

# Implementing Cyber Security tools and/or techniques in The reduction of cyberbullying



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# CONTENTS

1. Introduction .....	3
2. Types of Cyberbullying.....	4
3. People Involved .....	6
4. Cyberbullying tools.....	7
5. Impact of Cyberbullying.....	8
6. Cyberbullying Detection .....	9
7. Challenges in detection.....	10
7.1 Language Challenge.....	10
7.2 Dataset Challenge .....	10
7.3 Data Representation Challenge .....	10
8. Cyberbullying Prevention .....	11
8.1 Awareness programs .....	11
8.2 Natural Language Processing (NLP).....	11
8.3 Preventing cyberbullying through instant messaging apps .....	12
8.4 Apps for preventing cyberbullying .....	13
9. Conclusion .....	17
References.....	18

## 1. INTRODUCTION

Cyberbullying is when someone threatens or harasses another person online. Cyberbullying is defined as a group or individuals using telecommunication privileges to threaten others across communication networks. However, many scholars on cyberbullying define cyberbullying as "willful and persistent injury committed through the medium of electronic text" (Hamiza Wan Ali, Mohd and Fauzi, 2018). Before the Internet and mobile phones introduction, the term "cyberbullying" did not exist. However, it has evolved into something that may now ruin people's daily lives. Someone who is not a bully in the real world may become one online due to the anonymity of cyberbullying. To enter online social networks and terrorize others, cyberbullies only need access to the Internet (Zainudin et al., 2016).

## 2. TYPES OF CYBERBULLYING

In present-day communication channels, there are many different types of cyberbullying that have been reported. The various types are:

- **Flaming:** starting an argument online.
- **Harassment:** The victim receives disrespectful and harsh texts frequently; this is the most prevalent type of cyberbullying because most of the literature tries to address it.
- **Cyberstalking:** Threatening or offensive texts are sent to the victim. The victim feels terror as a result.
- **Masquerade:** The bully makes a false persona out of themselves.
- **Trolling:** making offensive comments on social media sites with the express purpose of upsetting other users.
- **Denigration:** spreading unfavorable rumors about another individual
- **Outing:** divulging sensitive facts about someone else in public forums.
- **Exclusion:** the act of keeping someone out of a social group.
- **Catfishing:** when someone creates a false internet presence in order to trick people while using another person's identity as their own
- **Dissing** is the act of publishing details or fantasies about another person with the purpose to harm their popularity or reputation.
- **Trickery:** This is when someone manipulates you into believing they are trustworthy so you will divulge your secrets or private information to them so they can use it to share it with the public online.

- **Fraping:** When someone logs into your social media account while feigning ownership, they start uploading inappropriate stuff to make it appear as though you posted it (Mahlangu, Tu and Owolawi, 2018).

### 3. PEOPLE INVOLVED

There are numerous causes for cyberbullying. According to the Stopbullying.gov website, there are two groups of people who are more inclined to bully: those who are social outcasts and those who are popular. To remain popular and feel powerful, teens bully others, while teenagers who are less socially skilled bully to provide them with means to deal with their self-esteem issues. Either they don't have the ability to feel empathy for the people they affect, or they think it will help them fit in with their peers. Additionally, a few factors influence people's decision to bully online. Bullies can remain anonymous for several reasons, including the fact that it takes less guts and gives the impression that they will not be detected. The National Council on Crime Prevention claims that in a survey of teens, 81% claimed that despite being oblivious of the hurt they have caused to others, they find cyberbullying entertaining. (Zainudin et al., 2016).

Most of the effects of cyberbullying can be seen in the victim's increased sensitivity to their environment, complete emotional change, feelings of insecurity while using social media, anxiety when receiving messages or emails, and avoidance of social situations with family, friends, and crowds, among other effects. Bipolar sleep condition, refraining from using technology and attempting to commit suicide (Amarah et al., 2020).

## 4. CYBERBULLYING TOOLS

According to Fig. 1, online social networks are the most frequently used tools for bullying. One reason is that many people use these platforms as their primary online communication. There is a lot of information posted there that cyber bullies might exploit to initiate incidents. In cases of cyberbullying, Instagram may provide more image and video data than Facebook and Twitter. Someone may capture images of victims, alter them into something vulgar, and then distribute them on social media. So many people will see it, condemn it, and it will harm a person's reputation and self-esteem. The victim may become disheartened because of the comments displayed beneath the photo (Zainudin et al., 2016).

