the same extent as educational initiatives, it nonetheless occupies a critical niche in the overall strategy for combating cyberbullying.

The practical implications of these findings are significant. First, the high loading and moderate rating for reporting and flagging mechanisms highlight the need for digital platforms to continuously improve their incident response systems. Enhancing the speed, transparency, and accountability of these systems could significantly boost public confidence and encourage more proactive reporting, thereby facilitating quicker interventions. Second, the favorable view of filtering and blocking tools suggests that investments in technology that empower users to control their digital environment are well-placed. Continuous updates to filtering algorithms and user interface improvements can help ensure that these tools remain effective even as cyberbullying tactics evolve.

Third, the analysis of parental control software tools points to a nuanced understanding of their role in cyberbullying prevention. While these tools are essential for protecting younger users, there is a clear need for approaches that balance supervision with respect for privacy. Educating parents about digital safety and fostering open dialogues between parents and children could enhance the effectiveness of these tools and mitigate some of the concerns associated with them. Finally, the insights regarding legal awareness and corrective measures call for greater efforts in promoting digital rights and improving the accessibility of legal recourse. Public awareness campaigns, targeted legal literacy programs, and streamlined procedures for addressing cyberbullying cases could help bridge the gap between the theoretical benefits of legal frameworks and their practical application.

Table 3: Component Loadings

Rotated Component Matrix

	Component	
	1	2
Perceived effectiveness of online resources and tutorials help in addressing cyberbullying incidents	0.791	
Perceived effectiveness of community based initiatives help in addressing cyberbullying incidents	0.719	
Perceived effectiveness of school's cyberbullying prevention programs	0.652	
Perceived effectiveness of social media campaigns help in addressing cyberbullying incidents	0.628	
Perceived effectiveness of Reporting and Flagging Mechanisms help in addressing cyberbullying incidents		0.789
Perceived effectiveness of Filtering and Blocking tools help in addressing cyberbullying incidents		0.726
Perceived effectiveness of Parental Control Software tools help in addressing cyberbullying incidents		0.581
Perceived effectiveness of Legal awareness and Corrective measures help in addressing cyberbullying incidents		0.523
Extraction Method: Principal Component Analysis.		
Rotation Method: Varimax with Kaiser Normalization.		
a. Rotation converged in 3 iterations.		

Furthermore, the integration of regulatory and technological measures into the broader context of cyberbullying prevention speaks to a multi-layered approach that is essential for addressing the complex nature of online abuse. Whereas educational initiatives (as captured by Component 1) aim to reshape societal attitudes and build long-term resilience against cyberbullying, the measures encompassed in Component 2 are designed to provide immediate, concrete protection when incidents occur. The balance between these two approaches is critical. For instance, even the most well-informed and digitally literate population remains vulnerable if there are no effective mechanisms in place to respond to breaches of safety. Conversely, a reactive system that relies solely on technological fixes without addressing the underlying cultural and educational factors may fail to prevent the recurrence of harmful behavior.

In this context, regulatory and technological interventions act as both a safety net and a deterrent. They not only protect individuals in the moment but also contribute to a broader culture of accountability. When users see that there are robust systems in place to report, filter, and penalize abusive behavior, it sends a clear message that cyberbullying will not be tolerated. This, in turn, reinforces the educational efforts aimed at fostering respectful and responsible online interactions. The interplay between these two domains—awareness and regulation—is where the true strength of a comprehensive cyberbullying prevention strategy lies.

Moreover, the technological landscape is in a state of constant evolution, necessitating that regulatory and technological measures are dynamic and adaptable. The loadings observed in this component suggest that while current measures are viewed as moderately effective, there is significant potential for improvement. Rapid advancements in artificial intelligence, machine learning, and data analytics offer promising avenues for enhancing the precision and responsiveness of reporting and filtering systems. Future developments in these fields could lead to more proactive detection of cyberbullying behaviors, potentially preventing harm before it escalates.

At the same time, legal frameworks must also evolve to keep pace with technological change. The digital domain often outstrips the speed at which traditional legal systems operate, creating gaps that can be exploited by those who engage in cyberbullying. Thus, continuous reform and modernization of legal policies are required to ensure that they remain relevant and effective. Collaborative efforts between lawmakers, technology experts, and civil society organizations could yield more agile legal mechanisms that are better suited to the challenges of the digital age.

In conclusion, Component 2—Regulatory and Technological Control Measures—offers a critical perspective on the immediate, action-oriented strategies necessary for mitigating cyberbullying. With its elements ranging from reporting and flagging mechanisms to filtering tools, parental controls, and legal corrective measures,

this component encapsulates the direct interventions that provide users with tangible, enforceable protection against online abuse. Although it explains 22% of the overall variance—a smaller share compared to the educational outreach measures—it plays an indispensable role in the comprehensive prevention strategy. Its elements underscore the need for robust systems that can respond quickly to incidents, empower users to control their digital environment, and enforce legal accountability.