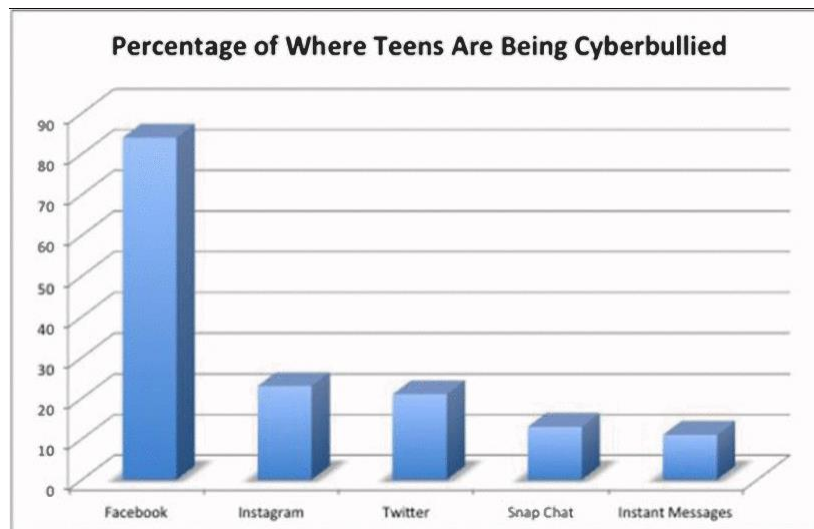


Fig. 1: Cyberbullying tools (Zainudin et al., 2016)

## 5. IMPACT OF CYBERBULLYING

There is a significant link between engaging in cyberbullying and having an emotional problem, and the study found a correlation between oppression from cyberbullying and depressive affect. The study discovered that 32% of the people who had been the targets of cyberbullying had at least one stress symptom. Children who are the targets of cyberbullying sustain a great deal of the same harm as someone who is the target of traditional bullying. These consequences may include a decline in academic performance and a loss of confidence. There may be other saving effects. Recent research demonstrates that fear is the most common emotional side effect that cyberbullying victims share (Mahlangu, Tu and Owolawi, 2018).



## 6. CYBERBULLYING DETECTION

Numerous platforms, including text messaging, instant conversations, social media, and online games, are used for cyberbullying. According to [statisticbrain.com](http://statisticbrain.com), Facebook topped the social media sites where cyberbullying most frequently occurs (Hamiza Wan Ali, Mohd and Fauzi, 2018). Cyberbullying detection studies are based on the following:

- Content
  - Profanity
  - Negativity
  - Subtlety
- User
  - Intelligence
  - Race and Culture
  - Sexuality
- Sentiment
- Network

## 7. CHALLENGES IN DETECTION

### 7.1 Language Challenge

In terms of research, the study of cyberbullying is still in its infancy. Positive message verses may occasionally be expressed to convey sarcasm. However, identifying bullying might be challenging because it is very subjective and subtle. Additionally, with the advancement of technology and language in the current world, both are expanding quickly. Teenagers' vocabulary is changing swiftly in this area, impacting the keywords used to detect cyberbullying (Hamiza Wan Ali, Mohd and Fauzi, 2018).

### 7.2 Dataset Challenge

Data extraction from social media is harrowing because it involves private information, and social media platforms do not readily disclose data. As a result, accessing information like a list of friends could be difficult. Additionally, data labelling or annotation is a challenging operation because it necessitates the assistance of professionals to label (Hamiza Wan Ali, Mohd and Fauzi, 2018).

### 7.3 Data Representation Challenge

Most scholars only study bullying language in communications. However, obtaining content-based traits presents its own set of difficulties. Performance in detecting cyberbullying may suffer if a user's account does not include information like gender or age. Nevertheless, users' language should be examined to estimate their age. Finding age-related words may take some time (Hamiza Wan Ali, Mohd and Fauzi, 2018).

## 8. CYBERBULLYING PREVENTION

### 8.1 Awareness programs

Understanding the issues requires education. Therefore, it is crucial to provide teachers and parents with professional assistance to spread knowledge about cyberbullying so that it can be identified, reported, and handled. Children in schools aged 9 to 11 should be subjected to experimental sensitive education programs that focus on the victims or a particular target. They should be taught about cyberbullying, its repercussions, and the benefits of the Internet, all of which will favour the child's views and behaviours (Amarah et al., 2020).

Game-based learning helps to increase awareness among children. One such approach is as follows:

The player must make friends when they begin at a new school. However, more and more in-game characters will start cyberbullying the player daily in various ways. To combat cyberbullying, players can choose differently while engaging with other game characters. For instance, maintaining a positive relationship with their parents by speaking with them about events at school, asking the teacher for assistance when they run into difficulties, avoiding conflict with bullies, keeping their social media passwords to themselves, or being kind to other classmates all result in positive points (Calvo-Morata et al., 2021).

### 8.2 Natural Language Processing (NLP)

Create a system that uses NLP to categorize social media content. This system will be used to categorize user postings and comments, which will be further examined and

categorized into categories like Crime, Riots, Worst, or Vulgar. NLP (Natural Language Processing) method is used for sentiment analysis on user posts and comments to identify user sentiments. Therefore, this technique will be beneficial in promptly filtering anything that violates moral standards, is insulting, or is unethical (Quayyum, Cruzes and Jaccheri, 2021).

### 8.3 Preventing cyberbullying through instant messaging apps

Every instant messaging app has a thorough written policy stating that posting bullying, harassing, threatening, demeaning, hateful, or offensive content is not acceptable. The instant messaging apps' most popular and widely advised anti-cyberbullying tactics include blocking, reporting complaints to an official email address, and unfollowing/removing. An internal feature in WhatsApp, Kik, and Instagram allows users to report instances of cyberbullying. Snapchat, Google Hangout, and WhatsApp all have a help/support/safety centre with advice and tips for online security. When it comes to cyberbullying, the recommendations made by messaging apps include the following:

- a) Talking to the perpetrator(s) about the issue
- b) Aiding the victims if an incident is observed
- c) Refraining from retribution
- d) Reconsidering before transmitting or posting a detrimental content
- e) Contacting the local authorities or law enforcement
- f) Finding out more from other online resources like [stopbullyingnow.hrsa.gov](http://stopbullyingnow.hrsa.gov), [ncpc.org/cyberbullying](http://ncpc.org/cyberbullying), [cyberbullying.us](http://cyberbullying.us), [connectsafely.org](http://connectsafely.org), [cyberbullying.org](http://cyberbullying.org) and [stopbullying.gov](http://stopbullying.gov)

- g) Requesting assistance and direction from reliable sources (Topcu-Uzer and Tanrıku, 2018).

#### 8.4 Apps for preventing cyberbullying

Fig. 2, 3 and 4 list the app for preventing cyberbullying. Certain apps are aimed to enhance awareness about cyberbullying, and certain apps are targeted towards parents and children and provide information about how to react to a cyberbullying incident and prevent incidents before they escalate. Eleven apps provided helpful information regarding the nature and preventive and intervention measures. On the other hand, four apps work without providing such data. The applications for cyberbullying use various tactics. The two most popular methods were playing online games and reading to learn new information. In addition to video segments, quizzes, and comics, the apps used blocking, reporting, evidence-saving/sharing, and rethinking tactics. Four applications were interventions, one app was made for prevention and intervention, and most of the apps were preventative (Topcu-Uzer and Tanrıku, 2018).

Name	Aim	Content	Strategy	Preventive or interventional
Back Off Bullies	Providing awareness about cyberbullying	Information about the nature and prevention methods of cyberbullying	- Playing an online game, which provides information about cyberbullying	Preventive
BeCybersafe Game	Providing awareness about cyberbullying	Information about the nature and prevention methods of cyberbullying	- Playing an online game, which provides information about cyberbullying	Preventive
Bully Block	Saving the cyberbullying-related materials and blocking the cyberbullies	No specific content is provided	<ul style="list-style-type: none"> <li>- Blocking a phone number used for cyberbullying purposes</li> <li>- Blocking a phone call of a cyberbully by aborting a call, making the cyberbully listen a busy signal or an automatic voice message</li> <li>- Blocking an SMS with cyberbullying content and sending automatic text message respond to the cyberbully</li> <li>- Recording the cyberbullies' voice during the cyberbullying calls besides in real-life situations</li> <li>- Creating and saving a file for audio, video, photo, or written cyberbullying materials to be used as evidence</li> <li>- Sending the audio, video, photo, or written records to the necessary authorities</li> </ul>	Interventional
Bully Mysteries	Providing awareness about cyberbullying	A short story about a cyberbullying incident	- Solving the mystery provided in the story	Preventive