Ultimately, a balanced cyberbullying prevention framework must integrate both long-term educational efforts and immediate regulatory and technological safeguards. Only by harmonizing these approaches can policymakers, educators, and digital platform developers create an environment that not only prevents cyberbullying but also respond decisively when it occurs. The insights derived from the analysis of Component 2 serve as a valuable guide for refining existing interventions and developing new strategies that are both proactive and reactive, ensuring that all users are protected in the ever-changing digital landscape.

Conclusion

The study examined perceptions of cyberbullying prevention strategies among digitally active youths and adults in Imphal by analyzing respondents' ratings on a five-point Likert scale. Two principal components emerged from the analysis, explaining a combined 90% of the total variance. The first component, Awareness and Educational Outreach Measures, accounts for 68% of the variance. This component encompasses school-based cyberbullying prevention programs (which appeared twice with loadings of 0.791 and 0.652), community-based initiatives (loading 0.719), and social media campaigns (loading 0.628). These strategies collectively emphasize the importance of education, community engagement, and digital citizenship in the long-term prevention of cyberbullying. Descriptive statistics reveal that school-based programs and online outreach efforts are generally rated at a moderate level (with means around 2.97 to 3.13 and modes consistently at 3), while community initiatives show a slightly higher mean (3.27) suggesting a modestly stronger approval. The distribution patterns—indicated by the box plots—show that responses for these educational and outreach strategies are relatively concentrated around the median value, pointing to a consensus on their moderate effectiveness, yet also signaling room for improvement in implementation and outreach.

In contrast, the second component, Regulatory and Technological Control Measures, explains 22% of the total variance and reflects strategies that provide immediate, concrete interventions to address cyberbullying. This component includes reporting and flagging mechanisms (with a high loading of 0.789, mean of 3.34, and mode of 3), filtering and blocking tools (loading 0.726, mean of 3.34, and mode of 4), parental control software tools (loading 0.581, mean of 3.25, mode of 3), and legal awareness and corrective measures (loading 0.523, mean of 3.33, mode of 4). Distribution analysis of these measures indicates a more varied pattern: filtering and blocking tools are generally viewed favorably, with a median leaning toward 4 and many respondents expressing strong confidence in their ability to offer immediate protection. Conversely, parental control software exhibits a wider spread, reflecting mixed perceptions—likely due to concerns about circumvention and privacy issues. Reporting and flagging mechanisms, despite being essential for immediate intervention, reveal a moderate consensus, possibly due to inconsistent response times or enforcement. Similarly, legal measures, while holding a strong deterrent appeal for some (as indicated by the mode of 4), are rated moderately on average due to practical challenges in implementation and enforcement.

Synthesizing these findings, it becomes clear that the dual approach represented by the two components is both complementary and necessary. The Awareness and Educational Outreach Measures focus on shaping long-term behaviors through education, community engagement, and digital literacy initiatives. They lay the groundwork for a culture of responsible digital citizenship, even if their current effectiveness is only moderate and could benefit from further enhancement. On the other hand, the Regulatory and Technological Control Measures provide immediate, tangible means of protecting users from cyberbullying through technical, parental, and legal interventions. While these measures offer rapid response and control over harmful content, their effectiveness is also tempered by issues such as inconsistent enforcement, potential privacy intrusions, and the evolving nature of digital communication platforms.

The distribution of responses, as depicted by the box plots, reveals a consistent pattern: while respondents generally agree on the moderate effectiveness of educational and outreach strategies, there is more variability in the ratings of regulatory and technological measures. This variability suggests that although direct intervention tools are valued, there is a clear need for improvement in aspects such as response speed, transparency, and adaptability to new digital threats. Taken together, these findings imply that a successful cyberbullying prevention strategy must integrate both long-term educational initiatives and short-term, reactive measures.

In short, the study's analysis demonstrates that cyberbullying prevention requires a balanced, multi-faceted approach. The Awareness and Educational Outreach Measures—accounting 68% of the variance—highlight the foundational role of schools, community efforts, and social media in building digital awareness and fostering positive behavior. Simultaneously, the Regulatory and Technological Control Measures—explaining 22% of the variance—underscore the importance of having robust, responsive systems in place to immediately address and deter harmful behavior online. Although both sets of measures are perceived as moderately effective, the synthesis of these findings indicates that neither approach alone is sufficient. Instead, a comprehensive strategy that harmonizes educational outreach with direct regulatory and technological interventions is essential. Such an integrated approach can not only mitigate the immediate impacts of

cyberbullying but also promote a long-term culture of respect and accountability in the digital space. Policymakers, educators, and digital platform developers should therefore focus on enhancing both dimensions—improving the quality and consistency of awareness campaigns while simultaneously strengthening the technical and legal infrastructures that safeguard users. This dual focus will be key to developing a more resilient and effective response to the evolving challenges of cyberbullying.

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