Fig. 2: Apps for preventing cyberbullying (Topcu-Uzer and Tanrikulu, 2018)

Name	Aim	Content	Strategy	Preventive or interventional
Clear Cyberbullying	Providing awareness about solutions to cyberbullying	Information about the nature and prevention methods of cyberbullying	- Playing online games, which provide information about cyberbullying	Preventive
Cyberbullying By Grey Lab	Providing awareness about cyberbullying	Information about the nature and prevention methods of cyberbullying	- Reading about functional information about cyberbullying	Preventive
Cyberbullying By Maple Tree	Providing awareness about cyberbullying	Information regarding the definition, the nature, the impacts, the signs and the avoiding strategies of cyberbullying	- Reading about functional information about cyberbullying	Preventive
Cyberbullying First-Aid	Giving information about the tactics to fight against cyberbullying	Behavioral tips, encouragement, legal aspects, web links to counseling centers, instructions about reporting, blocking or deleting cyberbullying materials	- Watching the short video clips	Interventional
Cyberbully Hotline	Helping the students and parents anonymously report cyberbullying incidents in a safe setting	No specific content is provided	- Setting up an online system by using schools' phone numbers - Reporting cyberbullying incidents via text or voice messages - Enabling the school managers take care and respond to the cyberbullying incidents without knowing who reported the incidents	Interventional

Fig. 3: Apps for preventing cyberbullying (Topcu-Uzer and Tanrikulu, 2018)

Name	Aim	Content	Strategy	Preventive or interventional
Cyberbully Zombies Attack	Providing awareness about cyberbullying	Information about the nature and prevention methods of cyberbullying	- Playing online games, which provide information about cyberbullying	Preventive
Cybersafe	Giving information about the tactics to fight against cyberbullying	Information about how to save the evidence in cyberbullying incidents, how to keep online accounts safe from cyberbullies and the advices against cyberbullying	- Playing online games which provide information about cyberbullying	Preventive
Delete Cyberbullying	Providing awareness about cyberbullying	Information about the nature and prevention methods of cyberbullying	- Solving quizzes - Watching a short video clip - Asking for direct help in case of cyberbullying incidents	Preventive and interventional
Guardian Angel	Providing awareness about cyberbullying	No specific content is provided	- Reporting photos or the screenshots of the cyberbullying incidents to the related school counselor	Interventional
Professor Garfield Cyberbullying	Providing awareness about cyberbullying	Information about the nature and prevention methods of cyberbullying	- Reading comics - Solving quizzes	Preventive
Put an End to Cyberbullying	Providing awareness about cyberbullying	Information about the nature and prevention methods of cyberbullying	- Reading about functional information about cyberbullying	Preventive
ReThink	Preventing cyberbullying before it occurs	No specific content is provided	- Warning the users to stop and think again before sending a text message with cyberbullying content	Preventive

Fig. 4: Apps for preventing cyberbullying (Topcu-Uzer and Tanrikulu, 2018)



## 9. CONCLUSION

Cyberbullying partially appears to be a problem created by the affordances offered by online technologies. At the same time, it is still unclear whether it should be characterized as a relational or technological problem. Although technical tools provide several cyberbullying prevention and response measures, there is a severe lack of empirical data regarding their efficacy. Researchers continue to produce evidence-based but nontechnological remedies for cyberbullying, despite the technology companies' apparent scepticism about profiting from the sparse number of evidence-based technical solutions for cyberbullying. As a result, collaboration among technology providers, scholars, and other concerned parties is required to put in place a more effective action plan to prevent and intervene in cyberbullying (Topcu-Uzer and Tanrikulu, 2018).

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